# THE MEASUREMENT OF VALUES: A MULTIVARIATE ANALYSIS OF FIVE VALUE BATTERIES AND THE RELATION OF TWELVE VALUE DIMENSIONS TO BEHAVIORAL AND ATTITUDINAL VARIABLES

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## DEDICATION

I would like to dedicate this thesis to my mother and father.

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# THE MEASUREMENT OF VALUES: A MULTIVARIATE ANALYSIS OF FIVE VALUE BATTERIES AND THE RELATION OF TWELVE VALUE DIMENSIONS TO BEHAVIORAL AND ATTITUDINAL VARIABLES

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## ABSTRACT

The purpose of this study was twofold: (1) to determine to what extent the measures of values found in five value batteries reflected separable but identifiable, underlying value dimensions, and (2) to determine to what extent these value dimensions were related to other attitudes and behavior.

The first concern was an attempt to resolve to some extent the problem of the multiplicity of values by reducing them to more basic factors. Consequently, five contemporary value batteries composed of 67 value measures were administered to 208 Vancouver City College students. The five value batteries were the Scott Value Scales, the Morris Ways to Live (WTL), the Rokeach Surveys of Terminal and Instrumental Values and the Gordon Survey of Personal Values. The Rokeach and Gordon batteries were altered in format to lessen their ipsativity. In the non-ipsative forms, they were referred to as the Rok 1 (measuring Terminal values), the Rok 2 (measuring Instrumental values) and the Gordon SPV.

The intercorrelation matrix resulting from the administration of these five batteries was factorized according to the principal-components method. Eleven factors were obtained, and rotated to a varimax criterion (Kaiser, 1960). These eleven factors accounted for 62% of the variance of the intercorrelation matrix. An examination of the factors indicated that they were confounded with an unexpected element that was called 'battery variance'. That is, different measures of even the same apparent value seemed to be more greatly related to the battery of which they were a member rather than to each other. Consequently, it was decided to inquire further into the nature of the value domain as measured by these five value batteries.

A canonical redundancy analysis of the 10 possible value battery pairs was next undertaken in an effort to determine the extent to which the value batteries overlapped in what they were purporting to measure. The finding that there was little overlap between the five batteries led to the decision to factorize the value batteries individually.

The factors derived from the individual-battery factor analysis proved to be less confounded and more clearly definable. There were two factors from the Scott battery and three factors each from the Rokeach 1,

Rokeach 2 and the Ways to Live batteries and one factor from the Gordon battery. The two Scott value factors were labelled 'Social Conventionality' and 'Social Autonomy'. The three Rokeach 1 value factors were labelled 'Social Idealism', 'General Security' and 'General Satisfaction'. The three Rokeach 2 value factors were labelled 'Poised Concern for Others', 'Scrupulousness' and 'Free Thinking'. The three Ways to Live value factors were labelled 'Effacing Self-Concern', 'Social Activism' and 'Experiential Variety or Adventure'. The Gordon value factor was labelled 'Active, Systematic Practicality'.

The 12 individual-battery factors were then utilized as the independent variables in a stepwise regression analysis of 21 attitudinal and behavioral dependent variables, the second concern of the study. The latter were comprised of an Academic versus Technical Program Choice, Age, Sex, a measure of Machiavellian attitude, a measure of Conservativism, 10 measures of job preferences and 6 measures of personality type. Data on these 21 variables was obtained at the same time that the five value batteries were administered. The results of the regression analysis indicated ten statistically significant $R^2 \geq .20$ (at $p = .001$). Values appeared to be substantially related in particular to Academic versus Technical Program choice, Age, Sex, Machiavellianism, Conservativism, job preferences for an 'Interesting Experience',

'Security' and 'Profit', and to two personality types, the 'Realistic Type' and the 'Artistic Type' and these relationships and their size were discussed.

It was concluded that the results of both aspects of the study warranted further replication before any non-speculative conclusions would be justified. In general, it seems necessary to develop individual measures of values which do more justice to the complexity and subtlety of values, as well as batteries of values that will in fact map the entire domain, if that is possible, more definitely.

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# Chapter 1

# INTRODUCTION

## Statement of Purpose

The essential purpose of this thesis was to determine whether or not there are basic underlying values common amongst the chief value batteries presently being utilized in social psychological research on values. A secondary purpose was to investigate the predictive utility and functional relationships of this smaller set of values - if such a set was discovered. The empirical results were interpreted with a view to contributing to further knowledge of the nature and scope of the value domain.

## Scope of Study

In an attempt to achieve these goals the study was divided into two parts. Part I dealt with the identification and specification of the independent variables of concern, namely, values. Contingent with the exploratory nature of this study and the present undeveloped state of the field, sixty-seven value measures from five prominent value batteries were factorized. Since the factors derived appeared confounded, a canon-

ical analysis comparing one value battery with every other was undertaken. The results of the latter analysis indicated that each of the batteries was quite unique with very little overlap with respect to each of the other batteries. Thus, each battery was factorized individually in an effort to identify and specify the basic, underlying values comprising that battery. These factors were not confounded and were easily identifiable. It was concluded that they be utilized as the basic set of independent predictor variables for Part II of the study.

This second part of the study dealt with the predictive utility and functional relationships of values. Since the stability of the derived value-factors had not been demonstrated, only a general idea of the relationships between the derived value-factors and other attitudinal and behavioral variables was looked for. Consequently, a stepwise regression analysis was utilized in an effort to display the maximum relationships between the independent and dependent variables.

## Overview

Although the study of values is usually assumed important in the social sciences, the empirical investi-

gation of values remains a subordinate area within the field of social psychology. In its sister disciplines of anthropology, sociology and philosophy, the study of values has a fundamental importance and status (Williams, 1968). This chapter contains a brief overview of the social psychology of values. Chapter two reviews the literature concerning the various instruments utilized to measure values in social psychology. In chapter three the rationale of this study is outlined in detail. Chapter four specifies the methodology utilized and the particular independent and dependent variables involved. Chapter five reports the results of Part I and Part II. These results are discussed in chapter six.

The field of values in social psychology is only in its infancy. Even though the importance of values to understanding human behavior has often been reiterated, a substantially developed theory of the social psychology of values is lacking (Handy, 1970). The field also lacks, moreover, a tradition of theory construction and development (Baier, K. and N. Rescher, 1968). Consequently, while there is much empirical research, most of it is still at the stage of attempting to clearly specify the extent of the domain of values and to specify clearly the variables comprising this

domain. This task is not an easy one but is essential to the development of a social psychological theory of values. Yet, despite the importance of such work to the development of theory, other social psychological variables such as attitudes and beliefs have received much greater attention in empirical research. Although there are many techniques for the measurement of attitudes which have given rise to a wealth of empirical information and theoretical discussion concerning their nature and relation to behavior, most of the empirical work concerning values has been derived from one value battery, the Allport-Vernon-Lindzey Study of Values (Feather, 1970). But since the validity of this measurement instrument has been seriously questioned on both methodological and substantitive grounds, the credibility of much of the information obtained from the usage of this instrument, (and thus, of much of the empirical information available on the social psychology of values) remains seriously in doubt. Since this point is gone into detail below and in the next chapter, it will only be so mentioned for the time being.

## Reasons for the Lack of Attention

While the reasons for the lack of attention to values in social psychological research are varied

and complex, a major reason probably derives from the concern of psychologists to be scientific, and from the subsequent difficulties of applying rigorous, objective methods and measurement to the study of values. Thus, although Thurstone (1954, 1959) argued that the problem of developing a subjective metric for 'social values' was manageable with existing measurement techniques, the 'social values' he dealt with were more readily identifiable as attitudes or norms (these, of course, may embody values) than as values per se (Levitin in Robinson and Shaver, 1969, p. 407-8). Consequently, a vast amount of effort and time was expended on the study and measurement of attitudes without bothering to delineate clearly values from attitudes. In terms of research values were simply viewed as attitudes which were particularly intractable and especially difficult to measure. Hence, attitudes became the prominent focus of social psychological research and values were pushed into the background. As a result, a better consensus was reached amongst the researchers concerning the meaning of attitudes, and the methods both for measuring attitudes and for their experimental manipulation developed rapidly. Thus, the field of values has for the most part been overlooked by social psychological researchers. Furthermore, with

the confirmation of the experimentability of attitudes and the development of quantitative methods for studying them, there came the demand for attitude theories rather than value theories to explain the results. Thus, as a consequence of this secondary status, the social psychology of values has also remained in a rudimentary state theoretically.

## Refocussing on Values

Recent papers, however, have called for a refocussing of attention on values (Rokeach, 1968; Feather, 1970; Handy, 1970). Rokeach has argued that despite the apparent lack of agreement within the social sciences and social psychology on what a value means and on how to identify values, the time is ripe for a switch from attitude research as the central concern of social psychology to the empirical study of values and value systems. His argument is threefold:

> First, value seems to be a more dynamic concept since it has a strong motivational component as well as cognitive, affective, and behavioral components. Second, while attitude and value are both widely assumed to be determinants of social behavior, value is a determinant of attitude as well as of behavior. Third, if we further assume that a person possesses considerably fewer values than attitudes, then the value concept provides us

> with a more economic analytical tool for describing and explaining similarities and differences between persons, groups, and cultures. (Rokeach, p. 157, 1968).

Moreover, since value is a concept common to all the social sciences, research on values can act as an interdisciplinary bridge bringing the otherwise disparate social sciences together.

## The General Problem of the Social Psychology of Values

The general aim of a social psychological theory of values is mainly the development of a better understanding of how, and to what extent, values govern cognition, volition, conation, affection, and behavior. In particular, social psychologists and sociologists view values as central to choice behavior (Handy, 1970; Rescher, 1969) and to interpersonal conflicts (Kolb, 1957; Rose, 1955). The interest in values in this first case arises because they are implicitly indicated in an exhibited choice or preference behavior, especially in the case of a selective-rejective sort (Handy, 1970). The assumption here is that in any choice or decision situation, values are the implicit criteria on which choices and decisions (or preferences and selections) are based (Rescher, 1969). In the case of interpersonal conflict, values are seen

as basic to both the cause for conflict (i.e., conflicts are essentially over values), and the reason for whether resolution of the conflict occurs or not (i.e., whether values change or not) (Kolb, 1957). In both cases, values are seen as the major independent variable of concern. The specific problem which values present to social psychology as such is the determination of consistent attitudinal or behavioral preferences, for example, which are contingent on the values of the person. In order to demonstrate and verify these relationships, however, it is necessary to measure values as well as attitudes and behavior. The importance and indefiniteness of values only makes the development of these measures more challenging and urgent.

The measurement of values does not, however, proceed in a vacuum. There are notions both of values as a general concept and of particular values. In so far as the general notion of values is concerned, there are numerous conceptions. In an attempt to simplify the many and varied ways of conceiving of values as a general notion (Baier et al, 1968, have listed thirty-two such conceptions), Rescher (1969) has suggested that, rather than conceptualizing values themselves, attention be directed to the process of evaluation, and that it be construed as composed of three aspects: (1) the value object, (2) the locus of value, and (3) the underlying

values. In this schema the value object is the particular thing, whether object or idea, being evaluated, while the underlying values are the values proper, the abstract, universal, usually implicit sort of things with respect to which the value object is prized. The locus of value refers to the mechanism through which the benefit at issue in the value is to be realized. For example, in the following value statement, "Bill's legal expertise was of the greatest value for the preservation of Tom's career", 'Bill's legal expertise' is the value object, 'the preservation of Tom's career' the locus of value, and 'financial security' the underlying value. The idea of value is involved in each aspect of the process of evaluation so conceived, but the degree of abstractness and generality along a continuum is what distinguishes one aspect from another. While there may be an unlimited number of value objects, it is assumed by Rescher (p. 8, 1969) that the number of loci of value in any particular society is rather limited, and the number of underlying values even more limited. This assumption seems to be one on which all writers on values seem to be in accord in the field of social psychology.

## The Problem of Multiplicity

Although the conception of a process of evalua-

tion is a convenient framework for viewing the valuing person, the specification and identification of the underlying values is still a problem. If underlying values are viewed as containing all possible specific preferences or standards or desiderata, then the number of variables fulfilling this criteria becomes both practically and scientifically unmanageable. Consequently, underlying values are traditionally viewed as a relatively small number of basic tendencies or principles underlying the perhaps infinite number of specific, verbal or behavioral indicators. This conceptual restriction also reduces the enormity of the problem of multiplicity but does not do away with the issue. As will be seen below, the large number of contenders for underlying values conceptualized by value researchers still points to the presence of the problem. Aside from merely conventional, and thus somewhat arbitrary, attempts at reducing the problem of multiplicity, value researchers have usually tried to reduce this problem by empirical statistical methods.

## Empirical Problems of Multiplicity: The 'Humpty-Dumpty' versus the 'Every Little Movement' Approach to Value Measurement

Although several value batteries have been dev-

eloped in the last twenty years, and there is some empirical knowledge concerning the relationships between specific values and other variables, there has been little systematic empirical delineation of the scope and dimensions of the value sphere itself (Handy, 1970). This deficiency is no doubt partially due to the lack of a precise, testable theory specifying not only what specifically to measure but also what particular aspects to focus on. In the absence of such a theory, however, it is highly unlikely that one will develop if the researchers persist in adopting what Gulliksen (1968) refers to either as a "Humpty-Dumpty" view or an "Every Little Movement" view towards the measurement of values. In the "Humpty-Dumpty" view the value chosen to be measured is operationally defined by fiat. Then, the measure used by the researcher is automatically identified with the value being measured. That the measure does in fact measure the variable of concern is tacitly assumed. On the other extreme, the "Every Little Movement" view, the researcher uncritically uses as his measure of the value simply a large number of definitions of the value in question, usually as many kinds as there are tests for this value. Then what that value 'is' is simply what all these diverse measures measure. The consequence is obscure and sometimes unrepeatable results. Neither view resolves, or even lessens, the problem of multiplicity

in any way (actually both appear to increase the problem). In both views, the inevitable question arises as to whether the empirical results derived from using these measures are due only to the researcher's particular definitions (and hence conflicting results arising from different conflicting definitions), or to other causes. It may be asked whether similar results are equivalent and different results are, in fact, different. That is, in the case of values, it may be asked whether there are different measures of the same values or different measures of different values. A vagueness of this sort with respect to measurement does not lead to precise theories (and hence improved knowledge), and Gulliksen has argued that;

> A reasonable middle ground would seem to be to insist that any hypothetical construct or intervening variable, or attribute, be made the subject of some investigation, to determine the extent to which the scientist or the group of scientists have a reasonably consistent set of ideas regarding this concept. If they do not agree, there may be food for additional thought regarding either the nature of the measurement methods used or the redelineation of the hypothetical trait. (Gullikeen, p. 35, 1968).

As will be seen in the next chapter (and a casual perusal of the value batteries in Appendix B will also illustrate this point), the researchers on values appear

to have different ideas about what constitutes the domain they are measuring, and, moreover, there appears to be little a priori overlap even on the protocol level. This being the case, it would seem that a validation strategy is called for. One such strategy is the convergent-discrimination method advocated by Campbell and Fiske (1959) wherein each particular trait is measured by a number of methods. The resulting multitrait-multimethod matrix is factorized in the hopes of obtaining a set of one-factor tests. A necessary condition for the applicability of this model, however, is that there be different measures of the same values, as well as many different values, and this is not the existing situation in value research. Rather than questioning only the validity of value measures at this early stage of value research, it seems necessary to ask the logically prior question of how many really distinct values are represented by these batteries of value measures.

The Allport-Vernon-Lindzey Study of Values

There have been few empirical comparisons of value batteries and scales with respect to the aforementioned question, primarily because the investigators were more interested in relating values to other attitudinal and behavioral variables and seem to have taken little cognizance of each other's work. The Allport-Vernon-Lindzey Study of Values, as the standard battery

for thirty years, was most often chosen for comparative research in the few cases available (the empirical results of these comparisons are reviewed in the next chapter), but it is technically problematic (see Technical Problem below). Consequently, it would seem that a major priority in the empirical study of values is the determination of the empirical scope and major dimensions of the value domain. To some degree this problem can be attacked by a factor analysis of scores derived from the value batteries typically used in empirical research (this point is taken up in detail below in Chapter III).

A Technical Problem: Ipsativity of Measures

Before factor analytic methods are applicable, however, the basic conditions for correlational analysis must be satisfied. One of the most often violated restrictions, especially in the case of value measures, is that of the non-ipsativity of the measures (Guilford, 1952). Whereas the chief intent of obtaining intercorrelations amongst variables is to reflect the degree of empirical relationship or association amongst these variables, ipsative measures yield scores on variables such that each score for each variable for a person is mathematically dependent on his own scores on other

variables being assessed primarily because of the measurement technique utilized. That is, one score is the direct function of another primarily because of the method of measurement-whether or not the variables so measured are, in fact, related to each other. In the case of ipsative psychological measures, the usual interdependency is such that a high score on one variable can only be obtained as a result of a lower score on another variable being measured. Thus, the scales for each attribute are not statistically independent of each other. Ipsative scores are produced by measurement instruments requiring the individual to rank-order all the items, to make choices from systematic pairings of choices, or to make choices from systematic variations of triads. Ipsative scores are attainable by other procedures also (see Hicks, 1970). Examples of ipsative measuring instruments of values are the Allport-Vernon-Lindzey Study of Values, the Rokeach Value Survey, and the Gordon Survey of Personal Values.

The main consequence of using ipsative measures is that interindividual interpretations based on these measures are spurious because there is not a common scale for each attribute as in the case of normative measures, but, rather, a scale for each individual which may or may not coincide (since it is only implicit)

with the scale of another individual. Consequently, a high score on a variable assessed ipsatively is obtained only at the expense of the score of another variable being measured and leads by necessity to interindividual comparisons on this variable such as

> this individual is higher on this variable relative to his scores on the other variables assessed than are other individuals' scores on this variable relative to their scores on these other variables. (Hicks, p. 168, 1970).

Moreover, this defining characteristic, aside from introducing interpretative difficulties, also introduces many peculiar properties into the ipsative score matrix which severely limit the amount of information conveyed by these measures and which make factorization of the matrix pointless (Hicks, 1970). The chief statistical weakness is that ipsative measures produce a spurious number of negative intercorrelations into the score matrix which in turn will produce an artefactual set of factors which depend on the scoring procedure rather than the empirical relationships (if any exist) between the variables.

A factorization of batteries whose measures violate the assumption of statistical independence of

dimensions predicated in this statistical technique is pointless. Consequently, in this study, those batteries which were composed of ipsative measures were either converted to less ipsative measures such as Likert-scales, or not used at all if the conversion was too difficult. Attention will now be turned to a survey of the various batteries used to measure values.

# Chapter 2

# REVIEW OF SOCIAL PSYCHOLOGICAL LITERATURE ON THE MEASUREMENT OF VALUES

## Introduction

Some fairly typical attempts of psychologists and sociologists to measure values will be examined in this chapter. While there is an extensive literature on values both in philosophy and in the social sciences, an attempt at surveying this vast literature would be quite beyond the limits of this study. Rather extensive bibliographic introductions to the literature can be found in Baier and Rescher (1969), Rescher (1968), and Thomas (1967). The major emphasis of philosophers, in short, has been on the attempt to clarify value terminology, to distinguish values from the rest of the universe, and to examine justifications for various value systems. On the other hand the social scientist, and especially the social psychologist, has been mainly concerned with the description and assessment of values held by particular individuals or groups of individuals, with the relationship of these held values to other characteristics of the individual, and with value changes. This review will be primarily concerned with social psychological conceptions of values, their

measurement, and the empirical relationships found between these values and other variables. These concerns have been best exemplified in the empirical research on values utilizing the Allport-Vernon-Lindzey Study of Values, the Morris Ways to Live document, the Scott Value Scales, the Gordon Survey of Personal Values, and the two Rokeach Value Surveys.

## The Allport-Vernon-Lindzey Study of Values

The major instrument used in the first half of this century for measuring values was the Allport-Vernon-Lindzey Study of Values, an ipsative instrument which purports to measure six values: the Theoretic, Economic, Politic, Aesthetic, Social and Religious values. Values in this battery are viewed simply as basic interests or personality motives.

> The test is composed of 45 items, 30 of which are forced choice (Part I), and 15 of which require rank ordering of four alternatives (Part II). In Part I the subject can express a strong or weak preference for his choices by the way he distributes three points. That is, a strong preference for alternative a over alternative b would be indicated by marking alternative a as 3 and b as 0. A slight preference for a over b would be indicated by marking a as 2 and b as 1, etc. Each value is represented by 10 of the 60 possible answers. In Part II the subject rank orders four

> statements from 1 to 4, where 4 indicates greatest preference. Again each value is represented by 10 of the 60 possible answers. Scores for each of the six values are obtained by summing item scores and adding or subtracting correction figures. (Levitin in Robinson, p. 419, 1969).

A major review of the psychological research on values to 1955 indicated this instrument to be the primary one used for the assessment of values (Dukes, 1955). Dukes classified the research into three areas:

1) Individual Differences - the measurement of the values of individuals and the relation of these results to other data concerning these groups;

2) The origin and development of values within the individual;

3) The influence of an individual's values on his cognitive life. Since only (1) and (3) are relevant to this study, a brief summary of these only will be presented.

With respect to value differences between groups, there is data available comparing differences in sexes, academic interests, and vocational interests. For example, a consistent finding with regards to the sex differences is that men score higher than women on the theoretical, economic and politic values but lower on the aesthetic, religious and social values. Different

academic college groups have also been analyzed with respect to their values. Commercial and business students, for example, score higher than the college norm for the economic value but lower for the aesthetic value. Humanity students, on the other hand, score higher than the norm on the aesthetic value, while science students are highest on the theoretic value. Insofar as vocational interests are concerned, data from the Study of Values indicates that certain vocations can be distinguished from others by their value preferences. For example, people in religious occupations score extremely high on the religious value as would be expected. Consistently high positive relations have also been reported between interest in being an office worker and the economic and social values; between interest in being an artist or an architect and the aesthetic value; and between being a physician, scientist, or engineer and the theoretical value.

The relationships between an individual's cognitive life and his values were just beginning to be investigated at the time of Dukes review. Consequently, little research was reported, and the data that was obtained was of a rudimentary sort. For example, it was reported that Woodruff and Di Vesta (1942, 1945, 1948) provided data which indicated that a person's attitude

toward an event is a function of his concepts of how his strong values will be affected by that event. Other findings, however, indicated that the observed relationships between attitudes and values were equivocal; i.e., not all differences in attitude can be viewed as differences in values, and conversely, some strongly held values may be irrelevant to some attitudes. In other areas of cognition, Dukes reported that the main finding was that values can function as an organizer in perceiving and remembering, but the specification of precisely when it operates was still a major problem. The effects of this 'organizing function' were described as manifested in selected, accentuated, more easily fixated, and less variable responses (Dukes, p. 43 - 44, 1955).

Summary and Criticism of the Study of Values:

The major criticism of the Study of Values is psychometric - it is an ipsative instrument. To score highly on one value the subject must score the other five values lower. Consequently, although one group of individuals scores higher on, for example, the religious value than another group, this difference may, in fact, not exist. The difference may only appear because the individual's rating of any value is relative to how he rates the other five. Thus, comparisons between indivi-

duals is ruled out because the metric of comparison is implicit and unspecified (if it is even there). Dukes, in summarizing the criticisms of the Study of Values, also noted

> that the usual scoring procedures and the subsequent treatment and interpretation of the test results violate the non-additive character of ordinal instruments . . . (Dukes, p. 34, 1955).

This criticism is essentially the same as the argument against using ipsative measures mentioned earlier in Chapter I. As a consequence, the validity of measures used in this way is highly questionable and the results based on such measures even more so. As the inventors of the Study of Values warned, this instrument can be safely used only as a means for obtaining intraindividual information and is valid only in this domain. Dukes did not make as much of these criticisms as, perhaps, he should have, but his summary of the results of value research up to 1955 is warranted. He found the social psychological study of values up to that time to be somewhat equivocal and inconclusive, generally exploratory but on the whole very suggestive, and calling, especially, for further sophistication in the development of measures of values.

## The Morris Ways to Live Document

Morris' empirical work (1956) is primarily concerned with isolating and defining the primary value dimensions of an individual's conception of the good life. He has attempted to develop a scale for the measurement of human values through a scale and factor analysis of data obtained from the administration of his Ways to Live (WTL) document.

He starts from the assumption that values are employed in three different ways:

1) Operative values -

> the tendency or disposition of living beings to prefer one kind of object rather than another,

2) Conceived values -

> the preference for a symbolically indicated object: those cases of preferential behavior directed by 'an anticipation or foresight of the outcome' of such behavior,

and

3) Object values -

> values concerned with what is preferable or desirable regardless of whether it is in fact preferred or conceived as preferable.
> (Morris, p. 9-12, 1956).

The WTL battery, however, attempts to measure conceived values only (see Appendix B for a copy of this

document). He has not developed measurement instruments for the other two kinds of values. The WTL consists of 13 individual paragraphs describing various conceptions of the good life, each of which incorporates a particular value orientation based on a 'conceived' value or set of values. The subject rates each Way to Live from 1 (least desirable) to 7 (most desirable) on a Likert-scale.

The value dimensions were identified by factor analysis of both cross-cultural and intra-cultural studies. This data indicated there were either four or five stable factors. These factors were: Factor A - 'Social Restraint and Self-Control'; Factor B - 'Enjoyment and Progress in Action'; Factor C - 'Withdrawal and Self-Sufficiency'; Factor D - 'Receptivity and Sympathetic Concern'; Factor E - 'Self-Indulgence or Sensuous Enjoyment'. The cross-cultural replication of Morris' work (data from India, China, Japan, Norway and Canada) indicated that the value dimensions isolated by the factor analysis are genuine, common dimensions. For the purposes of this review only the U.S.A. data will be summarized.

Factor A - 'Social Restraint and Self Control' was composed of high factor loadings from Ways 1 and 10,

and a low loading from Way 4. Way 1, which is characterized as "preserving the best in society", had a positive factor loading of +.51 while Way 10, "dignified self-control", loaded +.41. Way 4, an "abandonment to sensuous enjoyment", had a high negative loading of -.44.

Factor B - 'Enjoyment and Progress in Action' - had high positive loadings from Ways 12, 5, 6, and a negative loading from Way 2. Way 12 "dynamic physical interaction with the environment", Way 5 "group action toward common goals", and Way 6, "progress through realistic solution problems", had high positive factor loadings of +.58, +.34, and +.30 respectively. Way 2, "self-sufficiency, reflection and meditation", had a negative loading of -.28.

Factor C - 'Withdrawal and Self-Sufficiency' - had high loadings from Way 11, "contemplation of rich inner Life" (+.54), and Way 2, "self-sufficiency, reflection and meditation", (+.50). Way 5, "group action toward common goals", had a negative factor loading of -.36.

Factor D - 'Receptivity and Sympathetic Concern' was composed of positive factor loadings from Way 13, "humble obedience to cosmic purposes", Way 9, "quiet receptivity to experience", and Way 3, "sympathy, concern

for others, restraint of self". The factor loadings were +.51, +.47, and +.34 respectively. There were no high negative factor loadings for this factor.

Factor E - 'Self-Indulgence of Sensuous Enjoyment' had Way 8, "wholesome enjoyment of simple comforts", and Way 4, "abandonment to sensuous enjoyment", positively loaded on it, +.44 and +.38 respectively. Way 13, "humble obedience to cosmic purposes", and Way 10, "dignified self-control", had high negative factor loadings of -.27 and -.25 respectively.

Morris compared these factors, which he called value dimensions, with the Allport-Vernon-Lindzey Study of Values and found no identity of these dimensions with any of the six value categories of the Study of Values. He explained the lack of identity as due to a difference in what was being measured; i.e., he sees the WTL as measuring conceptual values, whereas he sees the Study of Values as measuring operative values in terms of institutionalized social roles (Morris, p. 56, 1956). He does not indicate whether or not there is an empirical basis to his observations of the lack of identity between the two batteries, nor to the difference in kinds of values being measured. There are no recorded comparisons of the WTL with any of the other value batteries

being surveyed in this review.

Later research, however, has produced evidence for the stability in the factor structure of the WTL. Butt (1966) and Butt and Signori (1965a, 1965b), using Canadian college students from the University of British Columbia, have found a similar factor structure even though different factoring techniques were used. And Osgood, Ware, and Morris (1961) have also found a stability of the WTL preferences in their semantic differential analysis of the connotative meanings of the Ways to Live.

## The Scott Value Scales

Scott has developed a paper-and-pencil value battery in an attempt to measure the values of American college students and to relate these to fraternity and sorority organizations. Although he is interested in personal values, he views the basis of values to be culturally shared conceptions (Scott, 1965). Thus, it can be expected that a core of values will be found amongst a group of people around which there will be a consensus. These personal values, which he views as "concepts of ideal relations among people, or of ideal personal traits (as expressed in interpersonal relations)," can be assessed

via the questionnaire approach. It is assumed that:

> a person may be said to entertain a value to the extent that he conceives a particular state of affairs as an ultimate end, an absolute good under all circumstances, and an universal "ought" towards which all people should strive. (Scott, 1965, p. 15).

Moreover,

> a value provides more than a concrete goal of action; it provides a criterion by which goals are chosen (Williams, 1951). It does not simply represent something that is preferred, but something the person feels ought to be preferred. This is because, from his point of view, the value of the preferred state inheres in the state itself, and does not depend on any characteristic of himself, such as a desire or ability to perceive it (Catton, 1959) . . . (Scott, 1965, p. 4).

Consequently, Scott views verbal professions of ideal standards of conduct as good indicators of values, and questionnaires as legitimate sources of empirical data concerning the structure and operation of the value domain.

The Scott battery attempts to measure twelve values chosen to be appropriate to fraternity and sorority life. These values are - Intellectualism, Kindness, Social Skills, Loyalty, Academic Achievement, Physical Development, Status, Honesty, Religiousness Self-Control, Creativity and Independence. (See Appendix B for example of test). Unlike Morris' WTL, the Scott battery

deals with whether or not one agrees with a specific value rather than a way of life embodying a collection of values. Consequently, the twelve values are not intended to cover the entire value area, and so, the battery is limited in this respect. The measures are not ipsative in nature. The scales require the subject to check one of the following categories in response to each of 60 items: 'Always Admire', 'Depends on Situation', 'Always Dislike'. The 'Always Admire' is always scored one (1) and the latter two are always scored zero (0). Total scores for each value are obtained by summation over the keyed responses. Later improvements of the scale include 'reversed' items to control for an agreement response-set. In this case, 'Always Admire' and 'Depends on the Situation' are scored zero (0).

The Scott value questionnaire was utilized in an extensive study of the structure and function of social organization as epitomized in social fraternities and sororities. The author was interested, for example, in who joins, why they join, why they stay, why they leave, and fraternities and sororities as sources of influence on the life of college students and this influence as a function of the values emphasized, and inherent, in the structure of these organizations. Since the interest of the present study is in the value domain <u>per se</u> and

not in social organization, the results of this study which are very extensive will not be summarized. (They can be found in Scott, 1965). It is sufficient for this study that values were found to relate to interpersonal and personal behavior and that these twelve values do seem to differentiate and predict behavior. (For a detailed examination of the hypotheses the scales were developed to help test, see Scott, 1965). Although the aspect of the value domain that it does measure is probably significant, whether or not the questionnaire reflects the entire scope of the value domain is yet to be examined, as Scott's value scales have not been compared with any of the other batteries reviewed here.

The Gordon Survey of Personal Values

The next value battery of interest is Gordon's Survey of Personal Values (SPV). In this battery values are viewed as motivational patterns. Six critical values are measured which presumably help determine the manner in which an individual copes with the problems of everyday living. These values are Practical Mindedness, Achievement, Variety, Decisiveness, Orderliness, and Goal Orientation.

While a vast amount of statistical evidence

has been compiled concerning the reliability, validity and research applicability of this survey, this data is vitiated by the fact that the test, as utilized in these studies is an ipsative instrument, thus casting doubt on the meaning of the results derived from the statistical operations underlying these comparisons. This battery is a forced-choice triad test instrument. There are thirty groups with three value statements in each group. Each statement is keyed to one of the six values. The subject checks the statement most and least important to him. Total scores for each value are obtained by summation over the keyed responses. Nevertheless, some of these relationships will be reported (with all statistics reported in Gordon, 1967).

Significant correlations were found between values as measured by the SPV and various personality traits as measured by the Gordon Personal Profile and the Gordon Personal Inventory. For example, those who reflect the trait tendency to be 'reflective, assertive' tend also to be high in Achievement; those who are 'nonpersevering, impulsive' are high in Variety; those who are 'persevering, careful' are high in Goal Orientation (Gordon, 1967). The correlations which are significant at the one percent level range from +.21 for Achievement and the 'reflective, assertive' trait to

+.35 for Variety and the 'nonpersevering, impulsive' trait.

While the Allport-Vernon-Lindzey Study of Values was compared with the SPV, only two of the scales of the Study of Values have significant correlations with the latter instrument. The economic value of the Study of Values is correlated positively with Practical Mindedness (r = +.41) and Orderliness (r = +.37), and negatively with Achievement (r = -.33) and Variety (r = -.40). The aesthetic value of the Study of Values is correlated positively with Variety (r = +.44) and negatively with Goal Orientation (r = -.37). All the reported r's are significant at the .01 level (Gordon, 1967) .

There is a large amount of statistical data compiled for the Gordon battery mainly concerned with establishing norms for each of the six values. As this information is not pertinent to the present study it is not included here, but can be found in Gordon (1967). The ipsative character of the test calls into question, however, all of this data. Before the test can be useful in the development of theory, its ipsative scoring technique would have to be altered. In an altered, non-ipsative form, a comparison of this value battery with others could help to delineate basic dimensions or areas

of the value domain. Even in its ipsative form, however, this test has only been compared with the Study of Values battery.

## The Rokeach Value Surveys

Unlike the preceding investigator, Rokeach has devised a value battery in an attempt to support a social psychological theory of value. Since his battery is closely linked to his initial or working theory, it will be necessary to describe this theory to some extent.

The basic unit of Rokeach's theory is the belief, which is

> any simple proposition, conscious or unconscious, inferred from what a person says or does, capable of being preceeded by the phrase 'I believe that . . . '. The content of a belief may describe the object of belief as true or false, correct or incorrect; evaluate it as good or bad; or advocate a certain course of action or a certain state of existence as desirable or undesireable . . . all beliefs are predispositions to Action. (Rokeach, 1968, p. 113).

Furthermore, an attitude in this theory is

> an organization or interrelated col-

> lection of beliefs which are focused on some object or situation. (Rokeach, 1968, p. 159).

A value, on the other hand,

> is a single enduring belief about a specific mode of conduct or an end-state of existence which, once internalized, becomes a standard or criterion for guiding actions, for developing and maintaining attitudes towards relevant objects and situations, for justifying one's own and other's actions and attitudes, for morally judging self and others, for comparing self with others, and for influencing the values, actions, and attitudes of at least some others. (Rokeach, 1968, p. 160).

Thus,

> while an attitude represents several beliefs focused on a specific object or situation, a value is a single belief that transcendentally guides actions and judgments across specific objects and situations, and beyond immediate goals to more ultimate end-states of existence. Moreover a value, unlike an attitude, is an imperative to action, not only a belief about the preferable but also a preference for the preferable (Lovejoy, 1950). (Rokeach, 1968, p. 160).

Rokeach further distinguishes between two basic kinds of values, Terminal or End Values, and Instrumental or Means Values and has created a measurement battery

for each kind. He conceives each class of values as organized into hierarchical structures and substructures making up value systems. These systems may be viewed as measurable by rank-orderings of values along a continuum of importance. Moreover, each kind of value, Terminal and Instrumental, is organized in this hierarchical manner. Consequently, the value battery devised by Rokeach for each system is one in which the subject ranks a number of values, so defined in their order of importance to himself. Thus, the value measurement is of an ipsative nature.

Rokeach has used his instruments to collect descriptive information concerning fundamental similarities and differences among various groupings. The intent of this research has been to describe meaningfully and economically the typical Terminal and Instrumental values of known groups. To this end he collected, for example, the rank averages and value profiles on nine subgroups labelled nonbelievers, Jews, Catholics, and six Protestant denominations. (Rokeach, 1968, p. 170). All the groups were similar in ranking World at Peace, Family Security, and Freedom as the most important Terminal values and Exciting Life, Pleasure, Social Recognition, and a World of Beauty as least important. With respect to Instrumental values, all agreed that Honesty

was the most important, ranked Ambitious and Responsible highly, and placed least value on being Imaginitive, Intellectual, Logical and Obedient. There were differences also. Christians placed less value on such Terminal values as Equality, Pleasure, Family, Security, Inner Harmony and Wisdom. Christians also ranked the social Instrumental values of Clean, Obedient and Polite higher than did the average Jewish person. The latter ranked the Instrumental values of personal competence, i.e., Capable, Independent, Intellectual and Logical, higher than did the average Christian. Jews and nonbelievers had similar value profiles for both Terminal and Instrumental values. There were, however, some quite unexpected results amongst the Christian groups. Baptists, one of the six Protestant groups, ranked the Terminal value Salvation considerably higher than both the non-Christian and the other Christian groups and a Sense of Accomplishment lower. They ranked the Instrumental values of Clean, Forgiving, and Obedient relatively higher than the other Christian groups and Broadminded, Capable and Logical relatively lower. Although these results were only descriptive, Rokeach found them to be promising and to warrant further work.

Feather, a student of Rokeach, has continued this research and some of his findings and conclusions

are pertinent to this study. He found the choice by students of what faculty to enter related to their Terminal and Instrumental value rankings. A World of Beauty was ranked higher by students intending to enter the Humanities, than those intending to enter either the Social Sciences or the Natural Sciences (Feather, 1970). The latter two groups ranked a Comfortable Life higher than those students intending to enter the Humanities. The Humanities students ranked the Instrumental values of Forgiving, Imaginative and Intellectual as more important and Ambitious, Capable and Self-Controlled as less important than did the students oriented towards the other two schools. Science oriented students, however, ranked the Instrumental values Capable and Self-Controlled higher and Forgiving lower than did the other students. There were no sex differences for these three sets of students concerning either kind of values (Feather, 1970).

Feather also attempted to relate specific attitudes and values. In looking at the relationship between seven attitudes (attitudes towards Flinders University, towards Yourself, Australian Participation in Vietnam War, White Australia, Legalized Abortion, Religious Instruction, and Student Representative Council Legal Aid to Dissenters) and the Rokeach Terminal and Instrumental Value rankings, only one significant relationship was found.

Students who opposed the white Australia policy ranked Equality higher than did those students who favoured this policy. The lack of expected relationships was given two possible explanations. It could be: (a) a function of restricted variance in some of the measures, or (b) that values are not related to specific attitudes on a one-to-one basis. The first reason was not further elaborated, but the second was, and is important to the aim of the present study.

Feather hypothesized that since the attitudes intercorrelated positively to some extent, prediction of a specific attitude would be improved if a cluster of values, rather than a single value were utilized as the independent variable. This hypothesis was also supported theoretically by Baier (1969) & Handy (1970). Feather (1970) found that students who scored high on Form E of the Dogmatism scale - another test designed by Rokeach - tended to favour American Intervention in Vietnam, Religious Instruction in Schools and to oppose Legalized Abortion and S.R.C. Legal Aid to Demonstrators when compared to those who were less dogmatic. Furthermore, high dogmatic scorers ranked Salvation, Obedient and Honest as more important and Equality, Broadminded, Mature Love, and Pleasure as less important values than did lower dogmatic scorers. Feather concluded from these

results that clusters of values were related to attitude, and that further inquiry into the idea of clusters of values with respect to other attitudes was called for. The early failure to find significant relationships between attitudes and values indicated to Feather that the measurement techniques and the dimensionality of the value space needed more attention and concern (Feather, 1970). These findings called for qualifications of Rokeach's initial notions concerning, at least, the relationship between attitudes and values. Another possibility is that there are more basic values underlying Rokeach's particular selection of terminal and instrumental values. Since there are neither factorizations of Rokeach's value surveys available, nor are there any comparisons of his selections of values with the other researchers reviewed here, this possibility remains unexplored. As was indicated in Chapter I, it is the intention of the present study to investigate this possibility.

## Conclusions

All the investigators reviewed assumed that values are psychologically and sociologically basic variables, that values are measurable, that the researchers were measuring important areas of the value domain, and

that these areas are importantly related to other aspects of the person's life such as his attitudes and behavior. It can also be concluded that these men have worked quite independently of each other for the most part, and that there are different ways of measuring values as well as different values. The general lack of comparison of these value batteries raises the question of the extent to which all these value measures are different measures of the same values, rather than different measures of different values. The next chapter is an explanation of how the present study attempted to deal with that question.

# Chapter 3

## RATIONALE OF THE PRESENT STUDY

In this chapter the twofold rationale of the present study will be presented. As will be seen below, there are actually two aims to the study. These aims will be dealt with one at a time, the first aim in Part I of the rationale, the second aim in Part II. The first aim is to delineate further the underlying values of individuals by factorizing the correlation matrix of scores derived from the value batteries of four of the researchers reviewed in the last chapter. The second aim is to inquire into the predictive significance of the underlying values with respect to attitudes and behavior of the individuals holding these values.

## Part I Rationale

### The Problem of Multiplicity Again

While each of the previously reviewed researchers sought to detect the underlying values, however conceptualized, of the individual, and while each has come

up with a 'basic' set of values, all have also worked quite independently of each other. As a consequence, there are several different sets of 'basic' values corresponding to the ideas of each researcher despite the fact that the aim of each researcher was to determine fundamental values and thereby reduce the problem of multiplicity. Thus, one of the questions that then arises, and to which this study is primarily directed, is how many distinct values are being measured by the value measures comprising the value batteries of Rokeach, Scott, Gordon and Morris. (The Allport-Vernon-Lindzey Survey of Values was not utilized because (a) removal of its ipsativity would necessitate a major revision in the battery, and (b) it is also in serious need of updating; (Handy, 1970)). That is, do the 67 value measures comprising these value batteries reduce to a smaller set of distinct, meaningful value categories, namely, a basic set of underlying values?

## The Questionability of Conceptual Comparisons

Simply looking at what values each researcher claims to be measuring, i.e. a conceptual comparison, will not do since each not only conceptualizes the general value domain somewhat differently but may also, in fact, be calling the same value by a slightly different

name. Although it is possible to compare these 67 values conceptually, the sheer number of comparisons necessary to exhaust all the possible combinations clearly precludes such a comparison, if only on practical grounds. In order to avoid either the 'Humpty-Dumpty' or the 'Every Little Thing' approach to value measurement (as mentioned in Chapter 1), some other approach is called for. One set of procedures for determining to what extent the 67 value variables are really several different measures of a smaller, more basic set of variables, is factor analysis. It may help here since factor analysis is essentially a mathematical method for determining constellations of related variables.

## A Factor Analytic Approach

Factor analysis was used in this study precisely because it is a method for identifying underlying factors amongst observable clusters of correlations derived from a larger number of variables. It is a

> complex mathematical method of identifying a few abstract dimensions that will account for much of the observed correlation among a set of scores or other measurements. (Fiske, 1971, p. 258)

Mathematically, a factor is any linear combination of

variables in the data matrix and factor analytic methods are methods for determining the weights and the way they are used for obtaining these linear combinations of variables. That is, if V is a factor, then $V = w_a a + w_b b + w_c c + \ldots + w_k k$, where a, b, . . . , k, are variables and $w_a, w_b, \ldots, w_k$ are weights derived from factorizing the correlation matrix. Thus, in the sense of this equation, factors are said to explain correlations among variables or to explain the common variance among variables. Principal-components analysis, the particular technique used in this study, is a way of selecting the weights such that the average squared factor loading is maximized, that is, such that the average squared factor-variable correlations are maximized. The mathematics required for obtaining such weights is quite complicated and for a mathematical discussion of these methods the reader is referred to Anderson (1958) or Harman (1967).

## The Conceptual Meaning of Factors

Conceptually, a factor may be viewed as a construct - a hypothetical 'X' - which indicates an underlying commonality amongst groups of related variables, in this case presumably groups of underlying values (Nunnally, 1967). The factors derived in a factor analy-

sis are primarily a function of the variables comprising the analysis. That is, a factor will not be identified unless it is represented, usually, by three or more of the variables being analyzed. Since a factor may also be a function of the form of analysis used, or of error and/or measurement method variance, the actual naming of the factor is a conceptual problem whose solution must be viewed skeptically and tentatively. Only if similar factors emerge in subsequent factor analyses, can the factors then be viewed confidently as delineating constructs. According to Nunnally (p. 289, 1967),

> Factor analysis is important mainly because it is useful in the explication of constructs. The first step in the explication of constructs is to develop measures of particular attributes which are thought to be related to the construct. The second step is to correlate scores on different measures. The correlations are analyzed to determine whether (1) all measures are dominated by specific factors, (2) all measures are dominated by one common factor, and (3) the measures tend to break up into a number of common factors. The third step is to perform experiments relating that construct to other constructs.

Insofar as factor analysis seems a useful tool for displaying significant substantive interrelations in the valuing data and for reducing the complexity of the various value indicators to a simpler form, it may

be helpful in detecting underlying values commonly held by a particular sample of persons. That is, since underlying values are presumed to be those standards that are used explicitly or implicitly by the person in making evaluations, judgments or choices, and since they will consequently be used in making evaluations concerning whether, and to what extent, he prefers, believes, considers important, and likes certain possible states of affairs, ways to act, and general life-styles, then these underlying values ought to be reflected in the way in which such evaluations of valuings group together. In short, there seems to be a self-reference to values such that basic values are used in making basic evaluations where basic evaluations are evaluations of presumably basic values. Thus, the value objects in this case are presumably underlying values. Consequently, it is assumed that the evaluation of allegedly a priori value-laden words, statements, and paragraphs will reflect the underlying values of the persons making these evaluations and this reflection will emerge in the form of identifiable factors.

This last assertion is empirically testable to the extent that identifiable factors emerge. Thus, it is assumed that underlying values can be identified from amongst the myriad value-evaluations of each person

surveyed by a principal-components analysis. In this way, the problem of multiplicity, though not solved, should be narrowed.

## Part II Rationale

This construct-explication task was undertaken with the intention of using the resulting factors (principal-components) as a set of reference axes for the value domain and as a set of predictors or independent variables for inquiring into the relationship between values and other psychological constructs. Once the underlying values are ascertained, attention can then be directed to the second aspect of the study, namely, to determining to what extent a person's underlying values permit the prediction of other attitudinal and behavioral constructs. The relationship between the underlying values and other variables can be investigated by means of a regression analysis utilizing the underlying values found as a predictor set and a survey of attitudinal and behavioral constructs as dependent variables.

In this case, the method utilized was a stepwise regression analysis. The first step in any regression analysis is to select those of the independent

variables which are the most comprehensive but efficient predictors of the dependent variables. Since the primary concern at this stage of the analysis is simply to determine what relation, if any, the value domain has with the dependent variables or criteria, it was deemed desirable to choose the predictors so as to maximize the relationship. One such method is to select the largest principal-axes factors and to use these in a stepwise regression analysis (Darlington, 1968). Thus, first those factors which account for the maximum amount of variance in the predictor matrix are obtained. Then, the stepwise technique selects the most valid predictor-factor of the criterion of concern. Subsequent predictor-factors are chosen so as to maximally increase the multiple correlation with the criterion variable and thus yield the best predictor-factor equation amongst those equations which contain that variable. Variables that are found no longer useful in maximizing the multiple correlation are eliminated. This process continues until some reasonable chosen statistical criterion is reached. In this case, the stepwise addition and elimination stops when the addition or elimination of another variable doesn't increase the multiple correlation coefficient to a predetermined statistically significant degree.

# Chapter 4

## METHOD

This chapter will be concerned with describing the actual means of data collection. That is, it will describe the subjects who were surveyed, the actual batteries used for measuring values, those used for measuring the dependent variables, and the procedures by which the data was obtained.

### Subjects

The 208 subjects used in this study were first year students at Vancouver City College, a two-year post-secondary institution. Sixty-one students were enrolled in vocational programs and the remaining one hundred forty-seven were enrolled in college preparation courses. Besides the convenience of access afforded by these students to the experimenter, the open door policy of Vancouver City College provided access to subjects having a wide range of ages (17 - 35) and social-economic background.

## Materials

The questionnaire set was comprised of five value batteries (the predictors) and four dependent variable scales. The value batteries included the Scott Value Scales, two revised versions of the Rokeach Value Survey, the Morris Ways to Live Scale, and a revised version of Gordon's Survey of Personal Values. The dependent variable scales included the Holland Personal Survey, the Centers' Vocational Interest scale, the MachII Scale and the Conservatism Scale. Information concerning the age, sex and program choice was also obtained. Copies of all batteries and scales are included in Appendix B .

## Scott Values

The Scott Value Scale (cf. Appendix B ) is a 96 item scale which measures 12 values. These are the values of Intellectualism, Kindness, Social Skills, Loyalty, Academic Achievement, Physical Development, Status, Honest, Religiousness, Self-Control, Creativity, and Independence. The subject is asked to check one of the following three categories, 'Accepts', 'Rejects' or 'Depends on the Situation', concerning each of the 96 descriptions, all of which are intended to reflect only

one of the 12 values. For each value there are four positively directed and four negatively directed descriptions. The order of the statements is randomized to control the tendency of subjects to appear spuriously consistent.

Information on the Scott Value Scale indicates it to be a reliable and valid instrument. The reliability as measured by Cronbach's coefficient alpha for estimating scale reliability ranges between+.55 and+.78 (Scott, 1965). The construct validity has been obtained for some of the values by the "known groups" validation procedure in which scales are used to detect differences between groups whose values are expected to be of a certain character on an a priori basis. Using a point-biserial correlation coefficient a + .51 was obtained for the Religiousness value, a - .43 for Independence, and a + .36 for Kindness for Jesuit seminarisms at Loyola University in Colorado (Scott, 1965). A positive (+) correlation here means that the Jesuits scored higher than college males and a negative (-) correlation indicates the reverse. Members of the Players Club, a non-conformist group at the University of Colorado, scored +.35 for Independence, -.29 for Social Skills, -.26 for Status, -.27 for Honesty, -.24 for Religousness, and -.28 for Self-Control when compared with a random

university cross-section (Scott, 1965). The Women's Physical Education club at the University of Colorado scored +.34 for Physical Development, +.32 for Religiousness, +.33 for Self-Control, +.29 for Honest, +.24 for Loyalty, +.24 for Status, and -.25 for Independence when compared to a random cross-section of female students (Scott, 1965). Art Majors of both sexes at the University of California as compared to a random cross-section of University of Colorado students scored a +.38 for Creativity, (Scott, 1965). Male-Female undergraduates at the University of California with gradepoint averages over 3.5 on a 5 point grading scale scored +.36 for Academic Achievement, +.27 for Independence, and -.28 for Honesty when compared with students with gradepoint averages between 2.2 and 2.4 on the same grading scale (Scott, 1965). All of the above correlations were reported to be statistically significant.

Using "behavior indices constructed from questions referring as much as possible to objectively reported action . . . " correlations between an individual's scores on the 12 values and his overt behavior relating to these values were also obtained. For a random cross-section (n = 218) of the student body at the University of Colorado the correlations ranged from +.10 for Independence to +.55 for Religiousness with a

mean of +.23 and eleven of the twelve correlations were statistically and significantly different from zero (Scott, 1965). Moreover, each value scale correlated more highly with its corresponding index of behavior than it did with at least nine of the other (irrelevant) indices of behavior. Thus, there seems to be some evidence for a correspondence between values as measured by these scales and overall behavior.

Rokeach Value Battery

Forms D and E of the Rokeach Value Survey (cf. Appendix B ) measure 18 terminal and 18 instrumental values by a rank-ordering procedure for each set respectively. Normally, Form D uses 18 gummed labels, with the name of one value on each label, which can be arranged in the preferred order by the subject. Form E simply lists the 18 values and asks the subjects to number them according to their order of preference. The present study, however, used a seven-point Likert-type scale for each of the 36 values. These scales rather than the rank-order technique was used in order to minimize the ipsativity of the scales. The subject, then, checks one of seven possibilities ranging from "strongly believe" to "strongly disbelieve" for each of the 36 values.

There is no reliability or validity evidence for this revised version of the Rokeach Value Survey. While correlations derived from ipsative scores are very questionable, the reliability and validity evidence of the original Rokeach Value Surveys follows. The test-retest reliability of Form D ranged from +.78 and +.80 for terminal values and +.70 to +.72 for instrumental values (Penner, Homant and Rokeach, 1968). Form E had a test-retest reliability of +.74 for terminal values and +.65 for instrumental values in the same study, while a paired-comparison form showed the reliability to be +.87 for terminal values and +.60 for instrumental values. In another study (Rokeach, 1969) test-retest reliabilities for individual terminal values ranged from +.51 to +.88 and from +.45 to +.70 for individual instrumental values.

In "known groups" validation studies using the original Rokeach surveys, a high ranking of the Salvation value significantly predicted church attendance amongst college students (Rokeach, 1968). It was also found that policemen from a medium-size midwestern city ranked Freedom first on the average and Equality last, while unemployed negroes ranked Equality first and Freedom tenth. Furthermore, civil rights demonstrators ranked both Freedom and Equality highly on the

average (Rokeach, 1968).

In a behavioral validation study the Rokeach Form D Value Survey was administered to women employees who also were from strong religious denominations. It was found that the median ranks of the values of Honesty, Salvation and a World at Peace were significantly higher (from $p = .005$ to $p = .040$) for those who returned the scoring pencil as compared to those who did not (Shotland & Berger, 1970).

Morris' Value Battery

The third value scale in this study was Morris' Ways to Live scale (cf. Appendix B ). On this scale the subjects are asked to check their preference on a seven-point Likert-type scale for each of thirteen described 'Ways to Live'. Each 'Ways to Live' is a paragraph constructed around certain value areas with respect to the kind of life style one prefers.

The product-moment correlations for test-retest reliabilities ranged from +.67 to +.93 for a three-week interval for U. S. college students (Morris & Jones, 1955). Validity studies of the Ways to Live scale have shown the factor structure to be replicable (Osgood,

Morris and Jones, 1961; Butt, 1966).

Gordon's Value Battery

The last predictor set was Gordon's Survey of Personal Values (cf. Appendix B ). The original scale utilizes a forced-choice triad format to measure six values. The present study utilizes a 'YES', '?', 'NO' choice format in which the subject checks only one in response to a question concerning the importance to him of a value-laden statement. This format was used to reduce the ipsativity of the original format.

The format used in the present study has no reliability or validity information. However, this 'YES - ? - NO' scoring format used with Gordon's Survey of Inter-personal Values did demonstrate the superiority of the non-ipsative instrument over the ipsative form in differentiating groups which were predicted to differ on the dimension in question. (Knapp, 1964).

Test-retest reliability for the original format of the Survey ranged from +.74 to +.92 for individual values for seven to ten day intervals (Gordon, 1967). The Kuder-Richardson reliabilities for indivi-

dual values ranged from +.72 to +.92.

There is some evidence to indicate that the Survey has factorial validity. Subsequent usages of the test have shown the same factorial structure indicating discrete, reliable categories (Gordon, 1967).

## Dependent Variables

The variables to be used as dependent variables are choice of academic or technical program, age, sex, and scores on the Centers' Vocational Interest scales, the MachII Scale, the Conservatism scale, and the Holland Personal Survey.

College program choice between Technical and Academic programs affords the opportunity of a real-life selective-rejective behavior in which values presumably play a role. That is, it allows for answering whether or not there are particular kinds of value groupings which are related to actual behavioral selections. The four attitudinal variables were chosen to further investigate Feather's hypothesis (1970) of the relationship between value clusters and specific attitudinal styles. These four attitudinal measures all aim to characterize specific attitudes people have towards other people or

towards vocations. Also, since they are non-ipsative, correlational comparisons will not be vitiated by this criticism.

Academic or Technical Program Choice

Program choice was obtained by having the subject indicate their choice (T or A) on the envelope containing the questionnaires. Upon entering Vancouver City College the prospective student has to select either a Technical or Academic program to follow during his next two years. The technical program is vocationally oriented towards the development of professional or semi-professional job skills in such areas as accounting, journalism, commercial arts, etc. The academic program is equivalent to the first two years of university.

Age and Sex

Information concerning age and sex was obtained by having the subjects indicate it on the questionnaire envelope.

Centers' Vocational Interest Scale

The original Centers' Vocational Interest (cf.

Appendix B ) scales has a rank-ordering format for ten occupational characteristics that the subject would like to see in his job. The present study used a five-point Likert-type scale for each of the ten characteristics in order to reduce the ipsativity of the scales. There is no information reported for the reliability or validity of either the original scale or the present extension of the scales.

Mach II Scale

The Mach II Scale (cf. Appendix B ) attempts to measure an amoral, manipulative attitude towards other individuals combined with a cynical view of men's motives and their character. The scale uses twelve pairs of statements to which the subject indicates his agreement by checking one or both; indicates his disagreement by leaving one blank and checking the other; or indicates his indifference or inability to make a choice by leaving both blank. One statement is keyed to the Mach variable while the other is not but both are matched for social desirability (Christie & Geis, 1970). The keyed statement may be worded in the original, positive Machiavellian direction, or have its wording reversed and thus be non-Machiavellian. Each item if checked by the subject is scored two for an originally

directed (OD) Mach statement; zero for both a non-keyed statement when an OD-Mach statement is present, and for a reversed order Mach statement; and one for no answer. Hence, the subject can score from zero to twenty-four. The higher the score the more Machiavellian the subject.

Although no reliability data has been reported, some validation work has been reported. In a "known groups" study a Likert-type version of the scale significantly distinguished between "cynical, opportunistic" medical school seniors and those with an "overflowing love of mankind and human kindness" as distinguished by the ratings of a medical school professor (reported in Guterman, 1970). In another study, high-Mach scorers showed a significantly greater number of manipulative acts than low-Mach scorers (reported in Guterman, 1970). Also high-Mach scorers were significantly more successful in playing a power-coalition game than low-Mach scorers (reported in Guterman, 1970).

Conservatism Scale

The Conservatism scale (cf. Appendix B ) is a format of items which attempt to measure the degree of authoritarianism, dogmatism, fascism and anti-intellectualism on the part of the subject. The scale consists

of fifty items to which the subject responds 'YES,' 'NO', or '?'. The items were pre-selected for their conservative or liberal appeal as judged by characteristics expected in the extreme conservative or extreme liberal (Wilson & Patterson, 1968).

Each 'YES' to an odd-numbered item, and each 'NO' to an even-numbered item is score two, while a '?' to any item is scored one. Responses other than these receive a zero for the item. The subject can thus receive a score ranging from zero to one-hundred, and the higher the score the more conservative he is deemed to be.

The reliability of the scale as estimated by the split-half consistency coefficient calculated with a correction for test length by the use of the Spearman-Brown prophecy formula is .94 (N = 244) (Wilson & Patterson, 1968).

The validity was estimated by 'known groups' validation technique. Socialist and conservative political groups were significantly distinguished by their conservatism scores, the mean for the socialists being 17.3 (N = 17) while the conservatives was 55.8 (N = 20). A Gideon bible group with a mean of 70.5 (N = 17) was

significantly distinguished from a group of physical and social scientists whose mean was 30.8 (N = 20) (Wilson & Patterson, 1968).

## Holland Personal Survey

The last dependent variable scale used in this study is the Holland Personal Survey (cf. Appendix B ), a self-rating scale in which the subject responds to a large set and variety of items. These items are keyed into six occupational-type categories as derived from Holland's theory of vocational choice (Holland, 1966). The scale has seen limited use and there has been no reliability or validity data reported as yet.

## Procedures

The five value and four dependent variable batteries were randomly ordered and administered to classes at Vancouver City College ranging in size from 17 to 40 students. The entire set of batteries took approximately one and a half hours to complete. Each individual battery was hand-scored, the scores copied onto IBM keypunching sheets and then keypunched onto IBM cards for each subject for use in the computer analysis of the data. These steps were double-checked

for errors by three individuals.

# Chapter 5

## RESULTS

### Overview

In this chapter the results of the two aims discussed in Chapter 3 will be reported. Part I will report the results of the attempt at narrowing the multiplicity of the values measured. As will be seen the factor analysis of the value measures utilized by the value batteries produced somewhat confounded factors. Consequently, it was decided to further investigate these batteries before undertaking the regression analysis. Towards this end a canonical analysis of each value battery with every other value battery was completed. This analysis indicated that each battery was measuring substantially different aspects of the value domain. Hence, on the basis of the results of the canonical analysis it was decided to factorize each of the value batteries individually and if these factors were conceptually clearer than the all-battery factor analysis to use the resultant individual battery factors as the independent variables in the regression analysis of Part II. The factors obtained from the individual bat-

tery factor analysis were clearer, less confounded, and thus, were utilized as the independent variables.

In Part II of this chapter the results of the regression analysis are reported using the factors obtained from the individual battery factorization of Part I. From an examination of the kind of dependent variables represented by Academic/Technical choice, sex and age, it was decided to analyze their respective results in terms of Brogden's linear predictor approach. Since the remaining eighteen variables were viewed as functionally related to the independent variables (values as measured), in their case the traditional contribution to variance analysis was utilized. Thus, seven of the remaining eighteen dependent variables were chosen as warranting further analysis. Also included in Part II are the results of a canonical analysis of the set of independent variables as a whole with three partitions of the dependent variable set. Although some overlap was found, it was not unexpected.

## Results - Part I

Part I is concerned with reporting the results of the analyses of the independent variables (the values and their measures). Firstly, the results of the

factor analysis are reported, the factors labelled and briefly described. Secondly, since these initially derived factors were puzzling, a rationale for further examination of the value measures, namely a canonical analysis of each of the pairs of value batteries is described, undertaken, and the results reported. Finally, since the results of the canonical analysis indicated that the batteries themselves contained little overlapping variance, a factor analysis of each individual battery was undertaken and reported. The results of these latter factorizations indicated the presence of discernible and easily identifiable underlying factors. It was concluded at this point that these latter factors be utilized as the independent (predictor) variables in the subsequent regression analysis of the relationship between the value measures and the dependent variables, namely the attitudinal and behavioral measures.

## Analysis

The five batteries for appraising values provided scores for sixty-seven variables in the value domain and resulted in a sixty-seven by sixty-seven correlation matrix of value scores. The Scott battery provided twelve of these variables, the Rokeach 1 and 2

batteries eighteen each, the Ways to Live (WTL) thirteen, and the Gordon six variables for a total of sixty-seven variables. Since a principal-components analysis of these scores was intended to yield interpretable value dimensions, a set of twenty-one dependent variables was also used to obtain information appropriate for the second step of the study, a regression analysis. The independent and dependent variables together yield a total of eighty-eight variables.

The initial step in the analysis of the independent variables was factorizing the sixty-seven by sixty-seven correlation matrix using the principal-axes method. This yielded sixteen factors with characteristic roots greater than unity. Only those factors having eigenvalues greater than one were looked at because only these factors account for more variance than any individual variable. Since the characteristic roots associated with factors numbers twelve through sixteen were all close to unity, it was decided to seek the minimal amount of factors still accounting for the maximum amount of variances according to the following rules: 1) prevent a substantial loss in variance, and 2) maintain a high degree of factor content interpretability. This latter choice was largely a subjective matter. Thus sets of 9, 10, 11, 12, 13, 14, 15 and 16 factors were rotated to

a varimax criterion (Kaiser, 1960). Once these rotated factors were obtained, they were labelled as appropriately as possible, and the set of eleven factors was judged according to the above two rules to be the most meaningful set. The eigenvalues and respective variances of these factors are presented in Table 1. The factor structure of the eleven factors is displayed in Table 2. The rotated factor matrix is presented in Table A in Appendix A . Since these eleven factors were intended to be used as the predictor set in the regression analysis, factor scores were obtained. These scores were obtained by means of the regression method with the factor matrix (Lawley & Maxwell, Ch. 7.2, 1963; Harman, Ch. 16.5, 1967).

Interpretation of Factors

For the interpretation of these factors, attention was now directed toward factor loadings which differed from zero by at least $\pm.25$. This value is essentially arbitrary, but is conventionally used (Morris & Jones, 1956). Factors are labelled to facilitate discussion, but these labels are viewed as less than perfect representations of factor content.

The content of Factor 1 can be interpreted in

TABLE I

EIGENVALUES AND ASSOCIATED VARIANCES FOR FIRST FORTY FACTORS OF ALL BATTERY FACTORS

| Factor | Eigenvalue | Var. % Single | Var.% Accumulated |
|---|---|---|---|
| 1 | 10.69 | 18.66 | 18.66 |
| 2 | 5.70 | 9.95 | 28.61 |
| 3 | 3.26 | 5.69 | 34.31 |
| 4 | 3.11 | 5.43 | 39.74 |
| 5 | 2.58 | 4.50 | 44.24 |
| 6 | 2.13 | 3.71 | 47.96 |
| 7 | 1.74 | 3.04 | 51.01 |
| 8 | 1.72 | 3.00 | 54.02 |
| 9 | 1.40 | 2.62 | 56.64 |
| 10 | 1.43 | 2.50 | 59.14 |
| 11 | 1.38 | 2.41 | 61.56 |
| 12 | 1.15 | 2.01 | 63.57 |
| 13 | 1.12 | 1.96 | 65.54 |
| 14 | 1.08 | 1.88 | 67.43 |
| 15 | 1.04 | 1.82 | 69.26 |
| 16 | 1.01 | 1.77 | 71.03 |
| 17 | 0.97 | 1.69 | 72.73 |
| 18 | 0.94 | 1.63 | 74.37 |
| 19 | 0.87 | 1.51 | 75.89 |
| 20 | 0.83 | 1.44 | 77.34 |
| 21 | 0.79 | 1.39 | 78.73 |
| 22 | 0.74 | 1.30 | 80.03 |
| 23 | 0.72 | 1.25 | 81.29 |
| 24 | 0.67 | 1.17 | 82.47 |
| 25 | 0.64 | 1.12 | 83.60 |
| 26 | 0.61 | 1.07 | 84.68 |
| 27 | 0.57 | 1.01 | 85.69 |
| 28 | 0.52 | 0.90 | 86.60 |
| 29 | 0.49 | 0.86 | 87.46 |
| 30 | 0.47 | 0.82 | 88.29 |
| 31 | 0.46 | 0.80 | 89.09 |
| 32 | 0.45 | 0.78 | 89.88 |
| 33 | 0.44 | 0.77 | 90.65 |
| 34 | 0.42 | 0.73 | 91.39 |
| 35 | 0.40 | 0.70 | 92.09 |
| 36 | 0.36 | 0.64 | 92.74 |
| 37 | 0.36 | 0.62 | 93.37 |
| 38 | 0.34 | 0.60 | 93.97 |
| 39 | 0.34 | 0.59 | 94.57 |
| 40 | 0.28 | 0.50 | 95.07 |

TRACE IS 57.33

THE SUM OF THE FIRST 40 EIGENVALUES IS 54.51

TABLE II

FACTOR STRUCTURE: ALL BATTERY FACTORS

| Battery | Variable Number | Variable Name | Loading |
|---|---|---|---|
| Factor 1: - 'Active, Systematic Practicality and Advancement | | | |
| Gordon | (62) | Practical Mindedness | -.8502 |
| Gordon | (66) | Orderliness | -.8387 |
| Gordon | (63) | Achievement | -.7609 |
| Gordon | (67) | Goal Orientation | -.7566 |
| Gordon | (65) | Decisiveness | -.7313 |
| Scott | (7) | Status | -.3904 |
| Rok 2 | (46) | Logical | -.3904 |
| Rok 2 | (47) | Obedient | -.3590 |
| Scott | (5) | Academic Achievement | -.2074 |
| Ways to Live | (54) | Way 6 | -.2949 |
| Factor 2: - 'Poised Concern for Others' | | | |
| Rok 2 | (36) | Helpful | -.7563 |
| Rok 2 | (41) | Loving | -.6925 |
| Rok 1 | (17) | Self-Respect | -.6902 |
| Rok 2 | (33) | Responsible | -.6654 |
| Rok 2 | (37) | Broadminded | -.6575 |
| Rok 2 | (34) | Forgiving | -.6144 |
| Rok 1 | (19) | Equality | -.5674 |
| Rok 2 | (39) | Capable | -.5518 |
| Rok 1 | (16) | Happiness | -.5123 |
| Rok 1 | (26) | Mature Love | -.5043 |
| Rok 2 | (31) | Honest | -.5015 |
| Rok 2 | (43) | Polite | -.4751 |
| Rok 2 | (38) | Clean | -.4345 |
| Rok 1 | (25) | Inner Harmony | -.4150 |
| Rok 1 | (30) | An Exciting Life | -.3680 |
| Rok 1 | (27) | World of Beauty | -.3519 |
| Rok 1 | (15) | Freedom | -.3512 |
| Rok 1 | (22) | Comfortable Life | -.3416 |

Table II (Continued)

FACTOR STRUCTURE: ALL BATTERY FACTORS

| Battery | Variable Number | Variable Name | Loading |
|---|---|---|---|
| Factor 3: -'Effacing, self-concern' | | | |
| Ways to Live | (57) | Way 9 - Quiet receptivity to nature | .7481 |
| Ways to Live | (61) | Way 13 - Let oneself be used | .5941 |
| Ways to Live | (58) | Way 10 - Dignity, self-control | .5851 |
| Ways to Live | (51) | Way 3 - Sympathy, concern for others | .5698 |
| Ways to Live | (59) | Way 11 - Retreat from world and development of self | .5597 |
| Ways to Live | (50) | Way 2 - Self sufficiency | .5512 |
| Ways to Live | (49) | Way 1 - Refinement, moderation, restraint | .3305 |
| Ways to Live | (52) | Way 4 - Abandonment, sensuous enjoyment | .2983 |
| Factor 4: -'Socially, Upstanding Benevolence' | | | |
| Scott | (2) | Kindness | .7037 |
| Scott | (10) | Self-control | .6512 |
| Scott | (4) | Loyalty | .6264 |
| Scott | (3) | Social Skills | .5978 |
| Scott | (9) | Religiousness | .5281 |
| Scott | (5) | Academic Achievement | .4776 |
| Ways to Live | (52) | Way 4 - Abandonment, sensuous enjoyment | -.3945 |
| Scott | (8) | Honesty | .3910 |
| Rok 2 | (47) | Obedient | .3462 |
| Gordon | (64) | Variety | -.3348 |
| Rok 2 | (46) | Logical | .3102 |
| Factor 5: -' Self Sufficiency and Self Expression ' | | | |
| Scott | (6) | Physical Development | -.6832 |
| Scott | (11) | Creativity | -.6775 |
| Scott | (12) | Intellectualism | -.6095 |
| Scott | (7) | Status | -.4554 |
| Gordon | (64) | Variety | .4026 |
| Scott | (4) | Loyalty | .4017 |
| Scott | (1) | Independence | -.3770 |
| Scott | (5) | Academic Achievement | -.3247 |
| Rok 2 | (45) | Intellectual | -.3207 |

Table II (Continued)

FACTOR STRUCTURE: ALL BATTERY FACTORS

| Battery | Variable Number | Variable Name | Loading |
|---|---|---|---|
| Factor 6: - 'Philosophic Repose & Dynamism' | | | |
| Rok 1 | (18) | Wisdom | .5083 |
| Ways to Live | (60) | Way 12 - Outward, energetic action | -.4956 |
| Ways to Live | (55) | Way 7 - Integration of Diversity | -.4763 |
| Scott | (8) | Honesty | .3776 |
| Gordon | (64) | Variety | -.3513 |
| Factor 7: - 'Social Idealism' | | | |
| Rok 1 | (15) | Freedom | -.7234 |
| Rok 1 | (13) | World at Peace | -.6189 |
| Rok 1 | (27) | World of Beauty | -.5399 |
| Rok 1 | (24) | True Friendship | -.5058 |
| Rok 1 | (19) | Equality | -.3966 |
| Rok 2 | (46) | Logical | -.3880 |
| Rok 1 | (16) | Happiness | -.3785 |
| Rok 1 | (30) | An Exciting Life | -.3520 |
| Rok 2 | (42) | Cheerful | -.3385 |
| Rok 1 | (18) | Wisdom | -.3054 |
| Factor 8: -'Free Thinking' | | | |
| Rok 2 | (44) | Independent | -.5465 |
| Rok 2 | (48) | Imaginative | -.5106 |
| Rok 2 | (46) | Logical | -.4839 |
| Rok 2 | (45) | Intellectual | -.4816 |
| Rok 2 | (32) | Ambitious | -.3660 |
| Rok 2 | (35) | Courageous | -.3470 |
| Rok 2 | (39) | Capable | -.3425 |
| Factor 9: -'General Security' | | | |
| Rok 1 | (23) | Salvation | -.6804 |
| Rok 1 | (20) | National Security | -.5589 |
| Rok 1 | (14) | Family Security | -.5004 |
| Rok 2 | (43) | Polite | -.4684 |
| Rok 2 | (47) | Obedient | -.4361 |
| Rok 2 | (32) | Ambitious | -.4345 |
| Rok 1 | (22) | Comfortable Life | -.4319 |
| Scott | (9) | Religiousness | -.3821 |
| Rok 1 | (28) | Social Recognition | -.3719 |
| Rok 2 | (40) | Self Controlled | -.3332 |

Table II (Continued)

FACTOR STRUCTURE: ALL BATTERY FACTORS

| Battery | Variable Number | Variable Name | Loading |
|---|---|---|---|
| Factor 10: -'Individual Self-concern' | | | |
| Rok 2 | (35) | Courageous | -.5256 |
| Rok 1 | (25) | Inner Harmony | .4668 |
| Rok 2 | (33) | Responsible | -.4014 |
| Ways to Live | (58) | Way 10 - Dignity, Self control | -.3629 |
| Ways to Live | (52) | Way 4 - Abandonment, sensuous enjoyment | .3316 |
| Rok 1 | (30) | An Exciting Life | -.3050 |
| Factor 11:-'Pleasure' | | | |
| Rok 1 | (29) | Pleasure | .6256 |
| Ways to Live | (56) | Way 8 - Carefree, relaxed | .5862 |
| Ways to Live | (53) | Way 5 - Live outwardly, energetically | .4829 |
| Rok 1 | (22) | Comfortable Life | .4253 |
| Rok 1 | (21) | Sense of Accomplishment | .3442 |
| Rok 2 | (38) | Clean | .2879 |

at least two ways. On one hand, it appears to be reflecting an 'Active, Systematic Practicality and Advancement' and was so labelled. The first five loadings all seem to reflect a methodical approach to life as what is important to the individual. On the other hand, these same five loadings are five of the six variables comprising the Gordon Survey of Personal Values. This result plus the sharp drop in factor loadings between the fifth and sixth loadings (from -.7313 to -.3904) would seem to indicate that this factor is a battery factor.

Factor 2 was labelled 'Poised Concern for Others'. It was difficult to ascertain the factor content of this factor as it was comprised of 18 of 36 variables making up the Rokeach 1 and 2 batteries. Way 3 which presumably reflects an 'altruistic affection and concern for others' was not loaded on this factor at all. Moreover, although it might be expected that some of the values measured by the other batteries, such as Loyalty, Honest, Social Skills, and Kindness from the Scott battery would appear on this factor, none of the values measured by the other batteries were loaded on this factor.

Factor 3 labelled 'Effacing Self-Concern' was

loaded only with measures from the Ways to Live value battery. While interpretable, it too seems to be reflecting a 'battery' factor rather than a value dimension.

Factor 4 was comprised of seven of the twelve variables comprising the Scott value battery. The first six loadings are from this battery and there is a marked drop off between the sixth and seventh loading (from +.4776 to -.3945). While it also appears to be a 'battery' factor, its content may be interpreted as a 'socially, upstanding benevolence'. It appears to reflect an admiration for social reliability.

The fifth factor, Factor 5, was also a Scott 'battery' factor. It is bi-polar and loaded seven of the twelve Scott value variables, but only two, Academic Achievement and Loyalty, were loaded on both Factor 4 and Factor 5. The content of this factor appears to reflect an admiration for 'autonomy', a concern for self-sufficiancy on various social and personal levels and was labelled 'Self-sufficiency and Self-expression'.

Factor 6 is a bi-polar factor. On one pole there is a high loading for the value of Wisdom, from the Rokeach 1 battery, and a loading of Honesty, from

the Scott battery. The other pole contains loadings of Way 12, Outward, Energetic, Action; and Way 7, Integration of Diversity from the Ways to Live battery; and Variety from the Gordon battery. While it might be reasonably expected that the value of Honest from the Rokeach 2 battery might be loaded at one pole of this factor, it was not the case. This factor seems to reflect a value dichotomy between philosophic repose and dynamic, integrated interaction with the environment and was labelled 'Philosopic Repose and Dynamism'.

The content of Factor 7 seemed to reflect a cluster of idealistic values oriented towards a concern for humanity in general. It was, consequently, labelled 'social idealism'. It appeared, also to be a 'battery' factor, in that eight of the 10 variables loaded on this factor including the first five factor loadings were from the Rokeach 1 battery. The other two loadings were from the Rokeach 2 battery. This factor is similar to Factor 2 in that they have five variables in common, e.g. Freedom, World of Beauty, Equality, Happiness, An Exciting Life. Like Factor 2, it too is loaded with variables derived only from the Rokeach 1 and 2 batteries.

Factor 8, 'Free Thinking', is another factor whose content is difficult to interpret. While it ap-

pears to be indicating the value of intellectual autonomy, it does not have loadings from other such variables that would be intuitively expected. For example, it does not contain loadings for the Scott value measures of Independence and Intellectualness; the Rokeach 1 value measures of Freedom and Wisdom; or the Ways to Live value measures, Way 2, 'Self-sufficiency, reflection and mediation', Way 6, 'Progress through realistic solution of problems', or Way 11, 'Contemplation of rich inner life'. Moreover, this factor only loads variables from Rokeach 2 onto it. Consequently, it too may be viewed as a 'battery' factor.

Factor 9 is labelled 'General Security' since it seems to be tapping a value of security in various areas of life. It is comprised of five variables from the Rokeach 1 and Rokeach 2 variables. Although it might be expected that Way 1, 'Preserves the best in society'; Way 10, 'Dignified self-control'; or the Scott value measure of 'self-control' would also be loaded on this factor, none were.

Factor 10 was very difficult to label. A bipolar factor, it appears to be reflecting an 'Individual, Self-strength and Self-concern'. At one pole of this factor are the value variables Courageous, Responsible,

Dignified Self-control and An Exciting Life, while Inner Harmony and Abandonment to Sensuous Enjoyment are at the other. It does not appear to be a battery factor as its loadings are from three batteries.

Factor 11 seems to be a hedonistic factor whose content revolves around 'Pleasure'. Its content seems quite clear and it does not appear to be a 'battery' factor.

## Preliminary Discussion of Factors

Although it is possible to attach general labels to some of the factors which would incorporate most or all of the loadings on those factors, none of the factors in any of the eight sets of rotated factors had a factor content that was clearly discernible as a more basic value dimension or pattern. Rather, many of the factors, seven of eleven in the example case, appeared to be 'battery' factors. That is, they are largely or entirely composed of value measures from one battery. This finding was unexpected since the batteries are composed of individual items whose only operational connections were (a) identical methods of measurement, and (b) appearance together on the same battery. The factors were not simply method factors since many factors had

values measured by a different method loaded on them; e.g. Factor 1; and other factors correspond mainly to a particular battery even though this battery measured values in the same way as another battery, e.g. Factor 3, 4 and 8. Why variables appearing on the same battery should appear on the same factors predominantly is unclear since the batteries were not initially or intentionally constructed to center on any common themes. Rather, they were constructed simply to survey and measure the value domain in general. Moreover, it appeared that the individual batteries contained some commonality amongst their items which was separable from that of other batteries. This result was also unexpected because, at least, some values were measured by more than one test and, it would be expected that a factor would emerge loaded with this particular value; e.g. the value of Independence was measured by the Scott, Ways to Live (WTL), and the Rokeach 2 (Rok 2) batteries, but there is not a factor on which all three measures of Independence is loaded. This obscurity in factor content for so many factors does not lend much confidence to the interpretation of the other factors whose content seems more clearly discernible. Consequently, it is not clear whether the factors obtained were reflecting a value content variance, a method of measurement variance, a 'battery' variance or combination of all or some of the

above. Before a regression analysis with these value-factors as the predictor domain would be worthwhile, this domain itself must be further clarified. Consequently no regression analysis was undertaken at this point. Rather, attention was first directed to investigating further the nature of the value domain as measured by these value measurement batteries.

## Canonical Analysis of Value Batteries

In order to obtain a better understanding of the nature of the domain being measured by the value batteries, attention was directed to the extent these value batteries are measuring the same aspects of the value domain. This question can be investigated by means of a canonical correlation analysis of all possible pairs of the value batteries to determine to what extent their variances overlap.

The general idea of canonical correlation analysis is to find one set of linear functions or composites for each battery so as to maximize the correlation between batteries. After these two composites are found, further pairs of functions are obtained that also maximally correlate with each other but which are uncorrelated with all previously obtained composites (Koons

in Borko (ed), 1962, pp 268 - 269; Cooley and Lohnes, 1971, pp 188 - 9). The total number of linear functions is p or q, whichever is smaller, where p is the number of measures in battery 1 and q the number in battery 2. Whereas the principal-axes method of factor analysis attempts to find factors which will account for the maximum amount of variation of the variables, canonical analysis obtains factors which are maximally related to the variables (Harman, 1967, pp. 219) thus selecting linear combinations of variables that have maximum covariances between domains (Cooley and Lohnes, 1971, pp. 169). According to Cooley and Lohnes (1971, pp. 169), canonical analysis can be viewed as an exploration of the extent to which individuals occupy the same relative positions in one measurement space as they do in the other. (A rigorous discussion of the mathematical rationale of the canonical analysis can be found in Anderson, 1958, Ch. 12; and Hotelling, 1935.)

However, the canonical correlation coefficient, the maximum correlation that can be developed between the two best linear combinations of variables of two tests, is difficult to interpret since it (the canonical correlation coefficient squared) represents the variance shared by the linear functions of the two sets of variables (that is, the canonical variates) rather than the

shared variance of the two sets of variables (Stewart and Love, 1968, p. 160). That is, the canonical correlation may be very large but the linear functions themselves may extract only a small portion of the variance of their respective batteries. Consequently, rather than being a measure of the overlap of the two batteries the canonical correlation is only a measure of the overlap of two linear functions of the batteries, and these functions may or may not be important functions of the batteries. Stewart and Love (1968) and Miller (1969) have independently invented a tool by which the actual overlap of the two tests can be expressed. The redundancy index, ($\bar{R}$), developed by these investigators expresses the proportion of variance of one set (usually called the 'left set') of variables, say, battery 1, explained by the canonical correlation coefficient between the two derived linear functions of each of the batteries respectively. If this value is calculated for all the pairs of canonical functions of the batteries, the resultant sum ($\Sigma \bar{R}$) is the total proportion of the variance of battery 1 predictable from battery 2. If the proportion of the variance extracted from battery 2 is used rather than battery 1, the total proportion of the variance of battery 2 predictable from battery 1 can be obtained. The two resultant redundancy indices will not necessarily be the same since the shared

variance of the two correlated linear functions need not be the variance shared by the two sets of variables from which they were obtained. Thus, the redundancy index indicates not only the intersection of the sets of variables but also represents the proportion of one set which is in the intersection. (For a precise mathematical development see Cooley and Lohnes, 1970).

In this study the redundancy index for each pair of batteries was computed in order to estimate the degree of variance overlap between the pairs. Although there is no precise way of determining whether a canonical correlation is 'high' or 'low', the rule of thumb in the literature (Cooley & Lohnes, 1971) is to view only canonical correlations greater than .30 as non-trivial. Likewise there is no guide for estimating the highness or lowness of the redundancy index. However, if one battery is to be substitutable for another, or one battery is to be dropped because it is redundant, then the redundancy index should probably be at least .40 (Cooley & Lohnes, 1971). That is, one battery should, at least, predict 40% of the variance of the other battery. Nevertheless, the size of a significant redundancy index level is somewhat arbitrary. Given these general rules of thumb, a high redundancy (greater than .40) indicates that a major portion of the batteries are

measuring the same things. A low redundancy (less than .40) indicates that a major portion of the batteries are measuring different things. In the case of sets of measurements of presumably the same domain, as in this study, a low redundancy between batteries would indicate not only that the domain being measured is quite large but also that the batteries contain some homogeneity. That is, whatever it is that their independent variance is a reflection of, it cannot be ignored. Other conclusions are also possible given low redundancy. One may be that the batteries are measuring the same things in different ways resulting in different results because of the inclusion of confounding method variance. This is a question of the equivalence of measures. Another interpretation is that the value measures themselves are invalid resulting in largely erroneous and artefactual results. Both of these hypotheses could be investigated through a convergent and discriminative validity analysis (Campbell & Fiske, 1965; Jackson, 1969) but this would involve two or three measures for each purported value resulting in 134 to 201 variables that would have to be factorized. Also, for the sample to be reliable five to ten times as many subjects as variables would have to be obtained resulting in a minimum of 670 subjects, but 2000 being a more appropriate total for the number of variables involved. Since it was felt that it

was outside the scope of this study to undertake these kinds of analyses, it was speculatively assumed that the value measures were reasonably valid and the remainder of the study was conducted on the basis of this assumption.

The value of this index ($\bar{R}$) is that it gives a concise way to look at the amount of overlap of the batteries in question. The batteries are viewed as sets of measures of the domain of values, each measure purporting to measure some aspect of this domain. A canonical analysis of the 10 pairs of batteries affords a precise examination of the amounts and kinds of overlap between pairs of these batteries.

A summary of the canonical redundancies for the 10 pairs of value batteries only is shown in Table III. The complete results of the canonical analysis is presented in Table B in Appendix A. As seen in Table III, only 5 batteries show a redundancy of more than 20%; the Rokeach 2 battery predicting 22.5% of the variance in the Scott battery, 26.6% of the variance in the Rokeach 1, and 27.7% of the variance in the Gordon battery, the Rokeach 1 predicting 30.3% of the variance in the Rokeach 2, and the Scott battery predicting 29% of the variance in the Gordon battery. Thus, the over-

TABLE III

SUMMARY OF CANONICAL TOTAL REDUNDANCIES FOR

10 PAIRS OF VALUE BATTERIES

| | SCOTT | ROK 1 | ROK 2 | WTL | GORDON |
|---|---|---|---|---|---|
| SCOTT | | .1751 | .2247 | .1684 | .1115 |
| ROK 1 | .1107 | | .2659 | .1070 | .0514 |
| ROK 2 | .1535 | .3028 | | .1737 | .0908 |
| WTL | .1199 | .1384 | .1448 | | .0664 |
| GORDON | .2900 | .1803 | .2767 | .1378 | |

NOTE: Values below diagonal indicate proportion of row-variable variance predicted by column-variable variance. Values above diagonal indicate proportion of column-variable variance predicted by row-variable variance. (i.e., Scott variance predicts 11% of ROK 1 variance while ROK 1 variance predicts 17.5% Scott variance.)

lap of these batteries as indicated by the $\bar{R}$ is rather small.

Since the evidence from the canonical analysis of the batteries shows little redundancy between any of the pairs of batteries, none can be eliminated on the grounds of measuring the same thing better than any other battery. That is, all the value batteries appear to be measuring somewhat different things and none can be excluded without a loss of information concerning some aspect of the value domain. Moreover, on the assumption that the value measures are valid, the resulting low redundancies indicate that the homogeneity of the batteries themselves must be further investigated.

The low redundancies between individual batteries together with the unclear all-battery factors indicates that most of the variance of the value scores is contained in individual batteries because each is somewhat homogeneous; i.e., each battery seems to be representing a somewhat uniform and independent area of the value domain. A more parsimonious description of this variance can be obtained through a factor analysis of each of the individual batteries rather than from the all-battery factor analysis. This would reduce the number of variables describing each battery while still

retaining the predictive power of the many variables contained in that battery. Since the canonical analysis indicated that to some extent the batteries are measuring different aspects of the value domain, factors derived from these individual batteries would most efficiently and comprehensively describe these different aspects. Since it is expected that there is more homogeneity within a battery, factorization of each battery yields the minimum number of dimensions necessary to account for the variance of that battery.

Individual-Battery Factor Analysis

Proceeding on the assumption that the value measures were valid, the canonical correlation and redundancy results indicate also that the batteries themselves must be further investigated. With this in mind, the largest principal-axes factors of each individual value battery was obtained. The Scott battery and the Gordon battery yielded 2 factors each; and Rokeach 1, 2, and Ways to Live yielded 3 factors each. In each case, the factors yielded a characteristic root greater than unity. These 5 sets of factors were then each rotated to a varimax criterion. The rotated factor matrix for each battery is shown in Table C of Appendix A. The eigenvalues and their respective variances are shown

in Table D of Appendix A . The structure of each factor is displayed in Table IV. Since these factors were expected to be used as the predictor set for the subsequent regression analysis, the factor scores were also obtained by means of the regression method with the factors matrix (Lawley & Maxwell, 1963, Ch. 7.2; Harman, 1967, Ch. 16.5).

Factor I, 'Social Conventionality', from the Scott battery appears very much like Factor 4 of the all-battery factor analysis. They differ somewhat in the order of loadings, and Kindness which was loaded on Factor 4 is not loaded here, while Status which is loaded on Factor I is not loaded on Factor 4. Consequently, the orientation of this factor seems to be towards social convention rather than generosity.

The second Scott factor, Factor II, 'Social Autonomy', is very similar to Factor 5 of the all-battery factor analysis. The only difference is the addition of the value of Social Skills to this factor, and a slight difference in the ordering of the other loadings on this factor. The addition of the value of Social Skills to the composition of this factor alters it from the dimension of autonomy to that of social autonomy, or self-reliance in a social context.

TABLE IV

FACTOR STRUCTURE: INDIVIDUAL-BATTERY FACTORS

Scott Battery - Two Factors

| Variable Number | Variable Name | Loading |
|---|---|---|
| **Factor I - 'Social Conventionality'** | | |
| (3) | Social Skills | -.6587 |
| (9) | Religiousness | -.6364 |
| (10) | Self Control | -.5935 |
| (4) | Loyalty | -.5886 |
| (8) | Honesty | -.5596 |
| (5) | Academic Achievement | -.4966 |
| (7) | Status | -.2846 |
| **Factor II - 'Social Autonomy'** | | |
| (6) | Physical Development | .7006 |
| (11) | Creativity | .6687 |
| (7) | Status | .6173 |
| (12) | Intellectualism | .6115 |
| (5) | Academic Achievement | .4985 |
| (4) | Loyalty | .4549 |
| (3) | Social Skills | .3261 |
| (1) | Independence | .2903 |

Table IV (Continued)

FACTOR STRUCTURE: INDIVIDUAL-BATTERY FACTORS

Rok 1 Battery - Three Factors

| Variable Number | Variable Name | Loading |
|---|---|---|
| **Factor III - 'Social Idealism'** | | |
| (15) | Freedom | -.7054 |
| (17) | Self-Respect | -.6983 |
| (19) | Equality | -.6670 |
| (27) | World of Beauty | -.6030 |
| (24) | True Friendship | -.5752 |
| (16) | Happiness | -.5345 |
| (13) | World at Peace | -.5078 |
| (25) | Inner Harmony | -.4993 |
| (18) | Wisdom | -.4211 |
| (26) | Mature Love | -.3395 |
| (30) | An Exciting Life | -.3333 |
| **Factor IV - 'General Security'** | | |
| (20) | National Security | .7119 |
| (23) | Salvation | .5912 |
| (14) | Family Security | .5572 |
| (22) | Comfortable Life | .3994 |
| (28) | Social Recognition | .3970 |
| (21) | Sense of Accomplishment | .3098 |
| **Factor V - 'General Satisfaction'** | | |
| (29) | Pleasure | -.6829 |
| (30) | An Exciting Life | -.6213 |
| (22) | Comfortable Life | -.4662 |
| (28) | Social Recognition | -.4228 |
| (21) | Sense of Accomplishment | -.3725 |
| (16) | Happiness | -.3559 |

Table IV (Continued)

FACTOR STRUCTURE: INDIVIDUAL-BATTERY FACTORS

Rok 2 Battery - Three Factors

| Variable Number | Variable Name | Loading |
|---|---|---|
| **Factor VI - 'Poised Concern for Others'** | | |
| (36) | Helpful | -.8184 |
| (41) | Loving | -.7276 |
| (37) | Broadminded | -.6585 |
| (34) | Forgiving | -.6301 |
| (33) | Responsible | -.6209 |
| (31) | Honest | -.5611 |
| (39) | Capable | -.4905 |
| (38) | Clean | -.4404 |
| (43) | Polite | -.4255 |
| (40) | Self-Controlled | -.3268 |
| (35) | Courageous | -.2917 |
| **Factor VII - 'Scrupulousness'** | | |
| (47) | Obedient | .7839 |
| (46) | Logical | .5975 |
| (32) | Ambitious | .5922 |
| (43) | Polite | .5827 |
| (39) | Capable | .4781 |
| (42) | Cheerful | .4748 |
| (38) | Clean | .4704 |
| (40) | Self-Controlled | .4494 |
| (35) | Courageous | .4413 |
| (33) | Responsible | .3127 |
| **Factor VIII - 'Free thinking '** | | |
| (45) | Intellectual | .6135 |
| (44) | Independent | .5733 |
| (48) | Imaginative | .5691 |
| (39) | Capable | .4587 |
| (46) | Logical | .3346 |
| (35) | Courageous | .3241 |

Table IV (Continued)

FACTOR STRUCTURE: INDIVIDUAL-BATTERY FACTORS

Ways to Live (WTL) Battery - Three Factors

| Variable Number | Variable Name | Loading |
|---|---|---|
| **Factor IX - 'Effacing Self-Concern'** | | |
| (57) | Way 9 - Quiet receptivity to experience | -.7325 |
| (61) | Way 13 - Let oneself be used | -.6478 |
| (58) | Way 10 - Dignified self-control | -.6190 |
| (51) | Way 3 - Sympathy, concern for others | -.5219 |
| (59) | Way 11 - Retreat from world and development of self | -.4875 |
| (50) | Way 2 - Self-sufficiency | -.4847 |
| (49) | Way 1 - Refinement, moderation, restraint | -.4371 |
| **Factor X - 'Social Activism'** | | |
| (53) | Way 5 - Group action toward common goals | -.7585 |
| (54) | Way 6 - Progress through realistic solution of problems | -.6086 |
| (60) | Way 12 - Outward, energetic interaction with environment | -.3949 |
| (56) | Way 8 - Carefree, relaxed enjoyment of simple comforts | -.3388 |
| **Factor XI - 'Experimental Variety or Adventure'** | | |
| (52) | Way 4 - Abandonment to sensuous enjoyment | -.6680 |
| (55) | Way 7 - Integration of Diversity | -.5530 |
| (57) | Way 9 - Quiet receptivity to experience | -.3918 |
| (60) | Way 12 - Outward, energetic interaction with environment | -.3102 |

Table IV (Continued)

FACTOR STRUCTURE: INDIVIDUAL-BATTERY FACTORS

Gordon Battery - Two Factors

| Variable Number | Variable Name | Loading |
|---|---|---|
| **Factor XII - 'Active, Systematic Practicality'** | | |
| (66) | Orderliness | -.9254 |
| (62) | Practical Mindedness | -.8067 |
| (67) | Goal Orientation | -.7457 |
| (65) | Decisiveness | -.6405 |
| (63) | Achievement | -.6331 |
| **Factor XIII - "Active, Coordination'** | | |
| (64) | Variety | -.5972 |
| (63) | Achievement | -.5227 |
| (65) | Decisiveness | -.3595 |
| (62) | Practical Mindedness | -.3422 |

The first factor from the Rokeach 1 battery, Factor III, 'Social Idealism', is nearly identical to Factor 7 of the all-battery factor analysis with respect to the Rokeach 1 battery loadings. Factor III in this case, however, contains the additional value variables of Self-respect, Inner Harmony and Mature Love and these additions appear to fit neatly into the value conception of 'Social Idealism'.

Factor IV from the Rokeach 1 battery, 'General Security', is nearly identical to Factor 7 of the all-battery factor analysis. There is a slight change in ordering in this case with National Security receiving a larger factor loading than Salvation. Also, there is the addition of the value of a Sense of Accomplishment to Factor IV. The orientation of this factor does not appear to have changed much from Factor 7, and it still remains a 'General Security' factor in content.

Factor V, from the Rokeach 1 battery, 'General Satisfaction', and Factor 11 of the all-battery factor analysis have much in common. The Rokeach 1 values of Pleasure, Comfortable Life, and Sense of Accomplishment appear on both in the same order. In the case of Factor V, however, there is the addition of the values of An Exciting Life, Social Recognition, and Happiness. These

additions have altered the factor content to that of General Satisfaction.

Factor VI from the Rokeach 2 battery, 'Poised Concern for Others', and Factor 2 of the all-battery factor analysis have nine Rokeach 2 variables in common in essentially the same loading order. Factor VI, however, has the additional values of Self-controlled and Courageous also loaded on it, but their loadings are small. The factor content of Factor VI still appears to reflect a 'Poised Concern for Others'.

The second factor, Factor VII, derived from the Rokeach 2 battery does not appear to parallel any particular factor derived from the all-battery factor analysis. It does appear, however, to be a clearly discernible factor in terms of its content and this content seems to center on the value of 'Scrupulousness'. It also seems to be both personally and socially oriented which is not surprising in view of the initial protocol question concerning the battery.

Factor VIII from the Rokeach 2 battery, labelled 'Free Thinking', is almost identical to Factor 8 of the all-battery factor analysis. The order of the factor loadings is slightly different and Factor VIII

does not have the additional loading of the value of Ambitious. The factor content of Factor VIII, however, remains appreciably the same.

Factor IX from the Ways to Live battery is identical to Factor 3 of the all-battery factor analysis. Both are labelled 'Effacing Self-concern' and the only difference is that Way 4 is loaded on Factor IX of the all-battery factor analysis but is not loaded on this factor. Even the order of the loadings remains the same.

Factor X from the WTL battery does not appear similar to any of the factors obtained in the all-battery factor analysis. Its content, labelled 'Social Activism', appears to reflect a value dimension or cluster one might find in social welfare workers.

Factor XI from the WTL battery is somewhat similar to one of the poles of Factor 5 of the all-battery analysis in that Way 12 and 7 are common to both. Factor XI, labelled 'Experiential Variety or Adventure', seems to be concerned with a general way of approaching sensory and cognitive experience with some emphasis on pleasure or satisfaction in sensualness.

Factor XII from the Gordon battery is very similar to Factor 1 of the all-battery factor analysis. Both have been labelled 'Active, Systematic Practicality' and both contain the same five of six Gordon value variables, although the loadings are in different order. The content of this factor appears to be reflecting a value dimension or cluster one might find predominant in a businessman, executive or lawyer. It does not appear excessively rigid but definitely methodical and well-ordered.

Factor XIII from the Gordon battery, labelled 'Active Coordination', is not similar to any of the all-battery factors. Although it contains three of the same variables found in Factor XII from this battery its factor content seems to be displaying a slightly different orientation. This value constellation, it is conjectured, might be found in the person whose occupation is that of a Promoter.

The results and interpretations of the individual-battery analysis indicate a further confirmation of the hypothesis that the batteries themselves are the main source of variance of the correlation matrix of independent variables of values. Most of the factors from the all-battery factor analysis that were originally

deemed battery factors were also found in the individual-battery analysis. Since the results of the canonical analysis indicated that the batteries were measuring different things, it was decided that the homogeneity of the battery factor made them a more plausible description of the value domain measured by these factors rather than the all-battery factors. Consequently, 12 of the 13 factors obtained from the individual-battery analysis were used as the independent variables or predictors in the subsequent regression analysis. Only one factor was used from the Gordon battery, because it accounted for 81% of the variance of that battery. Thus, only 12 factor scores were obtained and used as the predictor set in the regression analysis.

## Results - Part II

### Regression Analysis

In this section the regression analysis results of the twenty-one dependent variables regressed onto the twelve individual-battery factors is reported. Only those results which appeared to indicate significant relationships ($R^2$ = 20 at least) amongst the twelve battery factors and the twenty-one attitudinal and behavioral variables are reported. Analysis and discussion of these

results is left to the next chapter. Thus, only ten cases of the twenty-one dependent variables are reported. These are Program Choice, Sex, Age, Machiavellian II, Conservativism, the Centers' Vocational Interest Scales of 'Interesting Experience', 'Occupational Security', 'Profit', and the Holland Personal Survey variables of 'Realistic Type', and 'Artistic Type'. Also included are the results of a canonical analysis of the Independent-Dependent variable domains.

A summary of ten regression equations with a rank-ordering of the variables in terms of their contribution to the multiple correlation squared is shown in Table V.

In Table V is shown the number of predictors in the regression equation, the Unshrunken and Single Shrunken multiple correlation (R) and multiple correlation squared ($R^2$), the F value of the multiple $R^2$ and the degrees of freedom. The column headed $R_c$ is the rank-ordering of the independent variables in terms of their zero-order validities. The column headed $\Delta R_c$ or $\Delta R_c^2$ or T is the rank-ordering of the independent variables in terms of three indices of relative contribution to $R^2$. The zero-order validity refers to the correlation of the particular independent variable with

the criterion of concern independently of the other independent variable. In the case of the unshrunken R or $R^2$ there is no correction for sample size and the R or $R^2$ here refers to how well the selected independent variables predict in the present sample. The single shrunken R or $R^2$ are estimates of the population multiple R or $R^2$ respectively. The F value is an index from which can be found the probability that the unshrunken R or $R^2$ differs from zero. The $\Delta R_c$ refers to the change in the absolute value of the multiple R while the $\Delta R_c^2$ refers to the change in multiple $R^2$ if that independent variable were eliminated from the regression equation. The T indicates the score from which the significance of the change in multiple $R^2$ given a specified degree of freedom can be found for each predictor. Since $\Delta R_c$, $\Delta R_c^2$, and T all rank order the independent variables in the same order, they are all listed as one column. They are each an index of the relative contribution of that independent variable to the regression equation. Actually, only the first independent variable can be judged as the most important predictor. The correlation matrix for the 12 independent variables (predictors) and 21 dependent variables (criterion) is shown in Table E of Appendix A. A complete report of all the components of the stepwise regression analysis is shown in Table F of Appendix A.

TABLE V

SUMMARY OF REGRESSION EQUATIONS WITH A RANK-ORDERING OF MOST IMPORTANT CONTRIBUTORS

Case (a) - Academic versus Technical Choice
- 6 Predictors

Unshrunken (US) : Mult R = .347 Mult $R^2$ = .120
F,OF = (6,202)

Single Shrunken (SS) : Mult R = .307 Mult $R^2$=.094
4.59,p = .001

| Rc | $\Delta Rc$ or $\Delta R_c^2$ or T |
|---|---|
| Rok 1-III | WTL - X |
| Rok 2-VI | Rok1 - III |
| WTL - X | WTL - IX |
| Gordon - XII | Gordon - XII |

Case (b) - Sex 5 Predictors

US : Mult R = .311 Mult $R^2$ = .097 F,DF=(5,203)

SS : Mult R = .273 Mult $R^2$ = .075 4.36,p = .001

| $R_c$ | $\Delta R_c$ or $\Delta R_c^2$ or T |
|---|---|
| Rok 1 - V | Rok 1 - V |
| WTL - X | WTL - XI |
| WTL - XI | Rok 1 - IV |

Table V (Continued)

SUMMARY OF REGRESSION EQUATIONS WITH A RANK-ORDERING OF MOST IMPORTANT CONTRIBUTORS

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Case (c) - Age — 9 Predictors

US : Mult R = .420 Mult $R^2$ = .177 F,OF = (9,199)

SS : Mult R = .373 Mult $R^2$ = .139 4.75 , p = .001

| $R_c$ | $\Delta R_c$ or $\Delta R_c^2$ or T |
|---|---|
| WTL - XI | WTL - XI |
| Scott - I | Rok 1 - V |
| Rok 1 - V | WTL - X |
| Gordon - XII | Scott - I |
| WTL - X | Gordon XII |

Case (d) - Mach II — 9 Predictors

US : Mult R = .458 Mult $R^2$ = .210 F,Df = (9,199)

SS : Mult R = .417 Mult $R^2$ = .174 4.87 , p = .001

| $R_c$ | $\Delta R_c$ or $\Delta R_c^2$ or T |
|---|---|
| WTL - IX | WTL - IX |
| Rok 2 - VI | Rok 2 - VII |
| WTL - X | Rok 2 - VI |
| Scott - II | Rok 1 - IV |

Table V (Continued)

SUMMARY OF REGRESSION EQUATIONS WITH A RANK-ORDERING OF MOST IMPORTANT CONTRIBUTORS

Case (e) - Conservativism 9 Predictors

US : Mult R = .468 Mult $R^2$ = .219 F,DF = (9,199)

SS : Mult R = .428 Mult $R^2$ = .184 6.20 , p = .001

| $R_c$ | $\Delta R_c$ or $\Delta R_c^2$ or T |
|---|---|
| Scott - I | Scott - I |
| Rok 2 - VII | Rok 1 - V |
| Gordon - XII | WTL - X |
| Rok 1 - IV | Gordon - XII |

Case (g) - Centers' (2) - 'Interesting Experience' 6 Predictors

US : Mult R = .509 Mult $R^2$ = .259 F,DF = (6,202)

SS : Mult R = .486 Mult $R^2$ = .237 11.74 , p = .001

| $R_c$ | $\Delta R_c$ or $\Delta R_c^2$ or T |
|---|---|
| Rok 2 - VI | Rok 2 - VI |
| Scott - II | Scott - II |
| WTL - XI | WTL - X |

Table V (Continued)

SUMMARY OF REGRESSION EQUATIONS WITH A RANK-ORDERING OF MOST IMPORTANT CONTRIBUTORS

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Case (j) - Centres' (5) - 'Security' 7 Predictors

US : Mult R = .583 Mult $R^2$ = .339 F,DF = (7,201)

SS : Mult R = .562 Mult $R^2$ = .316 14.71 , p = .001

| $R_c$ | $\Delta R_c$ or $(\Delta R_c^2)$ or T |
|---|---|
| Rok 2 - VII | Rok 2 - VII |
| Rok 1 - IV | Rok 1 - V |
| Rok 1 - V | Rok 2 - VI |
| Rok 2 - VI | Rok 2 - VIII |
| Scott - II | Rok 1 - IV |

Case (l) - Centres' (7) - 'Profit' 9 Predictors

US : Mult R = .478 Mult $R^2$ = .228 F,DF = (9,199)

SS : Mult R = .440 Mult $R^2$ = .194 6.54 , p = .001

| $R_c$ | $\Delta R_c$ or $\Delta R_c^2$ or T |
|---|---|
| Rok 1 - V | Rok 1 - V |
| Rok 2 - VII | Rok 1 - III |
| Rok 1 - IV | Rok 2 - VII |
| Scott - II | Scott - II |

Table V (Continued)

SUMMARY OF REGRESSION EQUATIONS WITH A RANK-ORDERING OF MOST IMPORTANT CONTRIBUTORS

Case (p) - Holland (1) - 'Realistic Type' 8 Predictors

US : Mult R = .434 Mult $R^2$ = .189 F,DF = (8,200)

SS : Mult R = .395 Mult $R^2$ = .156 5.82 , p = .001

| $R_c$ | $\Delta R_c$ or $\Delta R_c^2$ or T |
|---|---|
| Rok 2 - VI | Rok 2 - VI |
| Rok 1 - IV | Rok 1 - IV |
| WTL - IX | WTL - IX |
| Gordon - XII | Rok 2 - VII |
| Scott - II | |

Case (u) - Holland (6) - 'Artistic Type' 7 Predictors

US : Mult R = .528 Mult $R^2$ = .279 F,DF = (7,201)

SS : Mult R = .504 Mult $R^2$ = .254 11.1, p = .001

| $R_c$ | $\Delta R_c$ or $\Delta R_c^2$ or T |
|---|---|
| WTL - IX | WTL - IX |
| Rok 2 - VIII | Scott - I |
| Scott - I | Scott - II |
| Scott - II | Rok 1 - IV |
| Rok 1 - IV | Rok 2 - VIII |

The regression results will be presented in two parts. The first part will deal with the criterion variables of Academic/Technical Program choice, Sex and Age. These will be treated as criterion to be predicted from the predictor set rather than dependent variables having a functional relationship to the independent variables. The second part will deal with the remaining eighteen variables as dependent variables. The reason for this differentiation is that prediction rather than causality would be the main concern with respect to the first three variables, but the reverse would be the case for the remaining eighteen. As a consequence, the presentation of the results is somewhat different. In the first case the multiple correlation is viewed as a measure of the percentage of predictor improvement that would be attained by using a perfect set of predictors rather than these predictors. That is, the multiple R reflects the percentage of the prediction given by a perfect set of predictors. Thus, even low multiple R's may be valuable (Brogden, in Cronbach & Gleser, 1965, p. 30 - 33) indicators of the predictability of a predictor set. For the remaining 18 dependent variables, the multiple correlation squared will be viewed as 'explaining' or 'accounting for' that percentage of dependent variable variance (McNemar, 1962, p. 169).

In both cases, the problem of determining the relative contributions or importance of the independent variables to the regression equation still remains. This problem may be an unsolvable one theoretically (Hope, 1968, p. 157 - 160), but, nevertheless, certain conventions have been followed. Insofar as relative contribution can be determined the most effective indicators appear to be $\Delta R_c$, $\Delta R_c^2$ and T (Darlington, 1968) and these three will be utilized in the present analysis of the results. The sign of the zero-order validity will also be focused on in order to ascertain the direction of the relationship between the dependent and independent variable.

Case (a) - Program Choice

In the dependent variable of academic versus technical program choice, the shrunken multiple R is .31 for the given independent (predictor) variables. Since this dependent variable is discrete - the subject either is in the academic program (1) or the technical program (0) - this R can be viewed as a validity coefficient along the lines of Brogden (in Cronbach & Gleser, 1965, p. 32). According to Brogden the value of the R indicates the percentage of improvement in prediction of the criterion (in this case the dependent

variable) that would result from using a perfect set of predictors (independent variables). For this case, the improvement is approximately 31% of that attainable using a perfect predictor set. Since values have traditionally been considered somewhat nebulous things, the size of this improvement in prediction is not unimpressive. In the present instant, an $R^2$ of .123 is significantly different from zero at the .001 level.

For case (a), Academic versus Technical Program Choice, there are six predictor-factors in the regression equation. This suggests that given the total of 12 predictor-factors representing the value domain as measured by the 67 value measures, the six selected predictor-factors are the independent variables which would indicate most effectively whether a student would select an Academic or Technical program. Within this group of six predictors the most significant single contributing predictor to the regression equation (as indicated by its values in the $AR_c$, $AR_c^2$ and T columns) is the WTL factor X - 'Social Activism'. Its contribution is statistically significant at the .01 level. Two other predictors contribute significantly at the .05 level. These two are the Rok 1, factor III - 'Social Idealism', and the WTL factor IX - 'Effacing, Self-Concern'. Thus, whether one chooses an academic

or technical program at Vancouver City College seems dependent to some extent on whether one holds these three values 'highly'. If one values these three clusters 'highly', then one is more likely to choose an academic program rather than a technical one and vice-versa. The results make sense intuitively because at the time (1970) this data was collected, social concerns and social activism were highly valued amongst the students in colleges and universities around the country. Moreover, it is not unusual, nor unexpected, to find that career-oriented (business) candidates would not score as highly on these values.

The remaining three predictors are less significant contributors. Rok 2, factor VI - 'Poised Concern for Others' appears to enhance the prediction of the choice of an Academic Program, while the Gordon factor XII - 'Active, Systematic Practicality' seems to contribute to the prediction of the choice of a Technical Program. The final remaining predictor, Rok 1, factor V - 'General Satisfaction' appears to have no correlation with the criterion and may be acting as a suppressor variable in the regression equation, but it is difficult to ascertain this properly with this number of predictors.

Case (b) - Sex:

In case (b), Sex, there are five predictors in the regression equation. The F value for the multiple $R^2$ is significant at the .001 level indicating that sex differences in values can be predicted to some extent. Since this dependent variable is similar to case (a) in also being a discrete variable, it can be interpreted along similar lines. That is, utilizing this set of five predictors gives 27% of the improvement that would result from using a perfect set of predictors in the prediction of sex from values. The major predictor relative to this set is the Rok 1, factor V - 'General Satisfaction'. Its contribution to the regression equation is statistically significant at the .01 level. One other contributor, the WTL factor XI - 'Experiential Variety or Adventure', is statistically significant at the .05 level. According to this regression equation it would be expected that the female student values 'General Satisfaction' highly and 'Experiential Variety or Adventure' lowly while the reverse might have been expected to be true. This finding seems to be in accord with traditional expectations concerning what it is appropriate for males and females to value, but may be a bit surprising in these 'modern times'. The three remaining and less statistically significant predictors seem to indicate

that female students would value 'general security' and 'social activism' highly but not 'social idealism' while the reverse would be the case for male students.

Case (c) - Age:

There are nine predictors comprising the regression equation for case (c), Age. The F value for the multiple $R^2$ of .14 is statistically significant at the .001 level indicating that values tend to differ with age to some extent even in this narrow age range (approx. 19 - 27). While age is clearly not a discrete variable, Brogden's linear prediction model (as in case (a) and (b)) seems best suited for presenting and interpreting the results of this regression. Thus, this set of nine predictors gives 37% of the improvement that would result from using a perfect set of predictors in the prediction of age from values. The major predictor of age within this set is the WTL factor XI - 'Experiential Variety or Activity'. Its contribution is statistically significant at the .01 level. That is, a 'high' valuing of this variable tends to predict older students. Another predictor significant at the .01 level is Rok 1, factor V - 'General Satisfaction'. Thus, it would appear that 'low' valuings of this variable also predict age significantly. Two other predictors are statistically

significant at the .05 level. These are the Scott, factor I - 'Social Conventionality' and the WTL, factor X - 'Social Activism'. These findings are, perhaps, surprising in that they indicate that a 'high' valuing of 'Social Conventionality' and a 'low' valuing of 'Social Activism' predict younger students while the opposite is true for older students. The remaining five variables are less statistically significant and their contribution to the multiple $R^2$ is more difficult to interpret.

Since the remaining eighteen dependent variables are assumed each to be continuous and, perhaps, to be causally related to the value constellations described by the independent variables, the concern in interpretation shifts from prediction to how much variance in the dependent variables is accounted for by the independent variables. Only those cases in which at least 20% of the dependent variable variance is accounted for or explained by the independent variable variance is analyzed, because anything less could probably be attributed to sampling error in a sample of this size (McNemar, 1962). Consequently, although this cut-off point is somewhat arbitrary, only seven of the remaining eighteen cases have been analyzed. They are the MachII, Conservativism, Centers'(Interesting Experience), Centers'(Security),

Centers' (Profit) and the Holland 'Realistic Type' and 'Artistic Type' dependent variables.

Case (d) - Mach II:

There are nine predictors in the regression equation for case (d), Mach II. As will be recalled, Mach II is an attitudinal measure of amoral, interpersonal manipulative tendencies. The multiple $R^2$, which is statistically significant at the .001 level, indicates that 21% of the present sample Mach II variance is accounted for by this regression equation. The chief contributor to this regression equation is the WTL, factor IX - 'Effacing, Self-Concern', and it is statistically significant at the .01 level. This finding seems to accord with our understanding of Machiavellianism wherein the person holding this sort of attitude does not place his 'self' in the forefront of his interpersonal interactions, but, rather, forces it to be less apparent than it really is. Two other predictors are significant at the .01 level. These are the Rok 2, factor VII - 'Scrupulousness' and Rok 2, factor VI - 'Poised Concern for Others'. Rok 2, factor VII appears to be in accord with traditional idea of the machiavellian in that its negative weighting implies that the more one values unscrupulousness the more one is likely to be

higher in Machiavellianism. The finding that Rok 2, factor VI - 'A Poised Concern for Others' is a positive contributor to the regression equation is somewhat unexpected and puzzling. It may, perhaps, be necessary to hold such a value in order to successfully manipulate others (Rok 2 values are instrumental or means values), but why this would be so is not clear. A fourth independent variable, Rok 1, factor IV - 'General Security' is statistically significant at the .05 level. This finding indicates that 'high' valuing of general security is behind the Machiavellian attitude.

In case (e), Conservativism, the regression equation is composed of nine of the twelve independent variables. The multiple $R^2$ indicates that 22% of the dependent variable is 'explained' by the variance of this combination of these nine variables. The major contributor is the Scott, factor I - 'Social Conventionality'. It is statistically significant as a contributor at the .05 level. According to the zero-order validity a high valuing of social conventionality is related to a low conservatism. This finding, however, does not entirely agree with the common idea of the conservative as one who is traditionally conventional, but, rather, seems to indicate that the more one values 'social conventionality' the less conservative one will be. There are

three other contributors significant at the .05 level. These are the Rok 1, factor V - 'General Satisfaction', the WTL, factor X - 'Social Activism', and the Gordon, factor XII - 'Active, Systematic Practicality'. The data, here, seem to indicate that to the extent that one values 'general satisfaction' positively, 'social activism''social conventionality' and 'active, systematic practicality' negatively, one will also have conservative attitudes. This result may, perhaps, be placed into proper perspective if it is also realized that this group of subjects as a whole is not very conservative at all. The mean for this group (M = 34.2) is similar to that of the 'scientists' (M = 30.8) rather than that of the 'Junior National Party' (M = 55.8) or the 'Gideons' (M = 70.5) (Wilson and Patterson, 1968, p. 268). The 'scientists' were used as a 'known group' of non-conservatives while the 'J.N.P.' and the 'Gideons' were used as 'known groups' of conservatives in a set of validation studies during the development of the 'Conservativism scale. It may be the case in the present sample that only the low end or non-conservative end of the conservativism scale is being sampled with the resultant, and apparent,'anomaly'. That is, although 'social conventionality' may be valued lowly when 'conservativism' is valued highly, and vice-versa, the 'conservativism' is still not only not very high but

rather non-conservative. This same factor would be true for 'social activism' and 'active, systematic practicality' as well. Thus, in order to get a 'fuller' picture of the relationship between values as measured by these instruments and 'Conservativism', it would be necessary to obtain suitable scores from the full range of the 'conservatism' scale. Although the fact that this group scored low on 'conservativism' does not explain these results entirely, it does help to some extent.

In case (g), Centers' job preference for an occupation offering an 'Interesting Experience', there are six independent variables in the regression equation giving a multiple $R^2$ of .26. This multiple $R^2$ is statistically significant at the .001 level indicating that these six value measures can account for 26% of the variance of the dependent variable. The chief contributor to the regression equation is the Rok 2, factor VI - 'Poised Concern for Others'. It is statistically significant at the .01 level. A second variable is also statistically significant at the .01 level. This variable is the Scott, factor II - 'Social Autonomy'. These results indicate that those who place a high value on 'Social Autonomy' and a low value on 'Poised Concern for Others', such as social 'loners',

would also prefer occupations which provide interesting experiences.

The regression equation for case (j), Centers' job preference for a job offering security, contains seven independent variables. The multiple $R^2$ is .34 and is statistically significant at the .001 level. It presumably accounts for 34% of the variance of the 'Security' dependent variable. While Rok 2, factor VII - 'Scrupulousness' is the major contributor to the regression and is statistically significant at the .01 level, four other variables are also significant at this level. The four other contributors are the Rok 1, factor V - 'General Satisfaction'; Rok 2, factor VI - 'Poised Concern for Others'; Rok 2, factor VIII - 'Free Thinking'; and Rok 1, factor IV - 'General Security'. According to this system of independent variables those who value 'General Security' and 'Scrupulousness' 'highly' and 'Free Thinking', 'Poised Concern for Others', and 'General Satisfaction' 'lowly' will also prefer job security 'highly'. That is, the preference for job security appears to depend on a deep concern for carefulness in general rather than a more risky orientation.

In case (l), Centers' job preference for an occupation giving a good 'Profit', 23% of this dependent

variable is accounted for by the independent variables. The multiple $R^2$ of .23 is statistically significant at the .001 level. The major contributor is Rok 1, factor V - 'General Satisfaction'. This variable is statistically significant at the .01 level. This finding indicates that a job preference for profit depends on a low valuation of 'General Satisfaction'. One other variable, Rok 1, factor III - 'Social Idealism', is also significant at the .01 level. Two other variables, Rok 2, factor VII - 'Scrupulousness' and Scott, factor II - 'Social Autonomy' are statistically significant at the .05 level. Thus, the preference for an occupation with a central concern for profit seems to further depend on a 'high' valuation of 'Social Autonomy', 'Social Idealism', and 'Scrupulousness' and a lower valuation on 'General Satisfaction'. Why 'Social Idealism' contributes to the 'explanation' of an occupational preference for profit is not clear although it might reflect the high value placed on the dollar by many in our society in that an acceptance of the one value does not mean the rejection of the other preference.

There are eight independent variables comprising the regression equation for case (p), Holland's 'Realistic Type' personality. The multiple $R^2$ is .19, accounts for 19% of the variance of the dependent variable

and is statistically significant at the .001 level. The major contributor is the Rok 2, factor VI - 'Poised Concern for Others'. It's contribution is significant at the .01 level. Two other variables are significant at the .01 level. These are the Rok 1, factor IV - 'General Security', and the WTL, factor IX - 'Effacing Self-Concern'. A fourth variable Rok 2, factor VII - 'Scrupulousness' has a contribution which is significant at the .05 level. Rok 1, factor V - 'General Satisfaction and Rok II, factor VII - 'Scrupulousness' appear to be acting as suppression variables. These results suggest that a high score on the Holland 'Realistic Type' depends upon placing a high value on 'General Security', and a 'Poised Concern for Others' and a low value on an 'Effacing Self-concern'. According to Holland's model of the 'Realistic Type' personality, this type of person is

> masculine, unsociable, emotionally stable, materialistic, genuine, concretistic and oriented to the present. (Holland, 1966, p. 19)

Also, this personality type

> sees himself as mature, masculine, practical, conventional, persistent, unsociable, abasing, submissive, natural (not exhibitionistic), favorable to change, and having a narrow range of interests. Rates himself low in self-confidence, writing, speaking, originality, and leadership ... (Holland, 1966, p. 21).

Moreover, his values are conventional,

especially in the economic realm, and he places esthetic values very low in importance. He appears to be the stereotype, blue-collar worker. The results of this regression analysis confirm this model to some extent: Scott, factor I - 'Social Conventionality' and Gordon, factor XII - 'Active Systematic Practicability' are negatively correlated with this dependent variable; Scott, factor II - 'Social Autonomy', Rok I, factor IV - 'General Security' and Rok 2, factor VI - 'Poised Concern for Others' are all positively correlated. While it might be expected that the Gordon factor XII might have been expected to correlate positively with this dependent variable, the items loaded on the Gordon factor did tend to direct themselves more to the white-collar person than to the 'Realistic Type'.

The regression equation for the dependent variable, case (u), Holland (6) - 'Artistic Type' personality is composed of seven independent variables. The multiple $R^2$ is .28 ($p = .001$) and accounts for 28% of the variance of the dependent variable. The major contributor is the WTL, factor IX - 'Effacing Self-Concern'. Its contribution is significant at the .01 level. There are three other variables statistically significant at the .01 level. These are the Scott, factor I - 'Social Conventionality'; Scott, factor II -

'Social Autonomy'; and Rok 1, factor IV - 'General Security'. A fifth variable, Rok 2, factor VIII - 'Free Thinking' is significant at the .05 level. The data support the view that a high score on the Holland 'Artistic Type' depends upon also placing a high value on 'Social Conventionality', 'Social Autonomy', and 'Free Thinking', while placing a low value on 'General Security' and an 'Effacing Self-Concern'. Holland's model of the 'Artistic Type' is one who

> copes with his physical and social environment by using his feelings, emotions, intuitions, and imagination to create art forms or products. . . . problem solving (for him) involves expressing his imagination and taste through the conception and execution of his act. . . . The artistic person is characterized further by his complexity of outlook, independence of judgement, introversion, and originality. (Holland, 1960, p. 33)

Furthermore, the 'Artistic' person,

> sees himself as unsociable, feminine, submissive, introspective, depressive, abasing, sensitive (paranoid), independent, radical, impulsive, flexible, irresponsible, achieving, unstable, naive, tense, and subject to parental press for achievement. (He) Rates himself higher on writing skills, originality, neatness, independence, expressiveness, and self-confidence but low on popularity. (Holland, 1966, p. 34).

In view of Holland's model of the 'Artistic Type' this regression equation is somewhat unclear. The finding of positive correlations between the dependent variable and 'Social Autonomy', and 'Free Thinking' is expected as is the negative correlation with 'General Security' and 'Effacing Self-Concern'. The findings that 'Social Conventionality' correlates positively with 'Artistic Type' runs exactly counter to what Holland's model seems to expect. Moreover, it might have been reasonable to expect that Rok 1, factor III - 'Social Idealism' and WTL, factor XI - 'Experiential Variety or Adventure' would have had positive correlations with this dependent variable, but just the opposite was true. Both correlated negatively with 'Artistic Type'. Once again, however, it is necessary to realize that the group of subjects in this sample have scored fairly low on the average for Holland's 'Artistic Type' ($M = 6.5$, $\sigma = 3.4$). As in the case of 'Conservativism', it may be that this group of subjects is not very representative of the 'Artistic Type' population (Holland does not give any figures as to what is an exemplarary score for 'Artistic Type' but one might reasonably assume that it would be considerably higher than 7 out of a possible 21). Consequently, it may be that this group of subjects is only slightly 'artistic'. In fact, this group scored most highly on Holland's 'Social Type' which may account for the con-

centration on 'social conventionality'. If it is true that this group of subjects is really only slightly 'artistic', then the lack of positive correlations with 'Social Idealism' and 'Experiential Variety or Adventure' is not an unreasonable or even unexpected finding.

This concludes the presentation of the results concerning the regression equations dealing with the relationships between the value domain and those of behavior and attitudes. These results will be discussed in the second half of Chapter 6.

## Canonical Analysis of Independent and Dependent Variables

As an afterthought, and for the final step of the data analysis, a canonical redundancy analysis of the independent-dependent (predictor-criterion) domains was undertaken in order to examine the extent of overlap between these two domains. Since it might be helpful to know the source of any extensive overlap should any be found, the criterion domain was partitioned into four parts, and three were used in the analysis. These were the Machiavellian II, and Conservativism (Mach-Con) set, the Centers and Holland (Cen-Holl) criteria set, and the combination of these two sets, the All-Criteria set. The Academic/Technical, Age, and Sex criteria were

TABLE VI

SUMMARY OF CANONICAL TOTAL REDUNDANCIES FOR COMPARISONS OF INDEPENDENT-DEPENDENT VARIABLE DOMAINS

| | Independent Variables (Predictors) | Mach-Con | Cen-Holl | All-Criteria (All Dependent Variables) |
|---|---|---|---|---|
| Independent Variables (Predictors) | | .0594 | .2319 | .2547 |
| Mach-Con | .2174 | - | - | - |
| Cen-Holl | .1872 | - | - | - |
| All-Criteria (All Dependent Variables) | .1770 | - | - | - |

Note: Values below diagonal indicate proportion of row-variable variances predicted by column variable variance. Values above diagonal indicate proportion of column-variable variance predicted by row-variable variance. (i.e. Mach-Con variance predicts 6% of the Independent Variable Variance while the Independent Variables Variance predicts 22% Mach-Con variance.)

omitted because they were discrete. A summary of the total canonical redundancies is shown in Table VI. The complete results of this canonical analysis are shown in Table G of Appendix A. The redundancy measures indicate that 22% of the variance of the Mach-Con criteria are accounted for by the predictors, while 6% of the predictor variance is accounted for by the Mach-Con criterion variance. In case (2), the predictor set predicts 19% of the variance of the Cen-Holl criteria variance, and the Cen-Holl predicts 23% of the predictor variance. In the last case, the predictors account for 18% of the All-Criteria variance while the latter predicts 25% of the predictor set variance. These results indicate that although there is some overlap of the predictor and criterion domains, as was expected, they are not redundant measures. The fact that the All-Criteria variance actually predict a little more of the predictor variance than vice-versa may be due to the rather encompassing generality of these two attitudinal variables. However, insofar, as the 'rule-of-thumb' is to treat any redundancies less than .30 as nonsignificant, the general finding that these are not redundant measures seems warranted.

# Chapter 6

## DISCUSSION

In this chapter the results reported in the previous chapter will be discussed. These results will be divided into two sections. Part I will deal with the results concerning the value domain alone, namely the all-battery factor analysis, the canonical analysis and the individual-battery factor analysis. That is, it will be directed to an analysis of the confounded all-battery factors, of the lack of overlap between the various pairs of batteries, and of the more clearly definable individual-battery factors. Attention will also be directed to a possible remedy for removing 'battery' variance from the intercorrelation matrix. A general analysis of the individual-battery factors will then be undertaken with a concentration on how the factors found in the present study compare to previous studies. The final concern of this section will deal with the general consequences and implications of the removal of ipsativity for the Rokeach and Gordon value batteries and theories.

The second section, Part II will deal with the relationships found between the 12 individual-battery

factors as the independent variables and the 21 behavioral and attitudinal variables as dependent variables. It will mainly focus on the general relationships found between values and behavior and attitudes.

As was outlined in Chapter 3, this study attempted to narrow the problem of multiplicity of values which has arisen because of our nebulous knowledge of the nature of values and because value researchers have apparently developed value batteries and tests quite independently of each other. The resultant large array of measures all purporting to measure some aspect of the value domain has not led to a clarification of the nature and scope of that domain, but rather to increased confusion. It was conjectured that a factor analytic investigation of five such value batteries would determine the basic, value dimensions underlying these batteries. Furthermore, it was hypothesized that these value dimensions would be substantially related to other attitudes and behavior. The following Parts I and II are the discussion of the results of those investigations. In view of the importance of values and the problems of measurement and detection unearthed in this inquiry, it will be necessary to temper speculation and to interpret those results conservatively.

## Part I - The Value Domain

The primary concern of this study was to ascertain to what extent the measures of values found in the five value batteries reflected separable but identifiable, underlying value dimensions. That is, it sought to answer the question of "How many distinct values are being measured by these five value batteries". It was thought that by using a variety of values and methods of measuring values, factors having a value commonality, perhaps reflecting basic dimensions of values or basic value constellations, would emerge which would diverge from those not sharing this commonality. That is, if there are separable dimensions of values being measured by these batteries, then value dimension factors would have emerged from the data onto which common values measured by different batteries would have converged and from which contrasting factors (i.e., method factors and dimension factors) would have diverged. Thus, the variance due to any particular value dimension would have been separated both from that due to other values and from that variance due to methods of measurement. (Although the logic is similar to that found in convergent and discriminative validity models (Campbell & Fisher, 1959), it differs in that with the latter models <u>each</u> trait is measured by several different methods.)

As the results of the all-battery factor analysis indicate, however, this expectation was not confirmed for these five value batteries in this study. Rather, the factors that emerged were largely 'battery' factors - factors predominantly loaded with variables from the same battery independently of methods of measurement. In view of this fact, further analysis of the value domain was undertaken.

On the assumption that the value measures are, perhaps, valid, the results of the canonical analysis of the batteries give a partial explanation to the nature of the all-battery factor analysis. The very small redundancies of each of the battery-pairs points to the lack of overlap of the five value batteries although they may, in fact, be valid measures of parts of the value domain. That is, while there is common ground between the batteries, it was being blurred by the unexpected fact that value measures within a battery share more variance with each other than they do with measures from other batteries. Furthermore, an even more puzzling result is that measures of different values from the same battery seem to share more variance with other values within that battery than do the <u>same</u> values measured in the same way by different batteries. The intrusion of variance due to different methods of measurement is understandable and expected but that of battery variance was

not. That is, method factors were expected and taken into account somewhat in the survey design by using different methods of measurement.

With the obtaining of 'battery' factors from the all-battery factor analysis, the question arises as to whether different aspects of the value domain are being measured by these batteries or rather that the intrusion of 'battery' variance is confounding matters. That is, perhaps the value domain is not very large, but the different battery measures of the same values leads to different results; i.e., in this case obscure all-battery factors. In this case, the method of analysis must be capable of separating the effect due not only to measurement method variance but also to battery variance from that due to content or trait variance. While 'battery' variance has not been dealt with in the literature, method variance, to some extent has. According to Jackson (1969), the acquisition of factors containing confounded method and content variance occurs because traditional factor analytic techniques treat method and trait variance additively and as separable factorially because of their different variance structure. As has been well-documented (Jackson, 1969; Campbell and O'Connell, 1968) method variance has not been found to be randomly distributed as traditionally

assumed but, rather, to show a similar structure to content or trait variance. The result, since factor analysis seeks to identify a recurring common factor structure, will be to derive factors confounding this similarity in variance structure. Furthermore, if method variance and content variance do not combine additively but in some other fashion, say, multiplicatively (Campbell, et al, 1968), then traditional factor analytic techniques would be inappropriate methods of determining the content structure of a set of measures unless method variance could be attenuated (Jackson, 1969, pp. 33 - 34, p. 47). Although battery variance may operate differently than method variance in its relationship to content variance, consideration should be given to it especially in studies such as the present one in which different batteries of presumably independent measures are being utilized.

Jackson (1969) has developed a factor analytic technique called multimethod-factor analysis, in which only that section of the matrix is analysed which contains heterotrait-heteromethod variance. Method variance is eliminated from the multi-trait multi-method matrices by orthogonalizing the diagonal monomethod matrices prior to a principal-components analysis and rotation of axes (Jackson, 1969). That is, the chief

diagonal matrices which contain heterotrait-monomethod variance are removed and identity matrices substituted. With the monomethod variance removed, the new matrix is factored along traditional lines, the important result being the emergence of factors more clearly defined in terms of content variance (Jackson, 1968, 1969). Although the situation in the present study appears to indicate a confounding of various variances, a technique which removes battery variance from the correlation matrix and a computer program for its practical utilization would have to be developed. Until then the results of the all-battery factor analysis will have to remain tenuous and suggestive.

The results of the canonical redundancy analysis for the batteries are instructive here, however, in that canonical correlation analysis is based on the covariances between, rather than the variance within, the battery domain. And here, the redundancies were fairly low indicating that different things were being measured. The battery variance is held constant and only the covariances between batteries is looked at. The only role battery variance could play in this case is in an indirect effect upon the covariances which would be very unusual. Further study of the relationships amongst content, method and battery variance, in any case, is

indeed called for.

Jackson's dictum (1969, p. 47) that multimethod factor analysis will not render poor measures into silk purses is more to the point. While the data do not demand the conclusion that the measures of value, as incorporated by these five value batteries, are invalid, it does appear that individually none of these batteries does justice to the extensiveness of the value-domain. Together they may, but without further analysis of the value-domain, perhaps along the lines mentioned above, this latter conclusion is somewhat speculative. The small redundancies between batteries seems, however, to indicate this conclusion. The value domain may be so large that these batteries are simply tapping different aspects of that domain, aspects which overlap very little and whose similarity lies mainly in the fact that they are all included in the value space.

For this conclusion to be seriously considered, three things would be necessary; the value domain itself must be more carefully delimited and both the particular values and the procedures for measuring them would have to be more clearly defined and specified operationally. With the exception of the Ways to Live battery, all the batteries in this study utilized one word (or group of words) or a short phrase (or group of short

phrases) to specify a value. If values and their effects are as subtle as traditionally assumed, perhaps the specification of that value must be equally subtle or, at least, more distinctly articulated. This is especially true for values where the possible ambiguity of the referent may lead to a low stability in the responses to it. Since even measures of values having the same theoretical name did not appear on the same factors, nor correlate highly individually, it may be indicated that the values measured by these batteries are being only grossly represented. If values and their effects are as subtle as traditionally assumed, perhaps the specification of that value must be equally subtle or, at least, more distinctly articulated. While very sophisticated techniques exist for the analysis of data, the specification of what are to be counted as values and the means for measuring them still seem to lag behind.

## The Individual-Battery Factors

The results of the all-battery factor analysis and canonical analysis led to an alteration in the original plan of the study. Since most of the factors obtained in the all-battery factor analysis seemed to be 'battery' factors rather than basic dimensions of value, the individual batteries were factorized to see if more

clearly definable factors could be obtained. In as much as the individual-battery factor analysis did produce less confounded factors, it was decided to use these factors as the independent variables for the regression analysis in Part II of this study.

Before continuing to a discussion of the results of the regression analysis, it may be of interest as a rough index of factor structure stability to examine how the factors derived in the individual-battery factor analysis compared to past factorizations of the batteries. Since, however, only Morris' Ways to Live battery has received such treatment, this examination will be somewhat limited. The Scott value battery has had its intercorrelation matrix 'roughly' analyzed into 'groups' or 'clusters' of values and these will be compared to the Scott factors derived in this study. There will be no comparisons with respect to the Rokeach or Gordon batteries.

Scott Factors

In 'visually' analyzing the intercorrelation matrix obtained in his Colorado Study (Scott, 1965), Scott found that the intercorrelations amongst the scales indicated two groupings. The first he labelled

"inner-directed" values which contained the values of 'Independence', 'Intellectualism' and 'Creativity'. The average intercorrelation of these three was .33. The second group was labelled "other-directed" values and included the values of 'Loyalty', 'Social Skills', 'Kindness', 'Status', 'Physical Development', 'Self-Control' and 'Religiousness'. The average intercorrelation of these seven was .29. The value of 'Honesty' did not correlate highly with any scales (the average r = .04). The value of 'Academic Achievement', however, correlated moderately with all the scales (the average r = .20). In the present study the individual Scott factor I, 'Social Conventionality' corresponds very highly to Scott's "other-directed" values containing all except two of the values of this latter set. 'Kindness' and 'Physical Development' are missing from Scott factor I, while 'Honesty' and 'Academic Achievement' are included. Scott's "inner-directed" group of values corresponds, to some extent, to the Scott factor II of this study. The "inner-directed" group of values is entirely included in Scott factor II, but so are 5 other values making the content of this factor more socially-oriented. The differences between the two groups of values obtained by Scott himself and the two Scott factors of this study may very well be due to the very rough 'eyeball' analysis given by Scott to his intercorrelation matrix.

A factorization of his matrix would probably improve the fit between his groups and the Scott factor I and II of this study. As it stands, however, the present comparison seems to indicate that the factor structure of the Scott value battery is a stable one.

Morris' WTL Factors

As has been mentioned earlier Morris' WTL battery has been administered to several groups of subjects, including Canadian college students from the University of British Columbia, and the data obtained from these group factors analyzed. These analyses resulted in the derivation of five factors in three cases and four factors once. The factors from Morris' original study (Morris and Jones, 1956), Butt's Canadian Study (Butt, 1966) and those obtained in the present study from the factorization of WTL battery are displayed in Table VII for the sake of comparison.

It can readily be seen that the three factors found in the present study correspond to three of Morris' original five factors, and three of Butt's four factors. Morris' Factor B - 'Enjoyment in Action', Butt's Factor III - 'Sociability and Enjoyment in Action' and the present study's WTL Factor X - 'Social Activism'

TABLE VII

A COMPARISON OF FACTOR STRUCTURE FROM THREE SETS OF WTL DATA

| MORRIS' U.S.A. DATA | | BUTT'S CANADIAN DATA | | PRESENT STUDY CANADIAN DATA | |
|---|---|---|---|---|---|
| **Factor A:** Social Restraint and Self-Control | | **Factor IV:** Achievement | | | |
| Loading | Sign | Loading | Sign | | |
| Way 10 | + | Way 12 | + | | |
| Way 1 | + | Way 6 | + | | |
| Way 3 | + | Way 10 | + | | |
| Way 4 | - | Way 5 | + | | |
| | | Way 1 | + | | |
| | | Way 13 | - | | |
| **Factor B:** Enjoyment in Action | | **Factor III:** Sociability and Enjoyment in Action | | **Factor X:** Social Activism | |
| Loading | Sign | Loading | Sign | Loading | Sign |
| Way 5 | + | Way 8 | + | Way 5 | + |
| Way 12 | + | Way 4 | + | Way 6 | + |
| Way 8 | + | Way 9 | + | Way 12 | + |
| Way 10 | - | Way 5 | + | Way 8 | + |
| Way 2 | - | Way 12 | + | | |
| Way 11 | - | Way 10 | - | | |

| MORRIS' U.S.A. DATA | | BUTT'S CANADIAN DATA | | PRESENT STUDY CANADIAN DATA | |
|---|---|---|---|---|---|
| **Factor C:** Withdrawal and Self-Sufficiency | | **Factor II:** Withdrawal | | | |
| **Loading** | **Sign** | **Loading** | **Sign** | | |
| Way 9 | + | Way 2 | + | | |
| Way 2 | + | Way 11 | + | | |
| Way 11 | + | Way 9 | + | | |
| Way 6 | - | Way 4 | + | | |
| | | Way 10 | + | | |
| | | Way 5 | - | | |
| **Factor D:** Receptivity and Sympathetic Concern | | **Factor I:** Receptivity and Altruism | | **Factor IX:** Effacing Self-Concern | |
| **Loading** | **Sign** | **Loading** | **Sign** | **Loading** | **Sign** |
| Way 13 | + | Way 3 | + | Way 9 | + |
| Way 3 | + | Way 1 | + | Way 13 | + |
| Way 10 | + | Way 13 | + | Way 10 | + |
| Way 5 | + | Way 9 | + | Way 3 | + |
| Way 2 | - | Way 10 | + | Way 11 | + |
| Way 4 | - | | | Way 2 | + |
| | | | | Way 1 | + |

| MORRIS' U.S.A. DATA | | BUTT'S CANADIAN DATA | | PRESENT STUDY CANADIAN DATA | |
|---|---|---|---|---|---|
| Factor E: Self-Indulgence | | Factor V: Diversity or Pluralism | | Factor XI: Experiential Variety or Adventure | |
| Loading | Sign | Loading | Sign | Loading | Sign |
| Way 4 | + | Way 7 | + | Way 4 | + |
| Way 12 | + | | | Way 7 | + |
| Way 3 | − | | | Way 9 | + |
| | | | | Way 12 | + |

all seem to correspond well with all three loading Ways 5, 12, and 8. Morris' Factor D - 'Receptivity and Sympathetic Concern', Butt's Factor I - 'Receptivity and Altruism' and the present study's WTL Factor IX - 'Effacing Self-Concern' correspond well with all three loading Ways 13, 3, and 10 while Butt's Factor I and the present study's WTL Factor IX loading Ways 3, 1, 13, 9 and 10. Morris' Factor E - 'Self-Indulgence' appears to correspond to the present study's WTL Factor XI - 'Experiential Variety or Adventure' with Ways 4 and 12 appearing on both. Butt's Factor V - 'Diversity or Pluralism' and the present study's WTL Factor XI -'Experiential Variety or Adventure' share Way 7 in common but that is all. Morris' Factor A - 'Social Restraint and Self-Control' and Butt's Factor IV - 'Achievement' have no factor in the present study corresponding to them, although Ways 10 and 1, the supposedly defining Ways, are loaded on the present study's WTL Factor IX - 'Effacing Self-Concern'. Morris' Factor C - 'Withdrawal and Self-Sufficiency' corresponds to Butt's Factor II - 'Withdrawal' but the present study has no particular factor fitting with both. Once again, however, WTL Factor IX of the present study has Ways in common with both; i.e. Ways 9, 2 and 11 are loaded on all three Factors, while Butt's Factor II and the present study's WTL Factor IX also have Way 10 in common. Without belaboring the point further,

it can be readily seen the factor derived from the present usage of Morris' Ways to Live battery confirms past factor structures for the most part.

Insofar as comparisons with previously obtained factor structures is possible it may be concluded that the factors obtained in the Individual-Battery factorizations were generally confirmatory.

## The Consequences of the Minimization of the Ipsativity of Measures

While the minimization of the ipsativity in the Rokeach and Gordon value measures was originally intended to allow for a factor analytic comparison of all of the value measures, it had the unintended consequence of also making it possible to undertake a canonical analysis of the batteries and the subsequent factorization of the individual batteries. The results of the latter two analyses are interesting with respect to some of Rokeach's and Gordon's theoretical claims.

Although Gordon claims to have arrived at his six value measures through item analysis and factor analysis (Gordon, 1967), p. 3), to the extent that he utilized ipsative measures his findings are called into

question. This assumption is confirmed somewhat by the numerous intercorrelation matrices presented by Gordon with large numbers of high negative correlations, a significant mathematical consequence of ipsativity (Hicks, 1970). In fact all eleven of Gordon's intercorrelation matrices amply show this characteristic (Gordon, 1967). Consequently, his claim for 'factorial validity' may have to be modified in view of this result. In the present study, the ipsativity of the battery was removed before the test was administered. A factorization of the subsequent intercorrelation matrix resulted in one factor with an eigenvalue greater than unity. This factor accounted for 81% of the variance within the Gordon intercorrelation matrix and had five of Gordon's six measures highly loaded on it. It may be argued on these grounds that Gordon's measures may be measuring only one dimension, albeit an important and distinct one, of the value domain.

The results were even more dramatic with respect to the Rokeach 1 and 2 batteries, each comprised of 18 allegedly separable values. Individual factorizations of the batteries produced 3 factors (with eigenvalues greater than one) accounting for 64% of Rokeach 1 and three factors (with eigenvalues greater than one) accounting for 68% of Rokeach 2. These results strongly

question whether or not these two batteries are, in fact, measuring 36 separate and distinct values or dimensions of values.

While the ipsative forms of these three batteries forces a separation, by measurement method, of the values presumably being measured, the non-ipsative (or less ipsative) forms provide a more reliable basis for the determination of whether or not, and to what extent, separable dimensions are, in fact, being measured. The present data seem to indicate that 12 values or dimensions of values are being represented by the 67 value measures comprising these five value batteries. Further studies, of course, will have to confirm the present findings for these conclusions to be fully warranted.

The results of this study seem to have some indirect bearing on some of Rokeach's hypotheses concerning the size and nature of the value domain. He has theorized that the size of the value domain is small, perhaps composed of only a dozen or so values. This hypothesized size has theoretical consequence in that its 'smallness' combined with the generality of values serve to give values the psychological function of economically organizing all other attitudes, beliefs and opinions in

the cognitive realm. To quote Rokeach,

> . . . if we further assume that a person possesses considerably fewer values than attitudes, then the value concept provides us with a more economic analytic tool for describing and explaining similarities and differences between persons, groups, nations, and cultures. (Rokeach, 1968, p. 157).

and

> . . . the attitudes within the person's belief system are all in the service of and cognitively connected with perhaps a few dozen instrumental values, and that these, in turn are functionally and cognitively connected with an even fewer number of terminal values. (Rokeach, 1968, p. 157).

The results of this study, especially the canonical results, suggest that the size of the value domain is, perhaps, much larger than anticipated. That is, the results of the canonical analysis indicated that there was little overlap between the various pairs of value batteries. This finding does not, it seems, confirm Rokeach's claims concerning the size of the value domain. Moreover, the Rokeach I and II value batteries, with the ipsativity removed, were two of the batteries showing the largest overlap. This latter result appears to call into question Rokeach's separation of Terminal and Instrumental Values.

The two, presumably different kinds of values, would appear to be somewhat related. While the role of 'battery variance' needs to be specified and measured more accurately, of course, the canonical analyses of the value batteries used in this study do seem to indicate that they are measuring somewhat different aspects of the value domain. If this result is supported in subsequent studies, then Rokeach's theoretical contentions concerning the size and consequent nature of the value domain might have to be modified.

## Part II - Values and Their Relation to Other Behavioral and Attitudinal Variables

A secondary question originally asked by this study was that concerning the relationship between the basic, underlying values and attitudes and behavior. Since the factors derived from the factorization of the individual value batteries appear to be more clearly definable, the relationship between these factors (presumably significant value clusters) and the various dependent variables measured was ascertained. The results of this aspect of the study indicated that the value domain as reflected in the factorially derived value clusters of each battery had a significant and in some cases a substantial relationship to the dependent variables

measured. Thus, even if the present measures of value are viewed as much less than perfect, or even if the factors used as the predictors in this study are viewed as probably not representing the value domain adequately, the size of the multiple correlation coefficients (R) and multiple correlation coefficient squared ($R^2$) does indicate that important relationships are present. Nineteen of the twenty-one regression equations showed a multiple R $\geq$ .30, while seven of the twenty-one multiple $R^2$ were $\geq$ .20 and statistically significant at the .001 level. Moreover, it is probably an important finding, and of more interest at this beginning stage of research, that values as measured by these value instruments do, in fact, 'explain' and 'predict' a substantial portion of the dependent variables. And this finding is probably also more important than what are the particular values incorporated in the set of independent variables comprising the 'explainers' of the dependent variables. It should not be overlooked that the label (and its meaning) of the factor signifying an independent variable is a summary-concept of 'value' names which are themselves summaries of response protocols to a variety of statements, words and paragraphs. That is, the label of the particular summary-concept is the resultant product of many transformations of the verbalizations of the valuing person(s). The label is

some conceptual distance from the 'reality' it presumably represents. Thus, it has to be viewed skeptically insofar as it may take on meaning in addition to the specific ones it was chosen to represent. Consequently, the following discussions of the results of the regression analysis will not attempt to go into the particulars of the equations in any depth.

Case (a): Academic versus Technical Choice

The results strongly indicate a relationship between values and behavior according to the association between values and the behavioral choice of academic or technical college program choice. The results indicate that the behavioral choice could be predicted by values with a 31% improvement of a perfect set of predictors had the latter been available. While this result is not entirely unexpected, its empirical confirmation is suggestive of the hypothesis that values may be more related to behavior than had here-to-fore been assumed.

Cases (b) and (c): Sex and Age

Sex differences and age differences in the values of college students is, perhaps, not a result

which would strongly be expected. One might more likely expect differences in values between members of different generations rather than between members of the same generation. However, the results of this study indicate a rather wide disparity in values within this particular 'student generation'. For example, younger students tend to value 'social conventionality' highly and 'social activism' lowly while older students reverse this valuing. The situation with respect to sex differences is similar. The results suggest that with this particular 'student generation', differences in value orientation between the sexes exist. For example, females tended to value 'general security' and 'social activism' highly, and 'social idealism' lowly, while the males reversed this valuing. The mass media conception of 'unisex fashions' has apparently not fully infiltrated the domain of values with respect to these students.

Case (d): Machiavellianism

Attitudes of interpersonal manipulation seem to be strongly related to values as indicated by the results. There is a substantial relationship between values and Machiavellian scores ($R^2$ = .21). The value profiles seem to indicate that the high Machiavellian

person is not strictly amoral but maintains certain value stances for different reasons, perhaps, than most people. That is, to maintain a high valuing of 'Effacing Self-Concern' in the context of a high valuing of a 'Poised Concern for Others' and a low valuing of 'Scrupulousness' does not indicate a humble concern for self but, rather, a Uriah Heep framework for dealing with the world. This sort of individual would not be amoral, but would have a rather subtle set of values of the sort that would lead him to be a calculating individual. Certainly, further inquiry into the values of the Machiavellian individual is called for before hypotheses like these can be anything but speculative.

Case (e): Conservativism

While whether or not a person is conservative is undoubtedly related to his values, the nature of this relationship as indicated by the regression results were unanticipated and puzzling. Why would a more conservative person also show low valuings of 'social conventionality', 'social activism' and 'active, systematic practicality'? It was suggested in the previous chapter that this result be tempered because the present sample as a whole was rather non-conservative. Thus, it may be necessary to obtain a more representative sample of

conservativism itself in which conservativism is both deeply entrenched and common before it is truly possible to extensively investigate the relationships between values and conservativism. Nevertheless, the present findings if replicated in future studies would indicate the necessity for altering our usual conception of conservativism.

In the present study, it may have been that these students distinguished the element of change which seems to be present in the values of 'social conventionality' as it is today, from 'social activism' and 'active, systematic practicality'. It may be that having these three values to any extent also means valuing social changes as they are occuring today and scoring low on the Conservativism scale which revolves around social changes. That is, to score highly on the Conservativism scale it is necessary to embrace a set of preferences for things as they were in some time past and this tendency is not particularly active, conventional or practical. This explanation is somewhat speculative, but something along these lines may very well be what is happening. Further studies should indicate whether it is so or not.

Cases (g), (j), and (l): Vocational Preferences for 'Interesting Experience', 'Security', and 'Profit'

That vocational preferences and value orientations are related is not surprising. The results indicated that eight of the ten multiple $R^2$ were statistically significant at the .001 level, while one $R^2$ was significant at the .01 level and another at the .05 level. In order not to take an interpretative advantage of the possibility that the $R^2$ capitalized inordinately on chance, it was decided to concentrate only on those job preferences which indicated an $R^2$ greater than .20. Consequently, only three job preferences were reported in the previous chapter, 'Interesting Experience', 'Security' and 'Profit'.

It is not unexpected, for example, that the Centers' vocational preference for a job that provides interesting experiences is highly related to values depicting the individual as a 'social loner', although further articulation of this relationship is, of course, necessary. Another vocational preference in which a substantial relationship with expected value orientations was found was the preference for a job entailing occupational security. That is, those who value 'General Security' and 'Scrupulousness' highly and 'Free Thinking',

'Poised Concern for Others', and 'General Satisfaction' lowly will also rate job security highly. An example of an unexpected, and substantial, relationship between a vocational preference and measured values is that between the vocational preference for a job mainly concerned with profit and the high valuing of 'Social Autonomy', 'Social Idealism', and 'Scrupulousness' and a low valuing of 'General Satisfaction'. Why a high valuing of 'Social Idealism' should be related to a concern for a job mainly concerned with profit is unexpected and unclear. The other valuings are, perhaps, what one would expect a person with a high 'profit' orientation to have. Perhaps the students of today, as represented by this sample anyway, do not see any contradiction between 'higher profits' and 'social ideals', and, thus, the acceptance of one need not entail the rejection of the other. In any case, this unexpected finding is rather provocative.

Cases (p) and (u): Holland's 'Realistic' and 'Artistic' Types

Substantial relationships between the clusters of value measures and measures of personality type was also found in this study. Some interesting value profiles emerged in relation to Holland's personality types.

Two personality types showing a particularly solid relationship to the value factors were the 'Realistic' type and the 'Artistic' type. Those individuals who score highly on the Holland 'Realistic' type also place a high value on 'General Security' and a 'Poised Concern for Others' and a low value on 'Scrupulousness' and 'Effacing Self-Concern'. While none of these relationships are unexpected, further explanation and delineation of that relationship is necessary. The value profile seems to indicate a kind of strong middle-of-the-roadness in which value extremes are avoided. The 'Artistic' personality type as indicated by the Holland personality measures appears to value highly 'Social Conventionality', 'Social Autonomy', and 'Free Thinking' while valuing lowly 'General Security' and 'Effacing Self-Concern'. With the exception of the high valuing of 'Social Conventionality' this value profile fits the conventional picture of the artist. That artistic types should value 'social conventionality' highly is, perhaps, an indication that the romantic 'starving artist syndrome' is losing its attraction in modern society. As was mentioned in the previous chapter it may be that this sample of subjects is only slightly artistic as a whole and thus does not maintain the same values to the same extent that a more artistic group might be expected to maintain. If this assumption

were corroborated by further studies, it might also explain the lack of valuing of 'social idealism' and 'Experiential Variety or Adventure', values more traditionally associated with the artistic type.

## Summary of Part II

As was mentioned at the beginning of this section the specifics of the relationships between values and various attitudes is, perhaps, not as important as the fact that there are substantial empirical relationships between values and these other variables. That expected relationships are in fact found lends some confidence to the measures as measures of value. Moreover, the presence of unexpected relationships, along with expected ones, with attitudinal variables is itself an unexpected finding indicating that further empirical studies of values are called for.

## Conclusions

The consequence of this study leaves the question of values as puzzling as ever. Some extension for future investigations do seemwarrranted by the results. If value batteries are to be instruments of

theory as Loevinger (1957) has advocated, it will be necessary to develop measures and theory which do much more than simply indicate that values in general are being measured. More specifically, what might be more indicative of what values are being measured, their nature, and perhaps even their interrelationships, are value measures which reproduce in miniature, situations or problems in which certain kinds of values or value judgments are called for which will lead to demonstrably different solutions. An attempt at constructing such tests was initiated by Harding (1944) but was never carried through in any extensive research program. The problem situations could be structured such that the grounds for the choice of the subject would be his values and only his values. The latter could be accomplished, at least in part, by obtaining from the subject both his interpretation of the problem or situation and his solution and then by working backwards logically to the various assumptions on which this choice is based. This sort of rational reconstruction of the subject's value system has been argued for by Myrdal (1958) with respect to the values implicit in economic and sociological theory (i.e., the implicit values of economists and sociologists) and seems worthy of extension to empirical research on normal subjects. A close approximation to Myrdal's suggestions is Kohlberg's Moral

Judgment Questionnarie (KMJQ). It, however, attempts to determine the level or stage of moral reasoning rather than to identify explicitly the values or systems of values held by an individual. That is, while what stage of moral reasoning the person is at depends upon what values that person holds according to the KMJQ, it does not attempt to measure values per se. Rather, its scoring procedures are used to determine an overall moral judgment score which is indicative of what stage of moral development the person is presently maintaining. A slight alteration in the utilization and analysis of the person's responses on the KMJQ may enable Myrdal's suggestions also to be carried out, thereby making the KMJQ valuable both as a developmental and static measurement instrument of values.

More speculatively, it may be that sociological and psychological theories of values will have to be more precisely and rigorously stated before values can be profitably measured. An electron microscope is not capable of being devised until a fairly well-definedtheory of atoms is available even though a "notion" of atoms may be available. On the other hand, however, even with such a theory the technological success is not guaranteed. Thus, both improved theories of value and means of measurement will be necessary. While val-

ues may indeed be vague things, notions, ideas or what-not, guiding our behavior, neither our knowledge nor our measures of them need in turn also be vague.

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# APPENDIX A

TABLE A

VARIMAX ROTATION OF 11 FACTORS FROM ALL-BATTERY FACTOR ANALYSIS RESULTS ON 5 VALUE-TESTS

| Variables | | Factors 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| SCOTT | 1 | 0.0645 | 0.0911 | -0.0998 | 0.1906 | -0.3770 | -0.0585 |
| | 2 | 0.1241 | -0.1439 | 0.1526 | 0.7037 | -0.1046 | -0.0310 |
| | 3 | -0.2123 | -0.0402 | -0.1068 | 0.5978 | -0.2457 | 0.1428 |
| | 4 | -0.2106 | -0.0122 | -0.1367 | 0.6264 | -0.4017 | -0.0241 |
| | 5 | -0.2974 | 0.0234 | -0.0783 | 0.4776 | -0.3247 | 0.1486 |
| | 6 | -0.1628 | 0.0211 | -0.1021 | 0.2331 | -0.6832 | -0.0346 |
| | 7 | -0.3904 | -0.0718 | 0.0606 | 0.1782 | -0.4554 | 0.1839 |
| | 8 | -0.1505 | -0.1128 | 0.1206 | 0.3910 | -0.1423 | 0.3776 |
| | 9 | -0.0782 | -0.0224 | 0.0483 | 0.5281 | -0.1556 | 0.1461 |
| | 10 | -0.1146 | -0.0065 | 0.1297 | 0.6512 | 0.0098 | 0.0201 |
| | 11 | 0.0354 | 0.0770 | 0.1377 | -0.0145 | -0.6775 | 0.0940 |
| | 12 | -0.1902 | -0.0431 | 0.0588 | 0.2398 | -0.6095 | -0.0759 |
| ROK 1 | 13 | 0.0714 | -0.1645 | -0.0347 | -0.1010 | 0.0234 | -0.0551 |
| | 14 | -0.0900 | -0.1228 | 0.0635 | 0.1080 | 0.0443 | 0.1701 |
| | 15 | 0.0484 | -0.3512 | 0.0091 | 0.0840 | -0.0586 | -0.0261 |
| | 16 | -0.0074 | -0.5123 | -0.0334 | 0.1271 | -0.0534 | -0.1113 |
| | 17 | -0.0423 | -0.6902 | 0.0252 | -0.0510 | -0.0271 | 0.2306 |
| | 18 | -0.2347 | -0.1817 | 0.1477 | 0.0512 | -0.0740 | 0.5083 |
| | 19 | -0.0600 | -0.5674 | 0.1093 | 0.1280 | -0.0713 | 0.0262 |
| | 20 | -0.1697 | -0.1529 | -0.0859 | 0.0424 | 0.0797 | 0.1987 |
| | 21 | -0.1852 | -0.2190 | -0.1051 | 0.0497 | -0.1076 | 0.1787 |
| | 22 | 0.0066 | -0.3416 | -0.1653 | 0.1310 | -0.0006 | -0.1270 |
| | 23 | -0.1351 | -0.1181 | 0.1565 | 0.0656 | -0.1233 | 0.0071 |
| | 24 | -0.0204 | -0.2129 | 0.0479 | -0.1423 | 0.0100 | 0.1971 |
| | 25 | 0.0777 | -0.4150 | 0.1886 | 0.0318 | 0.0061 | 0.1495 |
| | 26 | -0.0834 | -0.5043 | -0.0246 | -0.1553 | -0.0196 | 0.0249 |
| | 27 | 0.0767 | -0.3519 | 0.1479 | 0.0025 | -0.0485 | 0.0999 |
| | 28 | -0.2898 | -0.0902 | 0.0373 | -0.0308 | -0.0896 | -0.0768 |
| | 29 | 0.0456 | -0.0906 | -0.1143 | -0.0260 | -0.1029 | 0.0090 |
| | 30 | -0.0393 | -0.3680 | 0.0429 | 0.0043 | -0.1979 | -0.1614 |
| ROK 2 | 31 | 0.0758 | -0.6015 | 0.2033 | 0.1684 | 0.0826 | 0.1253 |
| | 32 | -0.2622 | -0.0291 | -0.0094 | 0.2024 | -0.1326 | -0.0053 |
| | 33 | -0.0884 | -0.6654 | 0.0112 | 0.1003 | -0.0892 | 0.0804 |
| | 34 | 0.1572 | -0.6144 | 0.1088 | 0.0516 | 0.1501 | 0.0099 |

Table A (Continued)

VARIMAX ROTATION OF 11 FACTORS FROM ALL-BATTERY FACTOR ANALYSIS RESULTS ON 5 VALUE-TESTS

| Variables | | Factors 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| ROK 2 | 35 | -0.1482 | -0.2948 | 0.0154 | 0.1176 | -0.2008 | 0.1192 |
| (Con'd) | 36 | -0.0106 | -0.7563 | 0.0399 | 0.1200 | 0.1675 | 0.0004 |
| | 37 | 0.0082 | -0.6575 | 0.0978 | -0.0637 | 0.0101 | -0.0889 |
| | 38 | -0.1264 | -0.4345 | -0.0591 | 0.2395 | -0.0601 | 0.0731 |
| | 39 | -0.2676 | -0.5518 | 0.1008 | 0.1516 | -0.2006 | -0.0768 |
| | 40 | -0.0941 | -0.2830 | 0.1156 | 0.1520 | -0.0431 | -0.2586 |
| | 41 | -0.0771 | -0.6925 | 0.0303 | -0.0513 | -0.0018 | 0.2726 |
| | 42 | -0.1370 | -0.1257 | -0.0257 | 0.1517 | 0.1709 | -0.1398 |
| | 43 | -0.1520 | -0.4751 | -0.1217 | 0.2456 | 0.0782 | 0.0334 |
| | 44 | -0.0363 | -0.1377 | 0.1239 | -0.0090 | -0.1578 | 0.0772 |
| | 45 | -0.1882 | -0.0670 | 0.0716 | -0.0289 | -0.3207 | -0.1124 |
| | 46 | -0.3904 | 0.0138 | -0.0828 | 0.3102 | 0.1089 | -0.1403 |
| | 47 | -0.3590 | -0.1963 | 0.0495 | 0.3462 | 0.1431 | 0.0735 |
| | 48 | -0.1698 | -0.1539 | 0.2260 | -0.1262 | -0.1743 | 0.0651 |
| WTL | 49 | -0.1906 | -0.1005 | 0.3305 | 0.2858 | 0.2532 | -0.0138 |
| | 50 | 0.0500 | 0.0026 | 0.5512 | -0.1076 | -0.0070 | 0.0353 |
| | 51 | 0.0079 | -0.0746 | 0.5698 | 0.1559 | 0.0266 | -0.1180 |
| | 52 | 0.0804 | 0.1555 | 0.2983 | -0.3945 | -0.1579 | -0.2522 |
| | 53 | -0.1978 | 0.1802 | -0.0230 | 0.0365 | -0.0843 | -0.2480 |
| | 54 | -0.2949 | 0.2047 | 0.1330 | 0.1634 | -0.0737 | -0.1985 |
| | 55 | -0.0518 | -0.1144 | 0.1473 | -0.0376 | 0.0132 | -0.4763 |
| | 56 | -0.0355 | -0.0457 | 0.0567 | 0.0111 | 0.1015 | -0.0796 |
| | 57 | 0.0880 | -0.0865 | 0.7481 | -0.0257 | -0.1171 | 0.0282 |
| | 58 | -0.1647 | -0.0841 | 0.5851 | 0.0451 | 0.0844 | 0.1301 |
| | 59 | -0.0563 | -0.0589 | 0.5597 | 0.0294 | -0.0649 | -0.0552 |
| | 60 | -0.1797 | -0.1462 | 0.1082 | -0.1748 | -0.1099 | -0.4956 |
| | 61 | -0.0174 | -0.0089 | 0.5941 | 0.0529 | 0.0780 | -0.0310 |
| GORDON | 62 | -0.8502 | -0.1111 | -0.0375 | 0.0367 | -0.1459 | -0.0020 |
| | 63 | -0.7609 | -0.0252 | 0.1389 | 0.0307 | -0.1766 | -0.1953 |
| | 64 | -0.2556 | -0.0569 | -0.0286 | -0.3348 | -0.4026 | -0.3513 |
| | 65 | -0.7313 | 0.0193 | 0.0350 | 0.0292 | -0.1449 | -0.0095 |
| | 66 | -0.8387 | -0.0471 | 0.0242 | 0.1759 | -0.0010 | 0.1389 |
| | 67 | -0.7566 | -0.0050 | -0.0747 | 0.0980 | 0.0859 | 0.0018 |

Table A (Continued)

VARIMAX ROTATION OF 11 FACTORS FROM ALL-BATTERY FACTOR ANALYSIS RESULTS ON 5 VALUE-TESTS

| Variables | | Factors 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|
| SCOTT | 1 | -0.0901 | -0.0200 | 0.2659 | 0.1034 | -0.1130 |
| | 2 | 0.0284 | -0.0538 | 0.0249 | 0.2216 | -0.0928 |
| | 3 | -0.0020 | -0.0215 | -0.1894 | -0.0894 | 0.2395 |
| | 4 | -0.0385 | 0.0701 | -0.1234 | -0.1609 | 0.0983 |
| | 5 | 0.0323 | -0.0586 | -0.1120 | -0.2911 | 0.2247 |
| | 6 | 0.1374 | -0.0460 | -0.1780 | 0.0755 | 0.0868 |
| | 7 | 0.0553 | -0.1510 | -0.1925 | -0.1590 | 0.1754 |
| | 8 | 0.1250 | -0.0683 | -0.1037 | -0.0726 | -0.0776 |
| | 9 | 0.0546 | 0.1587 | -0.3821 | 0.0327 | -0.2513 |
| | 10 | -0.0046 | -0.0030 | -0.0261 | -0.0384 | 0.0265 |
| | 11 | -0.1776 | -0.1323 | 0.0692 | -0.1572 | 0.0158 |
| | 12 | 0.0570 | -0.2568 | 0.0816 | -0.0123 | 0.0154 |
| ROK 1 | 13 | -0.6189 | -0.1095 | -0.0229 | 0.0713 | 0.0466 |
| | 14 | -0.1740 | -0.2086 | -0.5004 | -0.0137 | 0.0997 |
| | 15 | -0.7234 | -0.0401 | -0.0602 | 0.0069 | -0.0595 |
| | 16 | -0.3785 | 0.1188 | -0.1431 | 0.0423 | 0.1554 |
| | 17 | -0.2749 | 0.2080 | 0.0230 | 0.0342 | 0.1209 |
| | 18 | -0.3054 | -0.0863 | -0.0387 | 0.0498 | -0.0228 |
| | 19 | -0.3966 | 0.1972 | 0.0343 | 0.0595 | 0.1062 |
| | 20 | -0.2043 | -0.0619 | -0.5589 | 0.0535 | 0.1616 |
| | 21 | -0.0466 | -0.2468 | -0.1739 | -0.0009 | 0.3442 |
| | 22 | -0.0325 | -0.1329 | -0.4319 | 0.0633 | 0.4253 |
| | 23 | 0.0279 | 0.1319 | -0.6804 | 0.0109 | -0.2757 |
| | 24 | -0.5058 | -0.0225 | -0.1597 | 0.0732 | 0.0913 |
| | 25 | -0.2447 | 0.0493 | -0.1861 | 0.4668 | 0.1534 |
| | 26 | -0.0225 | -0.0888 | -0.1258 | 0.0977 | 0.1690 |
| | 27 | -0.5399 | -0.0087 | -0.0183 | -0.1514 | 0.0502 |
| | 28 | -0.1963 | 0.0266 | -0.3719 | -0.2108 | 0.1930 |
| | 29 | -0.2717 | 0.0482 | -0.0230 | -0.1285 | 0.6256 |
| | 30 | -0.3520 | -0.0070 | -0.0537 | -0.3050 | 0.2813 |
| ROK 2 | 31 | -0.0568 | -0.0887 | -0.2365 | 0.0036 | -0.2170 |
| | 32 | 0.0969 | -0.3660 | -0.4345 | -0.1059 | 0.1470 |
| | 33 | -0.0249 | -0.0206 | -0.0949 | -0.4014 | 0.0358 |
| | 34 | -0.1065 | -0.2224 | -0.1174 | -0.1202 | -0.0916 |

Table A (Continued)

VARIMAX ROTATION OF 11 FACTORS FROM ALL-BATTERY FACTOR ANALYSIS RESULTS ON 5 VALUE-TESTS

| Variables | | Factors 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|
| ROK 2 | 35 | 0.0084 | -0.3570 | -0.1915 | -0.5256 | 0.0240 |
| (Con'd) | 36 | -0.1319 | -0.0694 | -0.0249 | -0.1711 | -0.0984 |
| | 37 | -0.1833 | -0.1751 | 0.0265 | 0.1405 | 0.0457 |
| | 38 | -0.1455 | -0.1873 | -0.2532 | -0.1773 | 0.2879 |
| | 39 | -0.1056 | -0.3425 | -0.2365 | -0.1618 | 0.0748 |
| | 40 | -0.1611 | -0.2026 | -0.3332 | -0.2904 | -0.0448 |
| | 41 | -0.1004 | -0.1315 | -0.0405 | 0.0699 | -0.0715 |
| | 42 | -0.3385 | -0.2247 | -0.2506 | -0.1701 | 0.1833 |
| | 43 | -0.0597 | -0.1567 | -0.4684 | -0.1121 | 0.0737 |
| | 44 | -0.0142 | -0.5465 | -0.0696 | -0.0847 | 0.0271 |
| | 45 | -0.1768 | -0.4816 | -0.2179 | -0.0839 | -0.1373 |
| | 46 | -0.3880 | -0.4839 | -0.1779 | 0.0415 | 0.0791 |
| | 47 | -0.1302 | -0.0549 | -0.4361 | -0.1197 | 0.0431 |
| | 48 | -0.0626 | -0.5106 | 0.1177 | 0.0696 | 0.0300 |
| WTL | 49 | 0.0110 | -0.2054 | -0.0769 | -0.2258 | 0.0670 |
| | 50 | -0.1154 | -0.1087 | 0.2210 | -0.0743 | -0.0936 |
| | 51 | -0.1446 | -0.0601 | -0.0449 | -0.0121 | 0.0156 |
| | 52 | 0.0166 | -0.0320 | 0.1395 | 0.3316 | 0.2650 |
| | 53 | -0.0938 | 0.2697 | -0.2582 | -0.0708 | 0.4829 |
| | 54 | -0.0399 | 0.2337 | -0.0937 | -0.0714 | 0.2121 |
| | 55 | -0.0739 | -0.0642 | 0.2160 | 0.1629 | 0.0717 |
| | 56 | 0.0492 | -0.0620 | 0.0503 | 0.1331 | 0.5862 |
| | 57 | -0.0050 | -0.1116 | -0.1262 | 0.2319 | 0.0160 |
| | 58 | 0.0217 | 0.0600 | -0.1457 | -0.3629 | -0.0159 |
| | 59 | -0.0234 | -0.0280 | 0.1310 | 0.1359 | -0.0692 |
| | 60 | 0.0732 | 0.1278 | -0.0026 | -0.1595 | 0.1744 |
| | 61 | 0.2307 | 0.0213 | -0.2578 | -0.0852 | 0.0210 |
| GORDON | 62 | 0.0277 | -0.0501 | -0.0917 | -0.0276 | 0.0736 |
| | 63 | 0.1126 | -0.1750 | -0.0281 | -0.1650 | -0.0693 |
| | 64 | -0.0554 | -0.1001 | -0.0503 | 0.1130 | -0.2266 |
| | 65 | -0.0257 | -0.0765 | -0.1496 | -0.0175 | -0.0918 |
| | 66 | 0.0830 | -0.1755 | -0.0819 | 0.0310 | 0.0748 |
| | 67 | -0.0390 | -0.0316 | -0.1100 | -0.0138 | 0.0796 |

TABLE B

COMPONENTS OF REDUNDANCY MEASURE FOR CANONICAL ANALYSIS OF 10 PAIRS OF VALUE BATTERIES

| I | II | III | IV | V | VI |
|---|---|---|---|---|---|
| Root # | Canonical R ($R_c$) | R Squared $\lambda$ | Variance Extracted VC | Redundancy $\lambda$.VC | Proportion of Total Redundancy |
| | Left Set (Set A (Rok 1) Given | | Set B (Scott) ) | | |
| 1 | .6648 | .4419 | .0878 | .0388 | .3505 |
| 2 | .5701 | .3247 | .0622 | .0202 | .1825 |
| 3 | .4919 | .2420 | .0574 | .0139 | .1256 |
| 4 | .4135 | .1707 | .0433 | .0074 | .0668 |
| 5 | .4123 | .1696 | .0401 | .0068 | .0614 |
| 6 | .3317 | .1098 | .0856 | .0094 | .0849 |
| 7 | .3000 | .0900 | .0366 | .0033 | .0298 |
| 8 | .2681 | .0719 | .0570 | .0041 | .0370 |
| 9 | .2175 | .0473 | .0846 | .0040 | .0361 |
| 10 | .1939 | .0376 | .0479 | .0018 | .0163 |
| 11 | .1319 | .0174 | .0402 | .0007 | .0063 |
| 12 | .0933 | .0087 | .0345 | .0003 | .0027 |
| | Right Set (Set B (Scott) Given | | Set A (Rok 1) ) | | |
| 1 | .6648 | .4419 | .1351 | .0597 | .3390 |
| 2 | .5701 | .3247 | .1149 | .0373 | .2118 |
| 3 | .4919 | .2420 | .0810 | .0196 | .1113 |
| 4 | .4135 | .1707 | .0808 | .0138 | .0784 |
| 5 | .4123 | .1696 | .0766 | .0130 | .0738 |
| 6 | .3317 | .1098 | .1093 | .0120 | .0681 |
| 7 | .3000 | .0900 | .0744 | .0067 | .0380 |
| 8 | .2681 | .0719 | .0987 | .0071 | .0403 |
| 9 | .2175 | .0473 | .0761 | .0036 | .0204 |
| 10 | .1934 | .0376 | .0505 | .0019 | .0108 |
| 11 | .1319 | .0174 | .0460 | .0008 | .0045 |
| 12 | .0933 | .0087 | .0576 | .0006 | .0034 |

Note.--Total variance extracted from left set = .6202; $\bar{R}$, total redundancy for left set, given right set = .1107. Total variance extracted from right set = 1.000; $\bar{R}$, total redundancy for right set, given left set = .1751.

Table B (Continued)

COMPONENTS OF REDUNDANCY MEASURE FOR CANONICAL ANALYSIS OF 10 PAIRS OF VALUE BATTERIES

| I Root # | II Canonical R ($R_c$) | III R Squared $\lambda$ | IV Variance Extracted VC | V Redundancy $\lambda$ .VC | VI Proportion of Total Redundancy |
|---|---|---|---|---|---|
| | Left Set (Set A (Rok 2) Given Set B (Scott) ) | | | | |
| 1 | .7071 | .5002 | .1469 | .0735 | .4788 |
| 2 | .5692 | .3243 | .0684 | .0222 | .1446 |
| 3 | .5010 | .2514 | .0911 | .0229 | .1492 |
| 4 | .4450 | .1984 | .0514 | .0102 | .0664 |
| 5 | .4025 | .1620 | .0457 | .0074 | .0482 |
| 6 | .3389 | .1135 | .0467 | .0053 | .0345 |
| 7 | .3068 | .0941 | .0266 | .0025 | .0163 |
| 8 | .2502 | .0626 | .0399 | .0025 | .0163 |
| 9 | .2042 | .0417 | .1007 | .0042 | .0274 |
| 10 | .1985 | .0394 | .0457 | .0018 | .0117 |
| 11 | .1356 | .0184 | .0380 | .0007 | .0046 |
| 12 | .0825 | .0068 | .0441 | .0003 | .0020 |
| | Right Set (Set B (Scott) Given Set A (Rok2) ) | | | | |
| 1 | .7071 | .5002 | .2453 | .1227 | .5648 |
| 2 | .5692 | .3243 | .1042 | .0338 | .1556 |
| 3 | .5010 | .2514 | .0907 | .0228 | .1050 |
| 4 | .4450 | .1984 | .0706 | .0140 | .0644 |
| 5 | .4025 | .1620 | .0513 | .0083 | .0382 |
| 6 | .3389 | .1135 | .0617 | .0070 | .0322 |
| 7 | .3068 | .0941 | .0584 | .0055 | .0253 |
| 8 | .2502 | .0626 | .0527 | .0033 | .0452 |
| 9 | .2042 | .0417 | .0911 | .0038 | .0175 |
| 10 | .1985 | .0394 | .0482 | .0019 | .0087 |
| 11 | .1356 | .0184 | .0706 | .0013 | .0060 |
| 12 | .0825 | .0068 | .0441 | .0003 | .0014 |

Note.--Total variance extracted from left set = .7452; $\bar{R}$, total redundancy for left set, given right set = .1535. Total variance extracted from right set = 1.000; $\bar{R}$, total redundancy for left set, given right set = .2247.

Table B (Continued)

COMPONENTS OF REDUNDANCY MEASURE FOR CANONICAL ANALYSIS OF 10 PAIRS OF VALUE BATTERIES

| I | II | III | IV | V | VI |
|---|---|---|---|---|---|
| Root # | Canonical R ($R_c$) | R Squared $\lambda$ | Variance Extracted VC | Redundancy $\lambda$.VC | Proportion of Total Redundancy |
| | Left Set (Set A (Ways to Live) Given Set B (Scott) ) | | | | |
| 1 | .6261 | .3916 | .1042 | .0408 | .3403 |
| 2 | .4889 | .2388 | .1445 | .0345 | .2877 |
| 3 | .4370 | .1908 | .0755 | .0144 | .1201 |
| 4 | .3701 | .1369 | .0489 | .0067 | .0559 |
| 5 | .3781 | .1432 | .0468 | .0067 | .0559 |
| 6 | .3063 | .0938 | .0650 | .0061 | .0509 |
| 7 | .2337 | .0546 | .0586 | .0032 | .0267 |
| 8 | .1844 | .0340 | .0912 | .0031 | .0250 |
| 9 | .1772 | .0314 | .0669 | .0021 | .0167 |
| 10 | .1500 | .0225 | .0933 | .0021 | .0175 |
| 11 | .0529 | .0028 | .0714 | .0002 | .0017 |
| | Right Set (Set B (Scott) Given Set A (Ways to Live) ) | | | | |
| 1 | .6261 | .3916 | .2306 | .0903 | .5362 |
| 2 | .4889 | .2388 | .0867 | .0207 | .1229 |
| 3 | .4370 | .1908 | .0922 | .0176 | .1045 |
| 4 | .3701 | .1369 | .0745 | .0102 | .0606 |
| 5 | .3781 | .1432 | .0691 | .0099 | .0558 |
| 6 | .3063 | .0938 | .0608 | .0057 | .0338 |
| 7 | .2337 | .0546 | .1172 | .0064 | .0380 |
| 8 | .1844 | .0340 | .1057 | .0036 | .0214 |
| 9 | .1772 | .0314 | .0796 | .0025 | .0148 |
| 10 | .1500 | .0225 | .0578 | .0013 | .0077 |
| 11 | .0529 | .0028 | .0714 | .0002 | .0012 |

Note.--Total variance extracted from left set = .8683; $\bar{R}$, total redundancy for left set, given right set = .1199. Total variance extracted from right set - 1.000; $\bar{R}$, total redundancy for right set, given left set = .1684.

Table B (Continued)

COMPONENTS OF REDUNDANCY MEASURE FOR CANONICAL ANALYSIS OF 10 PAIRS OF VALUE BATTERIES

| I | II | III | IV | V | VI |
|---|---|---|---|---|---|
| Root # | Canonical R ($R_c$) | R Squared $\lambda$ | Variance Extracted VC | Redundancy $\lambda$.VC | Proportion of Total Redundancy |
| | Left Set (Set A (Scott) Given Set B (Gordon) ) | | | | |
| 1 | .5857 | .3432 | .2022 | .0694 | .6224 |
| 2 | .4827 | .2328 | .1221 | .0261 | .2341 |
| 3 | .3521 | .1236 | .0599 | .0074 | .0664 |
| 4 | .3023 | .0914 | .0624 | .0057 | .0571 |
| 5 | .1649 | .0272 | .0515 | .0014 | .0126 |
| 6 | .1466 | .0215 | .0698 | .0015 | .0135 |
| | Right Set (Set B (Gordon) Given Set A (Scott) ) | | | | |
| 1 | .5857 | .3432 | .4668 | .1602 | .6737 |
| 2 | .4827 | .2328 | .2199 | .0512 | .2153 |
| 3 | .3521 | .1236 | .1497 | .0185 | .0778 |
| 4 | .3023 | .0914 | .0394 | .0036 | .0151 |
| 5 | .1649 | .0272 | .0625 | .0017 | .0071 |
| 6 | .1466 | .0215 | .1209 | .0026 | .0109 |

Note.--Total variance extracted from left set = .5679; $\bar{R}$, total redundancy for left set, given right set = .1115. Total variance extracted from right set = 1.000; R, total redundancy for right set, given left set = .2900.

Table B (Continued)

COMPONENTS OF REDUNDANCY MEASURE FOR CANONICAL ANALYSIS OF 10 PAIRS OF VALUE BATTERIES

| I Root # | II Canonical R ($R_C$) | III R Squared $\lambda$ | IV Variance Extracted VC | V Redundancy $\lambda$.VC | VI Proportion of Total Redundancy |
|---|---|---|---|---|---|
| | Left Set (Set A (Rok 1) Given Set B (Rok 2) ) | | | | |
| 1 | .8118 | .6589 | .2333 | .1537 | .5653 |
| 2 | .6603 | .4361 | .0686 | .0299 | .1100 |
| 3 | .5731 | .3285 | .0447 | .0147 | .0451 |
| 4 | .5376 | .2887 | .0402 | .0116 | .0427 |
| 5 | .5010 | .2512 | .0410 | .0103 | .0379 |
| 6 | .4583 | .2102 | .0642 | .0135 | .0497 |
| 7 | .3975 | .1581 | .0304 | .0048 | .0177 |
| 8 | .3950 | .1564 | .0320 | .0050 | .0184 |
| 9 | .3479 | .1208 | .0439 | .0053 | .0195 |
| 10 | .3263 | .1065 | .0404 | .0043 | .0158 |
| 11 | .2968 | .0881 | .0477 | .0042 | .0154 |
| 12 | .2931 | .0859 | .0431 | .0037 | .0136 |
| 13 | .2381 | .0567 | .0547 | .0031 | .0114 |
| 14 | .1503 | .0226 | .0354 | .0008 | .0250 |
| 15 | .1175 | .0138 | .0435 | .0006 | .0022 |
| 16 | .1030 | .0106 | .0377 | .0004 | .0015 |
| 17 | .0283 | .0008 | -- | .0000 | -- |
| 18 | .0173 | .0003 | -- | .0000 | -- |
| | Right Set (Set B (Rok 2) Given Set A (Rok 1) ) | | | | |
| 1 | .8118 | .6589 | .2688 | .1771 | .5849 |
| 2 | .6603 | .4361 | .0764 | .0333 | .1100 |
| 3 | .5731 | .3285 | .0569 | .0187 | .0618 |
| 4 | .5376 | .2887 | .0540 | .0165 | .0515 |
| 5 | .5010 | .2512 | .0685 | .0172 | .0568 |
| 6 | .4583 | .2102 | .0461 | .0097 | .0297 |
| 7 | .3975 | .1581 | .0329 | .0052 | .0172 |
| 8 | .3950 | .1564 | .0326 | .0051 | .0168 |
| 9 | .3479 | .1208 | .0323 | .0039 | .0129 |
| 10 | .3263 | .1065 | .0338 | .0036 | .0119 |
| 11 | .2968 | .0881 | .0318 | .0028 | .0092 |
| 12 | .2931 | .0859 | .0361 | .0031 | .0102 |
| 13 | .2381 | .0567 | .0441 | .0025 | .0083 |
| 14 | .1503 | .0226 | .0310 | .0007 | .0023 |
| 15 | .1175 | .0138 | .0362 | .0005 | .0017 |
| 16 | .1030 | .0106 | .0283 | .0003 | .0010 |
| 17 | .0283 | .0008 | -- | .0000 | -- |
| 18 | .0173 | .0003 | -- | .0000 | -- |

Note.--Total variance extracted from left set = .8998; $\overline{R}$, total redundancy for left set, given right set = .2659. Total variance extracted from right set = 1.000; R, total redundancy for right set, given left set = .3028.

Table B (Continued)

COMPONENTS OF REDUNDANCY MEASURE FOR CANONICAL ANALYSIS OF 10 PAIRS OF VALUE BATTERIES

| I Root # | II Canonical R ($R_c$) | III R Squared $\lambda$ | IV Variance Extracted VC | V Redundancy $\lambda$.VC | VI Proportion of Total Redundancy |
|---|---|---|---|---|---|
| | Left Set | (Set A (Rok 1) | Given | Set B (Ways to Live) ) | |
| 1 | .5797 | .3356 | .0444 | .0149 | .1393 |
| 2 | .5586 | .3121 | .1102 | .0344 | .3215 |
| 3 | .5050 | .2548 | .0502 | .0128 | .1196 |
| 4 | .4405 | .1940 | .0670 | .0130 | .1215 |
| 5 | .3912 | .1527 | .0897 | .0137 | .1280 |
| 6 | .3435 | .1181 | .0313 | .0037 | .0346 |
| 7 | .2718 | .0739 | .0907 | .0067 | .0626 |
| 8 | .2569 | .0660 | .0394 | .0026 | .0243 |
| 9 | .2296 | .0527 | .0455 | .0024 | .0225 |
| 10 | .1480 | .0219 | .0457 | .0010 | .0094 |
| 11 | .1453 | .0211 | .0332 | .0007 | .0065 |
| 12 | .1221 | .0149 | .0403 | .0006 | .0050 |
| 13 | .1086 | .0118 | .0424 | .0005 | .0047 |
| | Right Set | (Set B (Ways to Live) | Given | Set A (Rok 1) ) | |
| 1 | .5797 | .3356 | .0858 | .0288 | .2092 |
| 2 | .5586 | .3121 | .0849 | .0265 | .1924 |
| 3 | .5050 | .2548 | .1323 | .0337 | .2447 |
| 4 | .4405 | .1940 | .0624 | .0121 | |
| 5 | .3912 | .1527 | .0557 | .0085 | .0617 |
| 6 | .3435 | .1181 | .0652 | .0077 | .0559 |
| 7 | .2718 | .0739 | .1245 | .0092 | .0067 |
| 8 | .2569 | .0660 | .0667 | .0044 | .0320 |
| 9 | .2296 | .0527 | .0607 | .0032 | .0232 |
| 10 | .1480 | .0219 | .0776 | .0017 | .0213 |
| 11 | .1453 | .0211 | .0569 | .0012 | .0087 |
| 12 | .1221 | .0149 | .0537 | .0008 | .0058 |
| 13 | .1086 | .0118 | .0508 | .0006 | .0044 |

Note.--Total variance extracted from left set = .7300; R, total redundancy for left set, given right set = .1070. Total variance extracted from right set = 1.000; R, total redundancy for right set, given left set = .1384.

Table B (Continued)

COMPONENTS OF REDUNDANCY MEASURE FOR CANONICAL ANALYSIS OF 10 PAIRS OF VALUE BATTERIES

| I | II | III | IV | V | VI |
|---|---|---|---|---|---|
| Root # | Canonical R ($R_c$) | R Squared $\lambda$ | Variance Extracted VC | Redundancy $\lambda$ .VC | Proportion of Total Redundancy |
| | Left Set | (Rok 2 (Set A) | Given | Ways to Live (Set B) ) | |
| 1 | .6348 | .4034 | .1643 | .0663 | .3817 |
| 2 | .5604 | .3136 | .1757 | .0551 | .3172 |
| 3 | .4970 | .2472 | .0388 | .0096 | .0553 |
| 4 | .4572 | .2090 | .0503 | .0102 | .0587 |
| 5 | .4195 | .1764 | .0573 | .0101 | .0581 |
| 6 | .3661 | .1343 | .0640 | .0086 | .0495 |
| 7 | .3478 | .1277 | .0587 | .0075 | .0432 |
| 8 | .2385 | .0569 | .0316 | .0018 | .0104 |
| 9 | .1982 | .0393 | .0305 | .0012 | .0069 |
| 10 | .2000 | .0400 | .0450 | .0018 | .0104 |
| 11 | .1480 | .0219 | .0274 | .0006 | .0046 |
| 12 | .1378 | .0190 | .0421 | .0008 | .0046 |
| 13 | .0520 | .0027 | .0370 | .0001 | .0006 |
| | Right Set | (Set B (Ways to Live) | Given | Set A (Rok 2) | |
| 1 | .6348 | .4034 | .0882 | .0356 | .2554 |
| 2 | .5604 | .3136 | .0896 | .0281 | .1976 |
| 3 | .4970 | .2472 | .0902 | .0223 | .1568 |
| 4 | .4572 | .2090 | .0547 | .0111 | .0781 |
| 5 | .4195 | .1764 | .0652 | .0115 | .0809 |
| 6 | .3661 | .1343 | .1013 | .0136 | .0956 |
| 7 | .3478 | .1277 | .0791 | .0101 | .0710 |
| 8 | .2385 | .0569 | .0615 | .0035 | .0246 |
| 9 | .1982 | .0393 | .0941 | .0037 | .0260 |
| 10 | .2000 | .0400 | .0725 | .0029 | .0204 |
| 11 | .1480 | .0219 | .0502 | .0011 | .0077 |
| 12 | .1378 | .0190 | .0632 | .0012 | .0084 |
| 13 | .0520 | .0027 | .0370 | .0001 | .0007 |

Note.--Total variance extracted from left set = .8227; $\bar{R}$, total redundancy of left set, given right set = .1737. Total variance extracted from right set - 1.000; R, total redundancy of right set, given left set = .1448.

Table B (Continued)

COMPONENTS OF REDUNDANCY MEASURE FOR CANONICAL ANALYSIS OF 10 PAIRS OF VALUE BATTERIES

| I | II | III | IV | V | VI |
|---|---|---|---|---|---|
| Root # | Canonical R ($R_c$) | R Squared $\lambda$ | Variance Extracted VC | Redundancy $\lambda$.VC | Proportion of Total Redundancy |
| | Left Set ( Set A (Rok 1) Given Set B (Gordon) ) | | | | |
| 1 | .4940 | .2443 | .0769 | .0188 | .3658 |
| 2 | .4416 | .1954 | .0397 | .0076 | .1479 |
| 3 | .4025 | .1615 | .0836 | .0135 | .2620 |
| 4 | .3066 | .0940 | .0585 | .0055 | .1070 |
| 5 | .2594 | .0673 | .0386 | .0026 | .0506 |
| 6 | .2098 | .0440 | .0772 | .0034 | .0661 |
| | Right Set (Set B (Gordon) Given Set B (Rok 1) ) | | | | |
| 1 | .4940 | .2443 | .4744 | .1159 | .6428 |
| 2 | .4416 | .1954 | .1700 | .0332 | .1841 |
| 3 | .4025 | .1615 | .0743 | .0120 | .0666 |
| 4 | .3066 | .0940 | .0840 | .0079 | .0438 |
| 5 | .2594 | .0673 | .1189 | .0080 | .0444 |
| 6 | .2098 | .0440 | .0750 | .0033 | .0183 |

Note.--Total variance extracted from left set = .3745; $\bar{R}$, total redundancy of left set, given right set = .0514. Total variance extracted from right set = 1.000; $\bar{R}$, total redundancy of right set, given left set = .1803.

Table B (Continued)

COMPONENTS OF REDUNDANCY MEASURE FOR CANONICAL ANALYSIS OF 10 PAIRS OF VALUE BATTERIES

| I | II | III | IV | V | VI |
|---|---|---|---|---|---|
| Root # | Canonical R ($R_c$) | R Squared $\lambda$ | Variance Extracted VC | Redundancy $\lambda$.VC | Proportion of Total Redundancy |
| | Left Set (Set A (Rok 2) Given Set B (Gordon)) | | | | |
| 1 | .6050 | .3663 | .1578 | .0578 | .6366 |
| 2 | .5621 | .3159 | .0544 | .0172 | .1894 |
| 3 | .4913 | .1864 | .0397 | .0074 | .0815 |
| 4 | .2872 | .0825 | .0388 | .0032 | .0352 |
| 5 | .2542 | .0646 | .0464 | .0030 | .0330 |
| 6 | .1903 | .0362 | .0608 | .0022 | .0242 |
| | Right Set (Set B (Gordon) Given Set A (Rok 2) ) | | | | |
| 1 | .6050 | .3663 | .5452 | .1997 | .7217 |
| 2 | .5621 | .3159 | .1583 | .0500 | .1807 |
| 3 | .4313 | .1864 | .0708 | .0132 | .0477 |
| 4 | .2872 | .0825 | .0713 | .0066 | .0239 |
| 5 | .2542 | .0646 | .0727 | .0047 | .0170 |
| 6 | .1903 | .0362 | .0691 | .0025 | .0090 |

Note.--Total variance extracted from left side = .3979; $\bar{R}$, total redundancy of left set, given right set = .0908. Total variance extracted from right side = 1.000; R, total redundancy of right set, given left set = .2767.

Table B (Continued)

COMPONENTS OF REDUNDANCY MEASURE FOR CANONICAL ANALYSIS OF 10 PAIRS OF VALUE BATTERIES

| I | II | III | IV | V | VI |
|---|---|---|---|---|---|
| Root # | Canonical R ($R_c$) | R Squared $\lambda$ | Variance Extracted VC | Redundancy $\lambda$.VC | Proportion of Total Redundancy |
| | Left Set (Set A (Ways to Live) Given Set B (Gordon)) | | | | |
| 1 | .5148 | .2648 | .1072 | .0284 | .4277 |
| 2 | .4680 | .2187 | .0860 | .0188 | .2831 |
| 3 | .3240 | .1048 | .1088 | .0114 | .1717 |
| 4 | .2408 | .0580 | .0828 | .0048 | .0723 |
| 5 | .1735 | .0301 | .0930 | .0028 | .0422 |
| 6 | .0663 | .0044 | .0454 | .0002 | .0030 |
| | Right Set (Set B (Gordon) Given Set A (Ways to Live)) | | | | |
| 1 | .5148 | .2648 | .2353 | .0673 | .4521 |
| 2 | .4680 | .2187 | .1943 | .0425 | .3084 |
| 3 | .3240 | .1048 | .2290 | .0240 | .0174 |
| 4 | .2408 | .0580 | .1000 | .0058 | .0421 |
| 5 | .1735 | .0301 | .0864 | .0026 | .0189 |
| 6 | .0663 | .0044 | .1364 | .0006 | .0435 |

Note.--Total variance extracted from left set = .5232; $\bar{R}$, total redundancy of left set, given right set = .0664. Total variance extracted from right side = 1.000; R, total redundancy of right set, given left set = .1378.

TABLE C

ROTATED FACTOR MATRIX FOR INDIVIDUAL BATTERIES

VARIMAX ROTATION OF 2 FACTORS FROM
RESULTS ON SCOTT VALUE BATTERY

| Variable Number | Factors I | II |
|---|---|---|
| 1 | -0.0320 | 0.2903 |
| 2 | -0.5853 | 0.0386 |
| 3 | -0.6587 | 0.3261 |
| 4 | -0.5886 | 0.4549 |
| 5 | -0.4966 | 0.4985 |
| 6 | -0.2190 | 0.7006 |
| 7 | -0.2846 | 0.6173 |
| 8 | -0.5596 | 0.1196 |
| 9 | -0.6364 | 0.0703 |
| 10 | -0.5935 | 0.0574 |
| 11 | 0.0943 | 0.6687 |
| 12 | -0.2047 | 0.6115 |

VARIMAX ROTATION OF 3 FACTORS FROM
RESULTS ON ROKEACH 1 VALUE TEST

| | III | IV | V |
|---|---|---|---|
| 13 | -0.5078 | 0.0162 | -0.0994 |
| 14 | -0.1552 | 0.5572 | -0.1357 |
| 15 | -0.7054 | 0.0844 | -0.1447 |
| 16 | -0.5345 | 0.1165 | -0.3559 |
| 17 | -0.6983 | 0.0730 | -0.1703 |
| 18 | -0.4211 | 0.2666 | 0.1413 |
| 19 | -0.6670 | -0.0131 | -0.2604 |
| 20 | -0.1765 | 0.7119 | -0.1314 |
| 21 | -0.1055 | 0.3098 | -0.3725 |
| 22 | -0.1329 | 0.3994 | -0.4662 |
| 23 | -0.0303 | 0.5912 | 0.0784 |
| 24 | -0.5752 | 0.2640 | 0.0852 |
| 25 | -0.4993 | 0.2136 | -0.1208 |
| 26 | -0.3395 | 0.1805 | -0.1830 |
| 27 | -0.6030 | 0.0180 | -0.2113 |
| 28 | -0.0216 | 0.3970 | -0.4228 |
| 29 | -0.1498 | -0.0657 | -0.6829 |
| 30 | -0.3333 | 0.0075 | -0.6213 |

Table C (Continued)

ROTATED FACTOR MATRIX FOR INDIVIDUAL BATTERIES

VARIMAX ROTATION OF 3 FACTORS FROM
RESULTS ON ROKEACH 2 VALUE BATTERY

| Variable Number | Factors VI | VII | VIII |
|---|---|---|---|
| 31 | -0.5611 | 0.1898 | -0.0363 |
| 32 | 0.0305 | 0.5922 | 0.2595 |
| 33 | -0.6209 | 0.3127 | 0.0726 |
| 34 | -0.6301 | 0.1418 | 0.1062 |
| 35 | -0.2917 | 0.4413 | 0.3241 |
| 36 | -0.8184 | 0.1752 | -0.0070 |
| 37 | -0.5685 | -0.0364 | 0.2341 |
| 38 | -0.4404 | 0.4704 | 0.1012 |
| 39 | -0.4905 | 0.4781 | 0.4587 |
| 40 | -0.3268 | 0.4494 | 0.1803 |
| 41 | -0.7276 | 0.0124 | 0.2266 |
| 42 | -0.1708 | 0.4748 | 0.1266 |
| 43 | -0.4255 | 0.5827 | 0.0305 |
| 44 | -0.1107 | 0.1361 | 0.5733 |
| 45 | -0.0432 | 0.2636 | 0.6135 |
| 46 | 0.0318 | 0.5975 | 0.3346 |
| 47 | -0.1243 | 0.7839 | -0.1255 |
| 48 | -0.1057 | 0.0094 | 0.5691 |

VARIMAX ROTATION OF 3 FACTORS FROM
RESULTS ON WAYS TO LIVE VALUE BATTERY

| | IX | X | XI |
|---|---|---|---|
| 49 | -0.4371 | -0.1846 | 0.2378 |
| 50 | -0.4847 | 0.1950 | -0.1825 |
| 51 | -0.5219 | -0.0572 | -0.1037 |
| 52 | -0.0649 | -0.0776 | -0.6680 |
| 53 | 0.0598 | -0.7585 | -0.0417 |
| 54 | -0.1185 | -0.6086 | 0.0784 |
| 55 | -0.0502 | -0.0785 | -0.5530 |
| 56 | 0.0143 | -0.3388 | -0.2348 |
| 57 | -0.7325 | 0.1601 | -0.3918 |
| 58 | -0.6190 | -0.1062 | 0.1879 |
| 59 | -0.4875 | 0.0460 | -0.1930 |
| 60 | -0.0394 | -0.3949 | -0.3102 |
| 61 | -0.6478 | -0.1215 | 0.0867 |

Table C (Continued)

ROTATED FACTOR MATRIX FOR INDIVIDUAL BATTERIES

VARIMAX ROTATION OF 2 FACTORS FROM
RESULTS ON GORDON VALUE BATTERY

| Variable Number | Factors XII | XIII |
|---|---|---|
| 62 | -0.8067 | -0.3422 |
| 63 | -0.6331 | -0.5227 |
| 64 | -0.0677 | -0.5972 |
| 65 | -0.6405 | -0.3595 |
| 66 | -0.9254 | -0.0215 |
| 67 | -0.7457 | -0.1125 |

TABLE D

EIGENVALUES AND ASSOCIATED VARIANCES FOR INDIVIDUAL-BATTERY FACTORS

| Factor | Eigenvalue | Var.% Single | Var.% Accumulated |
|---|---|---|---|
| Scott Battery Factors: | | | |
| 1 (I) | 3.79 | 52.91 | 52.91 |
| 2 (II) | 1.18 | 16.53 | 69.45 |
| 3 | 0.69 | 9.75 | 79.20 |
| 4 | 0.47 | 6.65 | 85.86 |
| 5 | 0.36 | 5.13 | 90.99 |
| 6 | 0.30 | 4.31 | 95.30 |
| TRACE IS | 7.17 | | |
| THE SUM OF THE FIRST 6 EIGENVALUES IS | | | 6.83 |
| Rokeach 1 Battery Factors | | | |
| 1 (III) | 4.55 | 41.01 | 41.01 |
| 2 (IV) | 1.40 | 12.66 | 53.67 |
| 3 (V) | 1.10 | 9.92 | 63.60 |
| 4 | 0.83 | 7.55 | 71.15 |
| 5 | 0.66 | 5.96 | 77.11 |
| 6 | 0.57 | 5.16 | 82.28 |
| 7 | 0.41 | 3.70 | 85.98 |
| 8 | 0.35 | 3.17 | 89.16 |
| 9 | 0.32 | 2.94 | 92.11 |
| 10 | 0.23 | 2.16 | 94.27 |
| 11 | 0.19 | 1.78 | 96.05 |
| TRACE IS | 11.10 | | |
| THE SUM OF THE FIRST 11 EIGENVALUES IS | | | 10.66 |

Table D (Continued)

EIGENVALUES AND ASSOCIATED VARIANCES FOR INDIVIDUAL-BATTERY FACTORS

| Factor | | Eigenvalue | Var.% Single | Var.% Accumulated |
|---|---|---|---|---|
| Rokeach 2 Battery Factors | | | | |
| 1 | (VI) | 5.54 | 44.79 | 44.79 |
| 2 | (VII) | 1.70 | 13.75 | 58.54 |
| 3 | (VIII) | 1.09 | 8.86 | 67.41 |
| 4 | | 0.73 | 5.93 | 73.34 |
| 5 | | 0.64 | 5.19 | 78.53 |
| 6 | | 0.55 | 4.46 | 83.00 |
| 7 | | 0.48 | 3.91 | 86.92 |
| 8 | | 0.39 | 3.22 | 90.14 |
| 9 | | 0.30 | 2.49 | 92.64 |
| 10 | | 0.25 | 2.09 | 94.73 |
| 11 | | 0.17 | 1.45 | 96.18 |

TRACE IS 12.37

THE SUM OF THE FIRST 11 EIGENVALUES IS 11.90

Table D (Continued)

EIGENVALUES AND ASSOCIATED VARIANCES FOR INDIVIDUAL-BATTERY FACTORS

| Factor | Eigenvalue | Var.% Single | Var.% Accumulated |
|---|---|---|---|
| Ways to Live Battery Factors | | | |
| 1 (IX) | 2.39 | 32.42 | 32.42 |
| 2 (X) | 1.38 | 18.68 | 51.10 |
| 3 (XI) | 1.12 | 15.24 | 66.35 |
| 4 | 0.58 | 7.86 | 74.21 |
| 5 | 0.55 | 7.51 | 81.72 |
| 6 | 0.40 | 5.53 | 87.26 |
| 7 | 0.38 | 5.22 | 92.48 |
| 8 | 0.18 | 2.48 | 94.97 |
| 9 | 0.14 | 1.98 | 96.95 |
| TRACE IS | 7.39 | | |
| THE SUM OF THE FIRST | 9 EIGENVALUES IS | | 7.16 |
| Gordon Battery Factors | | | |
| 1 (XII) | 3.28 | 80.51 | 80.51 |
| 2 (XIII) | 0.48 | 11.93 | 92.45 |
| 3 | 0.18 | 4.41 | 96.87 |
| TRACE IS | 4.07 | | |
| THE SUM OF THE FIRST | 3 EIGENVALUES IS | | 3.94 |

TABLES E AND F

Table E shows the correlation matrix for the 12 Predictor-Factors (independent) and 21 Criterion (dependent) variables. The results from the Stepwise Regression analysis are shown in Table F. The Beta column contains the standard score weights of the regression equation rather than the raw score weights. The second column, $\sigma_\beta$, is the standard of error of the Beta weights. The third column contains the zero-order validity of that particular predictor-factor with the criterion of concern. The fourth column refers to the change in absolute value of the multiple correlation coefficient, while the fifth column refers to the change in multiple $R^2$ if that predictor-factor is eliminated. The sixth column refers to the "uniqueness" of each predictor-factor and is 1 minus the squared multiple correlation of that predictor with the other predictors currently in the regression equation. Columns 4, 5, 6, and 7, are all indices of the relative contribution of that predictor-factor to the regression equation. Column 7 indicates the t score from which the significance of the change in multiple correlation squared given the specified degrees of freedom listed at the head of the column can be found for each predictor. Directly above each set of regression components are the multiple

correlation, the multiple correlation squared for both the unshrunken case and single shrunken case, the F significance test, and the degrees of freedom. In the case of the unshrunken R or $R^2$ there is no correction for sample size and, thus, R or $R^2$ refers to an estimate of how well the selected independent variables predict in the present sample. The single shrunken R or $R^2$ are estimates of the population multiple R or $R^2$ respectively. The F value, herein is an index from which the probability can be found that the unshrunken R or $R^2$ differs from zero. The probability levels for statistical significance of the t (T) and F values is as follows:

| | |
|---|---|
| * * * | p = .001 |
| * * | p = .01 |
| * | p = .05 |

TABLE E

CORRELATION MATRIX FOR 12 PREDICTOR-FACTORS AND 21 CRITERION VARIABLES

| Predictors | | Criterion Variables | | | | |
|---|---|---|---|---|---|---|
| Battery Factors | | Acad/Tech 1 | Sex 2 | Age 3 | Mach 2 4 | Consv. 5 |
| SCOTT | I | -.0169 | .1032 | -.2372 | .1024 | -.3111 |
| 2 FACTORS | II | -.0021 | -.0123 | .0924 | .1458 | -.0153 |
| ROK 1 | III | -.2195 | -.0693 | -.1083 | .0926 | .0299 |
| 3 FACTORS | IV | .0124 | .0674 | .0003 | .0228 | .2447 |
| | V | .0001 | .2190 | -.1600 | -.0993 | .0527 |
| ROK 2 | VI | -.1680 | .0203 | -.1347 | .2140 | .0335 |
| 3 FACTORS | VII | .0361 | -.0958 | .1046 | -.0810 | .2881 |
| | VIII | -.0614 | -.0192 | .0856 | .0644 | -.1634 |
| WAYS TO | IX | .0926 | -.0569 | -.0743 | .3214 | .0254 |
| LIVE | X | -.1381 | .1375 | .1130 | -.1541 | -.2034 |
| 3 FACTORS | XI | .0039 | -.1294 | .2473 | -.0796 | .2214 |
| GORDON | XII | .1052 | .0219 | -.1410 | -.0884 | -.2715 |

| | | Centers (1) 6 | Centers (2) 7 | Centers (3) 8 | Centers (4) 9 | Centers (5) 10 |
|---|---|---|---|---|---|---|
| SCOTT | I | -.0030 | -.0497 | -.0293 | -.0368 | -.2970 |
| 2 FACTORS | II | .1636 | .2081 | .1013 | .2079 | .1319 |
| ROK 1 | III | -.0019 | -.2315 | -.0178 | .1655 | -.1753 |
| 3 FACTORS | IV | -.0210 | .0509 | .1967 | .1069 | .3727 |
| | V | -.2995 | -.2011 | -.2539 | -.2178 | -.3200 |
| ROK 2 | VI | -.0866 | -.4019 | -.0460 | .0869 | -.2845 |
| 3 FACTORS | VII | .0756 | .0261 | .3033 | .1945 | .4577 |
| | VIII | .0993 | .0598 | .1009 | .0983 | -.0450 |
| WAYS TO | IX | -.0896 | -.0615 | -.0577 | -.0627 | -.1226 |
| LIVE | X | -.0799 | -.0867 | -.2366 | -.1955 | -.1393 |
| 3 FACTORS | XI | -.0808 | -.0897 | -.0034 | .0219 | .0977 |
| GORDON | XII | -.1461 | -.0433 | .1929 | -.2522 | -.2610 |

Table E (Continued)

CORRELATION MATRIX FOR 12 PREDICTOR-FACTORS AND 21 CRITERION VARIABLES

| Predictors Test-Factors | | Criterion Variables Centers (6) 11 | Centers (7) 12 | Centers (8) 13 | Centers (9) 14 | Centers (10) 15 |
|---|---|---|---|---|---|---|
| SCOTT | I | -.0150 | -.0921 | -.0344 | -.0995 | .0688 |
| 2 FACTORS | II | .0557 | .2112 | .2732 | -.0393 | .1530 |
| ROK 1 | III | -.0671 | .0553 | .0730 | -.2605 | -.0225 |
| 3 FACTORS | IV | -.0720 | .2321 | .0827 | .0196 | .0941 |
| | V | -.1796 | -.3311 | -.2396 | -.0876 | -.1696 |
| ROK 2 | VI | -.0826 | -.0819 | .0273 | -.3258 | -.1078 |
| 3 FACTORS | VII | .0190 | .2973 | .2061 | .2094 | .0709 |
| | VIII | .1072 | .0319 | .2341 | .0058 | .1521 |
| WAYS TO | IX | -.0943 | .0535 | -.0600 | -.0469 | -.1024 |
| LIVE | X | -.0678 | -.2129 | -.1935 | .0215 | -.0494 |
| 3 FACTORS | XI | -.0710 | -.0214 | -.0595 | .0700 | -.0815 |
| GORDON | XII | -.0550 | -.1516 | -.1646 | -.0966 | -.1308 |

| | | Holland (1) 16 | Holland (2) 17 | Holland (3) 18 | Holland (4) 19 | Holland (5) 20 | Holland (6) 21 |
|---|---|---|---|---|---|---|---|
| SCOTT | I | -.1275 | -.0995 | -.0414 | -.1986 | -.0565 | .2183 |
| 2 FACTORS | II | .1547 | .1889 | -.1815 | -.0632 | .1655 | .1865 |
| ROK 1 | III | .1565 | .0469 | -.2432 | .1421 | .0823 | -.0598 |
| 3 FACTORS | IV | .2126 | .0108 | .0114 | .1155 | .0409 | -.1717 |
| | V | .0089 | -.0340 | .0501 | -.0119 | -.0954 | .1057 |
| ROK 2 | VI | .2382 | .0534 | -.1454 | .0865 | .0957 | .0568 |
| 3 FACTORS | VII | .0590 | .0356 | .0379 | .1793 | .0441 | -.1651 |
| | VIII | .0466 | .2734 | -.1086 | -.0602 | .1584 | .2795 |
| WAYS TO | IX | -.1617 | -.1556 | -.1195 | -.0686 | .0146 | -.3015 |
| LIVE | X | -.0693 | -.0400 | .0676 | -.1575 | -.1168 | .1493 |
| 3 FACTORS | XI | .0252 | .0001 | .0643 | .1031 | .0969 | -.1548 |
| GORDON | XII | -.1595 | -.2510 | .0130 | -.1816 | -.2054 | .0764 |

Table E (Continued)

CORRELATION MATRIX FOR 12 PREDICTOR-FACTORS AND 21 CRITERION VARIABLES

| Predictors Test-Factors | | Criterion Variables Scott I | Scott II | Rok 1 III | Rok 1 IV | Rok 1 V | Rok 2 VI |
|---|---|---|---|---|---|---|---|
| SCOTT | I | 1.0000 | | | | | |
| 2 FACTORS | II | -.1576 | 1.0000 | | | | |
| ROK 1 | III | .0221 | -.0008 | 1.0000 | | | |
| 3 FACTORS | IV | -.3077 | .0992 | -.0788 | 1.0000 | | |
| | V | .1391 | -.1784 | .1441 | -.0702 | 1.0000 | |
| ROK 2 | VI | .0931 | .1016 | .5846 | -.1546 | .2241 | 1.0000 |
| 3 FACTORS | VII | -.4985 | .2737 | -.1473 | .5363 | -.2875 | -.1016 |
| | VIII | .0577 | .3836 | -.0851 | .1054 | -.1590 | -.0680 |
| WAYS TO | IX | .1372 | -.0069 | .1238 | -.1657 | -.0649 | .1723 |
| LIVE | X | .1492 | -.1558 | -.0770 | -.1513 | .2704 | -.1238 |
| 3 FACTORS | XI | .3744 | -.0342 | .0533 | .2020 | .0610 | -.0562 |
| GORDON | XII | .3300 | -.2918 | -.0297 | -.3384 | .1246 | -.0213 |

| | | Rok 2 VII | Rok 2 VIII | WTL IX | WTL X | WTL XI | GORDON XII |
|---|---|---|---|---|---|---|---|
| SCOTT | I | | | | | | |
| 2 FACTORS | II | | | | | | |
| ROK 1 | III | | | | | | |
| 3 FACTORS | IV | | | | | | |
| | V | | | | | | |
| ROK 2 | VI | | | | | | |
| 3 FACTORS | VII | 1.0000 | | | | | |
| | VIII | .1030 | 1.0000 | | | | |
| WAYS TO | IX | -.1431 | -.1679 | 1.0000 | | | |
| LIVE | X | -.2443 | .0450 | -.0082 | 1.0000 | | |
| 3 FACTORS | XI | .3115 | -.1598 | .0932 | .0203 | 1.0000 | |
| GORDON | XII | -.4981 | -.1681 | .0953 | .2347 | -.1923 | 1.0000 |

TABLE F

COMPONENTS OF STEPWISE MULTIPLE LINEAR REGRESSION

Criterion: Academic vs. Technical Program Choice

| | Mult R | Mult $R^2$ | F,DF=(6,202) |
|---|---|---|---|
| Unshrunken | .347 | .120 | 4.59 *** |
| Single Shrunken | .307 | .094 | |

| Predictor Name | Factor Number | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | Uniqueness | T, DF=202 |
|---|---|---|---|---|---|---|---|---|
| ROK 1 | II | -.189 | .081 | -.2195 | .0359 | .0236 | .6569 | 2.326 * |
| | V | .111 | .072 | .0001 | .0153 | .0104 | .8419 | 1.545 |
| ROK 2 | VI | -.130 | .085 | -.1680 | .0153 | .0103 | .6091 | 1.541 |
| WTL | IX | .132 | .068 | .0926 | .0247 | .0165 | .9442 | 1.945 |
| | X | -.227 | .072 | -.1381 | .0705 | .0439 | .8531 | 3.174 ** |
| GORDON | XII | .124 | .069 | .1052 | .0211 | .0142 | .9290 | 1.806 |

Criterion: Sex

| | Mult R | Mult $R^2$ | F,DF=(5,203) |
|---|---|---|---|
| Unshrunken | .311 | .097 | 4.36 *** |
| Single Shrunken | .273 | .075 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=203 |
|---|---|---|---|---|---|---|---|---|
| ROK 1 | III | -.076 | .068 | -.0693 | .0089 | .0055 | .9531 | 1.107 |
| | IV | .125 | .069 | .0674 | .0240 | .0144 | .9240 | 1.798 |
| | V | .224 | .070 | .2190 | .0830 | .0448 | .8967 | 3.173 ** |
| WTL | X | .094 | .071 | .1375 | .0128 | .0078 | .8916 | 1.324 |
| | XI | -.166 | .069 | -.1294 | .0453 | .0262 | .9483 | 2.425 * |

Criterion: Age

| | Mult R | Mult $R^2$ | F,DF=(9,199) |
|---|---|---|---|
| Unshrunken | .420 | .177 | 4.75 *** |
| Single Shrunken | .373 | .139 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=199 |
|---|---|---|---|---|---|---|---|---|
| SCOTT | I | -.173 | .078 | -.2372 | .0249 | .0203 | .6763 | 2.216 * |
| ROK 1 | III | -.090 | .067 | -.1083 | .0090 | .0075 | .9167 | 1.344 |
| | IV | -.095 | .078 | .0003 | .0074 | .0062 | .6890 | 1.225 |
| | V | -.214 | .071 | -.1600 | .0470 | .0373 | .8162 | 3.002 ** |
| ROK 2 | VI | -.118 | .095 | .1046 | .0077 | .0065 | .4505 | 1.249 |
| WTL | IX | -.093 | .068 | -.0743 | .0095 | .0079 | .9031 | 1.378 |
| | X | .173 | .070 | .1130 | .0316 | .0256 | .8528 | 2.486 * |
| | XI | .235 | .073 | ..2473 | .0542 | .0426 | .7719 | 3.210 ** |
| GORDON | XII | -.138 | .076 | -.1410 | .0164 | .0135 | .7154 | 1.807 |

Table F (Continued)

COMPONENTS OF STEPWISE MULTIPLE LINEAR REGRESSION

Criterion: Mach II

| | Mult R | Mult $R^2$ | F,DF=(9,199) |
|---|---|---|---|
| Unshrunken | .458 | .210 | 5.87 *** |
| Single Shrunken | .417 | .174 | |

| Predictor Name | Factor Number | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | Uniqueness | T, DF=199 |
|---|---|---|---|---|---|---|---|---|
| SCOTT | II | .111 | .068 | .1458 | .0116 | .0105 | .8559 | 1.628 |
| ROK 1 | III | -.090 | .079 | .0926 | .0056 | .0051 | .6382 | 1.137 |
| | IV | .166 | .077 | .0228 | .0207 | .0186 | .6703 | 2.161 * |
| | V | -.122 | .072 | -.0993 | .0127 | .0115 | .7751 | 1.701 |
| ROK 2 | VI | .217 | .083 | .2140 | .0308 | .0273 | .5794 | 2.621 ** |
| | VII | -.269 | .087 | -.0810 | .0436 | .0380 | .5248 | 3.095 ** |
| WTL | IX | .288 | .066 | .3214 | .0933 | .0768 | .9266 | 4.397 *** |
| | X | -.094 | .069 | -.1541 | .0081 | .0073 | .8391 | 1.360 |
| GORDON | XII | -.122 | .076 | -.0884 | .0115 | .0104 | .6973 | 1.619 |

Criterion: Conservativism

| | Mult R | Mult $R^2$ | F,DF=(9,199) |
|---|---|---|---|
| Unshrunken | .468 | .219 | 6.20 *** |
| Single Shrunken | .429 | .184 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=199 |
|---|---|---|---|---|---|---|---|---|
| SCOTT | I | -.186 | .074 | -.3111 | .0273 | .0248 | .7140 | 2.515 * |
| | II | -.079 | .072 | -.0153 | .0051 | .0047 | .7509 | 1.096 |
| ROK 1 | IV | .093 | .076 | .2447 | .0064 | .0059 | .6813 | 1.228 |
| | V | .150 | .069 | .0527 | .0201 | .0184 | .8232 | 2.165 * |
| ROK 2 | VII | .123 | .091 | .2881 | .0078 | .0073 | .4769 | 1.361 |
| | VIII | -.126 | .072 | -.1634 | .0131 | .0121 | .7587 | 1.757 |
| WTL | IX | .086 | .066 | .0254 | .0072 | .0067 | .9145 | 1.307 |
| | X | -.141 | .068 | -.2034 | .0186 | .0170 | .8529 | 2.083 * |
| GORDON | XII | -.155 | .075 | -.2715 | .0180 | .0166 | .6904 | 2.055 * |

Criterion: Centers (1) - Leadership

| | Mult R | Mult $R^2$ | F,DF=(5,203) |
|---|---|---|---|
| Unshrunken | .359 | .129 | 6.00 *** |
| Single Shrunken | .327 | .107 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=203 |
|---|---|---|---|---|---|---|---|---|
| SCOTT | II | .104 | .070 | .1636 | .0135 | .0095 | .8806 | 1.490 |
| ROK 1 | V | -.307 | .069 | -.2995 | .1484 | .0845 | .8944 | 4.436 *** |
| ROK 2 | VII | -.121 | .080 | .0756 | .0140 | .0099 | .6768 | 1.515 |
| WTL | IX | -.114 | .067 | -.0896 | .0180 | .0126 | .9659 | 1.711 |
| GORDON | XII | -.127 | .077 | -.1461 | .0166 | .0116 | .7237 | 1.646 |

Table F (Continued)

COMPONENTS OF STEPWISE MULTIPLE LINEAR REGRESSION

Criterion: Centers (2) - Interesting Experience

| | Mult R | Mult $R^2$ | F,DF=(6,202) |
|---|---|---|---|
| Unshrunken | .509 | .259 | 11.74 *** |
| Single Shrunken | .486 | .237 | |

| Predictor Name | Factor Number | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | Uniqueness | T, DF=202 |
|---|---|---|---|---|---|---|---|---|
| SCOTT | II | .292 | .069 | .2081 | .0686 | .0651 | .7639 | 4.210 *** |
| ROK 2 | VI | -.466 | .062 | -.4019 | .2759 | .2045 | .9414 | 7.464 *** |
| | VII | -.094 | .070 | .0261 | .0066 | .0066 | .7561 | 1.345 |
| | VIII | -.083 | .068 | .0598 | .0055 | .0055 | .8049 | 1.228 |
| WTL | X | -.116 | .064 | -.0867 | .0120 | .0121 | .8918 | 1.813 |
| | XI | -.088 | .066 | -.0897 | .0065 | .0065 | .8509 | 1.334 |

Criterion: Centers (3) - Esteem

| | Mult R | Mult $R^2$ | F,DF=(4,204) |
|---|---|---|---|
| Unshrunken | .401 | .161 | 9.78 *** |
| Single Shrunken | .380 | .144 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=204 |
|---|---|---|---|---|---|---|---|---|
| SCOTT | I | .167 | .074 | -.0293 | .0269 | .0209 | .7505 | 2.252 * |
| ROK 1 | V | -.149 | .069 | -.2539 | .0250 | .0194 | .8746 | 2.174 * |
| ROK 2 | VII | .308 | .077 | .3033 | .0919 | .0653 | .6886 | 3.984 *** |
| WTL | X | -.146 | .068 | -.2366 | .0245 | .0191 | .8956 | 2.154 * |

Criterion: Centers (4) - Power

| | Mult R | Mult $R^2$ | F,DF=(8,200) |
|---|---|---|---|
| Unshrunken | .413 | .170 | 5.13 *** |
| Single Shrunken | .370 | .137 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=200 |
|---|---|---|---|---|---|---|---|---|
| SCOTT | I | .124 | .075 | -.0368 | .0139 | .0113 | .7359 | 1.649 |
| | II | .111 | .069 | .2079 | .0133 | .0108 | .8781 | 1.611 |
| ROK 1 | III | .204 | .067 | .1655 | .0492 | .0382 | .9205 | 3.035 ** |
| | V | -.184 | .070 | -.2178 | .0360 | .0284 | .8364 | 2.616 ** |
| ROK 2 | VII | .093 | .086 | .1945 | .0059 | .0048 | .5592 | 1.080 |
| WTL | IX | -.088 | .066 | -.0627 | .0090 | .0073 | .9453 | 1.330 |
| | X | -.072 | .069 | -.1955 | .0054 | .0044 | .8615 | 1.033 |
| GORDON | XII | -.160 | .077 | -.2522 | .0223 | .0179 | .6980 | 2.078 * |

Table F (Continued)

COMPONENTS OF STEPWISE MULTIPLE LINEAR REGRESSION

Criterion: Centers (5) - Security

| | Mult R | Mult $R^2$ | F,DF=(7,201) |
|---|---|---|---|
| Unshrunken | .583 | .339 | 14.71 *** |
| Single Shrunken | .562 | .316 | |

| Predictor Name | Factor Number | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | Uniqueness | T, DF=201 | |
|---|---|---|---|---|---|---|---|---|---|
| SCOTT | II | .095 | .066 | .1319 | .0059 | .0069 | .7620 | 1.448 | |
| ROK 1 | IV | .187 | .069 | .3727 | .0208 | .0238 | .6822 | 2.691 | ** |
| | V | -.204 | .063 | -.3200 | .0302 | .0343 | .8200 | 3.228 | ** |
| ROK 2 | VI | -.194 | .061 | -.2845 | .0291 | .0330 | .8749 | 3.170 | ** |
| | VII | .263 | .074 | .4577 | .0371 | .0418 | .6055 | 3.566 | *** |
| | VIII | -.185 | .064 | -.0450 | .0240 | .0274 | .8038 | 2.887 | ** |
| WTL | IX | -.064 | .060 | -.1226 | .0032 | .0037 | .8996 | 1.061 | |

Criterion: Centers (6) - Self Expression

| | Mult R | Mult $R^2$ | F,DF=(4.204) |
|---|---|---|---|
| Unshrunken | .243 | .059 | 3.21 * |
| Single Shrunken | .202 | .041 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=204 | |
|---|---|---|---|---|---|---|---|---|---|
| ROK 1 | IV | -.111 | .069 | -.0720 | .0257 | .0119 | .9617 | 1.604 | |
| | V | -.184 | .069 | -.1796 | .0795 | .0324 | .9614 | 2.649 | ** |
| ROK 2 | VIII | .071 | .070 | .1072 | .0099 | .0047 | .9386 | 1.010 | |
| WTL | IX | -.113 | .070 | -.0943 | .0259 | .0119 | .9394 | 1.608 | |

Criterion: Centers (7) - Profit

| | Mult R | Mult $R^2$ | F,DF=(9,199) |
|---|---|---|---|
| Unshrunken | .478 | .228 | 6.54 *** |
| Single Shrunken | .440 | .194 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=199 | |
|---|---|---|---|---|---|---|---|---|---|
| SCOTT | II | .152 | .071 | .2112 | .0188 | .0176 | .7598 | 2.132 | * |
| ROK 1 | III | .206 | .079 | .0553 | .0288 | .0267 | .6295 | 2.623 | ** |
| | IV | .143 | .076 | .2321 | .0147 | .0138 | .6761 | 1.886 | |
| | V | -.237 | .070 | -.3311 | .0491 | .0445 | .7943 | 3.389 | *** |
| ROK 2 | VI | -.152 | .082 | -.0819 | .0143 | .0135 | .5804 | 1.865 | |
| | VII | .190 | .085 | .2973 | .0205 | .0192 | .5325 | 2.223 | * |
| | VIII | -.098 | .070 | .0319 | .0081 | .0076 | .7892 | 1.403 | |
| WTL | IX | .087 | .067 | .0535 | .0069 | .0066 | .8760 | 1.302 | |
| | X | -.133 | .070 | -.0214 | .0151 | .0142 | .8033 | 1.914 | |

Table F (Continued)

COMPONENTS OF STEPWISE MULTIPLE LINEAR REGRESSION

Criterion: Centers (8) - Fame

| | Mult R | Mult $R^2$ | F,DF=(7,201) |
|---|---|---|---|
| Unshrunken | .408 | .166 | 5.73 *** |
| Single Shrunken | .370 | .137 | |

| Predictor Name | Factor Number | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | Uniqueness | T, DF=201 | |
|---|---|---|---|---|---|---|---|---|---|
| SCOTT | I | .085 | .075 | -.0344 | .0065 | .0052 | .7332 | 1.124 | |
| | II | .148 | .073 | .2732 | .0213 | .0169 | .7752 | 2.019 | * |
| ROK 1 | III | .118 | .067 | .0730 | .0164 | .0131 | .9390 | 1.776 | |
| | V | -.149 | .070 | -.2396 | .0236 | .0186 | .8378 | 2.119 | * |
| ROK 2 | VII | .141 | .080 | .2061 | .0161 | .0129 | .6480 | 1.764 | |
| | VIII | .149 | .072 | .2341 | .0226 | .0180 | .8070 | 2.080 | * |
| WTL | X | -.106 | .070 | -.1935 | .0120 | .0096 | .8585 | 1.524 | |

Criterion: Centers (9) - Social Service

| | Mult R | Mult $R^2$ | F,DF=(4,204) |
|---|---|---|---|
| Unshrunken | .415 | .164 | 9.98 *** |
| Single Shrunken | .384 | .147 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=204 | |
|---|---|---|---|---|---|---|---|---|---|
| SCOTT | II | -.069 | .067 | -.0393 | .0054 | .0044 | .9065 | 1.032 | |
| ROK 1 | IV | -.179 | .077 | .0196 | .0289 | .0225 | .7009 | 2.345 | * |
| ROK 2 | VI | -.317 | .065 | -.3258 | .1450 | .0963 | .9593 | 4.846 | *** |
| | VII | .292 | .078 | .2094 | .0773 | .0566 | .6612 | 3.714 | *** |

Criterion: Centers (10) - Independence

| | Mult R | Mult $R^2$ | F,DF=(7,201) |
|---|---|---|---|
| Unshrunken | .312 | .097 | 3.09** |
| Single Shrunken | .256 | .066 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=201 | |
|---|---|---|---|---|---|---|---|---|---|
| SCOTT | I | .176 | .072 | .0688 | .0462 | .0267 | .8595 | 2.437 | * |
| | II | .133 | .072 | .1530 | .0256 | .0153 | .8669 | 1.847 | |
| ROK 1 | III | .086 | .083 | -.0225 | .0078 | .0048 | .6512 | 1.033 | |
| | V | -.143 | .071 | -.1696 | .0307 | .0182 | .8832 | 2.011 | * |
| ROK 2 | VI | -.139 | .086 | -.1078 | .0194 | .0117 | .6037 | 1.615 | |
| WTL | IX | -.110 | .069 | -.1024 | .0187 | .0113 | .9337 | 1.585 | |
| GORDON | XII | -.122 | .074 | -.1308 | .0204 | .0123 | .8241 | 1.656 | |

Table F (Continued)

COMPONENTS OF STEPWISE MULTIPLE LINEAR REGRESSION

Criterion: Holland (1) - Realistic Type

| | Mult R | Mult $R^2$ | F,DF=(8,200) |
|---|---|---|---|
| Unshrunken | .434 | .189 | 5.82 *** |
| Single Shrunken | .395 | .156 | |

| Predictor Name | Factor Number | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | Uniqueness | T, DF=200 | |
|---|---|---|---|---|---|---|---|---|---|
| SCOTT | I | -.106 | .074 | -.1275 | .0095 | .0082 | .7359 | 1.421 | |
| | II | .104 | .069 | .1547 | .0108 | .0093 | .8595 | 1.513 | |
| ROK 1 | IV | .275 | .077 | .2126 | .0637 | .0513 | .6767 | 3.556 | *** |
| | V | -.073 | .070 | .0089 | .0052 | .0045 | .8310 | 1.050 | |
| ROK 2 | VI | .303 | .068 | .2382 | .1048 | .0801 | .8712 | 4.443 | *** |
| | VII | -.227 | .092 | .0590 | .0293 | .0246 | .4788 | 2.462 | * |
| WTL | IX | -.183 | .066 | -.1617 | .0370 | .0308 | .9236 | 2.755 | ** |
| GORDON | XII | -.081 | .076 | -.1595 | .0054 | .0046 | .7047 | 1.069 | |

Criterion: Holland (2) - Intellectual Type

| | Mult R | Mult $R^2$ | F,DF=(6,202) |
|---|---|---|---|
| Unshrunken | .394 | .156 | 6.20 *** |
| Single Shrunken | .361 | .130 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=202 | |
|---|---|---|---|---|---|---|---|---|---|
| SCOTT | I | -.111 | .076 | -.0995 | .0114 | .0089 | .7181 | 1.456 | |
| ROK 2 | III | .077 | .066 | .0534 | .0072 | .0050 | .9516 | 1.156 | |
| | IV | -.178 | .082 | .0356 | .0255 | .0195 | .6164 | 2.157 | * |
| | V | .242 | .067 | .2734 | .0758 | .0541 | .9223 | 3.596 | *** |
| WTL | IX | -.115 | .067 | -.1556 | .0157 | .0121 | .9255 | 1.704 | |
| GORDON | XII | -.250 | .076 | -.2510 | .0616 | .0448 | .7186 | 3.272 | ** |

Criterion: Holland (3) - Social Type

| | Mult R | Mult $R^2$ | F,DF=(5,203) |
|---|---|---|---|
| Unshrunken | .334 | .112 | 5.11 *** |
| Single Shrunken | .300 | .090 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=203 | |
|---|---|---|---|---|---|---|---|---|---|
| SCOTT | II | -.150 | .072 | -.1815 | .0298 | .0190 | .8483 | 2.085 | * |
| ROK 1 | III | -.240 | .067 | -.2432 | .0989 | .0564 | .9786 | 3.590 | *** |
| ROK 2 | V | -.079 | .074 | -.1086 | .0076 | .0050 | .8046 | 1.072 | |
| WTL | IX | -.111 | .068 | -.1195 | .0179 | .0117 | .9526 | 1.632 | |
| | XI | .070 | .067 | .0643 | .0071 | .0047 | .9683 | 1.035 | |

Table F (Continued)

COMPONENTS OF STEPWISE MULTIPLE LINEAR REGRESSION

Criterion: Holland (4) - Conventional Type

| | Mult R | Mult $R^2$ | F,DF=(6,202) |
|---|---|---|---|
| Unshrunken | .332 | .110 | 4.16 *** |
| Single Shrunken | .289 | .084 | |

| Predictor Name | Factor Number | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | Uniqueness | T, DF=202 | |
|---|---|---|---|---|---|---|---|---|---|
| SCOTT | I | -.124 | .077 | -.1986 | .0178 | .0115 | .7408 | 1.613 | |
| | II | -.158 | .070 | -.0632 | .0354 | .0222 | .8881 | 2.246 | * |
| ROK 1 | III | .149 | .068 | .1421 | .0337 | .0212 | .9517 | 2.193 | * |
| ROK 2 | VII | .105 | .087 | .1793 | .0098 | .0064 | .5808 | 1.203 | |
| WTL | X | -.102 | .070 | -.1575 | .0145 | .0094 | .9088 | 1.459 | |
| GORDON | XII | -.106 | .079 | -.1816 | .0122 | .0079 | .7012 | 1.341 | |

Criterion: Holland (5) - Enterprising Type

| | Mult R | Mult $R^2$ | F,DF=(7,201) |
|---|---|---|---|
| Unshrunken | .319 | .102 | 3.24 ** |
| Single Shrunken | .265 | .070 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=201 | |
|---|---|---|---|---|---|---|---|---|---|
| ROK 1 | V | -.102 | .075 | -.0954 | .0131 | .0082 | .7885 | 1.350 | |
| ROK 2 | VI | .109 | .070 | .0957 | .0171 | .0106 | .9019 | 1.542 | |
| | VII | -.151 | .084 | .0441 | .0233 | .0143 | .6291 | 1.791 | |
| | VIII | .160 | .071 | .1583 | .0382 | .0229 | .8965 | 2.263 | * |
| WTL | X | -.078 | .074 | -.1168 | .0079 | .0050 | .8240 | 1.055 | |
| | XI | .146 | .073 | .0969 | .0293 | .0178 | .8321 | 1.997 | * |
| GORDON | XII | -.192 | .079 | -.2054 | .0443 | .0263 | .7102 | 2.424 | * |

Criterion: Holland (6) - Artistic Type

| | Mult R | Mult $R^2$ | F,DF=(7,201) |
|---|---|---|---|
| Unshrunken | .528 | .279 | 11.1 *** |
| Single Shrunken | .504 | .254 | |

| | | $\beta$ | $\sigma_\beta$ | $R_c$ | $\Delta R_c$ | $\Delta R_c^2$ | U | T, DF=201 | |
|---|---|---|---|---|---|---|---|---|---|
| SCOTT | I | .205 | .066 | .2183 | .0343 | .0350 | .8364 | 3.124 | ** |
| | II | .200 | .067 | .1865 | .0308 | .0316 | .7894 | 2.966 | ** |
| ROK 1 | IV | -.180 | .064 | -.1717 | .0274 | .0281 | .8661 | 2.800 | ** |
| | V | .081 | .064 | .1057 | .0054 | .0057 | .8710 | 1.258 | |
| ROK 2 | VIII | .164 | .068 | .2795 | .0200 | .0207 | .7670 | 2.402 | * |
| WTL | IX | -.325 | .063 | -.3015 | .1012 | .0967 | .9181 | 5.190 | *** |
| | X | .091 | .064 | .1493 | .0069 | .0072 | .8762 | 1.418 | |

TABLE G

COMPONENTS OF REDUNDANCY MEASURE FOR INDEPENDENT-DEPENDENT VARIABLE DOMAINS

| I | II | III | IV | V | VI |
|---|---|---|---|---|---|
| Root | Canonical R | R Squared | Variance Extracted | Redundancy | Proportion of Total Redundancy |
| # | $R_c$ | $\lambda$ | VC | $\lambda$.VC | |
| | Left Set (Set A (Predictors) Given Set B (MachCon Criteria)) | | | | |
| 1 | .5167 | .2673 | .1377 | .0368 | .6195 |
| 2 | .4301 | .1853 | .1220 | .0226 | .3805 |
| | Right Set (Set B (MachCon Criteria ) Given Set A (Predictors)) | | | | |
| 1 | .5167 | .2673 | .4014 | .1073 | .4936 |
| 2 | .4301 | .1853 | .5942 | .1101 | .5064 |

Note.--Total variance extracted from left set = .2597; $\bar{R}$, total redundancy of left set, given right set = .0594. Total variance extracted from right set = 1.00; R, total redundancy of right set, given left set = .2174.

Table G (Continued)

COMPONENTS OF REDUNDANCY MEASURE FOR INDEPENDENT-DEPENDENT VARIABLE DOMAINS

| I Root # | II Canonical R $R_c$ | III R Squared $\lambda$ | IV Variance Extracted VC | V Redundancy $\lambda$.VC | VI Proportion of Total Redundancy |
|---|---|---|---|---|---|
| Left Set (Set A (Cen Holl Criteria) Given Set B (Predictors)) | | | | | |
| 1 | .6914 | .4784 | .0987 | .0472 | .2521 |
| 2 | .6083 | .3704 | .1193 | .0442 | .2361 |
| 3 | .5727 | .3277 | .1309 | .0429 | .2292 |
| 4 | .4827 | .2327 | .0842 | .0196 | .1047 |
| 5 | .4336 | .1880 | .1975 | .0095 | .0507 |
| 6 | .4012 | .1610 | .0789 | .0127 | .0678 |
| 7 | .3015 | .0909 | .0037 | .0034 | .0182 |
| 8 | .2498 | .0624 | .0353 | .0022 | .0118 |
| 9 | .2216 | .0491 | .0407 | .0020 | .0107 |
| 10 | .1732 | .0300 | .0433 | .0013 | .0069 |
| 11 | .1356 | .0184 | .0543 | .0010 | .0053 |
| 12 | .1114 | .0124 | .0968 | .0012 | .0064 |
| Right Set (Set B (Predictors) Given Set A (Cen Holl Criteria)) | | | | | |
| 1 | .6914 | .4784 | .1712 | .0819 | .3532 |
| 2 | .6083 | .3704 | .1420 | .0526 | .2268 |
| 3 | .5727 | .3277 | .1037 | .0340 | .1460 |
| 4 | .4827 | .2327 | .0928 | .0216 | .0931 |
| 5 | .4336 | .1880 | .1227 | .0108 | .0466 |
| 6 | .4012 | .1610 | .0807 | .0131 | .0565 |
| 7 | .3015 | .0909 | .0649 | .0059 | .0254 |
| 8 | .2498 | .0624 | .0641 | .0040 | .0172 |
| 9 | .2216 | .0491 | .0631 | .0031 | .0134 |
| 10 | .1732 | .0300 | .0057 | .0017 | .0073 |
| 11 | .1356 | .0184 | .0598 | .0011 | .0047 |
| 12 | .1114 | .0124 | .1693 | .0021 | .0019 |

Note.--Total variance extracted from left set = .9836; $\bar{R}$, total redundancy left set, given right set = .1872. Total variance extracted from right set = 1.000; R, total redundancy right set, given left set = .2319.

Table G (Continued)

COMPONENTS OF REDUNDANCY MEASURE FOR INDEPENDENT-DEPENDENT VARIABLE DOMAINS

| I Root # | II Canonical R $R_c$ | III R Squared $\lambda$ | IV Variance Extracted VC | V Redundancy $\lambda$.VC | VI Proportion of Total Redundancy |
|---|---|---|---|---|---|
| | Left Set (Set A (All Criteria) Given Set B (All Predictors) | | | | |
| 1 | .7301 | .5329 | .0852 | .0454 | .2565 |
| 2 | .6603 | .4362 | .0766 | .0334 | .1887 |
| 3 | .5975 | .3569 | .0961 | .0343 | .1938 |
| 4 | .5206 | .2712 | .0973 | .0264 | .1492 |
| 5 | .4506 | .2034 | .0782 | .0159 | .0898 |
| 6 | .4347 | .1891 | .0449 | .0085 | .0480 |
| 7 | .3302 | .1091 | .0385 | .0042 | .0237 |
| 8 | .3143 | .0988 | .0395 | .0039 | .0220 |
| 9 | .2349 | .0552 | .0326 | .0018 | .0102 |
| 10 | .1819 | .0331 | .0423 | .0014 | .0079 |
| 11 | .1587 | .0252 | .0436 | .0011 | .0062 |
| 12 | .1315 | .0173 | .0405 | .0007 | .0040 |
| | Right Set (Set B (All Predictors) Given Set A (All Criteria) | | | | |
| 1 | .7301 | .5329 | .1764 | .0940 | .3549 |
| 2 | .6603 | .4362 | .1162 | .0507 | .1991 |
| 3 | .5975 | .3569 | .0992 | .0354 | .1390 |
| 4 | .5206 | .2712 | .1158 | .0314 | .1233 |
| 5 | .4506 | .2034 | .0619 | .0126 | .0495 |
| 6 | .4347 | .1891 | .0545 | .0103 | .0404 |
| 7 | .3302 | .1091 | .0687 | .0075 | .0294 |
| 8 | .3143 | .0988 | .0435 | .0043 | .0169 |
| 9 | .2349 | .0552 | .0779 | .0043 | .0169 |
| 10 | .1819 | .0331 | .0544 | .0018 | .0071 |
| 11 | .1587 | .0252 | .0555 | .0014 | .0055 |
| 12 | .1315 | .0173 | .0578 | .0010 | .0039 |

Note.--Total variance extracted from left set = .7153; $\bar{R}$, total redundancy of left set, given right set = .1770. Total variance extracted from right set = 1.000; $\bar{R}$, total redundancy of right set, given left set = .2547.

TABLE H

MEANS, AND STANDARD DEVIATIONS
FOR 67 VALUE MEASURES AND 21 CRITERION VARIABLES

| Variable Name | Variable No. | Mean | S.D. |
|---|---|---|---|
| Acad/Tech | 1 | .42583732 | .49446931 |
| Sex | 2 | .52153110 | .49953620 |
| Age | 3 | 23.220000 | 4.887 |
| Scott | 4 | 3.1004785 | 2.0342639 |
| 12 items | 5 | 5.1100478 | 1.8797191 |
| | 6 | 4.3732057 | 2.0922390 |
| | 7 | 3.4258373 | 2.1488847 |
| | 8 | 3.7894737 | 2.1080126 |
| | 9 | 4.6172249 | 2.3080657 |
| | 10 | 3.2248804 | 1.9496419 |
| | 11 | 2.9521531 | 1.8347021 |
| | 12 | 2.0287081 | 2.2219304 |
| | 13 | 2.6411483 | 1.8893888 |
| | 14 | 4.1387560 | 4.6355069 |
| | 15 | 5.4593301 | 1.9143181 |
| Rokeach 1 | 16 | 6.3684211 | 1.4320855 |
| 18 items | 17 | 6.3301435 | 1.0540877 |
| | 18 | 6.5358852 | 1.0165635 |
| | 19 | 6.6602871 | .76677534 |
| | 20 | 6.5789474 | .80354290 |
| | 21 | 6.4976077 | .76480227 |
| | 22 | 6.3636364 | 1.1664440 |
| | 23 | 5.5023923 | 1.5837826 |
| | 24 | 6.3923445 | .80615975 |
| | 25 | 5.7894737 | 1.3425977 |
| | 26 | 4.7846890 | 1.8756957 |
| | 27 | 6.5598086 | .79322005 |
| | 28 | 6.2822967 | 1.2302886 |
| | 29 | 6.3444976 | 1.1640471 |
| | 30 | 5.9665072 | 1.2465561 |
| | 31 | 5.0334928 | 1.4685956 |
| | 32 | 6.1330713 | .98856816 |
| | 33 | 5.9425837 | 1.1683854 |
| Rokeach 2 | 34 | 6.3157895 | .99076572 |
| 18 items | 35 | 5.7894737 | 1.2271585 |
| | 36 | 6.4306220 | .80442561 |
| | 37 | 6.263.579 | .98923951 |
| | 38 | 5.8803828 | 1.0760764 |
| | 39 | 6.425873 | .82165802 |
| | 40 | 6.3971292 | .96849481 |
| | 41 | 6.2488038 | .97593582 |
| | 42 | 6.0297081 | .96797463 |
| | 43 | 5.9425837 | 1.1560347 |
| | 44 | 6.5550239 | .84609213 |

Table H (Continued)

MEANS, AND STANDARD DEVIATIONS
FOR 67 VALUE MEASURES AND 21 CRITERION VARIABLES

| Variable Name | Variable No. | Mean | S.D. |
|---|---|---|---|
| Rokeach 2 | 45 | 6.3110048 | .86612122 |
| (continued) | 46 | 6.0660956 | 1.0650206 |
| | 47 | 6.2679426 | .86670253 |
| | 48 | 5.8564593 | 1.1894548 |
| | 49 | 5.9282297 | 1.1365517 |
| | 50 | 4.9234450 | 1.6380276 |
| | 51 | 6.1483254 | .99856815 |
| Ways to | 52 | 4.3349282 | 1.8018531 |
| Live | 53 | 3.4688995 | 1.6428005 |
| 13 items | 54 | 4.7129187 | 1.5510070 |
| | 55 | 4.3014354 | 1.6658828 |
| | 56 | 4.3875598 | 1.5888482 |
| | 57 | 4.3205742 | 1.4827905 |
| | 58 | 5.1818182 | 1.5484070 |
| | 59 | 4.6842105 | 1.7211850 |
| | 60 | 4.0717703 | 1.6309264 |
| | 61 | 3.5837321 | 1.6525820 |
| | 62 | 3.7320574 | 1.7702961 |
| | 63 | 4.6555024 | 1.4396906 |
| | 64 | 3.2057416 | 1.7528556 |
| Gorden | 65 | 8.8803828 | 3.9092637 |
| 6 items | 66 | 8.4162679 | 7.3010403 |
| | 67 | 10.148325 | 4.0489835 |
| | 68 | 8.1770335 | 4.2586528 |
| | 69 | 8.1626794 | 5.0625130 |
| | 70 | 9.7799043 | 4.4106632 |
| Mach 2 | 71 | 8.6363636 | 5.0662424 |
| Cons. | 72 | 34.205742 | 12.180099 |
| Centers | 73 | 3.3732057 | 1.1797533 |
| 10 items | 74 | 4.7320574 | .60695812 |
| | 75 | 3.4593301 | 1.1489631 |
| | 76 | 2.8612440 | 1.2810284 |
| | 77 | 3.7464115 | 1.3079803 |
| | 78 | 4.6650718 | .67261905 |
| | 79 | 3.5885167 | 1.2308095 |
| | 80 | 2.7894737 | 1.3064742 |
| | 81 | 4.4306220 | .88918009 |
| | 82 | 3.8708134 | 1.3005556 |
| Holland | 83 | 4.9712919 | 2.6788448 |
| 6 items | 84 | 5.3540670 | 2.8299484 |
| | 85 | 11.220096 | 3.6246601 |
| | 86 | 6.7511962 | 4.7828753 |
| | 87 | 7.2870813 | 3.1613509 |
| | 88 | 6.5933014 | 3.8552956 |

# APPENDIX B

VANCOUVER CITY COLLEGE

SCOTT Langara

:ructions: Please read over the following statements, and for each one indicate (by a check in the appropriate space) whether it is something you always admire (AA) in other people, or something you always dislike (AD), or something that depends on the situation (DOS) whether you admire it or not.

| | AA | DOS | AD | |
|---|---|---|---|---|
| 1. | ___ | ___ | ___ | never acting so as to violate social conventions |
| 2. | ___ | ___ | ___ | being kind to people, even if they do things contrary to one's beliefs |
| 3. | ___ | ___ | ___ | being well-mannered and behaving properly in social situations |
| 4. | ___ | ___ | ___ | defending the honor of one's group whenever it is unfairly criticized |
| 5. | ___ | ___ | ___ | studying hard to get good grades in school |
| 6. | ___ | ___ | ___ | being graceful and well-coordinated in physical movements |
| 7. | ___ | ___ | ___ | being respected by people who are themselves worthwhile |
| 8. | ___ | ___ | ___ | never cheating or having anything to do with cheating situations, even for a friend. |
| 9. | ___ | ___ | ___ | being devout in one's religious faith |
| 10. | ___ | ___ | ___ | practicing self-control |
| 11. | ___ | ___ | ___ | developing new and different ways of doing things |
| 12. | ___ | ___ | ___ | having no knowledge of current events |
| 13. | ___ | ___ | ___ | looking out for one's own interests first |
| 14. | ___ | ___ | ___ | dressing sloppily |
| 15. | ___ | ___ | ___ | being unconcerned with what other people think about one's group |
| 16. | ___ | ___ | ___ | being content with a "gentlemanly C" grade |
| 17. | ___ | ___ | ___ | being physically weak and puny |
| 18. | ___ | ___ | ___ | acting beneath one's dignity |
| 19. | ___ | ___ | ___ | helping a close friend get by a tight situation, even though one may have to stretch the truth a bit to do it. |
| 20. | ___ | ___ | ___ | being an atheist |

| | AA | DOS | AD | |
|---|---|---|---|---|
| 21. | ____ | ____ | ____ | showing one's feelings readily |
| 22. | ____ | ____ | ____ | enjoying a routine, patterned life |
| 23. | ____ | ____ | ____ | being outspoken and frank in expressing one's likes and dislikes |
| 24. | ____ | ____ | ____ | striving to gain new knowledge about the world |
| 25. | ____ | ____ | ____ | helping another person feel more secure, even if one doesn't like him |
| 26. | ____ | ____ | ____ | being able to get people to cooperate with one |
| 27. | ____ | ____ | ____ | working hard to inprove the prestige and status of one's groups |
| 28. | ____ | ____ | ____ | trying hard to understand difficult lectures and text-books |
| 29. | ____ | ____ | ____ | being good in some form of sport |
| 30. | ____ | ____ | ____ | gaining recognition for one's achievements |
| 31. | ____ | ____ | ____ | always telling the truth, even though it may hurt one-self or others |
| 32. | ____ | ____ | ____ | always attending religious services regularly and faithfully |
| 33. | ____ | ____ | ____ | replying to anger with gentleness |
| 34. | ____ | ____ | ____ | inventing gadgets for the fun of it |
| 35. | ____ | ____ | ____ | acting in such a way as to gain the approval of others |
| 36. | ____ | ____ | ____ | knowing only one's specialty |
| 37. | ____ | ____ | ____ | ignoring the needs of other people |
| 38. | ____ | ____ | ____ | interupting others while they are talking |
| 39. | ____ | ____ | ____ | paying little attention to what the members of one's group think |
| 40. | ____ | ____ | ____ | being oneself on being able to get by in school with little work |
| 41. | ____ | ____ | ____ | being an indoor type, and avoiding outdoor activities |
| 42. | ____ | ____ | ____ | not being able to do anything better than other people |
| 43. | ____ | ____ | ____ | deceiving others |

| | AA | DOS | AD | |
|---|---|---|---|---|
| 44. | ____ | ____ | ____ | treating man, rather than God, as the measure of all things |
| 45. | ____ | ____ | ____ | expressing one's anger openly and directly when provoked |
| 46. | ____ | ____ | ____ | doing things the same way that other people do them |
| 47. | ____ | ____ | ____ | standing up for what one thinks right, regardless of what others think |
| 48. | ____ | ____ | ____ | enjoying books, music, art, philosophy, and sciences |
| 49. | ____ | ____ | ____ | helping another achieve his own goals, even if it might interfere with your own. |
| 50. | ____ | ____ | ____ | always doing the right thing at the right time |
| 51. | ____ | ____ | ____ | performing unpleasant tasks, if these are required by one's group |
| 52. | ____ | ____ | ____ | getting the top grade on a test |
| 53. | ____ | ____ | ____ | having a good figure or physique |
| 54. | ____ | ____ | ____ | being in a position to direct and mold others' lives |
| 55. | ____ | ____ | ____ | speaking one's mind truthfully, without regard for the consequences |
| 56. | ____ | ____ | ____ | avoiding the physical pleasures that are prohibited in the Bible |
| 57. | ____ | ____ | ____ | hiding one's feelings of frustration from other people |
| 58. | ____ | ____ | ____ | trying out new ideas |
| 59. | ____ | ____ | ____ | keeping one's opinions to himself when they differ from the group's |
| 60. | ____ | ____ | ____ | having little interest in arts, theater, music, and other cultural activities |
| 61. | ____ | ____ | ____ | revenging wrongs that other people have done to one |
| 62. | ____ | ____ | ____ | being discourteous |
| 63. | ____ | ____ | ____ | getting by with as little involvement in organizations as possible |
| 64. | ____ | ____ | ____ | not letting studies interfere with one's college life |
| 65. | ____ | ____ | ____ | being uninterested in sports |
| 66. | ____ | ____ | ____ | being unable to exert any influence on things around one |

| | AA | DOS | AD | |
|---|---|---|---|---|
| 67. | ____ | ____ | ____ | stealing when necessary |
| 68. | ____ | ____ | ____ | taking a skeptical attitude toward religious teachings |
| 69. | ____ | ____ | ____ | letting off steam when one is frustrated |
| 70. | ____ | ____ | ____ | painting or composing or writing in a traditional style |
| 71. | ____ | ____ | ____ | encouraging other people to act as they please |
| 72. | ____ | ____ | ____ | keeping up with world news through regular reading or by watching informative programs |
| 73. | ____ | ____ | ____ | being considerate of others' feelings |
| 74. | ____ | ____ | ____ | being concerned about what kind of impression one makes on others |
| 75. | ____ | ____ | ____ | taking an active part in all group affairs |
| 76. | ____ | ____ | ____ | priding oneself on good grades |
| 77. | ____ | ____ | ____ | exercising regularly |
| 78. | ____ | ____ | ____ | doing what one is told |
| 79. | ____ | ____ | ____ | going out of one's way to bring dishonest people to justice |
| 80. | ____ | ____ | ____ | adhering to the doctrines of one's religion |
| 81. | ____ | ____ | ____ | not getting upset when things go wrong |
| 82. | ____ | ____ | ____ | always looking for new roads to travel |
| 83. | ____ | ____ | ____ | always basing one's behavior on the recognition that he is dependent on other people |
| 84. | ____ | ____ | ____ | being uninterested in national and world affairs |
| 85. | ____ | ____ | ____ | making jokes at the expense of other people |
| 86. | ____ | ____ | ____ | being unable to act in a way that will please others |
| 87. | ____ | ____ | ____ | not taking one's group memberships seriously |
| 88. | ____ | ____ | ____ | doing one's best to avoid working hard in a course |
| 89. | ____ | ____ | ____ | avoiding any form of exercise |
| 90. | ____ | ____ | ____ | failing to develop contacts that could improve one's position |

| | AA | DOS | AD | |
|---|---|---|---|---|
| 91. | ____ | ____ | ____ | being dishonest in harmless ways |
| 92. | ____ | ____ | ____ | treating the Bible only as an historical or literary work |
| 93. | ____ | ____ | ____ | letting people know when one is annoyed with them |
| 94. | ____ | ____ | ____ | not wishing to create beautiful and artistic objects |
| 95. | ____ | ____ | ____ | thinking and acting freely, without social restraints |
| 96. | ____ | ____ | ____ | having a strong intellectual curiosity |

MORRIS' WAYS TO LIVE

INSTRUCTIONS: Below are described thirteen ways to live which various persons at various times have advocated and followed.

Indicate, (by placing an "X" in the space following each way to live), to what degree you like or dislike each way. You may read ahead if you wish.

Remember that it is NOT a question of what kind of life you now lead, OR the kind of life you think it prudent to live in our society, OR the kind of life you think good for other persons, BUT SIMPLY THE KIND OF LIFE YOU PERSONALLY WOULD LIKE TO LIVE.

WAY 1. In this "design for living" the individual actively participates in the social life of his community, not to change it primarily, but to understand, appreciate, and preserve the best that man has attained. Excessive desires should be avoided and moderation sought. One wants the good things of life but in an orderly way. Life is to have clarity, balance, refinement, control. Vulgarity, great enthusiasm, irrational behavior, impatience, indulgence are to be avoided. Friendship is to be esteemed but not easy intimacy with many people. Life is to have discipline, intelligibility, good manners, predictability. Social changes are to be made slowly and carefully, so that what has been achieved in human culture is not lost. The individual should be active physically and socially, but not in a hectic or radical way. Restraint and intelligence should give order to an active life.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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WAY 2. The individual should for the most part "go it alone," assuring himself of privacy in living quarters, having much time to himself, attempting to control his own life. One should stress self-sufficiency, reflection and meditation, knowledge of himself. The direction of interest should be away from intimate associations with social groups, and away from the physical manipulation of objects or attempts at control of the physical environment. One should aim to simplify one's external life, to moderate those desires whose satisfaction is dependent upon physical and social forces outside of oneself, and to concentrate attention upon the refinement, clarification, and self-direction of one's self. Not much can be done or is to be gained by "living outwardly". One must avoid dependence upon persons or things; the center of life should be found within oneself.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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WAY 3. This way of life makes central the sympathetic concern for other persons. Affection should be the main thing in life, affection that is free from all traces of the imposition of oneself upon others or of using others for one's own purposes. Greed in possessions, emphasis on sexual passion, the search for power over persons and things, excessive emphasis upon intellect, and undue concern for oneself are to be avoided. For these things hinder the sympathetic love among persons which alone gives significance to life. If we are aggressive we block our receptivity to the personal forces upon which we are dependent for genuine personal growth. One should accordingly purify oneself, restrain one's self-assertiveness, and become receptive, appreciative, and helpful with respect to other persons.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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WAY 4. Life is something to be enjoyed -- sensuously enjoyed, enjoyed with relish and abandonment. The aim in life should not be to control the course of the world or society or the lives of others, but to be open and receptive to things and persons, and to delight in them. Life is more a festival than a workshop or a school for moral discipline. To let oneself go, to let things and person affect oneself, is more important than to do -- or to do good. Such enjoyment, however, requires that one be self-centered enough to be keenly aware of what is happening and free for new happenings. So one should avoid entanglements, should not be self-sacrificing; one should be alone a lot, should have time for meditation and awareness of oneself. Solitude and sociality together are both necessary in the good life.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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WAY 5. A person should not hold on to himself, withdraw from people, keep aloof and self-centered. Rather merge oneself with a social group, enjoy cooperation and companionship, join with others in resolute activity for the realization of common goals. Persons are social and persons are active; life should merge energetic group activity and cooperative group enjoyment. Meditation, restraint, concern for one's self-sufficiency, abstract intellectuality, solitude, stress on one's possessions all cut the roots which bind persons together. One should live outwardly with gusto, enjoying the good things of life, working with others to secure the things which make possible a pleasant and energetic social life. Those who oppose this ideal are not to be dealt with too tenderly. Life can't be too fastidious.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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WAY 6. Life continually tends to stagnate, to become "comfortable", to become "sicklied o'er with the pale cast of thought". Against these tendencies, a person must stress the need of constant activity -- physical action, adventure, the realistic solution of specific problems as they appear, the improvement of techniques for controlling the world and society. Man's future depends primarily on what he does, not on what he feels or on his speculations. New problems constantly arise and always will arise. Improvements must always be made if man is to progress. We can't just follow the past or dream of what the future might be. We have to work resolutely and continually if control is to be gained over the forces which threaten us. Man should rely on technical advances made possible by scientific knowledge. He should find his goal in the solution of his problems. The good is the enemy of the better.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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WAY 7. We should at various times and in various ways accept something from all other paths of life, but give no one our exclusive allegiance. At one moment one of them is the more appropriate; at another moment another is the most appropriate. Life should contain enjoyment and action and contemplation in about equal amounts. When either is carried to extremes we lose something important for our life. So we must cultivate flexibility, admit diversity in ourselves, accept the tension which this diversity produces, find a place for detachment in the midst of enjoyment and activity. The goal of life is found in the dynamic integration of enjoyment, action and contemplation, and so in the dynamic interaction of the various paths of life. One should use all of them in building a life, and no one alone.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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WAY 8. Enjoyment should be the keynote of life. Not the hectic search for intense and exciting pleasures, but the enjoyment of the simple and easily obtainable pleasures: the pleasures of just existing, of savory food, of comfortable surroundings, of talking with friends of rest and relaxation. A home that is warm and comfortable, chairs and a bed that are soft, a kitchen well-stocked with food, a door open to the entrance of friends -- this is the place to live. Body at ease, relaxed, calm in its movements, not hurried, breath slow, willing to nod and to rest, grateful to the world that is its food -- so should the body be. Driving ambition and the fanaticism of ascetic ideals are the signs of discontented people who have lost the capacity to float in the stream of simple, carefree, wholesome enjoyment.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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WAY 9. Receptivity should be the keynote of life. The good things of life come of their own accord, and come unsought. They cannot be found by resolute action. They cannot be found in the indulgence of the sensuous desires of the body. They cannot be gathered by participation in the turmoil of social life. They cannot be given to others by attempts to be helpful. They cannot be garnered by hard thinking. Rather do they come unsought when the bars of the self are down. When the self has ceased to make demands and waits in quiet receptivity, it becomes open to the powers which nourish it and work through it; and sustained by these powers it knows joy and peace. To sit alone under the trees and the sky, open to nature's voices, calm and receptive, then can the wisdom from without come within.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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WAY 10. Self-control should be the keynote of life. Not the easy self-control which retreats from the world, but the vigilant, stern, manly control of a self which lives in the world, and knows the strength of the world and the limits of human power. The good life is rationally directed and holds firm to high ideals. It is not bent by the seductive voices of comfort and desire. It does not expect social utopias. It is distrustful of final victories. Too much cannot be expected. Yet one can with vigilance hold firm the reins to his self, control his unruly impulses, understand his place in the world, guide his actions by reason, maintain his self-reliant independence. And in this way, though he finally perish, man can keep his human dignity and respect, and die with cosmic good manners.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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WAY 11. The contemplative life is the good life. The external world is no fit habitat for man. It is too big, too cold, too pressing. Rather it is the life turned inward that is rewarding. The rich internal world of ideals, of sensitive feelings, of reverie, of self-knowledge is man's true home. By the cultivation of the self within, man alone becomes human. Only then does there arise deep sympathy with all that lives, an understanding of the suffering inherent in life, a realization of the futility of aggressive action, the attainment of contemplative joy. Conceit then falls away and austerity is dissolved. In giving up the world one finds the larger and finer sea of the inner self.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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WAY 12. The use of the body's energy is the secret of a rewarding life. The hands need material to make into something: lumber and stone for building, food to harvest, clay to mold. The muscles are alive to joy only in action, in climbing, running, skiing, and the like. Life finds its zest in overcoming, dominating, conquering some obstacle. It is the active deed which is satsifying, the deed adequate to the present, the daring and adventuresome deed. Not in cautious foresight, not in relaxed ease does life attain completion. Outward energetic action, the excitement of power in the tangible present -- this is the way to live.

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WAY 13. A person should let himself be used. Used by other persons in their growth, used by the great objective purposes in the universe which silently and irresistibly achieve their goal. For persons and the world's purposes are dependable at heart, and can be trusted. One should be humble, constant, faithful, uninsistent. Grateful for the affection and protection which one needs, but undemanding. Close to persons and to nature, and secure because close. Nourishing the good by devotion and sustained by the good because of devotion. One should be a serene, confident, quiet vessel and instrument of the great dependable powers which move to their fulfiliment.

| I like it very much | I like it quite a lot | I like it slightly | I am indifferent to it | I dislike it slightly | I dislike it quite a lot | I dislike it very much |
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If you wish you may also invent in this space your own ideal way to live. It may be a combination of aspects described in the thirteen previous ways or may be totally original. Please try to confine your way to live to a summary statement no longer than two paragraphs long.

TO WHAT EXTENT DO YOU BELIEVE THIS VALUE IS PERSONALLY AND SOCIALLY WORTH STRIVING FOR?

LISTED BELOW ARE EIGHTEEN VALUES. ANSWER THE ABOVE QUESTION FOR EACH ONE ON THE SCALE BELOW EACH VALUE BY PLACING AN "X" IN THE APPROPRIATE SPACE.

1. A WORLD AT PEACE

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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2. FAMILY SECURITY

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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3. FREEDOM

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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4. HAPPINESS

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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5. SELF-RESPECT

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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6. WISDOM

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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7. EQUALITY

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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8. NATIONAL SECURITY

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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9. A SENSE OF ACCOMPLISHMENT

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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10. A COMFORTABLE LIFE

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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11. SALVATION

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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12. TRUE FRIENDSHIP

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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13. INNER HARMONY

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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14. MATURE LOVE

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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15. A WORLD OF BEAUTY

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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16. SOCIAL RECOGNITION

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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17. PLEASURE

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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18. AN EXCITING LIFE

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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TO WHAT EXTENT DO YOU BELIEVE THAT THIS WAY OF CONDUCTING YOURSELF IS PERSONALLY AND SOCIALLY PREFERABLE IN ALL SITUATION WITH RESPECT TO ALL OBJECTS?

LISTED BELOW ARE EIGHTEEN VALUES. ANSWER THE ABOVE QUESTION FOR EACH ONE ON THE SCALE BELOW EACH VALUE BY PLACING AN "X" IN THE APPROPRIATE SPACE.

1. HONEST

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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2. AMBITIOUS

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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3. RESPONSIBLE

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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4. FORGIVING

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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5. COURAGEOUS

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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6. HELPFUL

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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7. BROADMINDED

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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8. CLEAN

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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9. CAPABLE

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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| | | | | | | |

10. SELF-CONTROLLED

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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11. LOVING

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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12. CHEERFUL

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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13. POLITE

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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14. INDEPENDENT

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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15. INTELLECTUAL

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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16. LOGICAL

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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17. OBEDIENT

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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18. IMAGINATIVE

| I believe it very much | I believe it quite a lot | I believe it slightly | I am indifferent to it | I disbelieve it slightly | I disbelieve it quite a lot | I disbelieve it very much |
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| | | | | | | |

VANCOUVER CITY COLLEGE
Langara

INSTRUCTIONS: Please read over the following statements, and for each one indicate (by circling the appropriate answer) whether it is something that is important to you ("Yes"), or something which is unimportant to you ("No"), or something to which you are indifferent ("?"). Please answer all the items.

It is important to me to:

| | | | | |
|---|---|---|---|---|
| 1. | Work on something difficult | Yes | ? | No |
| 2. | Have well-defined goals or objectives | Yes | ? | No |
| 3. | Keep my things neat and orderly | Yes | ? | No |
| 4. | Be practical and efficient | Yes | ? | No |
| 5. | Seek amusement or entertainment | Yes | ? | No |
| 6. | Continually improve my abilities | Yes | ? | No |
| 7. | Know exactly what I am trying to accomplish | Yes | ? | No |
| 8. | Look at things from a practical point of view | Yes | ? | No |
| 9. | Take direct action toward solving a problem | Yes | ? | No |
| 10. | Do new and different things | Yes | ? | No |
| 11. | Do things in an outstanding fashion | Yes | ? | No |
| 12. | Have a very definite objective to aim for | Yes | ? | No |
| 13. | Keep my goals clearly in mind | Yes | ? | No |
| 14. | Schedule my time in advance | Yes | ? | No |
| 15. | Act with firm conviction | Yes | ? | No |
| 16. | Come to decisions without delay | Yes | ? | No |
| 17. | Get full use out of what I own | Yes | ? | No |
| 18. | Direct my efforts toward clear-cut objectives | Yes | ? | No |
| 19. | Attain the highest standard in my work | Yes | ? | No |
| 20. | Have a well-organized life | Yes | ? | No |
| 21. | Be able to travel a great deal | Yes | ? | No |
| 22. | Take proper care of my things | Yes | ? | No |
| 23. | Settle a problem quickly | Yes | ? | No |
| 24. | Be systematic in the things I do | Yes | ? | No |
| 25. | Have new or unusual experiences | Yes | ? | No |
| 26. | Get full value for what I spend | Yes | ? | No |
| 27. | Have well-organized work habits | Yes | ? | No |
| 28. | Do things I never did before | Yes | ? | No |
| 29. | Do more than is generally expected of me | Yes | ? | No |
| 30. | Know exactly what I am aiming for | Yes | ? | No |
| 31. | Hold firmly to my beliefs | Yes | ? | No |
| 32. | Have a variety of experiences | Yes | ? | No |
| 33. | Finish something once started | Yes | ? | No |
| 34. | Shop carefully for the things I buy | Yes | ? | No |
| 35. | Come to a definite decision on matters | Yes | ? | No |
| 36. | Keep things in their proper place | Yes | ? | No |
| 37. | Be methodical in my work | Yes | ? | No |
| 38. | Experience an element of danger | Yes | ? | No |
| 39. | Struggle with a complex problem | Yes | ? | No |
| 40. | Have a challenging job to tackle | Yes | ? | No |

| | | | | |
|---|---|---|---|---|
| 41. | Visit new and different places | Yes | ? | No |
| 42. | Have a definite goal toward which to work | Yes | ? | No |
| 43. | Take good care of my property | Yes | ? | No |
| 44. | Stick firmly to my own opinions or beliefs | Yes | ? | No |
| 45. | Plan my work out in advance | Yes | ? | No |
| 46. | Have an objective in mind and work toward it | Yes | ? | No |
| 47. | Do things that are highly profitable | Yes | ? | No |
| 48. | Accomplish something important | Yes | ? | No |
| 49. | Try out different things | Yes | ? | No |
| 50. | Do things in an organized manner | Yes | ? | No |
| 51. | Do an outstanding job in anything I try | Yes | ? | No |
| 52. | Lead a well-ordered life | Yes | ? | No |
| 53. | Be very careful with my possessions | Yes | ? | No |
| 54. | Always come directly to the point | Yes | ? | No |
| 55. | Go to strange or unusual places | Yes | ? | No |
| 56. | Be systematic in my work | Yes | ? | No |
| 57. | Stick with a problem until it is solved | Yes | ? | No |
| 58. | Set the highest standard of accomplishment for myself | Yes | ? | No |
| 59. | Have very specific aims or objectives | Yes | ? | No |
| 60. | Do things that are new and different | Yes | ? | No |
| 61. | Keep my things in good condition | Yes | ? | No |
| 62. | Devote all my energy toward accomplishing a goal | Yes | ? | No |
| 63. | Make my position on matters very clear | Yes | ? | No |
| 64. | Take frequent trips | Yes | ? | No |
| 65. | Do things according to a schedule | Yes | ? | No |
| 66. | Make decisions quickly | Yes | ? | No |
| 67. | Be very careful with my money | Yes | ? | No |
| 68. | Be able to overcome any obstacle | Yes | ? | No |
| 69. | Do things that are dangerous or exciting | Yes | ? | No |
| 70. | Have strong and firm convictions | Yes | ? | No |
| 71. | Have well-defined purposes | Yes | ? | No |
| 72. | Always keep myself neat and clean | Yes | ? | No |
| 73. | Do things that will pay off | Yes | ? | No |
| 74. | Be a very orderly person | Yes | ? | No |
| 75. | Take a definite stand on issues | Yes | ? | No |
| 76. | Experience the unusual | Yes | ? | No |
| 77. | Always get my money's worth | Yes | ? | No |
| 78. | Work on a difficult problem | Yes | ? | No |
| 79. | Have an important job to tackle | Yes | ? | No |
| 80. | Approach a problem directly | Yes | ? | No |
| 81. | Do things in a methodical manner | Yes | ? | No |
| 82. | Know precisely where I am headed | Yes | ? | No |
| 83. | Strive to accomplish something significant | Yes | ? | No |
| 84. | Do things in a practical and efficient manner | Yes | ? | No |
| 85. | Follow a systematic approach in doing things | Yes | ? | No |
| 86. | Come to a decision and stick to it | Yes | ? | No |
| 87. | Take very good care of what I own | Yes | ? | No |
| 88. | Seek adventure | Yes | ? | No |
| 89. | Have a definite course of action in mind | Yes | ? | No |
| 90. | Be able to do things in a superior manner | Yes | ? | No |

## CONSERVATISM

WHICH OF THE FOLLOWING DO YOU FAVOR OR BELIEVE IN? CIRCLE "YES" OR "NO". IF YOU ARE ABSOLUTELY UNCERTAIN, CIRCLE THE "?". THERE ARE NO CORRECT OR INCORRECT ANSWERS; JUST GIVE YOUR FIRST REACTION. ANSWER ALL THE ITEMS.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | Death Penalty | Yes | ? | No | 26. | Computer Music | Yes | ? | No |
| 2. | Rock Music | Yes | ? | No | 27. | Chastity | Yes | ? | No |
| 3. | Private Clubs | Yes | ? | No | 28. | Fluoridation | Yes | ? | No |
| 4. | Striptease Shows | Yes | ? | No | 29. | Segregated Schools | Yes | ? | No |
| 5. | Sabbath Observance | Yes | ? | No | 30. | Women Judges | Yes | ? | No |
| 6. | Hippies | Yes | ? | No | 31. | Conventional Clothes | Yes | ? | No |
| 7. | Divine Law | Yes | ? | No | 32. | Extramarital Sex | Yes | ? | No |
| 8. | Modern Art | Yes | ? | No | 33. | Apartheid | Yes | ? | No |
| 9. | Self-Denial | Yes | ? | No | 34. | Nudist Camps | Yes | ? | No |
| 10. | Working Mothers | Yes | ? | No | 35. | Church Authority | Yes | ? | No |
| 11. | Astrology | Yes | ? | No | 36. | Disarmament | Yes | ? | No |
| 12. | Birth Control | Yes | ? | No | 37. | Censorship | Yes | ? | No |
| 13. | Military Drill | Yes | ? | No | 38. | White Lies | Yes | ? | No |
| 14. | Premarital Sex | Yes | ? | No | 39. | Physical Punishment | Yes | ? | No |
| 15. | Patriotism | Yes | ? | No | 40. | Interracial Marriage | Yes | ? | No |
| 16. | Busing | Yes | ? | No | 41. | Strict Rules | Yes | ? | No |
| 17. | Moral Training | Yes | ? | No | 42. | Jazz | Yes | ? | No |
| 18. | Cousin Marriage | Yes | ? | No | 43. | Straitjackets | Yes | ? | No |
| 19. | White Superiority | Yes | ? | No | 44. | Communal Living | Yes | ? | No |
| 20. | Suicide | Yes | ? | No | 45. | Working Hard | Yes | ? | No |
| 21. | Chaperones | Yes | ? | No | 46. | Divorce | Yes | ? | No |
| 22. | Legalized Abortion | Yes | ? | No | 47. | Inborn Conscience | Yes | ? | No |
| 23. | Suburban Living | Yes | ? | No | 48. | Social Reforms | Yes | ? | No |
| 24. | Socialism | Yes | ? | No | 49. | Bible Truth | Yes | ? | No |
| 25. | Drug Laws | Yes | ? | No | 50. | Homosexuality | Yes | ? | No |

INSTRUCTIONS: Below are listed twelve (12) pairs of statements. Indicate which of the two statements you prefer or which you are in greater agreement with by placing an "X" in the space to the left of the statement. Place only one "X" per pair of statements. If you cannot make a choice with respect to a pair of statements leave that pair blank.

1. a) _____ It is best to pick friends that are intellectually stimulating rather than ones it is comfortable to have around.
   b) _____ Most men are brave.

2. a) _____ People are getting so lazy and self-indulgent that it is bad for our country.
   b) _____ The best way to handle people is to tell them what they want to hear.

3. a) _____ All in all, it is better to be humble and honest than to be important and dishonest.
   b) _____ A man who is able and willing to work hard has a good chance of succeeding in whatever he wants to do.

4. a) _____ Most people are basically good and kind.
   b) _____ The best criterion for a wife or husband is compatibility--other characteristics are nice but not essential.

5. a) _____ A capable person motivated for his own gain is more useful to society than a well-meaning but ineffective one.
   b) _____ It is hard to get ahead without cutting corners here and there.

6. a) _____ There is no excuse for lying to someone else.
   b) _____ Too many criminals are not punished for their crimes.

7. a) _____ People would be better off if they were concerned less with how to do things and more with what to do.
   b) _____ Most people who get ahead in the world lead clean, moral lives.

8. a) _____ Never tell anyone the real reason you did something unless it is useful to do so.
   b) _____ Once a truly intelligent person makes up his mind about the answer to a problem, he rarely continues to think about it.

9. a) _____ The ideal society is one where everybody knows his place and accepts it.
   b) _____ It is safest to assume that all people have a vicious streak and it will come out when they are given a chance.

10. a) _____ It is a good working policy to keep on good terms with everyone.
    b) _____ Honesty is the best policy in all cases.

11. a) _____ It is wise to flatter important people.
    b) _____ Once a decision has been made, it is best to keep changing it as new circumstances arise.

12. a) _____ Once a way of handling problems has been worked out, it is best to stick with it.
    b) _____ One should take action only when sure that it is morally right.

CENTERS VOCATIONAL INTEREST SCALE

Below are listed ten general characteristics of jobs, careers and occupations. In terms of the vocation you prefer and think you will get, place an "X" on the scale in the appropriate place for each characteristic. Make sure there is an "X" for each of the ten characteristics.

I am interested in my job having this characteristic:

1. A job where I would be a leader:

| very much | quite a lot | slightly | do not care either way | not at all |
|---|---|---|---|---|
| | | | | |

2. A very interesting job:

| very much | quite a lot | slightly | do not care either way | not at all |
|---|---|---|---|---|
| | | | | |

3. A job in which I would be looked upon very highly by my fellow men:

| very much | quite a lot | slightly | do not care either way | not at all |
|---|---|---|---|---|
| | | | | |

4. A job in which I would be the boss:

| very much | quite a lot | slightly | do not care either way | not at all |
|---|---|---|---|---|
| | | | | |

5. A job which I would be absolutely sure of keeping:

| very much | quite a lot | slightly | do not care either way | not at all |
|---|---|---|---|---|
| | | | | |

6. A job in which I can express my feelings, ideas, talents or skills:

| very much | quite a lot | slightly | do not care either way | not at all |
|---|---|---|---|---|
| | | | | |

7. A very highly paid job:

| very much | quite a lot | slightly | do not care either way | not at all |
|---|---|---|---|---|
| | | | | |

8. A job in which I can make a name for myself or even become famous:

| very much | quite a lot | slightly | do not care either way | not at all |
|---|---|---|---|---|
| | | | | |

9. A job in which I can help other people:

| very much | quite a lot | slightly | do not care either way | not at all |
|---|---|---|---|---|
| | | | | |

10. A job in which I can work more or less on my own:

| very much | quite a lot | slightly | do not care either way | not at all |
|---|---|---|---|---|
| | | | | |

# HOLLAND'S PERSONAL SURVEY

Name: _____ Age: _____ Sex: _____ (M-F)

A. Describe yourself by checking the adjectives that describe what you are like. Check as many as you wish. Try to describe yourself as you are, not as you would like to be.

| | | | | | |
|---|---|---|---|---|---|
| _____ | 1 | Aloof | _____ | 16 | Helpful |
| _____ | 2 | Argumentative | _____ | 17 | Inflexible |
| _____ | 3 | Arrogant | _____ | 18 | Insensitive |
| _____ | 4 | Capable | _____ | 19 | Introverted |
| _____ | 5 | Commonplace | _____ | 20 | Intuitive |
| _____ | 6 | Conforming | _____ | 21 | Irritable |
| _____ | 7 | Conscientious | _____ | 22 | Kind |
| _____ | 8 | Curious | _____ | 23 | Mannerly |
| _____ | 9 | Dependent | _____ | 24 | Masculine |
| _____ | 10 | Efficient | _____ | 25 | Nonconforming |
| _____ | 11 | Enduring | _____ | 26 | Not artistic |
| _____ | 12 | Energetic | _____ | 27 | Not cultured |
| _____ | 13 | Feminine | _____ | 28 | Not idealistic |
| _____ | 14 | Friendly | _____ | 29 | Not popular |
| _____ | 15 | Generous | _____ | 30 | Original |

| | | | |
|---|---|---|---|
| 31 | Pessimistic | 39 | Stable |
| 32 | Pleasure-seeking | 40 | Striving |
| 33 | Precise | 41 | Strong |
| 34 | Rebellious | 42 | Suspicious |
| 35 | Reserved | 43 | Thorough |
| 36 | Scholarly | 44 | Unassuming |
| 37 | Slow-moving | 45 | Unconventional |
| 38 | Social | | |

B. Rate yourself on each of the following traits as you really think you are as compared with other people of your age. We want the most accurate estimate of how you see yourself. Circle the appropriate number.

| | Top 10 Per Cent | Above Average | Average | Below Average |
|---|---|---|---|---|
| Absent-mindedness | 0 | 0 | 1 | 1 |
| Artistic ability | 1 | 1 | 0 | 0 |
| Clerical ability | 1 | 1 | 0 | 0 |
| Conservatism | 1 | 1 | 0 | 0 |
| Cooperativeness | 1 | 1 | 0 | 0 |
| Expressiveness | 1 | 1 | 0 | 0 |
| Leadership | 1 | 1 | 0 | 0 |
| Liking to help others | 1 | 1 | 0 | 0 |
| Mathematical ability | 1 | 1 | 0 | 0 |
| Mechanical ability | 1 | 1 | 0 | 0 |
| Originality | 1 | 1 | 0 | 0 |
| Popularity with the opposite sex | 1 | 1 | 0 | 0 |
| Research ability | 1 | 1 | 0 | 0 |
| Scientific ability | 1 | 1 | 0 | 0 |
| Self-confidence (social) | 1 | 1 | 0 | 0 |
| Self-understanding | 0 | 0 | 1 | 1 |
| Understanding of others | 1 | 1 | 0 | 0 |
| Neatness | 1 | 1 | 0 | 0 |

C. Indicate the importance you place on the following kinds of accomplishments, aspirations, goals, etc. **by circling one.**

| | Essential | Very Important | Somewhat Important | Little Importance |
|---|---|---|---|---|
| Becoming happy and content | 1 | 1 | 0 | 0 |
| Inventing or developing a useful product or device | 1 | 1 | 0 | 0 |
| Helping others who are in difficulty | 1 | 1 | 0 | 0 |
| Becoming an authority on a special subject in my field | 1 | 1 | 0 | 0 |
| Becoming an outstanding athlete | 1 | 1 | 0 | 0 |
| Becoming a community leader | 1 | 1 | 0 | 0 |
| Becoming influential in public affairs | 1 | 1 | 0 | 0 |
| Following a formal religious code | 1 | 1 | 0 | 0 |
| Making a theoretical contribution to science | 1 | 1 | 0 | 0 |
| Making a technical contribution to science | 1 | 1 | 0 | 0 |
| Writing good fiction (poems, novels, short stories, etc.) | 1 | 1 | 0 | 0 |
| Being well read | 0 | 0 | 1 | 1 |
| Producing a lot of work | 1 | 1 | 0 | 0 |
| Contributing to human welfare | 1 | 1 | 0 | 0 |
| Producing good artistic work (painting, sculpture, decorating, etc.) | 1 | 1 | 0 | 0 |
| Becoming an accomplished musician (performer or composer) | 1 | 1 | 0 | 0 |
| Becoming an expert in finance and commerce | 1 | 1 | 0 | 0 |
| Finding a real purpose in life | 1 | 1 | 0 | 0 |

D. From the following list of 12 famous people, check the one whose life you would most like to emulate.

| | | | |
|---|---|---|---|
| ___ | 1. Jane Addams | ___ | 7. Thomas Edison |
| ___ | 2. Bernard Baruch | ___ | 8. T. S. Eliot |
| ___ | 3. Admiral Byrd | ___ | 9. Henry Ford |
| ___ | 4. Andrew Carnegie | ___ | 10. Pablo Picasso |
| ___ | 5. Madame Curie | ___ | 11. John D. Rockefeller |
| ___ | 6. Charles Darwin | ___ | 12. Albert Schweitzer |

E. Circle L for those school subjects you like and D for those you dislike.

| | | | | | |
|---|---|---|---|---|---|
| L | D | 1. Art | L | D | 5. Industrial Arts |
| L | D | 2. Business | L | D | 6. Modern History |
| L | D | 3. Chemistry | L | D | 7. Physics |
| L | D | 4. General Science | L | D | 8. Social Studies |

F. I most enjoy the following (circle one):

| | |
|---|---|
| Reading and thinking about solutions to problems | 1 |
| Keeping records and doing computations | 2 |
| Holding a position of power | 3 |
| Teaching or helping others | 4 |
| Working with my hands, using tools, equipment, apparatus | 5 |
| Using my artistic talents | 6 |

G. My greatest ability lies in the following area (circle one only)

| | |
|---|---|
| Business | 1 |
| Arts | 2 |
| Science | 3 |
| Leadership | 4 |
| Human relations | 5 |
| Mechanics | 6 |

H. I am most incompetent in the following area (circle one only)

| | |
|---|---|
| Mechanics | 1 |
| Science | 2 |
| Human relations | 3 |
| Business | 4 |
| Leadership | 5 |
| Arts | 6 |

I. Which one of the following activities, if you must perform it, would you find most frustrating or would make you feel the most uncomfortable? (Circle one only):

| | |
|---|---|
| Having a position of little responsibility | 1 |
| Preparing a textbook on some abstract topic | 2 |
| Taking patients in mental hospitals on recreational trips | 3 |
| Teaching others | 4 |
| Keeping elaborate and accurate records | 5 |
| Leading or persuading others about a course of action | 6 |
| Writing a poem | 7 |
| Doing something requiring patience and precision | 8 |
| Participating in very formal social affairs | 9 |

## VOCATIONAL GOALS

J. Complete the following statements as explicitly as you can:

1. My present career choice is (if possible name an occupation): _____

   _____

2. If I could not have my first choice (above) I would select the following occupation: _____

   _____

3. If I could not have my first two choices, my third choice would be: _____

   _____

4. I have been elected to one or more social, political, or academic offices. (Circle one): 0 1 2 3 4 5 6 7 8 9 or more.

5. I have received one or more awards or honors for my academic achievement. (Circle one): 0 1 2 3 4 5 6 7 8 9 or more.

6. I have received one or more awards, honors, or special recognition for my business accomplishment. (Circle one): 0 1 2 3 4 5 6 7 8 9 or more.

7. I have received one or more awards, honors, or special recognition for civic, religious, or welfare services. (Circle one): 0 1 2 3 4 5 6 7 8 9 or more.

8. I have received one or more awards, letters, honors, prizes, or special recognition for my athletic ability. (Circle one): 0 1 2 3 4 5 6 7 8 9 or more.

9. I have received one or more awards, honors, or special recognition for my artistic, musical, or literary accomplishment. (Circle one): 0 1 2 3 4 5 6 7 8 9 or more.

10. List below all the vocations you have ever considered in thinking about your future. List the vocations you have daydreamed about as well as those you have talked to others about. Try to give a history of your tentative choices and daydreams. Put your present choice on line 1 and work backward to the first vocation you ever considered.

| | Vocation | At About What age? | |
|---|---|---|---|
| 1. | _____ | _____ | ____ |
| 2. | _____ | _____ | ____ |
| 3. | _____ | _____ | ____ |
| 4. | _____ | _____ | ____ |
| 5. | _____ | _____ | ____ |
| 6. | _____ | _____ | ____ |
| 7. | _____ | _____ | ____ |
| 8. | _____ | _____ | ____ |