

Division of Research
Graduate School of Business Administration
The University of Michigan

September 1983

THE OCCUPATIONAL INTERESTS OF
RESEARCH AND DEVELOPMENT MANAGERS

Working Paper No. 338

Pamela F. Roselle
and
Raymond E. Hill
Graduate School of Business Administration
The University of Michigan

FOR DISCUSSION PURPOSES ONLY

None of this material is to be quoted or
reproduced without the express permission
of the Division of Research

INTRODUCTION AND RESEARCH OBJECTIVE

The purpose of this research is to study the occupational interest patterns of research and development managers at a large, technology based organization, and to compare their general constellation of occupational motives to the male population-at-large. The primary objective of this study is to attempt to develop an occupational interest profile that is unique to this group and significantly different from the general population.

The development of such an interest profile would be helpful in counseling and managing scientist/engineers considering a career transition into administrative, managerial roles. It may also be an invaluable aid in the selection and development of R&D managers. With the shifting emphasis in the United States from heavy industry to high technology, the identification of individuals with dual technical-managerial interests and abilities will be critical to future organizational effectiveness.

FRAMEWORK FOR OCCUPATIONAL INTEREST RESEARCH

The framework from which this research study builds is John Holland's theory of vocational behavior. This theory, as presented in Making Vocational Choices: A Theory of Careers, consists of four working assumptions. These assumptions are:

1. In our culture, most persons can be categorized as one of six types: realistic, investigative, artistic, social, enterprising, or conventional. (For

definitions see Exhibit 1). Each type is the product of a characteristic interaction, between a variety of cultural and personal forces including peers, parents, social class, culture, and the physical environment. Out of this experience, a person learns first to prefer some activities as opposed to others. Later, these activities become strong interests. Such interests lead to a special group of competencies. Finally, a person's interests and competencies create a particular personal disposition that leads him to think, perceive, and act in special ways.

2. There are six kinds of environments: realistic, investigative, artistic, social, enterprising, and conventional. Each environment is dominated by a given type of personality, and each environment is typified by physical settings posing special problems and stresses. Because different types have different interests, competencies, and dispositions, they tend to surround themselves with special people and materials and to seek out problems that are congruent with their interests, competencies, and outlook on the world. Thus, where people congregate, they create an environment that reflects the types they are, and it becomes possible to assess the environment in the same terms we assess people individually.

3. People search for environments that will let them exercise their skills, express their attitudes and values, and take on agreeable problems and roles.

4. A person's behavior is determined by an interaction between his personality and the characteristics of his environment.¹

In order to make these six occupational themes more meaningful, Holland expanded his classification to incorporate combinations of these six types. An individual's resemblance, similar or dissimilar, to all six of the themes can be considered the person's "personality profile". By allowing the ordering and combination of the occupational themes, the system can describe 720 unique personality

¹John Holland, Making Vocational Choices, pps. 2-5.

EXHIBIT 1. HOLLAND'S GENERAL OCCUPATIONAL
THEME DEFINITIONS

REALISTIC: RUGGED, ROBUST, PRACTICAL, PREFER TO DEAL WITH
THINGS RATHER THAN PEOPLE.

INVESTIGATIVE: SCIENTIFIC, TASK ORIENTED, PREFER ABSTRACT
PROBLEMS, PREFER TO THINK THROUGH PROBLEMS RATHER THAN
ACT ON THEM, NOT HIGHLY PERSON ORIENTED, ENJOY
AMBIGUITY.

ARTISTIC: ENJOY CREATIVE SELF EXPRESSION, DISLIKE HIGHLY
STRUCTURED SITUATIONS, SENSITIVE, EMOTIONAL,
INDEPENDENT, ORIGINAL.

SOCIAL: CONCERNED WITH WELFARE OF OTHERS, ENJOY DEVELOPING,
TEACHING OTHERS, GOOD IN GROUP SETTINGS, EXTROVERTED,
CHEERFUL, POPULAR.

ENTERPRISING: GOOD FACILITY WITH WORDS, ESPECIALLY SELLING
AND LEADING, ENERGETIC, EXTROVERTED, ADVENTUROUS,
ENJOY PERSUASION.

CONVENTIONAL: PREFER ORDERED, NUMERICAL, VERBAL WORK, ENJOY
LARGE ORGANIZATIONS, RESPOND TO AUTHORITY, DISLIKE
AMBIGUOUS SITUATIONS, STABLE, DEPENDABLE.

patterns.²

Holland also contends that the occupational themes have a hexagonal relationship to one another as illustrated in Exhibit 2. This hexagonal relationship between types, or psychological relatedness, is assumed to be inversely proportional to the distances among the types as shown in Exhibit 2. The closer the types, the greater the similarity or psychological resemblance and the further apart, the greater dissimilarity.³

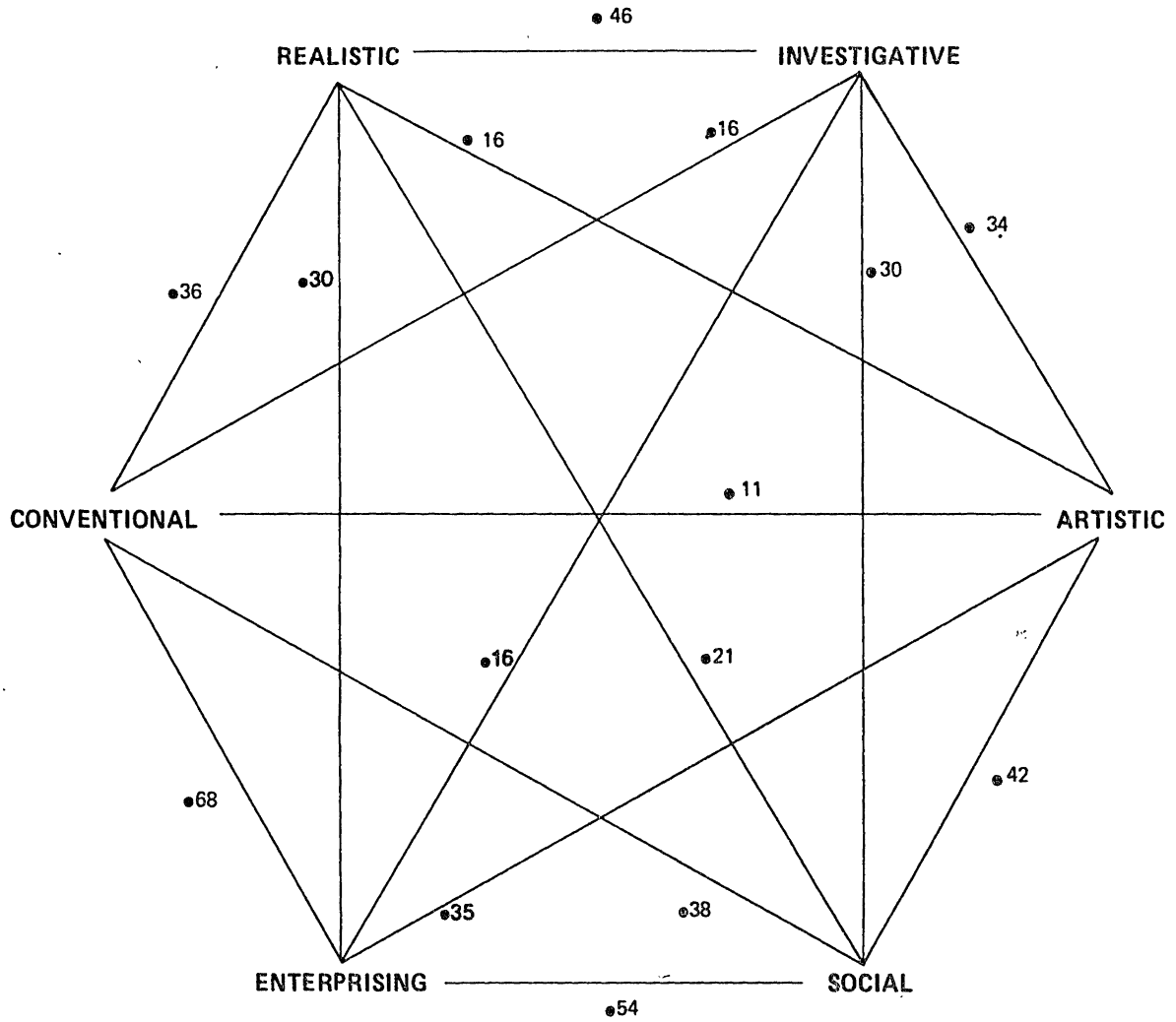
For example, realistic and investigative themes are adjacent and, therefore, somewhat reinforcing. Both of these types prefer to work with things and ideas rather than people. On the other hand, conventional and artistic types have dissimilar or opposing interests (i.e., conventional types like order and structure, whereas artistic types prefer free, open environments.)

In applying the theory to environments, a purely realistic personality type would not be satisfied working in a social environment. These two themes are opposing one another on the hexagonal model and as a result we would not expect congruence. This is not to say that a social type would perform a particular assignment better in a social environment than a realistic type but that they would use considerably different approaches and methodologies in completing the assignment.

²John Holland, Making Vocational Choices, p. 3.

³Ibid., p. 23.

EXHIBIT 2.
HOLLAND'S HEXAGONAL MODEL FOR
DEFINING THE PSYCHOLOGICAL RESEMBLANCE AMONG
TYPES AND ENVIRONMENTS



- NEIGHBORS RE-INFORCE
- DIAGONALS OPPOSE

Source: Holland, J.L., Whitney, D.R., Cole, N.S., and Richards, J.M., Jr.
 An empirical occupational classification derived from a theory of personality and intended for practice and research. ACT Research Report No. 29, Iowa City: The American College Testing Program, 1969. (Based on SDS instrument).

In summary, adjacent themes reinforce and opposing themes conflict. The degree to which the themes reinforce or oppose can be measured by their distance from one another in the hexagonal model. This interpretation applies to both personality types and environments. Usually an individual is not profiled as one pure type (i.e., realistic or social) rather best described as a blend of the most dominant two, three or four themes, usually as a continuum of adjacent types.

The entire hexagon can be perceived as a continuous model as illustrated in Exhibit 3 with occupational examples illustrating Holland's types or combination types. Depending on how they scored on the six general occupational themes, they could be described as realistic, realistic-investigative, etc. For any given theme, as measured by the Strong-Campbell Interest Inventory, for a random sample of people, in general the mean and standard deviation are 50 and 10 respectively.

This hexagonal model is not meant to limit one's view of the occupational world, but rather to provide organization or structure to enhance communication about it. Exhibit 4 illustrates a division of the hexagon which is particularly relevant to R&D management. That is the R&D manager must manage the inherent conflict between the abstract world of ideas and symbols and the here and now world of people and management. Therefore, it is probably adaptive for the R&D manager to exhibit personality patterns

EXHIBIT 3
RIASEC
Occupational Environments

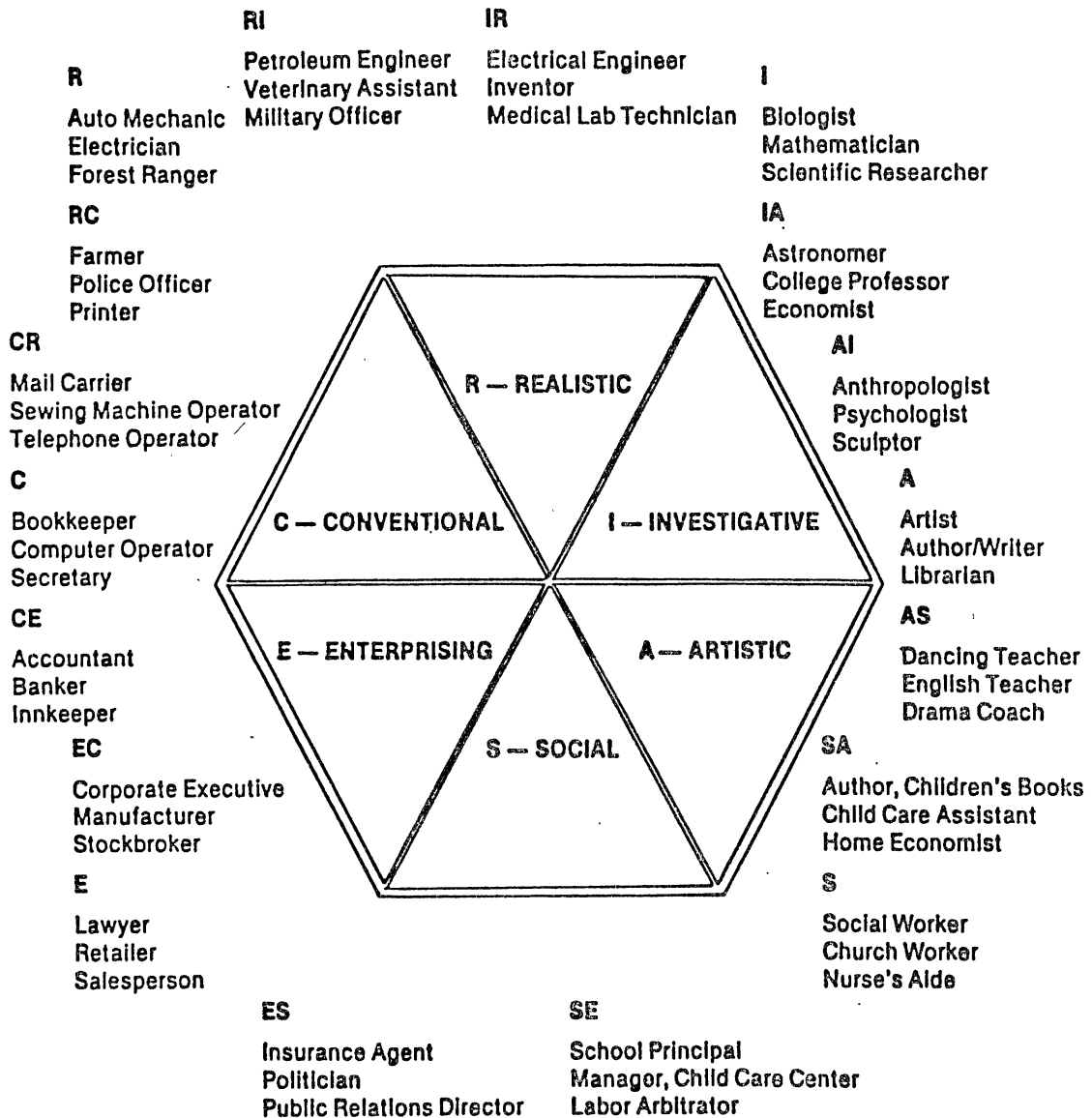
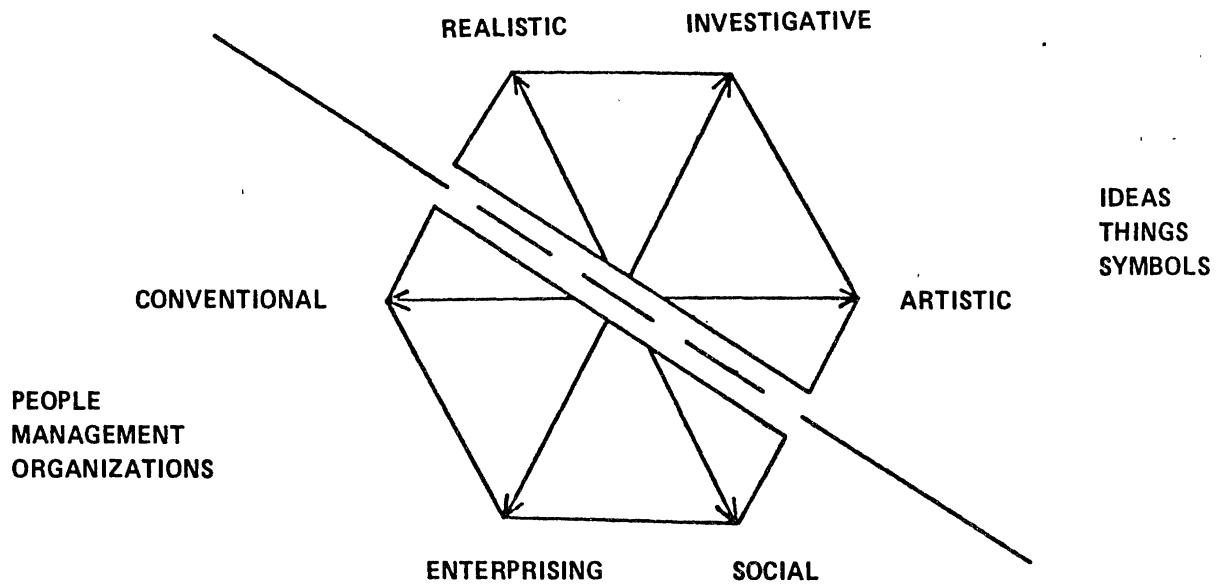


EXHIBIT 4. HOLLAND'S HEXAGONAL MODEL OF OCCUPATIONAL INTERESTS AND DOMAINS



which span the division shown in Exhibit 4. They are congruent with their work and environment by bending the occupational themes across the division (i.e. IRC, IRE, IC, IE, etc.). The R&D manager is one of the few occupations that must incorporate some degree of inconsistency or polarity into their personality profile due to the nature of their tasks and desire for job satisfaction. The majority of occupational profiles consist of reinforcing or adjacent themes. Intuitively, however, this does not represent the situation for the R&D manager.

HYPOTHESIS

A general organizing hypothesis in this research project is that R&D managers will exhibit a general personality profile which is simultaneously investigative-enterprising or investigative-conventional. In other words, due to the very nature of the R&D manager's job description it is expected that he/she will have a congruent occurrence of opposing domains. It is important to occupational success that the R&D manager have one foot in the investigative world of ideas and symbols and one in the administrative world of people and management. The investigative-conventional combination would be less inconsistent than the investigative-enterprising type because of the closer relationship on the hexagonal model of Holland. Therefore, a manager exhibiting the IC profile would be under less strain than the IE polarity would

suggest. An IC manager would most likely be attentive to details (i.e. budgets, deadlines, organized research results, etc.) whereas the IE manager would be more persuasive and marketing-oriented. The predominant R&D manager profile may be somewhat different (perhaps not significantly) between organizations given different corporate cultures (i.e., IC versus IE).

THE SAMPLE AND METHODOLOGY

The sample was drawn from the research and development division of a large technology based organization. Approximately, 100 packets were sent to R&D managers through the Vice President's office. Each packet contained a Strong-Campbell Interest Inventory (SCII) and a Work Description Questionnaire (WDQ). (See Appendix A for sample WDQ.) The respondents were asked, via the WDQ, to indicate whether their work was managerially based, and if managerially based, at what level of management they would classify themselves (on a seven step hierarchy). In addition, the respondents were queried about their degree of job satisfaction, level of education, length of tenure, age, and numerous other background questions. Seventy-five persons responded; however, only sixty-eight of those were included in the analysis. Those that were included met the following criteria: 1) 25-60 years of age; 2) minimum of 2 years R&D managerial experience; 3) educational background in physical or life sciences; 4) responded "like" or "very

satisfied" with their job. Those excluded from this analysis were either essentially technical not managerial or had a social science educational background. It should also be noted that all respondents were male.

Tables 1 and 2 provide descriptive statistics of age, education, tenure and hierarchical level within the organization's management structure. Descriptively, the population on average was forty-nine years of age with ten years of management experience with this organization, had post-graduate work in Electrical Engineering or Physics and was in middle or upper management.

RESULTS AND DISCUSSION

This research endeavor has been able to differentiate an unique personality profile of the R&D manager that is significantly different ($p < .001$) than the population of males in general as shown in Table 3. The results demonstrate that while the profiles for the two groups were similar on the artistic and conventional themes, the R&D managers scored significantly higher ($p < .001$) on the scientifically oriented themes of realistic and investigative. They also scored significantly lower ($p < .001$, $p < .003$) on the management oriented themes of social and enterprising, respectively. In general, the R&D managers within the sample have clearly maintained their psychological investment in science and engineering. These two relationships are also shown graphically in Figure 1.

TABLE 1. DESCRIPTIVE STATISTICS: AGE AND EDUCATION

	<u>AGE (YEARS)</u>	
	<u>SAMPLE</u>	<u>GENERAL POPULATION</u>
MEAN	48.7	33.4
STD. DEV.	6.2	N/A
N	68	300

	<u>EDUCATION (YEARS)</u>	
	<u>SAMPLE</u>	<u>GENERAL POPULATION</u>
MEAN	18.3	14.0
STD. DEV.	2.0	N/A
N	68	300

SAMPLE EDUCATIONAL LEVEL

PHD.	21%
MS	44%
BS/BA	35%

SAMPLE EDUCATIONAL AREA

ELECTRICAL ENGINEERING	55%
PHYSICS.	18%
MECHANICAL ENGINEERING	11%
MISC(MATH, PHYSICAL & LIFE SCIENCE, OTHER ENGINEERING) . .	16%

TABLE 2. DESCRIPTIVE STATISTICS:
TENURE AND HIERARCHICAL LEVEL

ORGANIZATIONAL TENURE

MEAN.	48.7
STD. DEV.	6.2
N	68

HIERARCHICAL LEVEL*

<u>LEVEL</u>	<u>FREQUENCY</u>
EXECUTIVE VP	1
UPPER MGMT	28
MIDDLE MGMT.	34
LOWER MGMT	4

*BASED ON SELF-RATING ON THE FOLLOWING CHART:

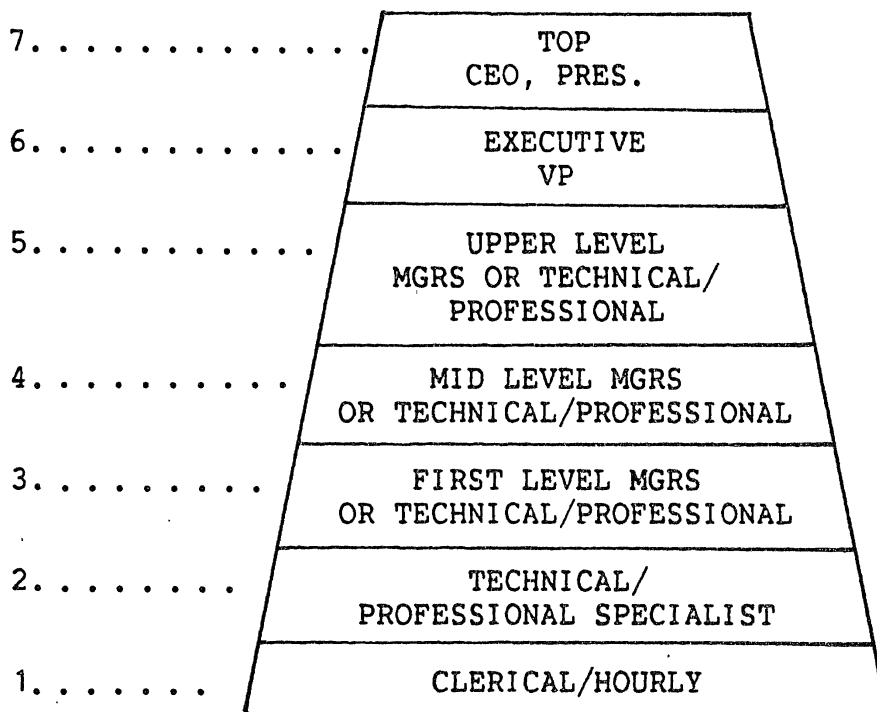


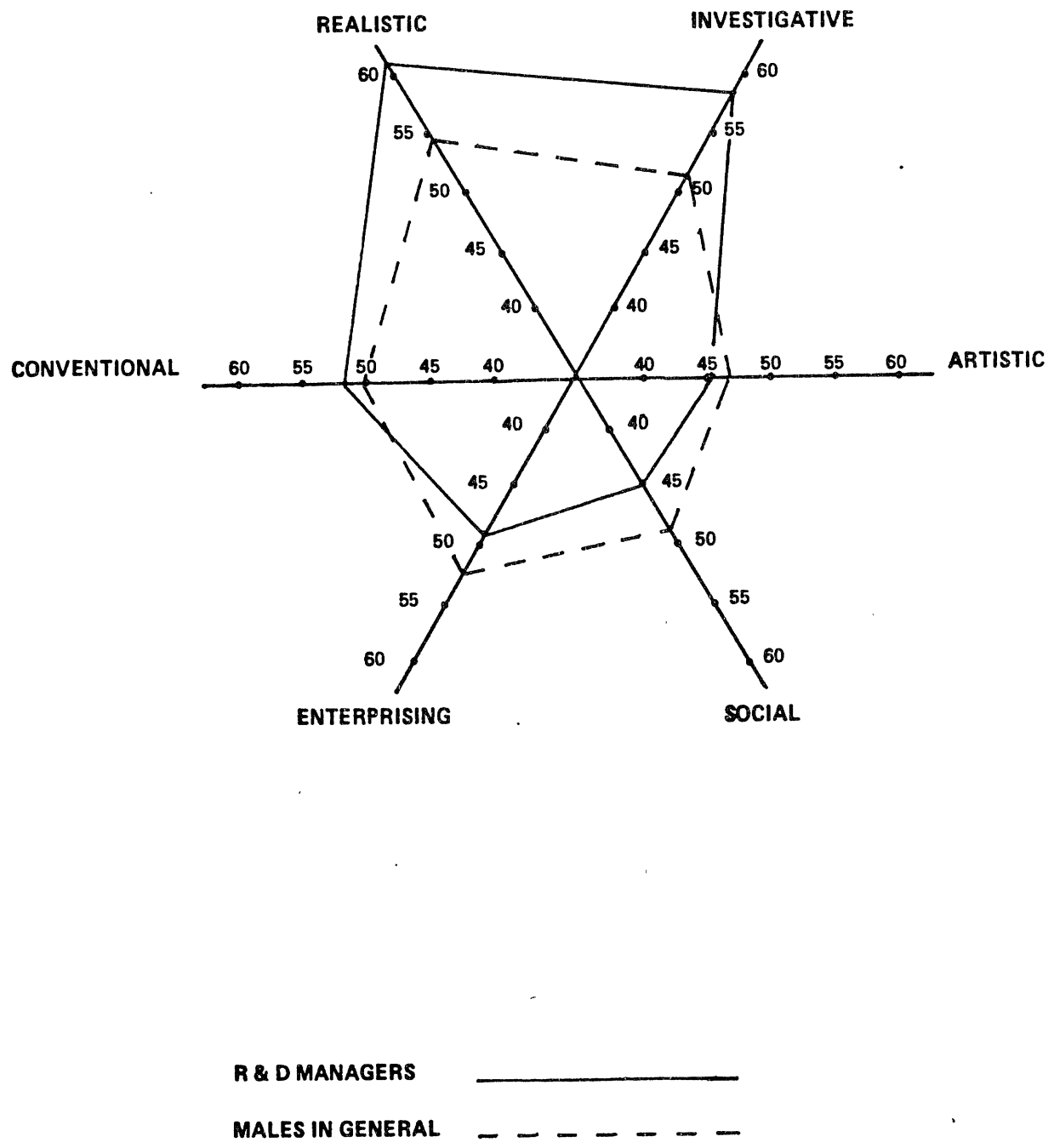
TABLE 3. MEANS AND STANDARD DEVIATIONS ON GENERAL OCCUPATIONAL THEMES FOR R&D MANAGERS AND GENERAL POPULATION

		R&D MANAGERS (N=68)	GENERAL POPULATION* (N=300)	PAIRWISE T	SIGNIFI
REALISTIC	\bar{X}	61.2	54.5	6.6	.001
	S	8.4	10.1		
INVESTIGATIVE	\bar{X}	58.7	51.5	9.7	.001
	S	6.1	9.9		
ARTISTIC	\bar{X}	45.6	46.8	-0.9	.348
	S	10.7	11.0		
SOCIAL	\bar{X}	45.0	48.7	-3.8	.001
	S	8.0	10.9		
ENTERPRISING	\bar{X}	49.0	51.9	-3.1	.003
	S	7.7	11.1		
CONVENTIONAL	\bar{X}	51.5	49.9	1.5	.144
	S	8.8	9.8		

HOTELLING T^2 STATISTIC ON PROFILES = 220.57,
F = 34.02, p < .001

*Analysis assumes N and S = sample (See Midas Statistical Manual, University of Michigan)

FIG. 1 GENERAL OCCUPATIONAL THEME MEANS FOR R&D MANAGER SAMPLE VERSUS GENERAL POPULATION.



The sample was then divided into two groups based on self-reported management level. The hierarchy was stratified into lower-middle managers and upper-top executive levels because of the clustering of the sample at the middle/upper levels. Tables 4 & 5 illustrate the differences in personality profiles between each group and the general population. The lower-middle management group's profile is statistically very similar to the total R&D sample. The upper-top executive management group's profile, however, is considerably different. This group, in addition to scoring significantly higher on the realistic-investigative themes and significantly lower on the social theme, scored significantly lower ($p < 0.1$) on the artistic theme, significantly higher ($p < .01$) on the conventional theme, and was similar to the general population on the enterprising theme.

Table 6 and Figure 2 illustrate the hierarchical stratification differences numerically and graphically. The primary difference between these two groups involves the conventional-artistic polarity. The lower-middle management group scored higher on the artistic theme and significantly lower ($p < .05$) on the conventional theme as compared to the upper level managers. This suggests that perhaps the profile patterns of the two groups are adaptive to the demands of their respective work roles. The lower-middle management group is more directly involved with direct R&D work, and must perhaps allow less structure and more freedom

TABLE 4. MEANS AND STANDARD DEVIATIONS ON GENERAL OCCUPATIONAL THEMES FOR LOWER-MIDDLE MANAGERS VERSUS GENERAL POPULATION

		LOWER- MIDDLE MANAGERS (N=38)	GENERAL POPULATION* (N=300)	PAIRWISE T	SIGNIFI
REALISTIC	\bar{X}	60.9	54.5	5.24	.001
	S	7.5	10.1		
INVESTIGATIVE	\bar{X}	58.3	51.5	6.90	.001
	S	6.1	9.9		
ARTISTIC	\bar{X}	47.6	46.8	0.46	.647
	S	10.4	11.0		
SOCIAL	\bar{X}	44.8	48.7	-3.13	.003
	S	7.6	10.9		
ENTERPRISING	\bar{X}	48.4	51.9	-2.87	.007
	S	7.5	11.1		
CONVENTIONAL	\bar{X}	49.7	49.9	-0.13	.899
	S	9.1	9.8		

HOTELLING T^2 STATISTIC ON PROFILES = 130.86,
 $F = 18.86, p < .001$

*Analysis assumes N and S = sample (See Midas Statistical Manual, University of Michigan)

TABLE 5. MEANS AND STANDARD DEVIATIONS ON GENERAL OCCUPATIONAL THEMES FOR UPPER-EXECUTIVE MANAGERS VERSUS GENERAL POPULATION

		UPPER- EXECUTIVE MANAGERS (N=29)	GENERAL POPULATION* (N=300)	PAIRWISE T	SIGNIFI
REALISTIC	\bar{X}	61.3	54.5	3.84	.001
	S	9.6	10.1		
INVESTIGATIVE	\bar{X}	59.3	51.5	6.59	.001
	S	6.4	9.9		
ARTISTIC	\bar{X}	43.4	46.8	-1.72	.097
	S	10.7	11.0		
SOCIAL	\bar{X}	45.1	48.7	-2.23	.034
	S	8.8	10.9		
ENTERPRISING	\bar{X}	49.9	51.9	-1.33	.193
	S	8.1	11.1		
CONVENTIONAL	\bar{X}	53.9	49.9	2.62	.014
	S	8.1	9.8		

HOTELLING T^2 STATISTIC ON PROFILES = 94.42,
 $F = 12.93, p < .001$

*Analysis assumes N and S = sample (See Midas Statistical Manual, University of Michigan)

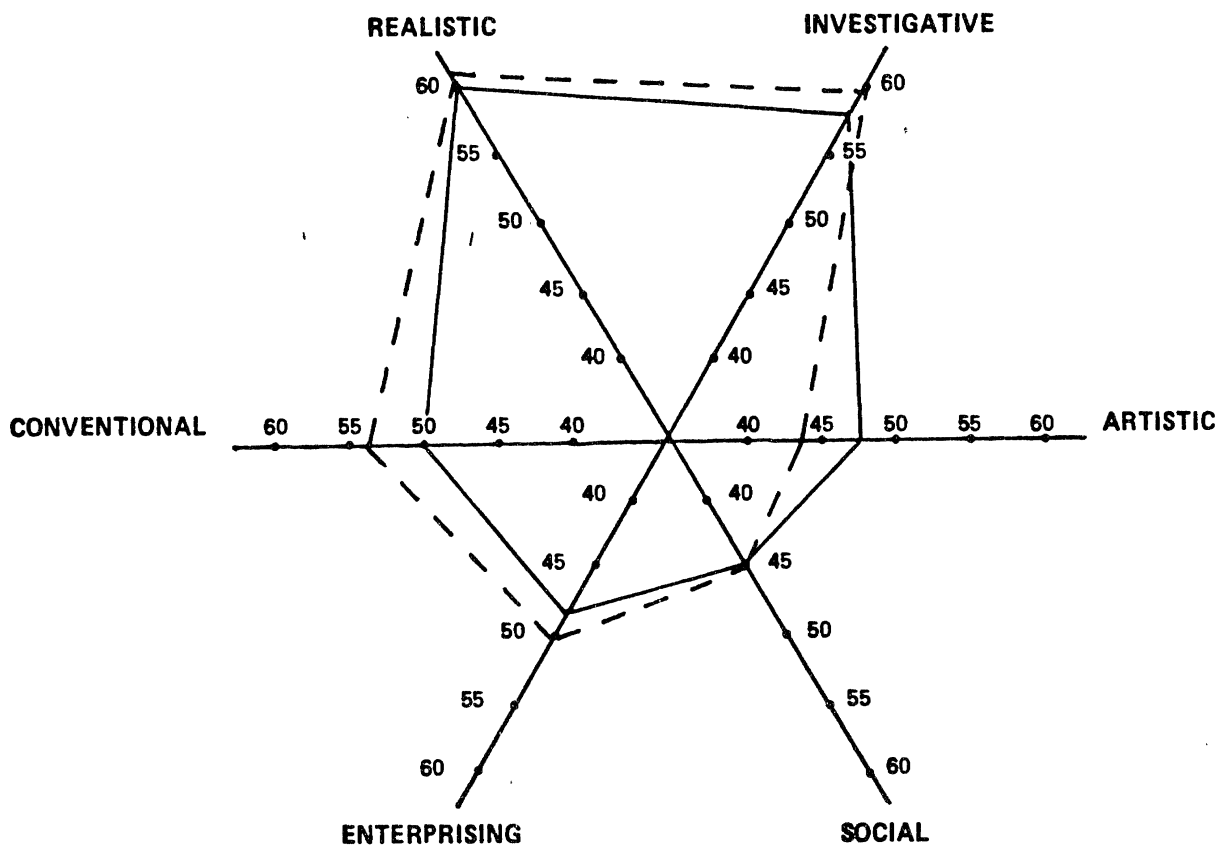
TABLE 6. MEANS AND STANDARD DEVIATIONS ON GENERAL OCCUPATIONAL THEMES FOR LOWER-MIDDLE MANAGERS VERSUS UPPER-EXECUTIVE MANAGERS

		LOWER- MIDDLE MANAGERS (N=38)	UPPER- EXECUTIVE MANAGERS (N=29)	PAIRWISE T	SIGNIFI
REALISTIC	\bar{X}	60.1	61.3	-0.19	.843
	S	7.5	9.53		
INVESTIGATIVE	\bar{X}	58.3	59.3	-0.69	.494
	S	6.1	6.4		
ARTISTIC	\bar{X}	47.6	43.4	1.62	.111
	S	10.4	10.7		
SOCIAL	\bar{X}	44.8	45.1	-0.11	.910
	S	7.6	8.8		
ENTERPRISING	\bar{X}	48.4	49.9	-0.77	.443
	S	7.5	8.1		
CONVENTIONAL	\bar{X}	49.7	53.7	-1.93	.058
	S	9.1	8.2		

HOTELLING T^2 STATISTIC ON PROFILES = 8.35,
 $F = 1.28, p < .28$

HOTELLING T^2 STATISTIC FOR ARTISTIC-CONVENTIONAL = 5.89,
 $F = 2.90, p < .06$

FIG. 2 GENERAL OCCUPATIONAL THEMES MEANS BY MANAGEMENT LEVEL.



LOWER & MIDDLE MANAGERS _____

UPPER & EXECUTIVE MANAGERS - - - - -

in their management style. Their subordinates and the processes they supervise need freedom (the I and A themes) to encourage scientific/engineering discovery. On the other hand, the upper management group must take a more global view of the research activity and concentrate on cost effectiveness (i.e., budgets, deadlines, accountability, etc.). Upper management is still highly investigative and, therefore, has a high tolerance for ambiguity, but it is directed toward solving scientific puzzles (the world of ideas and symbols). At the same time, they are more conventional which is generally associated with a dislike of ambiguity. Most likely this dislike is directed toward the world of social and organizational affairs. Even though upper management is more conventional and less artistic it does not mean that they have lost their creativity. Bringing order out of chaos is in itself a creative managerial task. Similarly, because the lower-middle managers are less conventional and more artistic does not mean they are not as effective managerially. Allowing their subordinates freedom may be the most effective approach in R&D management at the direct supervisory level.

The next stage of analysis involves comparison of R&D managers and the general population with regard to the Basic Interest Scales. These scales are easily interpreted since their item content is straightforward (i.e., items of the Mechanical Activities scale are concerned exclusively with mechanical activities). High scores on the scales are

achieved by responding "like" to the items on the scale whereas low scores correspond to "dislike" responses.⁴ Table 7 shows the means on the basic interest scales for the R&D manager sample and the general population and pairwise t ratios. The largest differences occur around mechanical activities, science, math, social service, sales, and office practices. The most significant differences occur within the investigative area. This finding is to be expected given the scientific nature of R&D work.

Tables 8 and 9 show analagous results for hierarchical level. Once again, the division occurred between middle and upper management because of the clustering at these two levels within the sample. The most significant differences between these two groups, as compared to the general population, are that upper level managers no longer scored lower on the enterprising (with the exception of sales) and conventional scales and scored higher ($p < .005$) on business management. This seems to support the earlier conclusion that as a manager is promoted to higher levels within the organization one can expect to see significantly higher levels of interest in the world of people and management. What we cannot determine is whether upper management develops this profile as a result of occupational experience or whether it is a stable precursor pattern which led to accession into upper management. Cross sectional analysis

⁴David Campbell and Jo-Ida Hansen, Manual for the SVIB-SCII, pps. 43-4.

TABLE 7. MEANS ON BASIC INTEREST SCALES FOR
R&D MANAGERS VERSUS GENERAL POPULATION

	R&D MANAGERS (N=68)	GENERAL POPULATION* (N=300)	PAIRWISE T	SIGNIFI**
R-AGRICULTURE	51.8	51.4	-0.40	
R-NATURE	47.9	48.4	-0.41	
R-ADVENTURE	56.0	53.9	2.01	.05
R-MILITARY	55.4	54.5	0.69	
R-MECHANICAL	61.8	52.7	9.21	.001
I-SCIENCE	59.9	51.6	10.70	.001
I-MATH	61.1	51.7	12.23	.001
I-MEDICAL SCIENCE	52.5	50.1	2.52	.01
I-MEDICAL SERVICE	45.3	47.4	-2.80	.01
A-MUSIC/DRAMA	44.4	46.0	-1.22	
A-ART	43.3	45.4	-1.66	
A-WRITING	46.6	47.5	-0.68	
S-TEACHING	47.5	48.1	-0.60	
S-SOCIAL SERVICE	40.6	47.5	-7.15	.001
S-ATHLETIC	52.8	52.9	-0.10	
S-DOMESTIC	40.2	42.7	-2.25	.05
S-RELIGIOUS	46.2	48.5	-1.83	
E-PUBLIC SPEAKING	48.8	52.0	-3.01	.01
E-LAW/POLITICS	50.4	52.5	-1.98	.05
E-MERCHANDISING	46.9	50.3	-3.27	.01
E-SALES	48.2	52.7	-4.27	.001
E-BUSINESS MANAGEMNT	53.2	52.0	1.19	
C-OFFICE	44.5	47.1	-3.52	.001

HOTELLING T^2 STATISTIC ON PROFILES = 491.13,
F = 14.34, p < .001

*Analysis assumes N and S = sample (See Midas Statistical Manual, University of Michigan)

**SIGNIFICANCE LEVELS ARE GIVEN ONLY IF P < .05

TABLE 8. MEANS ON BASIC INTEREST SCALES FOR
LOWER-MIDDLE MANAGERS VERSUS
GENERAL POPULATION

	LOWER- MIDDLE MANAGERS (N=38)	GENERAL POPULATION* (N=300)	PAIRWISE T	SIGNIFI**
R-AGRICULTURE	52.0	51.4	0.40	
R-NATURE	47.0	48.4	-0.81	
R-ADVENTURE	55.4	53.9	1.04	
R-MILITARY	52.8	54.5	-1.22	
R-MECHANICAL	62.1	52.7	7.77	.001
I-SCIENCE	59.7	51.6	7.61	.001
I-MATH	59.5	51.7	6.88	
I-MEDICAL SCIENCE	52.5	50.1	1.92	
I-MEDICAL SERVICE	45.7	47.4	-2.10	.05
A-MUSIC/DRAMA	46.5	46.0	0.28	
A-ART	44.7	45.4	-0.47	
A-WRITING	47.5	47.5	-0.02	
S-TEACHING	47.2	48.1	-0.72	
S-SOCIAL SERVICE	40.2	47.5	-5.91	.001
S-ATHLETIC	50.4	52.9	-0.33	
S-DOMESTIC	41.5	42.7	-0.77	
S-RELIGIOUS	48.3	48.5	-0.12	
E-PUBLIC SPEAKING	48.8	52.0	-2.29	.001
E-LAW/POLITICS	49.8	52.5	-1.88	
E-MERCHANDISING	45.7	50.3	-3.24	.01
E-SALES	47.8	52.7	-3.26	.01
E-BUSINESS MANAGEMNT	50.7	52.0	-1.00	
C-OFFICE	43.9	47.1	-3.01	.01

HOTELLING T^2 STATISTIC ON PROFILES = 282.68,
F = 4.98, p < .001

*Analysis assumes N and S = sample (See Midas Statistical Manual, University of Michigan)

**SIGNIFICANCE LEVELS ARE GIVEN ONLY IF P < .05

TABLE 9. MEANS ON BASIC INTEREST SCALES FOR
UPPER-EXECUTIVE MANAGERS VERSUS
GENERAL POPULATION

	UPPER- EXECUTIVE MANAGERS (N=29)	GENERAL POPULATION* (N=300)	PAIRWISE T	SIGNIFI**
R-AGRICULTURE	51.3	51.4	-0.08	
R-NATURE	49.1	48.4	0.39	
R-ADVENTURE	56.6	53.9	1.83	
R-MILITARY	58.4	54.5	1.85	
R-MECHANICAL	61.3	52.7	5.03	.001
I-SCIENCE	60.4	51.6	7.38	.001
I-MATH	63.0	51.7	12.65	.001
I-MEDICAL SCIENCE	52.5	50.1	1.50	
I-MEDICAL SERVICE	44.7	47.4	-2.04	.05
A-MUSIC/DRAMA	41.8	46.0	-1.94	
A-ART	41.8	45.4	-1.74	
A-WRITING	46.1	47.5	-0.72	
S-TEACHING	47.8	48.1	-0.21	
S-SOCIAL SERVICE	41.0	47.5	-4.05	.001
S-ATHLETIC	52.8	52.9	-0.06	
S-DOMESTIC	38.2	42.7	-2.93	.01
S-RELIGIOUS	43.9	48.5	-2.62	.01
E-PUBLIC SPEAKING	49.0	52.0	-1.77	
E-LAW/POLITICS	51.2	52.5	-0.78	
E-MERCHANDISING	48.6	50.3	-1.12	
E-SALES	48.7	52.7	-2.62	.01
E-BUSINESS MANAGEMNT	56.3	52.0	3.07	.005
C-OFFICE	45.3	47.1	-1.77	

HOTELLING T^2 STATISTIC ON PROFILES = 980.25,
F = 9.13, p < .006

*Analysis assumes N and S = sample (See Midas Statistical Manual, University of Michigan)

**SIGNIFICANCE LEVELS ARE GIVEN ONLY IF P < .05

cannot answer this question definitively as it was not the intention of this research to be highly inferential or prescriptive. This research endeavor is descriptive in nature but the "trend evidence" presented looks promising.

In conclusion, this paper provides exploratory data that indicates the study of occupational interest patterns for R&D managers can be fruitful in identifying unique profiles that are significantly different from the population in general. As more research is conducted on the R&D manager occupation information will be obtained that can be invaluable for career counseling and managerial staffing decisions.

REFERENCES

- Campbell, David P.; Hansen, Jo-Ida C. Manual For The SVIB-SCII. California: Stanford University Press, 1981.
- Cambell, David P.; Holland, John L. "A Merger in Vocational Interest Research: Applying Holland's Theory To Strong's Data." Journal of Vocational Behavior Vol2(1972): 353-376
- Holland, John L. Making Vocational Choices: A Theory of Careers. New Jersey: Prentice-Hall, Inc., 1973.
- Rosen, Ned; Billings, Robert. "The Emergence and Allocation of Leadership Resources Over Time in a Technical Organization." Academy of Management Journal Vol19(1976): 165-183