

EXPLORATIONS OF A THEORY OF VOCATIONAL CHOICE AND ACHIEVEMENT: II. A FOUR-YEAR PREDICTION STUDY¹

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Summary.—A theory of vocational choice and personality types was examined by testing some of its general hypotheses in a four-year longitudinal study. Personal constructs in the theory were defined by selected scales of the Strong Vocational Interest Blank and environmental constructs by the Environmental Assessment Technique. Generally, students who resembled the theoretical models possessed the hypothetical traits attributed to each model. The prediction of vocational choice and its stability was studied by analyses of model student types in different college environments. Congruence between the student type and the college type was conducive to student stability in vocational choice and major field. Student stability and achievement are more closely related to personal attributes, although they are related to both personality and institutional attributes.

GENERAL PROBLEM

This report is the second of several studies undertaken to explore a theory of vocational choice and personality types by testing and elaborating some of its hypotheses (Holland, 1959). The first report in this series was a longitudinal study of two samples of high aptitude students over one- and two-year periods (Holland, 1962). This second study is a four-year longitudinal study of the vocational choice and achievement of a single high aptitude sample.

Briefly, the theory assumes that at the time he chooses a vocation, a person is the product of his heredity and of a variety of cultural and personal forces

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including peers, parents and other significant adults, social class, American culture, and the physical environment. Out of this experience he has developed a hierarchy of orientations for coping with environmental tasks, a pattern of personal orientations.² From an ecological standpoint, these orientations are associated with characteristic physical and social environments and with characteristic patterns of abilities. The person making a vocational choice in a sense "searches" for those environments which are congruent with his personal orientations.

Model Orientations

Six types of people have been assumed to represent the characteristic patterns of personal development in our culture: Realistic, Intellectual, Social, Conventional, Enterprising, and Artistic. For each type, a theoretical model, the "model orientation," has been proposed. The model orientation describes a theoretical or model person who is characterized by certain coping mechanisms, personal traits, vocational and educational goals, life history, aptitudes, and other attributes.

The six model orientations have been abstracted from the original formulations (Holland, 1959) and are presented in the following paragraphs.³

Realistic.—The model type is masculine, physically strong, unsociable, aggressive; has good motor coordination and skill; lacks verbal and interpersonal skills; prefers concrete to abstract problems; conceives of himself as being aggressive and masculine and having conventional political and economic values. Laborers, machine operators, aviators, farmers, truck drivers, and carpenters resemble this type.

Intellectual.—The model type is task-oriented, intraceptive, asocial; prefers to think through rather than act out problems; needs to understand; enjoys ambiguous work tasks; has unconventional values and attitudes; is anal as opposed to oral. Physicists, anthropologists, chemists, mathematicians, and biologists resemble this type.

Social.—The model type is sociable, responsible, feminine, humanistic, religious; needs attention; has verbal and interpersonal skills; avoids intellectual problem-solving, physical activity, and highly-ordered activities; prefers to solve problems through feelings and through interpersonal manipulation of other people; is orally dependent. Social workers, nurses, teachers, interviewers, vocational counselors, and therapists resemble this type.

²In an earlier report (Holland, 1959) the term, "developmental hierarchy," was used; it appears now to be an unnecessary bit of jargon with which to designate what has often been called "personality profile" or "pattern." The phrase, "the pattern of personal orientations" has been substituted for "developmental hierarchy" in this report.

³Most of the types or classes have been redesignated with names whose connotations convey more accurately the character of the type. The old titles for these types were, in order of their presentation in the text: Motoric, Intellectual, Supportive, Conforming, Persuasive, and Esthetic. Similarly, "model" has been substituted for "modal" personal orientation.

Conventional.—The model type prefers structured verbal and numerical activities and subordinate roles; is conforming (extraceptive); avoids ambiguous situations and problems involving interpersonal relationships and physical skills; is effective in well-structured tasks; identifies with power, externals, and status. Bank tellers, secretaries, bookkeepers, and file clerks resemble this type.

Enterprising.—The model type has verbal skills for selling and for dominating and leading other people; conceives of himself as a strong, masculine leader; avoids well-defined language or work situations requiring long periods of intellectual effort; is extraceptive, differs from the Conventional type in that the Enterprising type prefers ambiguous social tasks and has a greater concern with power, status, and leadership; is orally aggressive. Salesmen, politicians, managers, promoters, and business executives resemble this type.

Artistic.—The model type is asocial; avoids problems which are highly structured or require gross physical skills; resembles the Intellectual type in being intraceptive and asocial, but differs from that type in that he needs individualistic expression, has less ego strength, and is more feminine; suffers more frequently than the other types from emotional disturbances; prefers dealing with environmental problems through self-expression in artistic media. Musicians, artists, poets, sculptors, and writers resemble this type.

According to the theory, these personal orientations can be defined by selected interest inventory scales. "Interest inventories are conceived here as personality inventories which reveal information such as the person's values, attitudes, needs, self-concepts, preferred activities, and sources of threat and dissatisfaction" (Holland, 1959). In the first study of the theory, a person's resemblance to each of the personal orientations was measured by six scales of the Vocational Preference Inventory (VPI, HVPI) (Holland, 1958), since the rationale of these scales corresponds to the conceptual definitions for the personal orientations. Other interest inventories can be used for this purpose by selecting scales which appear to conform to the personal orientations.

In the present study, six scales from the Strong Vocational Interest Block (SVIB) were used because they were available for our sample and because they provided an opportunity to extend the scope of the theory and the generality of its empirical definitions. The Strong scales and the personal orientations which they were assumed to represent are as follows: Aviator (Realistic), Physicist (Intellectual), Social Science Teacher (Social), Accountant (Conventional), Sales Manager (Enterprising), and Musician (Artistic). These particular Strong scales appear to exemplify best the six orientations in the theory. Moreover, these Strong scale names or titles were included in the corresponding HVPI scales used in the first study and are among the most efficient items for discriminating high and low scorers.

A person's resemblance to the model orientations can be assessed by other

interest inventories as well as the Strong. Such simple procedures as determining a person's orientations from his preference for (or work at) a particular occupation or major field characteristic of a given type are also useful, although they give only categorical information about his resemblance to a single type.

Groups of persons having the same personal orientation, or resembling the same type, are called *classes*. A typology not of occupational classes but of personality is used to account for such phenomena as vocational choice, vocational behavior, and achievement.

Every person, other things being equal, is impelled toward those groups of persons (occupational classes) whose members have personal orientations similar to his own. We might say that the problem of vocational choice is the problem of finding types of people who are like oneself, a formulation which also appears applicable to a broader range of phenomena including personal achievement, creative performance, and the formation of social groups. Social groups are, in fact, primarily the result of mutual attraction of people with similar patterns of attitudes, values, abilities, etc. It is true that usually a social group is made up of people who share work activities or job labels, but occupation is only one aspect of the personal orientations common to such groups.

Table 1 shows the six types of people, their corresponding model orientations, and the indexes of an hypothetical S's personal orientations which make up his pattern of personal orientations. In Table 1 each type of person is designated by a number (1-6) and a name for purposes of identification and coding. Each

TABLE 1
PERSONALITY TYPES, MODEL ORIENTATIONS, PERSONAL ORIENTATIONS:
THEIR INDEXES AND CORRESPONDENCES

Type No.	Name	Model Orientations for Each Type	Strong Vocational Interest Blank: Scales as an Index of:		
			Subject A's: Personal Orientations	Subject A's: Pattern of Personal Orientations	Subject A's: Coded Profile
1.	Realistic	Real. 1	Real. Score (Aviator)	Int. ranks 1	2
2.	Intellectual	Int. 2	Int. Score (Physicist)	Real. ranks 2	1
3.	Social	Soc. 3	Soc. Score (Soc. Sci. Teacher)	Art. ranks 3	6
4.	Conventional	Conv. 4	Conv. Score (Accountant)	Conv. ranks 4	4
5.	Enterprising	Ent. 5	Ent. Score (Sales Manager)	Soc. ranks 5	3
6.	Artistic	Art. 6	Art. Score (Musician)	Ent. ranks 6	5

type has a model orientation, a characterization of the typical member's physical, psychological, and demographic attributes (Real.₁, Int.₂, Soc.₃, etc.). The corresponding personal orientations shown for each type represent the degree to which a given person's attributes make him like or unlike the model orientation. The six SVIB scale scores (Aviator, Physicist, Social Science Teacher, Accountant, Sales Manager, and Musician)⁴ for each person are assumed to be measures of his six personal orientations. The rank order of these scales defines the pattern of his personal orientations—the patterning of his personality which results from his particular development, history, and heredity. In Table 1, the highest scale in Subject A's profile, the Intellectual Scale, is listed first, followed by the remaining scales in descending order. The last column of Table 1, which shows the code for Subject A's profile when the pattern of personal orientations is expressed in type numbers (Column 1), illustrates how students' SVIB scores are coded in subsequent analyses. The scale with the highest rank, Intellectual in this instance, is *S's dominant* personal orientation.

Since it was not clear then how the environment could be assessed, the original statement of the theory was concerned mostly with hypotheses about the nature of the person and only a few hypotheses were proposed about the environmental forces which affect vocational choice. But now it appears useful to characterize the environment in the same terms used for the person, thus extending the theory so that the interactions of the person and his environment can be studied. In this study we have used the proposed typology to classify the students in different major fields at a given college, thus characterizing the undergraduate institution by its dominant personality type. The assumptions here are (a) that the decision to major in a given field is an index of the student's personal orientation and (b) that the college environment is a reflection of the personalities of its students. In this way, it is possible to describe students and undergraduate institutions with the same terms.

The present study is concerned both with hypotheses derived from the formal statement of the theory and with hypotheses suggested by the first empirical study of the theory (Holland, 1962). The hypotheses tested are of two kinds: (1) hypotheses about the six model orientations (do students with a given personal orientation exhibit the traits hypothesized in the appropriate model?) and (2) hypotheses about the interactions of students and college environments, when both students and colleges are classified as belonging to one of the six hypothetical types. These hypotheses are stated more explicitly and tested in the following sections.

⁴For clarity, the SVIB scales which are used as indexes of the types have been designated with the same names as the type to which they refer so that the following correspondences of scale and type occur: Aviator and Realistic, Physicist and Intellectual, Social Science Teacher and Social, Accountant and Conventional, Sales Manager and Enterprising, Musician and Artistic.

SAMPLE

The data for this longitudinal study were obtained from a sample of students who were assessed at the end of their senior year in high school and again at the end of their senior year in college. A sample of 956 Finalists in the 1956 Merit Program was polled and tested by mail prior to college entrance. Students responded to a questionnaire which contained items about vocational choice, personal history, and attitudes; the SVIB; and the Omnibus Personality Inventory (OPI). This first form of the OPI (Darley & Weissman, 1957),⁵ a collection of scales taken largely from other inventories, includes the following scales: Schizophrenia, Hypomania, Social Introversion, Thinking Introversion, Responsibility, Complexity of Outlook, Originality, Authoritarianism (F), Ego Strength, Authoritarianism (F4) and Impulse Expression.⁶

These students were polled again at the end of their senior year in college with a brief questionnaire which included checklists of achievement in college (leadership, science, arts), vocational choice items (present choice, preferred role, reported influences, etc.), self-ratings, and free responses to questions planned to elicit original ideas.

These assessments provided the information for a four-year, longitudinal study of vocational choice and achievement. The original sample of 956 students was reduced to 592 (415 boys, 177 girls), since only students for whom there was both predictive and criterion data were included. No claim of representativeness is made for this sample; all the students have extremely high scholastic aptitude (see Table 2).

TABLE 2
SCHOLASTIC APTITUDE (SAT) LEVELS OF 1956 STUDENT SAMPLE

SAT	Boys (N = 369)		Girls (N = 154)	
	M	SD	M	SD
Verbal	691.40	53.85	707.27	44.72
Mathematics	726.36	60.00	673.37	74.83

RESULTS

The Personal Orientations and Their Attributes

The goal of this simple correlational analysis was to learn if the SVIB scales representing the six personal orientations of the student sample are correlated with those attributes hypothesized in the corresponding model orien-

⁵Darley, J. G., & Weissman, M. The Omnibus Personality Inventory. Unpublished manuscript, 1957. (Subsequent revisions of this inventory and its current form are by H. Webster and P. Heist.)

⁶I am especially indebted to T. R. McConnell for providing most of this assessment information.

tations. Are scores on the Sales Manager Scale (Enterprising), for example, positively correlated with popularity, self-confidence, sociability, surgency, etc.? The six Strong scales were intercorrelated (Pearson product-moment) with the students' self-ratings and self-evaluations (Self-Evaluation score equals the number of times a student rates himself above average), and with their scores on the following scales and tests: the Sense of Destiny Scale (a measure of personal dominance) from the Differential Reaction Schedule (Gough, 1957⁷), the Complexity-Simplicity and Originality scales from the Inventory of Personal Philosophy (Barron, 1952⁸), the Psychopathic Deviate and Hypomania scales from the MMPI-OPI, and the Verbal and Mathematical scales from the Scholastic Aptitude Test (SAT). Table 3 contains the results.

Significant results for boys (M, Table 3) provide the following descriptions. The Realistic boy (high scorer on Aviator Scale) rates himself relatively high on athletic ability and practical-mindedness, and relatively low on originality, leadership, drive to achieve, sociability, expressiveness, and perseverance. He obtains low scores on all three originality scales (Sense of Destiny, Complexity-Simplicity, Barron Originality). He tends to have a high Hypomania (Ma) score and low verbal aptitude.

The Intellectual boy (high scorer on Physicist Scale) is self-deprecating. Generally he tends to underestimate himself; he rates himself low on leadership, popularity, drive to achieve, sociability, aggressiveness, practical-mindedness, expressiveness, self-confidence, self-understanding, and perseverance. He tends to be a low scorer on the Sense of Destiny Scale but a high scorer on the Barron Originality Scale. The Ma Scale suggests he is somewhat depressive; also he has high verbal and mathematical aptitudes.

The Social boy (high scorer on the Social Science Teacher Scale) tends to rate himself high and to see himself as a leader, and as popular, dependable, sociable, expressive, self-understanding, and persevering. He tends to have a high Sense of Destiny score, which suggests personal dominance.

The Conventional boy (high scorer on the Accountant Scale) evaluates himself positively; he rates himself high on dependability, neatness, self-control, conservatism, and practical-mindedness, and low on originality. The originality scales also suggest his lack of potential for original performance. The negative correlations of the Ma and Pd scales with the Accountant Scale are consistent with his high self-ratings of self-control and dependability. He tends to have high mathematical rather than high verbal aptitude.

The Enterprising boy (high scorer on Sales Manager Scale) generally rates himself more favorably than boys of any other orientation. He rates himself

⁷Gough, H. G. Researchers' summary for the Differential Reaction Schedule. Univer. of Calif., 1957. (Ditto)

⁸Barron, F. Inventory of personal philosophy. Unpublished manuscript, 1952; Barron, F. Correlates of measures of creativity. Berkeley: IPAR, Univer. of Calif., n.d. (Unpublished memo)

TABLE 3
INTERCORRELATIONS OF PERSONAL ORIENTATIONS (STRONG SCALES) AND
SELF-RATINGS, ORIGINALITY AND PERSONALITY SCALES

	Real		Int		Soc		Conv		Ent		Art	
	M	F	M	F	M	F	M	F	M	F	M	F
Self-Ratings†												
Self-Evaluation	-.09	-.08	-.24	-.05 ^a	.11	.07	.13 ^a	.01	.27	.20	-.20	.02
Originality	-.12	-.10	-.06 ^a	.01 ^a	.06	-.03	-.15	-.26	.11	.13	.13	.20
Leadership	-.14	-.28	-.26	-.27	.15	.22	.05	.15	.29	.27	-.18	-.10
Popularity	-.05	-.15	-.16	-.08	.08	.06	.03	.05	.19	.18	-.17	-.16
Athletic Ability	.16	.12	.01	.14	-.04	-.19	-.02	-.01	.01	-.10	-.07	-.13
Dependability	-.09	-.06	-.09	-.01	.11	.01 ^a	.21	.08	.03	.01	-.04	-.02
Drive to Achieve	-.12	-.13	-.14 ^c	.03 ^a	.07	-.04	.02	.05	.21 ^c	.10 ^a	-.07	-.10
Scholarship	-.05	-.08	.04 ^a	-.06 ^a	.04	.03	-.02	-.06	-.04	.07	.12	.06
Sociability	-.12	-.21	-.26	-.10	.11	.03 ^a	.03	.02	.30	.36	-.11	.01
Aggressiveness	-.08	-.04	-.29	-.08	.09	.06	.06	-.03	.33	.24	-.19	-.16
Neatness	-.04	-.03	-.08	.05	-.01	-.14	.19	.00 ^a	.09	-.05	-.14	-.03
Self-Control	-.05	.06	-.02	.02	.01	-.07	.19	.07 ^a	.07	.05	-.09	-.06
Independence	.03	.04	-.07 ^a	.11 ^a	.00	-.13	-.07	-.07	.08	.11	.00 ^a	.01 ^a
Conservatism	.06	.03	-.04	-.04	-.03	-.05	.20	.16	.05	.04	-.21	-.24
Practical-Mindedness	.10	.15	-.13	.24 ^c	.00	-.20	.12	-.04 ^a	.13	-.07 ^a	-.18	-.01
Expressiveness	-.10	-.08	-.22	-.08	.16	.11	.02 ^a	-.26	.25	.18	.03 ^a	.28
Cheerfulness	-.04	.02	-.07	.00	.06	.01	.09	.04	.10	.22	-.10	.02 ^a
Self-Confidence	.00	.04	-.16	.09	.01	-.01	.06	.04	.27	.11	-.14	.05
Self-Understanding	-.09	.03	-.16	.03	.12	.01 ^a	-.04	-.14	.16	.14	.03	.20 ^c
Perseverance	-.21	-.08	-.15 ^c	.12	.15	-.11	.05 ^a	-.03 ^a	.14 ^c	-.03 ^a	-.03	.02
Personality Scales												
Sense of Destiny (DRS)	-.12	-.08	-.22	-.19	.12	.22	.10	.06	.27	.32	-.07	-.09
Complexity-Simplicity	-.14	-.06	.09 ^a	-.01 ^a	.00	.01	-.32	-.31	-.08	.00	.31	.20
Barron Originality	-.12	-.12	.19	-.04 ^a	-.05	.02	-.09	.03	-.08	.10	.15	.01 ^a
Pd (MMPI)	.03	-.01	.02	-.08	-.14	.05 ^a	-.17	-.09	.01	.07	.03 ^a	.16
Ma (MMPI)	.11	.11	-.10	-.15	-.07 ^a	-.06 ^a	-.18	-.08	.16	.30	-.03	-.06
Aptitude												
Verbal	-.14	-.07	.10	-.02	.00	.06	-.09	-.11	-.01	-.07	.17	.05
Math	.06	.18	.15	.29	-.08	-.17	.18	.07	-.10	-.07	-.02	.02

Note.—Decimals are omitted. For boys, $r_{.05} = .10$; for girls, $r_{.05} = .16$. ^a = ambiguous finding; an expected relationship is not significantly positive or negative. ^c = contrary to hypothesis for a given personal orientation. M = boys; F = girls in all tables.

†All self-ratings were obtained four years after the Strong scales with which they are correlated here. The personality and aptitude measures were obtained concurrently with the Strong.

high on originality, leadership, popularity, drive to achieve, sociability, aggressiveness, practical-mindedness, expressiveness, cheerfulness, self-confidence, self-understanding, and perseverance. The high self-ratings of drive to achieve and originality are not consistent with the description of the Enterprising orientation; they may be part of a general tendency for the Enterprising boy to rate himself high on many traits. The Enterprising boy tends to get high scores on the Sense of Destiny Scale, but the other originality scales are unrelated to this orientation. This apparent discrepancy may occur because the Sense of Destiny Scale comes from an originality inventory, while its empirical correlates suggest that it also measures personal dominance (Gough, 1957⁷; Holland, 1961). He also tends to have a low math score.

The Artistic boy (high scorer on the Musician Scale) tends to deprecate himself. He rates himself high on originality and scholarship, but low on leadership, popularity, sociability, aggressiveness, neatness, conservatism, practical-mindedness, cheerfulness, and self-confidence. The Complexity-Simplicity and Barron Originality scales characterize him as an original person.

Generally, the summaries for each orientation are consistent with the model formulations and the earlier report (Holland, 1962), although most of the significant relationships (correlations) are quite small. Since the first statement of the theory is often incomplete or inadequate, some of the relationships in Table 3 were not anticipated or are contradictory to our expectations. Those findings which seem clearly contradictory (c) or ambiguous (a) with respect to the model orientations have been indicated in Table 3 by a superior *c* or *a*. The remaining correlations are either consistent with our theoretical expectations or they are negligible correlations for which we have no hypothesis.

Prediction of Vocational Choice (Major Field), Preferred Role and Daydreams about Choice

This section is concerned with the prediction of vocational choice, major field, preferred role within the chosen vocation and daydreams about future vocational activities. All predictions were made from the high-point Strong code (the dominant personal orientation) obtained prior to college entrance; all criteria of choice and role were obtained from students in 143 colleges at the end of their senior year in college.

In the remainder of the report, the student's choice of major field and vocation have been classified into one of the six types or classes using the Vocational Preference Inventory keys (Holland, 1958) as guides. The categorization was done by a single judge who used the keys (which consist of lists of occupational titles) as guides and resolved ambiguities of classification (major fields and vocations not listed or implied in the keys) in discussion with the author. About 90% of this classifying was done objectively by the use of the keys alone.

TABLE 4
PREDICTION OF VOCATIONAL CHOICE FROM STRONG HIGH-POINT CODES
OVER A FOUR-YEAR INTERVAL (MALES = 263, FEMALES = 101)

Vocational Choice	Strong High-Point Code											
	1. Real		2. Int		3. Soc		4. Conv		5. Ent		6. Art	
	M	F	M	F	M	F	M	F	M	F	M	F
1. Realistic	<i>15</i>		<i>13</i>		<i>1</i>	<i>1</i>	<i>4</i>		<i>1</i>		<i>6</i>	<i>2</i>
2. Intellectual	<i>8</i>	<i>1</i>	<i>27</i>	<i>6</i>	<i>5</i>	<i>3</i>	<i>5</i>		<i>1</i>		<i>34</i>	<i>17</i>
3. Social	<i>6</i>		<i>5</i>	<i>1</i>	<i>11</i>		<i>2</i>	<i>2</i>		<i>1</i>	<i>16</i>	<i>25</i>
4. Conventional	<i>4</i>		<i>2</i>		<i>3</i>	<i>2</i>	<i>3</i>	<i>4</i>			<i>4</i>	<i>4</i>
5. Enterprising	<i>5</i>		<i>3</i>		<i>11</i>	<i>1</i>	<i>13</i>	<i>2</i>	<i>5</i>		<i>10</i>	<i>2</i>
6. Artistic	<i>1</i>		<i>2</i>	<i>1</i>	<i>4</i>		<i>2</i>		<i>1</i>		<i>8</i>	<i>14</i>
Miscellaneous	<i>4</i>	<i>1</i>	<i>4</i>		<i>3</i>		<i>1</i>		<i>1</i>	<i>2</i>	<i>9</i>	<i>9</i>
Total	<i>43</i>	<i>2</i>	<i>56</i>	<i>8</i>	<i>38</i>	<i>7</i>	<i>30</i>	<i>8</i>	<i>9</i>	<i>3</i>	<i>87</i>	<i>73</i>

Note.—Correct predictions are shown in italics.

Prediction of vocational choice and major field.—The relationship between the student's dominant personal orientation (Strong high-point codes) and his vocational choice four years later is shown in Table 4. For boys, 28.6% of the classifiable choices are correctly predicted from the high-point codes (the chance expectancy is 16.7%). For girls, 26.9% are correctly predicted. The base rates for each kind of choice vary considerably so that this estimate of efficiency does not exceed the base rate. For example, about 30% of the boys enter science, so that the prediction, "Everyone will enter science," equals the efficiency of the Strong codes. Presumably samples with more heterogeneous goals would yield more efficient predictions.

The prediction of major field at graduation from college from Strong

TABLE 5
PREDICTION OF MAJOR FIELD FROM STRONG HIGH-POINT CODES FOR A
FOUR-YEAR INTERVAL (MALES = 263, FEMALES = 105)

College Major	Strong High-Point Code											
	1. Real		2. Int		3. Soc		4. Conv		5. Ent		6. Art	
	M	F	M	F	M	F	M	F	M	F	M	F
1. Realistic	<i>19</i>		<i>12</i>		<i>2</i>		<i>6</i>		<i>3</i>		<i>6</i>	<i>1</i>
2. Intellectual	<i>12</i>	<i>2</i>	<i>33</i>	<i>4</i>	<i>9</i>	<i>1</i>	<i>9</i>	<i>1</i>	<i>1</i>		<i>39</i>	<i>20</i>
3. Social	<i>2</i>		<i>3</i>		<i>7</i>	<i>1</i>	<i>1</i>			<i>1</i>	<i>12</i>	<i>7</i>
4. Conventional	<i>5</i>		<i>1</i>		<i>2</i>		<i>7</i>	<i>4</i>	<i>2</i>			<i>5</i>
5. Enterprising	<i>2</i>		<i>2</i>		<i>6</i>	<i>3</i>	<i>5</i>	<i>2</i>	<i>1</i>		<i>6</i>	<i>3</i>
6. Artistic	<i>2</i>		<i>3</i>	<i>1</i>	<i>12</i>	<i>1</i>	<i>2</i>	<i>2</i>	<i>2</i>	<i>1</i>	<i>20</i>	<i>24</i>
Miscellaneous	<i>1</i>		<i>2</i>	<i>3</i>		<i>2</i>				<i>1</i>	<i>4</i>	<i>15</i>
Total	<i>43</i>	<i>2</i>	<i>56</i>	<i>8</i>	<i>38</i>	<i>8</i>	<i>30</i>	<i>9</i>	<i>9</i>	<i>3</i>	<i>87</i>	<i>75</i>

Note.—Correct predictions are shown in italics.

high-point codes is presented in Table 5. For boys and girls, 34.0 and 39.3% of fields at graduation are correctly identified. These results (Tables 4 and 5) approximate earlier ones obtained in the prediction of major field from VPI high-point codes over a two-year period (Holland, 1962; Tables 31 and 32).

Preferred vocational role.—To find out if it is possible to make more specific predictions about vocational choice, namely, about preferred role within a vocation, students in their senior year were asked: "What special role would you like to play within your particular choice: (1) Being a practitioner of my occupation; (2) Training or teaching others about my occupation; (3) Leading or supervising people; (4) Doing research in my field; (5) Acting as a consultant or expert to others; (6) Undecided; (7) Other role ———." The relation between students' responses to this questionnaire item and Strong high-point codes is shown in Table 6. The results in Table 6 suggest that personal orientations are not independent of preferred roles, but generally low-cell frequencies obviate any statistical test. Students with social orientations want to be practitioners of their art; Artistic orientations are associated with wanting to teach (a contradictory and unexpected result; it may reflect the belief that the artist must teach or starve); Conventional orientations are associated with wanting to be a leader (another contradictory result; we might more reasonably expect the Social or Enterprising student to prefer this role); Intellectual orientations are related to wanting to be a researcher. The Enterprising student's tendency to be undecided or to prefer more than one role is related to subsequent analyses of stability (see p. 571 ff.), in which it was found that instability of choice is more apt to occur in institutions which have a large percentage of Enterprising students.

TABLE 6
PREDICTION OF A STUDENT'S PREFERRED ROLE WITHIN HIS
CHOSEN VOCATION (MALES)

Preferred Role	Strong High-Point Code											
	1. Real		2. Int		3. Soc		4. Conv		5. Ent		6. Art	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Practitioner	10	23.3	17	30.4	16	42.1	7	23.3	1	11.1	24	27.6
Teacher	5	11.6	1	1.8	1	2.6	3	10.0			13	14.9
Leader	9	20.9	2	3.6	4	10.5	10	33.3	1	11.1	5	5.7
Researcher	8	18.6	21	37.5	4	10.5	3	10.0	1	11.1	19	21.8
Expert (Consult)	7	16.3	4	7.1	3	7.9	5	16.7	1	11.1	5	5.7
Undecided	1	2.3	3	5.4	4	10.5					7	8.0
More than one role	2	4.7	7	12.5	4	10.5	2	6.7	2	22.2	11	12.6
No response	1	2.3	1	1.7	2	5.3			3	33.3	3	3.4
Total	43	100.0	56	100.0	38	99.9	30	100.0	9	99.9	87	99.7

Note.—Italics indicate role predicted for each High-Point Code.

Student daydreams about choice.—Free responses to the item "When I daydream about my future career, I visualize myself doing the following things," were coded using 10 categories developed in a previous report (Holland, 1962). Two raters, coding independently, obtained 75% agreement. Table 7 shows the relationships between the students' personal orientations and their coded daydreams. The results in Table 7 generally replicate the results of the first study (Holland, 1962; Table C). Boys with Intellectual orientations daydream frequently about "high achievement, creativity and learning." Boys with Social or Artistic orientations daydream about "helping others" (this finding for the Artistic orientation is contrary to our hypothesis and does not replicate earlier findings). And the Enterprising orientation is associated with daydreams of "status, success and leadership." The trends and meanings of the remaining categories in Table 7 are not clear.

TABLE 7
PREDICTION OF STUDENT DAYDREAMS ABOUT VOCATIONAL CHOICE FROM THE
STRONG HIGH-POINT CODE (MALES)

Daydreams	Strong High-Point Code											
	1. Real		2. Int		3. Soc		4. Conv		5. Ent		6. Art	
	f	%	f	%	f	%	f	%	f	%	f	%
No Response Or												
Don't Daydream	15	13.5	25	18.4	11	17.7			3	10.0	2	15.4
Work Activities	41	36.9	58	42.6	24	38.7			15	50.0	4	30.8
High Achievement, Creativity, Learning	17	15.3	27	19.9	6	9.7			0		2	15.4
Help Others	3	2.7	5	3.7	9	14.5			3	10.0	3	23.1
Status, Success, Leadership	29	26.1	11	8.1	7	11.3			7	23.3	2	15.4
Miscellaneous	6	5.4	10	7.4	5	8.1			2	6.7		
Total	111	99.9	136	100.1	62	100.0			30	100.0	13	100.1

Note.—Italics indicate predicted daydreams for each High-Point Code.

Predictive efficiency of expressed choice.—Although it is popular to deprecate the predictive efficiency of the student's expressed vocational choice because it has only a moderate relationship with interest scales, the evidence for this bias is unclear. In a longitudinal study, McArthur and Stevens (1955) found equal validity for expressed and inventoried interests, but Wightwick (1945) found inventoried interests slightly more efficient than expressed interests. The present study offered an opportunity to study the relative predictive efficiency of expressed choice and interest scale scores; Table 8 summarizes the results. In Table 8, the students' pre-college vocational choices are related to their vocational choices in the senior year. For boys and girls, respectively, 58.9 and 48.7% of the initial and final vocational choices fall in the

TABLE 8
PREDICTION OF VOCATIONAL CHOICE AT GRADUATION FROM
VOCATIONAL CHOICE AT COLLEGE ENTRANCE

Vocational Choice at Graduation	Vocational Choice as High School Senior					
	1. Real	2. Int	3. Soc	4. Conv	5. Ent	6. Art
Males						
1. Realistic	51	11	1			
2. Intellectual	22	84	14			
3. Social	7	14	30		3	1
4. Conventional	4	7	2	2	1	
5. Enterprising	17	9	5	1	21	2
6. Artistic	3	5	4	1	2	7
Miscellaneous	7	5	4		3	2
Total	111	135	60	4	30	12
Females						
1. Realistic		1				1
2. Intellectual	1	23	8	1	1	
3. Social		9	25	1		7
4. Conventional		4	7	1	1	1
5. Enterprising		2				1
6. Artistic		6	5		2	7
Miscellaneous		5	9		2	3
Total	1	50	54	3	6	20

Note.—Correct predictions are shown in italics.

same class or type. These results are clear evidence that students' reports of their choice are more predictive than any other evidence available about this group of students. Similarly, expressed choice of major field predicts final choice of major field with 65.8 and 56.3% correct identification for boys and girls, respectively (see Table 9).

These analyses are simultaneously useful and disheartening in that they emphasize the importance of the student's expressed choice and indicate the high base rate we must exceed if theoretical predictions are to contribute to the prediction of vocational choice.

Similar results were obtained for the 1959 sample, one of the two samples used in the first report (Holland, 1962), when the student's choice of vocation before college entrance was compared with his major field at the end of his freshman year in college. For the total sample, the percentages of correct identification were 70.9 and 50.5 for boys and girls, respectively. Higher percentages of correct identification were obtained by using the following questionnaire items:

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. My third choice would be:

Of the students whose first *three* choices fell in the same class (for example, physicist, chemist and mathematician—all Type 2), 81.0 and 61.9% of the boys and girls have majors in the same class at the end of the freshman year. If a student's first *two* choices are in the same class, 76.8 and 60.0% are found in the same class after one year of college. And, if a student's first *two* choices are in different classes (for example, physicist and educator), the percentage of correct hits is lowered to 64.4 and 45.4 for boys and girls.

The relative instability of girls' choices is probably attributable to many factors (see subsequent analyses, pp. 562 ff). Instability seems to be connected with initial choices of Social (Type 3) occupations, an orientation whose correlates are femininity, sociability, dependence, surgency, etc. Moreover, her initial choice of vocation is less central to a woman's future role in our culture so that girls who change their fields of study or vocation may be influenced by considerations which are somewhat foreign to those which influence boys.

Stability of Vocational Choice (Major Field)

It has long been recognized that the study of students' change in vocational

TABLE 9
RELATION OF INITIAL CHOICE OF MAJOR FIELD TO FIELD AT GRADUATION

Major Field at Graduation	Initial Major Field					
	1. Real	2. Int	3. Soc	4. Conv	5. Ent	6. Art
Males						
1. Realistic	66	8	1			
2. Intellectual	20	116	8		1	
3. Social	6	9	11		2	1
4. Conventional	7	2	1	2	3	
5. Enterprising	4	6		4	8	2
6. Artistic	4	11	6	1	6	14
Miscellaneous	7	5	1			2
Total	114	157	28	7	20	19
Females						
1. Realistic	1					
2. Intellectual	1	32	5			
3. Social		1	9			4
4. Conventional		10	1	1		
5. Enterprising		2			1	3
6. Artistic		6	8	1	3	14
Miscellaneous		11	9		1	2
Total	2	62	32	2	5	23

Note.—Correct predictions are shown in italics.

choice during their college years is of substantial educational importance; such studies may also help us to conceptualize and predict post-college work history and subsequent vocational achievement. The stability of vocational choice and of choice of major field were studied in two ways: by examining the relationship between the personal orientations and stability of choice, and by examining the relationships of stability of choice to the interaction of students and colleges when both are categorized in the same terms. The goals of these analyses were, first, to discover the relative contribution of the student's personal attributes and of the college environment to stability of choice and, second, to define more clearly the nature of the personal and environmental attributes assumed to influence change.

In the following analysis, the student is regarded as a "changer" if during the four years of college he has changed his initial choice of major field or vocation to a choice in a different type or class. For example, an initial choice of engineering (Realistic) followed by a final choice of social work (Social) represents change. Students who persist in their first choices, or whose initial

TABLE 10
CHANGE IN CHOICE OF VOCATION AND ITS RELATION TO STRONG HIGH-POINT CODE

Strong High-Point Code	Vocational Choice					
	Vocation					
	Total Sample		Science		Non-science	
	No Change	Change	No Change	Change	No Change	Change
Males						
1. Realistic	22	19	20	16	2	3
2. Intellectual	30	26	28	21	2	5
3. Social	23	10	4	3	19	7
4. Conventional	14	13	7	10	7	3
5. Enterprising	5	3	2	3	3	0
6. Artistic	45	38	29	18	16	20
<i>N</i>	139	109	90	71	49	38
χ^2					2.99	
<i>P</i>	n.s.		n.s.		< .10	
Females						
1. Realistic	1	1	1	1	0	0
2. Intellectual	5	3	4	1	1	2
3. Social	3	4	0	0	3	4
4. Conventional	2	4	0	3	2	1
5. Enterprising	1	2	0	0	1	2
6. Artistic	29	43	12	16	17	27
<i>N</i>	41	57	17	21	24	36
χ^2	1.51		1.48			
<i>P</i>	< .30		< .30		n.s.	

TABLE 11
CHANGE IN CHOICE OF MAJOR FIELD AND ITS RELATION TO STRONG
HIGH-POINT CODES

Strong High Point Code	Choice of Major Field					
	Major Field					
	Total Sample		Science		Non-science	
	No Change	Change	No Change	Change	No Change	Change
Males						
1. Realistic	29	13	28	11	1	2
2. Intellectual	41	13	40	12	1	1
3. Social	17	14	7	2	10	12
4. Conventional	16	12	11	10	5	2
5. Enterprising	3	6	3	3	0	3
6. Artistic	46	31	34	18	12	13
N	152	89	123	56	29	33
χ^2	6.64		3.11			
P	< .01		< .10		n.s.	
Females						
1. Realistic	2	0	2	0	0	0
2. Intellectual	5	0	4	0	1	0
3. Social	3	1	0	0	3	1
4. Conventional	3	4	1	3	2	1
5. Enterprising	0	2	0	0	0	2
6. Artistic	28	26	18	14	10	12
N	41	33	25	17	16	16
χ^2	4.26		3.00			
P	< .05		< .10		n.s.	

and subsequent choices belong to the same type or class are classified as "non-changers." Thus, movement from chemistry to physics, from education to social work, or from literature to art represent "stability" or "no change" in the present classification scheme.

Personal orientations and stability.—To determine if change in vocational choice and major field is related to the student's high-point code (his dominant personal orientation), the students were classified as "non-changers" and "changers" and as science and non-science majors. Chi square tests of independence for Tables 10 and 11 suggest that change in vocational choice and major field is more a function of the personal orientations of the students than of their fields of first choice. This trend is greater for choice of major field than for choice of vocation, and more evident among boys than girls.

The findings here are consistent with the findings in a previous study (cf. Holland, 1962; Tables 35, 36): the Intellectual and Realistic orientations are associated with stability of major field and the remaining orientations with

change. There are several factors which may account for the ambiguities in the findings (Table 10): students are inexact or vague in reporting their choices; the theory may be inadequate; and expressed vocational choice does not require as much commitment as does actual participation in a major field of study.

The relation of stability of choice to the personal orientations was examined also in terms of the consistency of the students' personal orientations.⁹ "Consistency" is used in the sense of the psychological consistency of the traits, aptitudes, values, life goals, orientation toward others, etc. The student's consistency or inconsistency is assessed by examining his two-digit code, the first and second high points of his six-digit Strong profile. Using all available information from past empirical studies and especially the rationale for each model orientation, the following criterion lists of consistent and inconsistent codes were made: Consistent Codes (12, 21, 14, 41, 26, 62, 36, 63, 45, 54, 56, 65, 53, 35, 34, 43) and Inconsistent Codes (23, 32, 24, 42, 16, 61, 25, 52, 46, 64, 13, 31, 15, 51). For example, a 21 code is regarded as a consistent code since the model formulations and the empirical evidence indicate that the Intellectual and the Realistic types have many traits in common—unsociability, an orientation toward things rather than people, self-deprecation, and masculinity—although they also have some contradictory attributes. Inconsistent codes are assumed to indicate that the person has psychological attributes which are somewhat in opposition. For example, a 13 code is an inconsistent code, since the models for the Realistic and Social orientations contain such oppositions as: orientation toward things versus orientation toward people, masculinity versus femininity, poor interpersonal skills versus good interpersonal skills, motoric skills versus verbal skills, etc. It was assumed that consistent codes would be associated with stability of choice and inconsistent codes with instability.

TABLE 12
CHANGE IN VOCATIONAL CHOICE AND ITS RELATION TO CONSISTENT AND
INCONSISTENT TWO-DIGIT STRONG CODES FOR MALES ($N = 330$)

	Strong Code	
	Consistent	Inconsistent
No Change	145	91
Change	48	46
$\chi^2 = 2.98, P < .10$		

⁹This hypothesis stems indirectly from the first statement of the theory in which it was held that "modal patterns will be associated with stability and atypical patterns with instability" (Holland, 1959). In the earlier report (Holland, 1962), preliminary tests suggested that modal patterns (two-digit codes occurring with high frequency) were no more predictive of stability than infrequent codes. At this point, it was assumed that a better hypothesis and a more psychological one would be that consistent codes would be related to stability of student plans and inconsistent codes would be related to instability of vocational choice and major field.

Tables 12 and 13 show the relationships between the consistency of students' personal orientations and stability of vocational choice and major field. In the case of boys, consistency of personal orientations is related to stability of vocational choice and major field at the 10% level (Tables 12 and 13). The results for girls are not significant. For comparison, the relationship between single-digit, high-point codes and change in plans is also shown in Table 13.

TABLE 13
CHANGE IN MAJOR FIELD AND ITS RELATION TO CONSISTENT AND INCONSISTENT
TWO-DIGIT STRONG CODES

Major Field	Males ($N = 142$)			
	Consistency of Two-Digit Code		Strong High-Point Code	
	Consistent	Inconsistent	1-2	3-6
No Change	72	20	48	44
Change	32	18	18	32
χ^2	3.36		3.41	
P	<.10		<.10	

Note.— N for this table has been reduced because of the omission of Strong profiles with tied two-digit codes, a procedure which is necessary to obtain single digit high-point codes. Succeeding tables will also vary in N for this reason and because of variations in the available data.

Student-college interactions.—The effects of student-college interactions upon stability of choice are reported in this section. The original statement of the theory suggested that person-environment interactions might be studied. Subsequently, in the first empirical study of the theory (Holland, 1962), both colleges and students were coded and their interactions examined. The positive results obtained in that study suggested that environments could successfully be classified in the same way that we classified individuals.

If we assume that a major portion of environmental forces are transmitted through other people, it is possible, at least in principle, to characterize an environment by the types of people who dominate it. In the following analyses, an estimate of the college environment was obtained using the Environmental Assessment Technique (EAT). In 1961 in a preliminary investigation Astin and Holland validated EAT variables against the College Characteristics Index.

The EAT characterizes a college by classifying all its graduates by major field into the six types.¹⁰ Frequencies in each type are converted to percentages of the total enrollment at a college. The type with the highest percentage of majors becomes the high-point code of that institution; the type with the second highest percentage becomes the second digit in the institutional code, etc. For

¹⁰The EAT also uses the total enrollment and average aptitude level.

TABLE 14
CONGRUENCE OF STUDENT AND COLLEGE CODES AND CHANGE IN VOCATIONAL
CHOICE OVER A FOUR-YEAR PERIOD (MALES)

College Code	No Change						N	Change						N
	Student			Strong Code				Student			Strong Code			
	1	2	3	4	5	6		1	2	3	4	5	6	
1. Real	14	14	5		1	11	45	4	9	2	4	1	11	31
2. Int	3	3	1	2	2		11	3	4				4	11
3. Soc	1	5	5	2		11	24	4	3	2	2		3	14
4. Conv	3	4	7	5	1	13	33	4	6	6	3	1	9	29
5. Ent		1	3	1	1	3	9	2		2			7	11
6. Art		2	1	1		2	6		1		1	1	2	5
N	21	29	22	11	5	40	128	17	23	12	10	3	36	101

Note.—Among students who change their vocational choice, 14.9% have congruent Strong and College codes; whereas, among students who persist in their original choice, 23.4% have congruent Strong-College codes ($\chi^2 = 2.64$, $P < .10$). Congruent student-college codes are shown in italics.

example, an institution composed primarily of engineering majors with a smaller number of science majors would be coded 12.

The following aspects of the interaction of students and college environments were studied: congruence of student-college high-point codes and stability of choice, consistency of college environments and stability of choice, and consistency of both student and college codes and stability of choice.

Congruence and stability.—To discover if the student who has a "congruent" code, that is, the student who attends a college whose high-point code is identical with his own, is less likely to change his vocational choice than the student who

TABLE 15
CONGRUENCE OF STUDENT AND COLLEGE CODES AND CHANGE IN
MAJOR FIELD OVER A FOUR-YEAR PERIOD (MALES)

Code	No Change						N	Change						N
	Student			Strong Code				Student			Strong Code			
	1	2	3	4	5	6		1	2	3	4	5	6	
1. Real	16	17	4	1	2	12	52	2	6	2	3	1	9	23
2. Int	2	6		1			9	5	1	1		2	2	11
3. Soc	4	6	4	2		10	26	1	2	2	2		3	10
4. Conv	5	7	7	6	1	9	35	3	2	6	3	1	9	24
5. Ent	1	1		1		5	8	1		3		1	4	9
6. Art		2	1	1		3	7		1		1	1	2	5
N	28	39	16	12	3	39	137	12	12	14	9	6	29	82

Note.—25.6% of the students with congruent student-college codes do not change their major field, whereas only 13.4% of the students with congruent codes are found among students who change field ($\chi^2 = 4.55$, $P < .05$). Congruent student-college codes are shown in italics.

has an "incongruent" code, 6×6 tables were formed in which changers and non-changers were classified by personal orientation (Strong high-point code) and by their college's type (EAT high-point code). The analyses for boys are given in Tables 14 and 15. The data for girls yielded tables with cell frequencies too small to test.

In Table 14, we find that 23.4% of the non-changers have congruent college codes. In contrast, 14.9% of the changers had congruent codes ($\chi^2 = 2.64$, $P < .10$). In Table 15, 25.6% of the non-changers in major field had congruent codes, whereas only 13.4% of the changers had congruent codes. This difference is significant at the 5% level ($\chi^2 = 4.55$). These results imply that the student who attends a college dominated by types like himself tends to have more stable goals, and the student who attends an institution dominated by types unlike himself tends to change his goals.

Consistency and stability.—The results obtained in the exploration of the hypothesis about consistency of personal orientations and change (see p. 563 above) led to the following parallel analysis of the consistency of college environments and their effects upon students. The hypothesis tested in Tables 16 and 17 is that, when colleges are classified as having consistent or inconsistent codes and when students are classified as changers or non-changers, stability

TABLE 16
STABILITY IN VOCATIONAL CHOICE FOR STUDENTS IN CONSISTENT AND
INCONSISTENT COLLEGE ENVIRONMENTS

Vocational Choice	College Code			
	Males ($N = 339$)		Females ($N = 136$)	
	Consistent	Inconsistent	Consistent	Inconsistent
No Change	128	53	37	19
Change	98	60	57	23
χ^2	2.87			
P	<.10		n.s.	

will be associated with consistent college codes. For boys, Table 16 gives borderline support to the hypothesis ($P < .10$) for vocational choice. The results are not significant for girls.

Table 17 shows a similar positive relationship between college consistency and stability of major field ($P < .10$) for boys. The results for girls are not significant. This relationship is slightly more evident when boys are classified as science or non-science majors in consistent or inconsistent colleges ($P < .02$). (See the bottom half of Table 17.)

In another test of the consistency hypothesis, students were classified as science or non-science majors, using the Strong high-point codes (1-2 versus

TABLE 17
STABILITY IN MAJOR FIELD FOR STUDENTS IN CONSISTENT AND
INCONSISTENT COLLEGE ENVIRONMENTS

Major Field	College Code			
	Males (N = 340)		Females (N = 143)	
	Consistent	Inconsistent	Consistent	Inconsistent
No Change	159	58	41	22
Change	79	44	52	28
χ^2	3.06			
P	<.10		n.s.	

College Code	College Major: Males (N = 340)			
	Science (1-2)		Non-science (3-6)	
	No Change	Change	No Change	Change
Consistent	138	55	21	24
Inconsistent	44	34	14	10
χ^2	5.74			
P	<.02		n.s.	

3-6), and by consistent and inconsistent college codes (see Table 18). This analysis gives a more efficient prediction of stability in major field than any of the previous analyses, because it takes into consideration the Strong high-point code "effects" as well as the consistency of college environments ($P < .001$, $C = .28$). (See the second half of Table 18.) This result holds for science majors in consistent and inconsistent college environments ($\chi^2 = 9.63$, $P < .01$), but not for non-science majors (see first half of Table 18).

TABLE 18
STABILITY IN MAJOR FIELD FOR STUDENTS WITH DIFFERENT HIGH-POINT STRONG
CODES IN CONSISTENT AND INCONSISTENT COLLEGE ENVIRONMENTS
(MALES, N = 251)

College Code	Student HP Codes (Strong)			
	Science (1-2)		Non-science (3-6)	
	No Change	Change	No Change	Change
Consistent	56	13	51	45
Inconsistent	14	14	27	31
χ^2	9.63		n.s.	
P	<.01			
Student Code	College Code			
	Consistent		Inconsistent	
	No Change	Change	No Change	Change
Science (1-2)	56	13	14	14
Non-science (3-6)	51	45	27	31
χ^2	13.8		n.s.	
P	<.001			

TABLE 19
STABILITY IN VOCATIONAL CHOICE FOR STUDENTS WITH CONSISTENT AND
INCONSISTENT CODES IN CONSISTENT AND INCONSISTENT COLLEGES
(MALES, $N = 330$)

Student Strong Codes	College Code			
	Consistent		Inconsistent	
	No Change	Change	No Change	Change
Consistent	98	52	47	39
Inconsistent	32	34	16	12
χ^2 P	5.43 <.02		n.s.	

Tables 19 and 20 summarize the results for the interaction of students with consistent and inconsistent codes in colleges with consistent and inconsistent codes. Again, the hypothesis is that consistency will be associated with stability; more specifically, maximum stability of vocational choice and field of study will be associated with the interaction of consistent student codes and consistent college codes, and minimum stability will be associated with the interaction of inconsistent student and college codes. In the case of vocational choice the evidence only partially supports this hypothesis: although maximum stability is related to the consistent student-consistent college interaction, minimum stability is related about equally to inconsistent-student-inconsistent-college and inconsistent student-consistent college interactions. The analysis in Table 20 for stability of college major supports the hypothesis: the consistent student-consistent college interaction is related to maximum stability and the interaction of inconsistent student and inconsistent college has minimum stability. In other words, students with consistent personal orientations who attend colleges which are dominated by major fields consistent with one another are least likely to change major field. This conclusion is plausible from both a theoretical and a rational point of view: student consistency implies a person who has explicit

TABLE 20
STABILITY IN MAJOR FIELD FOR STUDENTS WITH CONSISTENT AND INCONSISTENT
CODES IN COLLEGES WITH CONSISTENT AND INCONSISTENT CODES
(MALES, $N = 366$)

College Code	Student Code (Strong)			
	Consistent		Inconsistent	
	No Change	Change	No Change	Change
Consistent	114	58	46	30
Inconsistent	47	43	11	17
χ^2 P	4.93 <.05		3.73 <.05	

goals and relatively stable values, self-concept, abilities, etc. Colleges dominated by consistent major fields probably exert a relatively homogeneous influence. The interaction of consistent student and consistent colleges, then, would be expected to be conducive to stability.

In contrast, the interaction of students with inconsistent personal orientations and colleges with inconsistent environments represents the interaction of persons whose goals, self-concepts, and abilities are undefined or confused and environments which exert heterogeneous influences. It is eminently reasonable that this interaction will result in the student's having unstable goals as far as vocational choice and major field are concerned.

It is quite possible that the results in Tables 12 to 20 are due not to student-college interactions but to the different characteristics of entering students. Perhaps students with consistent Strong codes select consistent or inconsistent colleges in a systematic rather than a random fashion. Similarly, "inconsistent" students may select consistent and inconsistent colleges in a systematic way. To investigate this possibility, students with "consistent" high-point codes who attended "consistent" colleges were compared with "consistent" students who attended "inconsistent" colleges. The same comparisons were made for "inconsistent" students attending "consistent" and "inconsistent" colleges. In all, 39 pre-student variables (that is, information obtained from the students during their senior year in high school) and post-student variables (information obtained during the senior year in college) were used to test for differences: self-ratings, SAT-V and M scores, Strong high-point codes, initial degree of certainty about choice, choice of major field, high school and college achievement, geographical origin, and scores on the Psychopathic Deviate, Hypomania, Originality, and Complexity-Simplicity scales. None of the pre-college variables distinguished the "consistent" students attending "consistent" colleges from those attending "inconsistent" colleges; likewise, no significant differences were found for "inconsistent" students. On post-college measures for boys, only three of 50 tests of significance (6%) reached the 5% level. For girls, only two of 78 tests of significance reached the 5% level. We conclude then that the *available* evidence gives no support for the hypothesis that the interactions shown in Tables 12 to 20 are due to personality differences in students entering "consistent" or "inconsistent" colleges.

Table 21 is a multiple classification scheme designed to differentiate more efficiently between changers and non-changers by using a series of pertinent variables. In Table 21, each student was classified successively as being a changer or non-changer in major field, as having a high-point code congruent or incongruent with a college's, as having a consistent or inconsistent college code, as being a science or non-science major, and finally as having a consistent or inconsistent two-digit code. The 2×16 table (Table 21) enables us to

TABLE 21

STABILITY IN MAJOR FIELD AND ITS RELATION TO THE CONGRUENCE OF STUDENT-COLLEGE CODES, CONSISTENCY OF STUDENT AND COLLEGE CODES, AND STUDENT HIGH-POINT CODES OF 1 + 2 VERSUS 3-6

Student Code	Males ($N = 238$)															
	No Change: Student-College Codes								Change: Student-College Codes							
	Congruent ($N=35$)				Incongruent ($N=102$)				Congruent ($N=13$)				Incongruent ($N=88$)			
	Consistency (College)				Consistency (College)				Consistency (College)				Consistency (College)			
	Con- sistent ($N=29$)		Incon- sistent ($N=6$)		Con- sistent ($N=67$)		Incon- sistent ($N=35$)		Con- sistent ($N=8$)		Incon- sistent ($N=5$)		Con- sistent ($N=51$)		Incon- sistent ($N=37$)	
	Student HP Code		Student HP Code		Student HP Code		Student HP Code		Student HP Code		Student HP Code		Student HP Code		Student HP Code	
	1-2	3-6	1-2	3-6	1-2	3-6	1-2	3-6	1-2	3-6	1-2	3-6	1-2	3-6	1-2	3-6
Consistent	15	9	2	1	26	24	8	22	0	6	1	2	6	24	5	23
Inconsistent	3	2	2	1	9	8	2	3	0	2	1	1	8	13	3	6
% Code 12, or scores of 4	51.7		33.3		38.8		22.9		0.0		20.0		11.8		13.5	

TABLE 22
STABILITY SCORES AND THEIR RELATIONSHIP TO CHANGE IN MAJOR FIELD
(MALES, $N = 238$)

Stability Score*	Major Field	
	Non-changers	Changers
4	15	0
3	40	13
2	46	42
1	33	40
0	3	6
$\chi^2 = 9.56, P < .01$		

*Cutting score of 2 yields 61.8% hits.

score changers and non-changers from 0 to 4. For example, students with congruent college codes, consistent college codes, science codes (1 or 2) and with consistent Strong codes have a score of 4. In the first row and column of Table 21, 15 non-changers have this score. The student who falls in all but one of these positive categories gets a score of 3; the student who falls in all but two gets a score of 2, etc. The percentage of students attaining the maximum score of 4 for each 2×2 table within the 2×16 table is shown at the bottom of Table 21.

The distributions of scores for changers and non-changers were taken from Table 21 to form Table 22. A median test indicates that this scoring procedure correctly identifies 61.8% of the changers and non-changers.

Institutional Characteristics and Student Stability

The major finding—that stability is associated with attendance at colleges with consistent codes—suggested the following question: since students entering consistent colleges do not differ significantly from students entering inconsistent colleges on those input variables thought to be predictive of stability, do colleges with consistent codes differ from "inconsistent" colleges in ways which would explain their assumed effects? This question includes three hypotheses which we have examined in the following analyses: are there any differences between consistent and inconsistent colleges?, are the obtained differences consistent with the theory, even though they were not anticipated in explicit fashion?, and what do the obtained differences imply about the specific nature of the student-college interaction?

Astin's *An Empirical Characterization of Higher Educational Institutions* (1962) provided 33 institutional attributes which had been factor-analyzed for a sample of 335 institutions and for five subgroups within this sample of institutions. The 18 variables used in the comparisons of "consistent"- "inconsistent" colleges included: type of college (liberal arts college, teachers college, technical

TABLE 23
CONSISTENCY OF COLLEGE CODES (EAT) AND INSTITUTIONAL CHARACTERISTICS

Institutional Characteristics	College Code (Males)				College Code (Females)			
	Con- sistent	Incon- sistent	χ^2	P	Con- sistent	Incon- sistent	χ^2	P
Homogeneity (EAT)	171 65	34 83	60.5 C = .383	<.001	72 33	8 34	29.7 C = .410	<.001
% Male	144 92	43 74	18.5	<.001	38 64	35 8	23.6	<.001
Private-Public	199 37	77 40	15.7	<.001	89 13	20 23	26.9	<.001
% Social (EAT)	99 137	75 42	15.6	<.001	43 59	29 14	7.7	<.01
% Intellectual (EAT)	131 105	50 67	5.1	<.05	64 38	10 33	18.9	<.001
% Realistic (EAT)	113 123	69 48	3.85	<.05	32 70	42 1	43.2	<.001
No. Major Fields	94 142	63 54	6.2	<.05	36 66	32 11	18.6	<.001
Liberal Arts	28 208	26 91	6.48	<.05	56 46	1 42	23.6	<.001
% Ph.D. Faculty	57 114	81 31	41.2	<.001	37 43	24 18		n.s.
Technical College	195 42	89 28		n.s.	32 68	40 3	44.5	<.001
Student Enrollment	115 121	63 54		n.s.	38 64	36 7	26.1	<.001
College Budget	135 101	48 67	7.4	<.01	42 60	29 13	9.2	<.01
% Artistic	127 109	65 52		n.s.	67 35	5 38	35.3	<.001
Teachers College	116 120	52 65		n.s.	30 72	33 10	27.6	<.001
% Enterprising (EAT)	110 126	70 47	5.5	<.05	59 43	15 28	6.4	<.05
Ph.D. Output	133 103	46 71	9.1	<.01	54 48	24 19		n.s.
Religious Affiliation	35 201	14 103		n.s.	28 74	4 39	5.8	<.05
% Conventional (EAT)	123 113	53 64	1.5	n.s.	50 52	22 19		n.s.

TABLE 24
INSTITUTIONAL CHARACTERISTICS AND STUDENT CHANGE IN MAJOR FIELD

Institutional Characteristic	Change in Major Field							
	Males				Females			
	No Change	Change	χ^2	P	No Change	Change	χ^2	P
% Enterprising (EAT)	91	92			30	44		
	114	56	10.8	~.001	34	37		n.s.
% Ph.D. Faculty	69	69			20	41		
	99	46	9.8	<.01	32	29	4.8	<.05
No Information	37	33			12	11		
Homogeneity (EAT)	140	83			32	34		
	87	73	2.73	<.10	47	36		n.s.
Budget	99	84			29	42		
	106	62	2.8	<.10	35	38		n.s.
No Information		2						n.s.

Note.—The following institutional attributes were not significantly related to student stability in major field: type of college (technical, liberal arts, teachers college, public-private, religious affiliation), enrollment, % male, % Realistic (EAT), % Intellectual (EAT), % Social (EAT), % Conventional (EAT), % Artistic (EAT), Ph.D. output, and No. major fields.

college; public or private control; religious affiliation), per cent of Ph.D.s on the faculty, total enrollment, per cent of males in college, budget (educational and general funds expressed as dollars per student), per cent of students in each of six major types (as measured by the EAT), Ph.D. output, number of major fields, and institutional homogeneity (the absolute difference between a college's highest and lowest percentage of majors in the six classes of the EAT). Table 23 presents the institutional variables which differentiate "consistent" from "inconsistent" colleges, arranged in approximate descending order of efficiency. Significance tests of the differences were computed with chi square by converting all data into 2×2 form. It is clear from Table 23 that the homogeneity of a college is positively and moderately associated with the consistency of the college ($C = .38$ and $.41$ for boys and girls). All the other institutional attributes have relatively small or negligible relationships with college consistency. A second analysis, shown in Table 24, was performed to identify those institutional attributes related to stability in major field. Parenthetically, it is important to note that the sheer number of major fields offered at an institution was not significantly related to change in field (Table 24). Neither this notion nor another popular explanation of change—that a student's initial degree of certainty about his vocational choice is related to stability—receives support. A comparison of Tables 23 and 24 reveals those institutional variables which are related both to change in major field and to institutional consistency. Only four of the 18 institutional characteristics are statistically significant

(10% level) in both analyses; and only three of these four variables discriminate changers from non-changers and consistent from inconsistent colleges in similar ways. Both consistency of the college code and stability of choice of major field are positively related to homogeneity. They are negatively related to the per cent of students with an Enterprising orientation and the per cent of faculty with the Ph.D., findings which suggest that these attributes of a college may be most conducive to change in major field.

The concept that homogeneity creates stability is a reasonable one: the homogeneous college is one in which one class of majors dominates a college because of its enrollment relative to the total; the particular class could be expected to have a larger faculty, more equipment, and higher status than other classes in the college. In a college dominated by majors in the sciences, for example, students might hesitate, rightly or wrongly, to change from science to fields which are less prestigious and attractive. Such a college might have an excellent science faculty and, by design or accident, a less competent or renowned arts faculty. The homogeneous college may generate considerable stability by virtue of its outstanding qualities—the virtual monopoly of particular fields on budget, faculty, equipment, space, and administrative support. Such concrete and obvious institutional attributes may be correlates of institutional homogeneity which account for stability.

The homogeneity hypothesis receives some rational and empirical support from Astin's factor analysis. The major variables which define his fifth factor, Homogeneity, are found to be associated with the consistency of college codes (Table 23): Homogeneity, Curricula Variety, and Enterprising orientation (Astin, 1962). Such similarities are helpful in suggesting hypotheses about the nature of institutional homogeneity, but the ambiguity of many single variables makes it hazardous to define exactly the nature of student-college interactions.

To see if consistent, as opposed to inconsistent, colleges have more two-digit codes including Realistic and Intellectual orientations—a possibility which would make the consistency hypothesis superfluous, two additional analyses were performed. Frequency distributions of the personal orientations represented in the two-digit codes for consistent and inconsistent colleges are almost identical and were not significantly different. In addition, consistent and inconsistent colleges with the same high-point code were compared for student stability in major field. In five of six comparisons, consistent college codes are associated with stability. The hypothesis that colleges with a consistent code exert a stabilizing influence seems then a tenable one.

The direction of change in major field.—The earlier analyses of stability (p. 560 ff.) provide useful information about differences between non-changers and changers, but not about *direction* of change. It would be useful not only

TABLE 25

THE RELATIONSHIP BETWEEN THE INITIAL AND FINAL CHOICES OF MAJOR FIELD FOR MEN (REANALYZED FROM IFFERT, 1958, TABLE 28, P. 56)

First Choice	N	Second Choice						Other
		1. Real	2. Int	3. Soc	4. Conv	5. Ent	6. Art	
1. Realistic	1191	713	102	23	23	93	11	226
%		59.8	8.6	1.9	1.9	7.8	.9	18.9
2. Intellectual	1002	139	464	21	17	86	30	245
%		13.9	46.3	2.1	1.7	8.6	3.0	24.5
3. Social	126	11	12	42	2	22	6	31
%		8.8	9.6	33.3	1.6	17.5	4.8	24.6
4. Conventional	217	11	7	4	79	88	2	26
%		5.1	3.3	1.8	36.4	40.5	.9	12.0
5. Enterprising	786	52	28	26	52	380	19	229
%		6.6	3.5	3.3	6.6	48.4	2.4	29.2
6. Artistic	113	2	11	1	1	28	28	42
%		1.8	9.8	.9	.9	24.8	24.8	37.2

Note.—Iffert's presentation was field by field. In the present table his fields were classified as belonging to one of the six classes in the theory and summarized. Italics indicate congruency of first and second choices.

to distinguish changers from non-changers, but also to predict the direction in which changers move and to learn if changers are more like the students in their second choices of field than they are like students in their fields of first choice. Such information would be of practical and theoretical value, since stability in major field may be a segment of the life history which can serve as a model for studying vocational histories and achievement after college.

Tables 8 and 9 (see p. 559 ff.), which were constructed to show the predictive value of a student's expressed choice, also show that the relationship between the first and final choice is not random. The student who changes field (moves from one type to another) tends to move to a related field. For example, students with initial Realistic choices, if they change, tend to make Intellectual choices most frequently; first choices of Intellectual tend to be followed by choices of Realistic. The remaining trends are less obvious because of smaller *N*s in the other four kinds of possible choice. These results may occur also because of the base rates associated with various fields, including movement in and out of each field.

Fortunately, Iffert (1958) has provided similar information about students' movement from field to field (Tables 28 and 29) for a relatively unselected sample. The reclassification of Iffert's tables, using the present classification scheme, resulted in Tables 25 and 26. In this new form, Iffert's data show again the movement from one kind of major field to a correlated class. The Iffert data, in contrast to our own, yield more explicit and theoretically meaning-

ful relationships. For boys, Realistic majors, if they change, change to Intellectual, and (less frequently) Enterprising fields; Intellectual choices are followed by Realistic choices; Social by Enterprising choices; Conventional by Enterprising choices; Enterprising by Conventional and Realistic choices; and Artistic by Enterprising and Intellectual choices.

Iffert's data for girls show a somewhat different set of migrations than those for boys. Girls with Realistic first choices tend to change to Artistic and Social fields; first choices of Intellectual fields are also followed by Social and Artistic choices. Girls with Social first choices tend to move to Artistic fields; Conventional choices are followed by Social choices; Enterprising choices are followed by Social and Artistic choices; and Artistic choices tend to be followed by Social choices.

Iffert's data are also interesting since they reproduce some other findings in the present study. In the case of boys, note that the average stability of the

TABLE 26
THE RELATIONSHIP BETWEEN THE INITIAL AND FINAL CHOICES OF MAJOR FIELD FOR WOMEN (REANALYZED FROM IFFERT, 1958, TABLE 29, P. 58)

First Choice	N	Second Choice						Other
		1. Real	2. Int	3. Soc	4. Conv	5. Int	6. Art	
1. Realistic	130	71	1	15	4	5	16	18
%		<i>54.6</i>	.8	11.6	3.1	3.8	12.4	13.8
2. Intellectual	141	5	34	31	5	11	19	36
%		3.6	<i>24.1</i>	22.0	3.6	7.8	13.6	25.5
3. Social	943	12	9	597	25	42	134	125
%		1.3	1.0	63.3	2.7	4.5	14.2	13.3
4. Conventional	329	7	4	49	196	21	28	24
%		2.1	1.2	14.8	<i>59.6</i>	6.4	8.5	7.3
5. Enterprising	287	6	4	48	13	116	46	54
%		2.1	1.4	16.7	4.6	<i>40.4</i>	16.1	18.8
6. Artistic	982	17	20	152	34	60	561	138
%		1.7	2.1	15.5	3.5	6.1	<i>57.1</i>	14.1

Note.—Italics indicate congruency of first and second choices.

Realistic and Intellectual classes is greater than that of the remaining four classes. Note too that the Realistic class is the most stable and that the Social class is the least stable (cf. with Tables 8, 9, 10, and 11 in this report).

These analyses (Tables 8, 9, 25, and 26 of this report) make it reasonably clear that the direction of change is not a random phenomenon. To discover if it is possible to predict the direction of choice, that is, to determine which of five classes the changer will select, the changer's Strong high-point code was compared with the major class to which he moved (Table 27). Table 27

TABLE 27
CONGRUENCY OF CHOICE OF FIELD AND STRONG HIGH-POINT CODE AND ITS
RELATION TO STUDENT STABILITY OF CHOICE

Strong High-Point Code	Realistic Majors (First Choice)								
	No Change		Changers to						
	% C ₁	% C ₁	% C ₂₋₆	2 Int	3 Soc	4 Conv	5 Ent	6 Art	
1. Realistic	18	41.9	28.1	21.9	2	2	5		
2. Intellectual	11				4			1	1
3. Social	2				1				1
4. Conventional	4				1		2	2	
5. Enterprising	2					1			1
6. Artistic	6				4	2	1	1	1
N	43				12	4	8	4	4
	Intellectual Majors (First Choice)								
	C ₂		C ₂	C _{1, 3-6}	1 Real	3 Soc	4 Conv	5 Ent	6 Art
1. Realistic	10							1	1
2. Intellectual	29	36.3	25.0	33.3	1	3		1	1
3. Social	5								
4. Conventional	7				2	1	2		
5. Enterprising	1				1				
6. Artistic	28					2		2	6
N	80				4	6	2	4	8
	Social Majors (First Choice)								
	C ₃		C ₃	C _{1, 4-6}	1 Real	2 Int	4 Conv	5 Ent	6 Art
1. Realistic					1				1
2. Intellectual									
3. Social	3	37.5	15.4	30.8					2
4. Conventional						1			
5. Enterprising									
6. Artistic	5					5			3
N	8				1	6			6
	Conventional Majors (First Choice)								
	% C ₁		% C ₁	% C _{1-3, 5-6}	1 Real	2 Int	3 Soc	5 Ent	6 Art
1. Realistic									
2. Intellectual									
3. Social					1			1	1
4. Conventional	1	100.0	14.3	28.6				1	
5. Enterprising								1	
6. Artistic								1	1
N	1				1			4	2

(continued next page)

TABLE 27 (cont'd)
CONGRUENCY OF CHOICE OF FIELD AND STRONG HIGH-POINT CODE AND ITS
RELATION TO STUDENT STABILITY OF CHOICE

		Enterprising Majors (First Choice)							
		C ₅	C ₆	C _{1-4, a}	1 Real	2 Int	3 Soc	4 Conv	6 Art
1. Realistic	1								
2. Intellectual								1	
3. Social	4					1	1	1	3
4. Conventional	2								
5. Enterprising		0.0	20.0	20.0				1	1
6. Artistic	1								1
N	8					1	1	3	5

		Artistic Majors (First Choice)							
		C ₀	C ₆	C ₁₋₅	1 Real	2 Int	3 Soc	4 Conv	5 Ent
1. Realistic									
2. Intellectual	1								
3. Social	3								1
4. Conventional	2								
5. Enterprising									
6. Artistic	6	50.0	66.6	0.0			1		1
N	12						1		2

	Totals		
	Non-Changers	Changers	
	% Congruent with First Major	% with Codes Congruent with NC Codes	% with Codes Congruent with Second Choice
Males (N = 241)	37.5	24.71	25.84
Females (N = 74)	29.27	15.12	45.45

suggests that changers move to the field (type) represented by their high-point code. For example, Realistic majors with a high-point on Intellectual (Strong Physicist Scale) move to a major field of the Intellectual type. The percentage of correct hits for all changers is 25.84%, a percentage which exceeds significantly the expected percentage of 16.7 ($P < .05$).

The data in Table 27 for boys and girls also support the major hypothesis in the theory: namely, that students move toward those major fields whose members they resemble and away from those groups of students from whom they differ.

Of the male non-changers, 37.5% have high-point codes which are congruent with their first choice of major field, whereas only 24.7% of the changers have congruent high-point codes. The changers do not, however, move to fields which are more congruent with their high-point codes than were their first

choices. The findings for girls are similar to those for boys, although the *N*s are relatively small. Among non-changers, 29.3% have congruent Strong codes and major fields, only 15.1% of the changers have congruent first fields and codes, and 45.5% of the changers move to fields which are congruent with their Strong codes. The findings for girls closely approximate our expectations: the Strong codes of non-changers are more congruent with their first choice of major field than those of changers. In addition, the changer tends to move to a field whose members she more closely resembles.

The trends in the data for men and women (see the bottom of Table 27) are interesting since they are correlated with the amount of change among women and men. Of the six possible comparisons in the "totals" section at the bottom of Table 27, five are significant (at the .20, .10, .10, .10, and .01 levels). Men change field much less frequently than women do and their initial choices are more likely to be congruent with their high-point codes. At the same time, women show more congruency between their second choices and their Strong codes than men do. It is as if men make "better" first choices of field; while women take longer (need a second choice) in order to achieve congruency between choice and Strong code.

Student Achievement and Originality

The first statement of the theory was concerned with achievement only insofar as level of vocational choice represents a kind of level of aspiration. However, the first empirical study in this series suggested that the high-point codes are useful for predicting leadership, and artistic and scientific achievement in high school and college (Holland, 1962), and that the model orientations and their patterning are applicable to and predictive of a broader range of behaviors than had been anticipated. The exploration of this possibility has been continued in this section.

Personal Orientations and Achievement

In the questionnaire given at the end of the senior year, students were asked to indicate their achievements in leadership, arts, and science. The following items taken from this form comprise the performance or achievement scales:

Leadership

1. Elected to one or more student offices. Circle appropriate number: 1 2 3 4
5 6 7 8 9 or more.
2. Initiated a business enterprise of any kind. Explain.
3. Initiated a student or social organization of any kind. Explain.
4. Received an award or special recognition for leadership of any kind. Explain.

Scientific Achievement

1. Received a research grant or National Science Foundation Fellowship. If grant, indicate nature.

2. Received a prize or award for scientific paper or project.
3. Gave an original paper at a scientific or professional meeting sponsored by a professional society or association. Name of society or association.
4. Had scientific or scholarly paper published (or in press) in a scientific or professional journal. Give complete reference here if published.
5. Invented a patentable device. If yes, indicate briefly its nature.
6. Constructed an original piece of scientific apparatus. Describe briefly.

Artistic Achievement

1. Won one or more speech or debate contests.
2. Had minor roles or leads in plays not produced by a college or university. Give name of organization producing play.
3. Was regular performer on radio or TV program.
4. Won prize or award in a musical competition as a performer.
5. Composed music which has been given at least one public performance.
6. Arranged music for public performance.
7. Had one or more musical publications.
8. Performed with a professional orchestra.
9. Gave public recital (not collegiate).
10. Received a literary award or prize for creative writing (poem, novel, play, etc.).

It was hypothesized that leadership in college will be positively associated with the Social and Enterprising orientations; scientific achievement will be associated with the Intellectual orientation and to a lesser degree with the Realistic orientation; and artistic achievement will be associated with the Artistic orientation and to a lesser extent with the Enterprising orientation. Table 28 shows the relationships between the personal orientations and the three criteria of achievement. The correlations support the hypotheses with a few exceptions: for girls, scientific achievement is correlated about equally with the Intellectual and the Conventional orientations and artistic achievement is correlated about equally with the Enterprising and the Artistic orientations. In the case of boys, artistic achievement is positively and significantly associated with the Enterprising orientation but not with the Artistic orientation. The results in Table 28 are similar to those obtained earlier (Holland, 1962; cf. Table 21).

TABLE 28
CORRELATIONS OF THE STUDENTS' PERSONAL ORIENTATIONS WITH THEIR
UNDERGRADUATE ACHIEVEMENT (MALES = 369, FEMALES = 154)

Achievement	1. Real		2. Int		3. Soc		4. Conv		5. Ent		6. Art	
	M	F	M	F	M	F	M	F	M	F	M	F
Leadership	-.03	-.06	-.16	-.13	.13	.15	-.02	.18	.15	.08	-.08	-.09
Science	.16	-.01	.18	.14	-.17	-.02	-.05	.21	-.09	-.04	.07	.01
Arts	-.25	-.09	-.21	-.17	.14	.17	-.06	-.20	.20	.18	.07	.18

Note.—For males, $r_{us} = .10$; for females, $r_{us} = .16$. Decimals omitted.

At the end of the senior year students were asked to respond to the following item; their responses were coded by an experienced scorer as either "original" or "unoriginal."

Select one of the following problems to comment on. Do not discuss more than one problem. Interpret and respond to the item in any way you wish.

1. What kind of scientific apparatus do you think we are in greatest need of? Do you have any ideas about how it should be constructed or how a solution might occur?

2. What scientific problem do you consider to be important and of special interest to you? Do you have any notions about how this problem might be solved?

3. What do you think is education's most acute problem? What kind of solutions do you envision?

4. What do you consider to be modern business's most difficult problem? How would you propose to solve this problem?

5. What do you think is our greatest problem in political leadership in the United States? What constructive action do you think is possible and desirable?

6. What innovations in the arts do you think may occur in the future?

Responses to this item were coded and related to the Strong high-point codes in a 2×6 table (Table 29). There are two hypotheses involved here: that codes and responses are not independent of one another, and that original

TABLE 29
PREDICTION OF ORIGINAL RESPONSES TO SIX HYPOTHETICAL QUESTIONS FROM
STRONG HIGH-POINT CODES (MALES)

Responses	Strong HP Codes					
	1. Real	2. Int	3. Soc	4. Conv	5. Ent	6. Art
Non-original	33	43	25	26	8	53
Original	6	6	10	1	1	19
<i>N</i>	39	49	35	27	9	72

Note.— $\chi^2 = 11.06$, $df = 5$, $P \sim .05$.

responses will be related more frequently to the Artistic and Intellectual orientations and less frequently to the Realistic, Conventional, Social and Enterprising orientations. The chi square indicated that the students' responses to this item were not independent of student "originality" ($\chi^2 = 11.06$, $df = 5$, $P \sim .05$).

The relatively large number of original responses for the Realistic and Social orientations is clearly contrary to our hypothesis. Nevertheless, if we take into account the effects which varying college experiences, test-taking attitudes, different rates of personal development, unsupervised mail assessments, etc. may have on the student's response to this question, it is surprising that we find any relationships at all over this four-year period. The finding that original responses are related most frequently to the Artistic orientation is consistent with past work (MacKinnon, 1960; Barron, n.d.⁸) and with other analyses in the present report (see self-ratings of originality and scores on originality tests and their r s with the Artistic orientation in Table 3).

Institutional influences and achievement.—The effects of undergraduate colleges on student achievement were studied by examining the relationship between congruency (of student-college orientations) and achievement, and by comparing the achievement of students attending congruent and incongruent colleges and having appropriate and inappropriate Strong codes. The hypotheses tested in these analyses are similar to those relating to change in goals: congruency of student and college codes will be positively associated with achievement as well as change. Students who have appropriate codes for a given kind of achievement and who attend colleges with congruent codes will achieve more than students with inappropriate codes at incongruent colleges.

Since differences in student achievement at various colleges may reflect differences in initial talent supplies, several control comparisons were made. Students entering consistent colleges have as much potential for achievement—as defined by SAT-V, SAT-M, achievements in high school, originality scales, etc.—as students entering inconsistent colleges. Similarly, no differences were found between students of the same type entering different colleges; that is,

TABLE 30
ARTISTIC ACHIEVEMENT AND ITS RELATION TO THE CONGRUENCE OF STUDENT AND COLLEGE CODES (MALES)

College High-Point Code	Student High-Point Code (Strong)						N
	1. Real	2. Int	3. Soc	4. Conv	5. Ent	6. Art	
1. Realistic							
Achievers*	11	8	5	4	1	18	47
Total Students	18	23	7	4	3	22	77
2. Intellectual							
Achievers	4	4	0	2	2	0	12
Total Students	7	7	1	3	2	4	24
3. Social							
Achievers	2	2	6	2		11	23
Total Students	5	8	8	4		14	39
4. Conventional							
Achievers	3	4	8	6	0	13	34
Total Students	8	10	14	9	2	22	65
5. Enterprising							
Achievers	0	1	3	1	0	5	10
Total Students	2	1	5	1	1	10	20
6. Artistic							
Achievers		1	0	2	0	5	8
Total Students		3	1	2	1	5	12
Total N	40	52	36	23	9	77	237

Note.—66.7% of the students with *congruent* college and Strong codes have one or more artistic achievements in college. 54% of the students with *incongruent* codes have artistic achievements ($\chi^2 = 2.51, P < .15$). Italics indicate congruency of student-college codes.

*The number of students with one or more achievements on a checklist of outstanding achievements in the arts, winning public recognition and awards, having their work published, etc.

TABLE 31
LEADERSHIP AND ITS RELATION TO THE CONGRUENCE OF STUDENT AND
COLLEGE CODES (MALES)

College Code	Strong HP Code						N
	1. Real	2. Int	3. Soc	4. Conv	5. Ent	6. Art	
1. Realistic Leaders*	14	15	5	3	3	16	56
Total Students	18	23	7	4	3	22	77
2. Intellectual Leaders	3	6	1	1	2	1	14
Total Students	7	7	1	3	2	4	24
3. Social Leaders	1	4	5	3	0	10	23
Total Students	5	8	8	4	0	14	39
4. Conventional Leaders	6	0	9	8	2	11	36
Total Students	8	10	15	9	2	22	66
5. Enterprising Leaders	0	1	3	0	0	9	13
Total Students	2	1	5	1	1	10	20
6. Artistic Leaders		2	1	0	1	5	9
Total Students		3	1	2	1	5	12
Total N	40	52	37	23	9	77	238

Note.—79.2% of the students with *congruent* college and Strong codes have been elected to one or more positions of leadership. 59.5% of the students with *incongruent* codes have been elected to student offices ($\chi^2 = 3.85$, $P < .05$). Italics indicate congruency of student-college codes.

*Number of students elected to one or more positions of leadership.

Intellectual students entering colleges categorized as Intellectual are not significantly different with respect to their potential for achievement from Intellectual students entering incongruent colleges. These analyses and those for the study of stability of choice suggest that, if two groups have similar distributions of personal orientations (codes), they tend to be similar on an extensive range of intellectual and personal variables.

Tables 30 and 31 show the relationships of student-college congruency to artistic achievement and social achievement (election to student offices) in college.

For boys, artistic achievement (Table 30) is greater when student-college codes are congruent than when they are not (66.7% as opposed to 54.0%; $\chi^2 = 2.51$, $df = 231$, $P < .15$); leadership (Table 31) too is related to the congruency of student-college codes, 79.2% as opposed to 59.5% ($P < .05$). The same analyses for girls and for scientific achievement for boys and girls were not statistically significant.

To see if the use of multiple categories would improve the prediction of

TABLE 32
ARTISTIC ACHIEVEMENT OF STUDENTS WITH CONGRUENT AND INCONGRUENT
COLLEGES AND APPROPRIATE AND INAPPROPRIATE STRONG CODES (MALES, 229)

Artistic Achievement	Student-College Congruency			
	Congruent Strong Code		Incongruent Strong Code	
	Appropriate 3-6	Inappropriate 1-2	Appropriate 3-6	Inappropriate 1-2
Low	8	18	65	53
High	12	7	54	12
χ^2	3.4		12.1	
P	<.10		<.001	

achievement, students were classified as attending congruent or incongruent colleges and as having appropriate personal orientations for the three kinds of achievements. The achievements of the student groups formed by these classifications were then examined. Only two of the resulting six analyses were statistically significant; and they are presented in Tables 32 and 33. Table 32, for boys, indicates that attending a congruent college and having an appropriate personal orientation is more conducive to artistic achievement than having an inappropriate code and attending an incongruent college.

A similar analysis for leadership in college is shown in Table 33. Again, having an appropriate orientation and attending a congruent college are more conducive to achievement.

The three criteria of achievement were also related to consistent and inconsistent college codes (Table 34), and to student and college consistent and inconsistent codes (Table 35). The hypothesis is that personal and institutional consistency make for achievement. Only two of 12 analyses were significant—scientific achievement for women (Tables 34 and 35). Consistency of college code is significantly and positively related to achievement in science for women. When personal consistency (as measured by the Strong two-digit codes) and college consistency are taken together (Table 35), there is no increase in the

TABLE 33
SOCIAL ACHIEVEMENT (LEADERSHIP) OF 229 MALES WITH APPROPRIATE AND
INAPPROPRIATE STRONG CODES IN CONGRUENT AND INCONGRUENT COLLEGES

Leadership	Student-College Congruency			
	Congruent Strong Code		Incongruent Strong Code	
	Appropriate 3, 5	Inappropriate 1, 2, 4, 6	Appropriate 3, 5	Inappropriate 1, 2, 4, 6
Low	3	6	12	87
High	5	31	22	63
χ^2	.77		4.9	
P	n.s.		<.05	

TABLE 34
SCIENTIFIC ACHIEVEMENT FOR FEMALES IN CONSISTENT AND
INCONSISTENT COLLEGE ENVIRONMENTS ($N = 143$)

Science Achievement	College Code		χ^2	P
	Consistent	Inconsistent		
High	19	3	5.20	<.05
Low	74	47		

relationship between consistency and achievement. These particular results (Tables 34 and 35) are inconclusive because most of the results are insignificant, and because the compounding of student and college consistency in Table 35 fails to show a gain in predictive efficiency.

TABLE 35
SCIENTIFIC ACHIEVEMENT FOR FEMALES WITH CONSISTENT AND INCONSISTENT
CODES IN COLLEGES WITH CONSISTENT AND INCONSISTENT CODES ($N = 143$)

Student Code	College Code		χ^2	P
	Consistent	Inconsistent		
Consistent			4.39	<.05
High Achievement	16	2		
Low Achievement	69	39		
Inconsistent			n.s.	n.s.
High Achievement	3	1		
Low Achievement	5	8		

Relationships Among Personal Types, Their Definitions, and Behavior

Several indirect and direct comparisons seem to justify the assumption that the scales selected from the SVIB measure student attributes similar to those measured by the VPI used earlier (Holland, 1962). In general, predictions made from these inventories and their correlates are similar. There are only slight differences between the predictions made from the VPI over one- and two-year periods and those made from the SVIB over a four-year period. Since the time periods for these comparisons are not identical, a comparison of the concurrent validities of the VPI and the SVIB was made, with the results reported in Table 36. Although the differences in this table favor the VPI, these differences may occur simply because of different normative populations and because the sample which was given the Strong has a more homogeneous set of vocational choices and major fields.

To find if the Strong and VPI codes are significantly and appropriately related to one another over a four-year period, the students were asked, at the end of the senior year in college, to rank-order six groups of five occupational

TABLE 36
CONCURRENT VALIDITIES OF SIX VPI AND SIX STRONG SCALES FOR THE
PREDICTION OF MAJOR FIELD AND VOCATIONAL CHOICE

	Vocational Choice				Major Field			
	Males		Females		Males		Females	
	N	%	N	%	N	%	N	%
VPI	780	48.0	402	35.1	790	45.0	410	36.7
Strong	247	30.8	88	20.6	244	32.8	97	25.0

Note.—Per cents indicate the percentage of hits obtained from high-point codes when student choices are classified in one of six categories.

titles, each group representing one of the six VPI scales. This information made it possible to relate Strong codes to crude revisions of the VPI high-point codes. Table 37 reveals that 36.6 and 38.0% of the Strong and VPI codes are in agreement; that is, they predict one another over a four-year period with moderate efficiency.

TABLE 37
RELATIONSHIPS BETWEEN STRONG AND VPI CODES FOR A FOUR-YEAR INTERVAL

VPI HP Code	Strong HP Code											
	Real		Int		Soc		Conv		Ent		Art	
	M	F	M	F	M	F	M	F	M	F	M	F
1. Realistic	12		11				3		1		2	
2. Intellectual	14	2	34	7	10	1	7	1	1		40	30
3. Social	3		2		12	4	1	3			14	14
4. Conventional	2				2		5	2			1	1
5. Enterprising	7		4		2	1	8	1	5		4	2
6. Artistic	2		4	1	7	2	3		1	3	22	25
Total	40	2	55	8	33	8	27	7	8	3	83	72

Note.—For this analysis, only 5-item VPI scales, rank-ordered from 1 to 6, were used rather than the full scales of 16 to 21 items. *Ns* for males = 246, females = 100.

The significance of these results is that it is possible to assess the student's personal orientations by at least two different sets of operations and obtain similar predictions about choice and achievement. In addition, the operational definitions of the personal orientations (VPI and SVIB codes) are directly related to one another. It is not necessary, then, to limit oneself to one particular test in order to define the personal orientations. On the contrary it seems desirable to extend the scope of the theory by using other related measures to define the personal orientations (for example, selected scales of the Kuder Preference Record) to learn if they yield similar predictions. Such variations in definition are helpful too in eliminating chance variations among *Ss*, ques-

tionnaires, college experience, and similar instrumental and experimental effects.

These results (the comparability of the Strong and VPI, and the similarity of the predictions made from these inventories) are also important in conjunction with the results of both monographs and with evidence about the reliability of the Strong and VPI. In effect, the evidence suggests that two definitions of the constructs and various behaviors assumed to reflect these constructs (choice of major field and vocation, stability of choice, achievement)

TABLE 38
INTERCORRELATIONS BETWEEN PERSONAL TYPES, THEIR DEFINITIONS, AND BEHAVIOR

	Model Type I		
	Definition ₁ (HVPI)	Definition ₂ (Strong)	Behavior (Choice, Stability of Choice, Achievement, Self-Ratings, Test Scores)
Definition ₁	+ <i>r</i> (Retest <i>r</i>)	+ <i>r</i>	+ <i>r</i>
Definition ₂	+ <i>r</i>	+ <i>r</i> (Retest <i>r</i>)	+ <i>r</i>
Behavior	+ <i>r</i>	+ <i>r</i>	+ <i>r</i> (Correlation between high school and college)

are all positively intercorrelated over time. Table 38 summarizes this matrix of positive relationships for a single personal type. This nomological net lends support to the hypothesis that the constructs which have guided the present studies have validity. That is, we can assume with some confidence that each of the constructs (Realistic, Intellectual, Social, Conventional, Enterprising, and Artistic) accounts for the covariance in Table 38. A failure to obtain this positive matrix of relationships would seriously weaken our confidence in the usefulness of the theory and the research done in connection with it.

DISCUSSION

The present monograph suffers from many of the same limitations as the original statement of the theory. First, the ambiguous portions of the original statement do not permit a rigorous testing of most of the hypotheses; many of the findings can probably be used in reformulating the theory. On the other hand, the major hypotheses about the model orientations and motivation to achieve appear to be helpful for organizing our knowledge about vocational choice and personal achievement. Second, the person's high-point code on the Strong or the VPI is at best a crude index for classifying him, since it uses only a small part of the total information in a profile. Slight errors in measurement from scale to scale probably result in some gross misclassifications. Third, the

homogeneity of the student sample limits the degree of differentiation and the size of the obtained correlations. The Conventional and Enterprising orientations, for example, are poorly represented in the present samples. More efficient discriminations could probably be made if more diverse samples of students and employed adults were used. Fourth, the high aptitude level of the sample makes it difficult to generalize the findings to lower aptitude levels, although the Iffert data (Tables 25 and 26) imply that similar results would be obtained for relatively representative samples of college students. Finally, the apparent student-college interactions are especially hazardous to interpret even though input measures reveal no differences. At present, we have no exact body of knowledge about what determines the likelihood of or potential for change, and so must apply controls in a common-sense way. We have found that, contrary to popular opinion, degree of initial uncertainty about vocational choice is not significantly related to change in vocational choice. Potential for change may be a function of some unknown variable or variables rather than of our present control variables (initial choice of major field, Strong high-point code, initial degree of certainty about choice, etc.). Similar difficulties occur when we attempt to discover those aspects of the college which contribute to the student's change of major or his achievement. The selected variables used in the present study to define the college environment represent only a crude and overly simple solution to the problem of characterizing such a complex, amorphous physical and socio-psychological organization. Again, we have little prior knowledge which will enable us to say confidently that we have assessed the variables most relevant to our present purposes.

These qualifications are not to say that our findings are without value—many are in fact replications of earlier work—but rather to indicate the need for further replications. We need to investigate more fully potential for change and achievement, and the nature of the college environment before we can attribute change and achievement to specific personal or institutional factors.

Some of the results lend support to broad hypotheses presented in earlier work, most of which is summarized in the recent monographs by Super, Crites, Hummel, Moser, Overstreet, and Warnath (1957), Super and Bachrach (1957), and in the books by Darley and Hagenah (1955), Roe (1956), Strong (1943), and Super (1957). That "occupational choice and occupational interests reflect . . . the value systems, the needs, and the motivations of individuals" (Darley & Hagenah, 1955, p. 191) and that vocational choice is in many respects "the implementation of a self-concept" (Super, *et al.*, 1957) are ideas supported by the present study. However, whether or not the results support other less general hypotheses is unclear, since much of this earlier work does not indicate *how* to make explicit predictions of vocational choice.

Congruencies between the findings in this report and more recent work

are easier to find. When the occupational images obtained by Beardslee and O'Dowd (1960) were categorized in terms of the classification used in the present study, considerable agreement was found between students' images of occupations and the attributes of students with similar vocational preferences (cf. Beardslee & O'Dowd, pp. 32-41, and Tables 3, 7, and 11 of this report and the Summary of Results in the first monograph). Similarly, some of the work of Tiedeman and his students appears consistent with the present report. For example, Kilbrick and Tiedeman's (1961) finding that "perservation of interest in nursing was largely related to the amount of consistency originally existing between a student's and her superiors' conception of the nurse and of her role" appears to illustrate the congruency of student and environment, and the stability associated with such an interaction. Another report by Walston (1959)¹¹ illustrates that students' self-images are related to their major field in college. Earlier studies by Stern, Stein, and Bloom (1956) reveal that the students whose attributes live up to the expectations of the faculty are more apt to have high academic achievement.

Perhaps the clearest support for the hypothesis that the dominant major fields at a college affect career plans is found in a recent study of a representative sample of 34,000 college seniors by Davis and Bradburn (1961): ". . . the presence of a large number of fellow students with a given career preference or a given level of educational aspiration tends to pull the remaining students toward the majority." Their results also show the differential stability among students in different fields and the movement to related fields found in the present report.

The relationship of the Strong scales to achievement (leadership, arts, and science) and to originality scales (Barron Originality, Complexity-Simplicity) is consistent with the results obtained in the first monograph in which the Vocational Preference Inventory (VPI) was used as a means of assessing the six personal orientations. Barron (n.d.)⁸, Gough (1957)⁷, and MacKinnon (1960) report similar relationships between Strong scales and achievement and originality scales.

In general, the major hypotheses tested in the first monograph and retested in this one are supported by the findings. The self-ratings, achievements, and scores on aptitude measures and originality scales associated with the different personal orientations are similar to the results obtained earlier. The prediction of vocational choice and major field using six selected Strong scales for a four-year period parallel the results obtained earlier with six VPI scales for one- and two-year intervals. Similarly, stability in vocational choice and major field appears to be primarily a function of the Intellectual and Realistic personal

¹¹Watson, E. B. The autobiography in the prediction of college field of concentration. Unpublished manuscript, 1959.

orientations, as assessed by either the Strong or the VPI. In both studies, stability of vocational choice is related to congruent student-college codes, even though colleges and students were assessed by *different methods in the two investigations* and over different time intervals.

Of special interest, the relationships among a student's first three expressed choices of vocation on admission to college (Holland, 1962; Tables I-N) are similar to the patterns of change in choice of vocation and major field over a four-year period (see Tables 8 and 9, p. 559 *ff* of this report). For example, students whose first choice at entrance falls in the Realistic class tend to have second and third choices in the same class or in a related class, the Intellectual class in this instance. In the present study, students choosing a Realistic occupation or major at entrance to college tend to have either a Realistic or an Intellectual choice at graduation. These findings lend additional support to the notion that expressed choices are useful predictors and are not to be deprecated because of their low relationships with interest inventories. On the contrary, such responses appear both ordered and efficient. The construction of new questionnaire items which consist of more extensive lists of occupations, and more thorough analysis of the significance of such items, are called for.

The major difference between the results of the first study and the results of the present monograph is that, in the first report, change in major field was positively related to attendance at Type 3 (Social) institutions. In the present report, similar analyses (which are not presented) failed to replicate these results. These conflicting findings are mitigated to some extent by several differences in procedure—the first report used a different method for assessing both students and colleges—and by other findings in this report. The results in Tables 23 and 24 reveal that in colleges which are dominated by Social (Type 3) and Enterprising (Type 5, a type closely related psychologically to Type 3) people, students tend to change their vocational plans. These results suggest that the different findings may be due in part to different methods rather than to a difference in substantive findings.

The significance of the results, especially when they are considered in conjunction with the first report, is as follows. Most important, perhaps, is the scope of the theory: it can be applied to a variety of phenomena (choice, change, achievement, college environments) under varying conditions and still provide relatively consistent predictions. The model personal orientations, for example, can be defined for experimental purposes by selected scales of the Strong, of the Vocational Preference Inventory, or by choice of major field or vocation. All four techniques for assessing personal orientations have yielded comparable results, and can be integrated by using six lists of occupational titles (six scales of the VPI) as approximate, coordinating definitions. These definitions permit the use of a variety of assessment techniques so that the model orientations are not literally equivalent to the VPI scales.

The use of criterion lists as approximate definitions of the model personal orientations has a number of unanticipated advantages: (1) We can describe social environments with the same terms that we use to describe individuals, a method which facilitates the execution and interpretation of person-environment interaction studies. Without any theoretical guides, such studies become inordinately complex and difficult to interpret. This method also provides a way of estimating the degree of stress inherent in various interactions and their outcomes suggested earlier by Sanford (1962). For example, minimal stress would be expected from congruent student-college interactions and maximum stress from interactions such as the following: the Realistic student in an Artistic college, the Conventional student in an Intellectual college, the Social student in a Realistic college, etc. (2) Vocational histories and achievement can be investigated in the same way that we study initial choice, choice of major field, and change in major field or vocational choice in college. For example, vocational histories can be analyzed for any desired time interval by classifying each job held within the specified time interval, using the criterion lists (VPI keys). "Stability," in this case, means holding jobs in the same class; "instability" means movement from one class to another. Within a single class, jobs per unit of time, a familiar dimension, becomes another dimension for assessing stability. The distinction between inter- and intra-class movement will help to distinguish major from minor changes which are often confounded in the use of jobs per unit of time alone. (3) The present occupational classification scheme or some other classification scheme, Fine's (1955) or Roe's classification (1956), for example, allows us to classify choices and occupations so we can study the process of choice, development, and vocational achievements without encountering prohibitive research problems. The alternative method, the study of individual choices and occupations, requires enormous samples and limits research to occupations with large memberships. Finally, we may be able to study a person's vocational history by coding the person and his work environment for each successive position and work environment using the same procedures described earlier. Thus the theory would encompass a great variety of vocational behaviors over a long time span.

Since most of the analyses for women in this second report proved to be ambiguous, it is clear that the theory needs to be extended to account for the vocational choice and achievement of women. A revision of the model formulations for women, a re-examination of the present findings, and studies of new female samples are indicated.

Similarly, the theory itself needs to be reformulated in more explicit terms. These preliminary reports were useful for locating the strengths and weaknesses of the first formulations. Other tests of hypotheses from the theory by Stockin (1961) and Schutz and Blocher (1961) are also useful. Both reports reveal

that the suggested formula for predicting level of choice has validity. In the Stockin thesis, the use of the model orientations was only partially successful.

A restatement is desirable, since the first model formulations—the basis for the theory—were incomplete, ambiguous, and inadequately defined, except implicitly by coded interest inventories. A restatement would also help to give more adequate form to the present evidence and to encourage more thorough examination of the theory's hypotheses and scope.

CONCLUSIONS

The scope of a theory of vocational choice has been explored by testing some hypotheses derived from its major formulations: the six model orientations and their attributes. In accordance with the first statement of the theory, scores on six interest scales from the Strong were used to represent the personal orientations of large national samples of high school seniors of superior scholastic aptitude. The students' profiles were then coded and classified so that information about their backgrounds, aptitudes, self-ratings, personal traits, originality, career choices, and college achievements could be related to each of the six codes. In this way, it was possible to test whether or not the six personal orientations were significantly different and whether the characteristics of each of the six types are consistent with the model orientation originally attributed to them.

The theory was extended by characterizing environments (colleges in this instance) in the same terms (the degree to which a college resembles each of the six model orientations) that we used to characterize students. The Environmental Assessment Technique (EAT) was used for this purpose. This coding of colleges and students made possible the study of achievement (leadership, science, arts) and stability of vocational choice and major field for different kinds of students in different kinds of colleges.

In general, the results support selected hypotheses in the theory. These results, and some incidental findings, are summarized in the following paragraphs.

1. Students with different dominant personal orientations (defined by their high-point scale from the SVIB) have significantly different attributes, including scholastic aptitude, self-concepts (*ratings*), personal traits, originality, daydreams, college majors, career choices, preferred roles, and achievements.

2. The attributes of students with a given dominant personal orientation generally correspond to the attributes hypothesized for the corresponding model orientation. However, because the model orientations in the original statement of the theory are not fully formulated, no precise tests of these relationships were made.

3. The "direction of vocational choice" is significantly related to the appropriate personal orientations in accordance with the theory.

4. Stability of major field and vocational choice is associated with the

Realistic and Intellectual types; instability is associated with the remaining four types.

5. Congruency of student and college (that is, both have the same code, and thus similar orientations) appears conducive to achievement, and to stability in major field and vocational choice.

6. Consistency of the college environment (whether or not the college is dominated by orientations which are complementary in a psychological sense) is positively related to stability and in a few instances to achievement.

7. Institutions in which students tend to change fields are characterized by heterogeneity (EAT), inconsistency (EAT), large percentages of students of the Enterprising type, and low percentages of Ph.D. degree holders on the faculty.

8. Students tend to move away from fields in which they are dissimilar to the typical student and to move toward fields in which they are similar to the typical student.

9. Although stability and achievement are related to both personal and institutional attributes, they are more closely related to personal attributes.

10. The student's expressed choice of major field or vocation at college entrance is a more efficient predictor of his choice at graduation than any other personal or situational variable.

11. The results generally replicate those obtained in a previous monograph, although different assessment inventories were used in the two studies—the Strong Vocational Interest Blank in the present study and the Vocational Preference Inventory in the earlier study. In addition, hypotheses were tested over different time intervals and college environments were assessed by different methods. These results imply that the theory has at least a limited range of applicability and usefulness.

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