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ABSTRACT

The construction and early validation of an ipsative, forced-choice vocational interest inventory (VII) to measure Roe's eight foci of occupational activity is detailed. Designed for counseling the broad range of high school students, the VII produced consistently interpretable mean profiles for groups of high school juniors having only tentative vocational orientations such as health sciences, engineering, business. Factor analytic studies revealed three dimensions. Service vs. Technology and Science vs. Business provided confirmation for the Roe-Holland hypothesis of a circular continuity of vocational interests. The third factor defined an Organizational (indoor) vs. Outdoor dimension. (Author)

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# A Vocational Interest Inventory

## Based on Roe's Interest Areas

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# A Vocational Interest Inventory Based on Roe's Interest Areas

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Roe (1956) has elaborated what must now be regarded as a rather long-lived and well-accepted scheme for the classification of occupations. This two-dimensional framework assigns occupations to one of eight interest groups, representing the focus of activity for the occupation, and to one of six levels, dependent upon the degree of responsibility, education or skills required by the occupation. Earlier research by the authors (Lunneborg and Lunneborg, 1968) suggested that Roe's classificatory scheme could be usefully employed, together with measures of academic aptitude, in predicting such disparate criteria of achievement as architecture school success, graduation from law school and grades in different freshman courses. Indeed, the predictive potential seemed strong enough to justify the development of measures more sensitive than the answer to the single question: What is the focus of your intended occupation? As a result work was begun three years ago on the construction of the Vocational Interest Inventory (VII).

## Test Construction

The major intent of the VII is to provide an intra-individual profile of interests across the eight Roe activity foci: Service (Svc--serving and attending to the personal tastes, needs, and welfare of others), Business Contact (Bus--face-to-face sales through personal persuasion), Organization (Org--concern with the organization and effective functioning of commercial activities and government activities), Technology (Tec--production, maintenance, and transportation of commodities and utilities),

Outdoor (Out--agriculture, forestry, fisheries, mining, etc.), Science (Sci--concern with scientific theory and its applications), General Cultural (Cul--preservation and transmission of the general cultural heritage), and Arts and Entertainment (Art--using special skills in the creative arts, sports, or entertainment). An ipsative, forced-choice format was adopted for the instrument. The VII consists of two 56-item sections, "Occupations" and "Activities." A typical item in the first section asks for a choice between two occupations, e.g., which occupation interests you more, pharmacist or bank loan officer. Each pair of occupations was matched for level and drawn from two different Roe groups. The example given is Level 2 for Science and Organization. Each group was paired twice with each of the other groups in producing the 56 items. Further, each of the six occupational levels was represented by nine items except the two highest levels which formed the basis for ten items each. The occupations used came from extensive groups by levels classifications carried out by Roe and the authors and may be found in Appendix 1 which is the authors' revised Coding-by-Example Manual for use by clerks in coding written occupations.

The second set of items calls for a choice between activities. The activity statements were written to be appropriate for a high school population and to be consistent with Roe's eight foci of activity. Again, each focus was matched twice with each other activity focus in building up the total set of 56 choices. An example which pits Cul with Art is: I would

rather visit a (a) museum of modern art

(b) new community college.

The initial inventory was administered to a statewide sample of high school juniors in the spring of 1969 in connection with the aptitude/achievement

battery of the Washington Pre-College (WPC) Testing Program. This test administration provided the basis for an item analysis and subsequent rewriting of approximately 15% of the items. Items were rewritten if they failed to correlate more highly with the two scales (Occupations or Activities) they were intended to tap than with any of the remaining scales, or if there was a significant sex of respondent bias in the distribution of choices. The latter problem was overcome by structuring the choices within an item to be either both stereotypically masculine, feminine, or neutral occupations or activities. The most noticeable source of poor items in the first version was the use of occupational titles which were either unknown or ambiguous to a number of students.

## Results

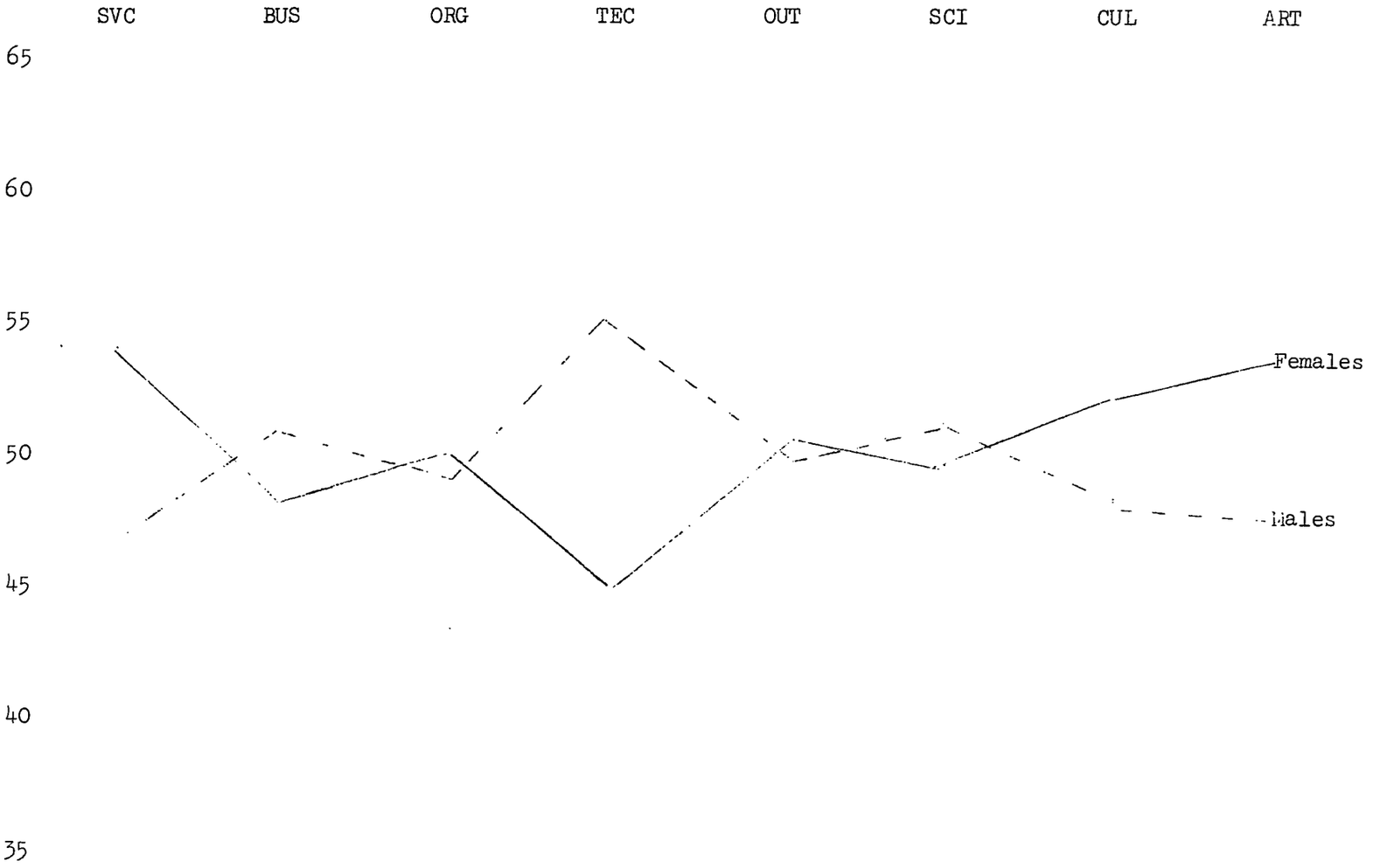
The revised VII was administered as a part of the WPC battery to all high school (HS) juniors in the statewide testing of spring 1970. Those tested, 75% of all enrolled HS juniors, are most easily typified as college-bound although this definition must include those students planning to enroll in the vocational-technical training programs of the cooperating community colleges as well as those entering academic curricula. Roughly one-sixth of those tested (2095 females and 1969 males from those high schools bearing names in the first part of the alphabet) were used in the analyses reported here.

Mean profiles. The VII was initially scored simply by summing, separately for the occupations and activities sections, the items answered in the keyed direction for each of the eight interest areas. The ipsative nature of the instrument insured that the sum of these eight scores within

either the occupations or activities sections was a constant, the number of items, 56. Mean scores for the two sexes were obtained for the two subsets of items. The resulting profiles were not flat with a raw score mean of 7.0 on each scale. For the occupations section the three highest means in the male sample were: Out, Art and Tec (8.1); the three lowest means were Bus, Org, and Cul (5.8). For the females occupational mean scores were: highest Art (8.1), Out, and Sci; lowest, Org, Cul, and Bus (5.7). For the activities section the mean profiles were more jagged. For males the highest and lowest areas were: Out (8.2), Svc, and Tec, vs. Org, Cul, and Bus (5.5). The activities profile for the females revealed high scores for Svc (9.5), as well as for Out and Art, and lowest scores for Org, Tec, and Bus (4.6). The female preference for outdoors occupations and activities was a surprise. Indeed, when the two sections are combined the females had a higher mean score, although not significantly so, on the outdoors scale than the males! As may be seen from Figure 1, combining over the two sections, females scored significantly higher ($p < .001$) than males on Svc, Org, Cul and Art, while male means were significantly higher on Bus, Tec and Sci. The scores reported in Figure 1 are in standard score form.

Scale correlations. The ipsative nature of the instrument imposed restrictions again on the correlations among the scales. Typically such correlations tended to be negative. For the full length scales, combining occupations and activities, the only appreciable intercorrelations were, for male subjects, Bus-Sci -.52, Org-Out -.45, and Tec-Cul -.46. Among female respondents these same scale pairs correlated -.44, -.45, and -.28. The only other female sample correlation of this same magnitude was -.30 between Bus

Male and Female Student Profiles of Mean Scores on Eight Scales of VII[1] (Spring 1970)




[1]Females scored significantly higher ($p < .001$) than males on Service, Organization, General Cultural, and Arts & Entertainment; males scored significantly higher on Business and Technical ($p < .001$) and on Science ($p < .05$). N = 2095 females, 1969 males.

Figure 1

and Cut. This pattern of intercorrelations is important in the outcome of a factoring of the VII and WPC battery reported below.

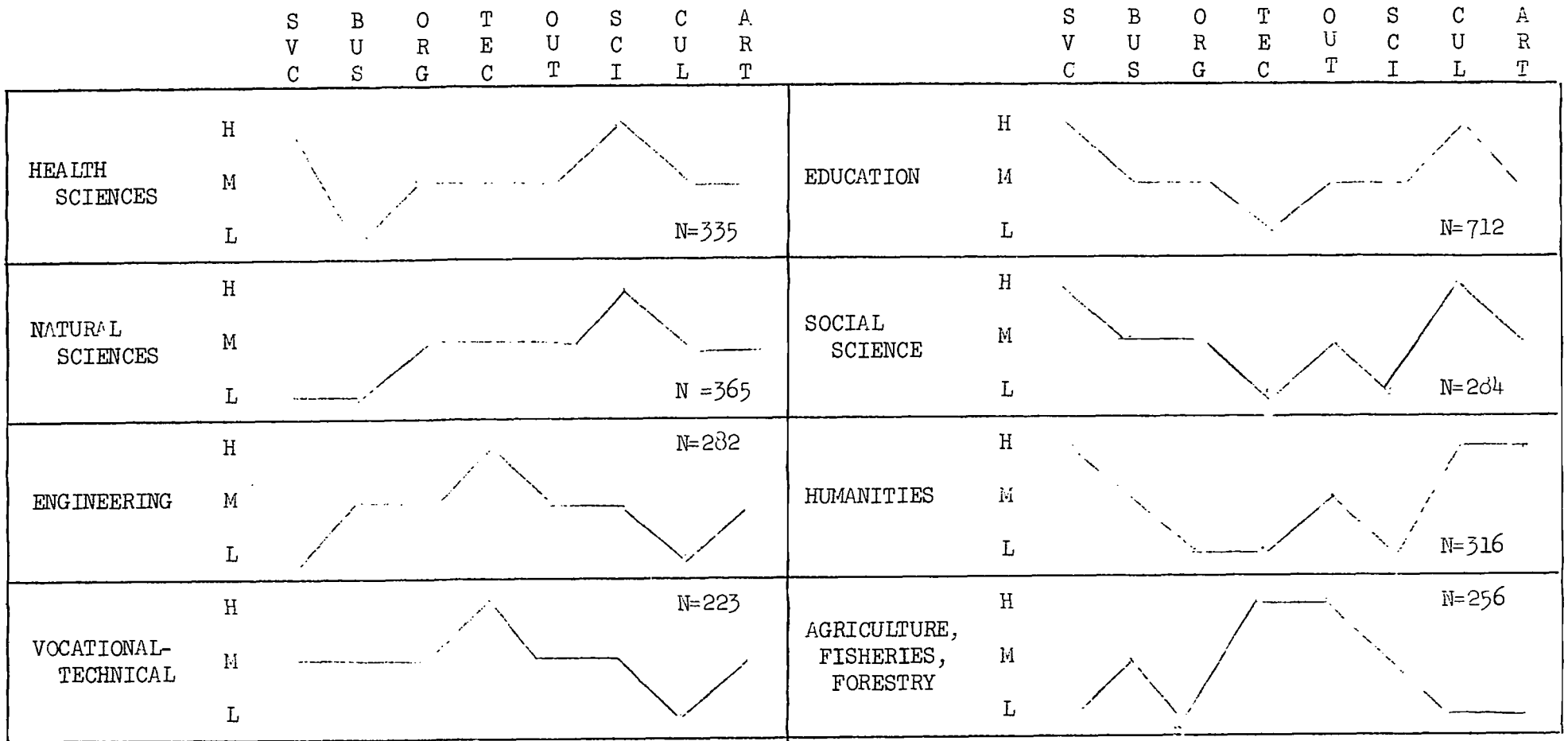
Mean profiles of intended training groups. As a part of the WPC battery students are asked both their educational goal (ranging from "begin college but no degree" to doctorate) and their planned major (10 possibilities). Mean profiles on the VII scales were determined for some of these groups contained within the sample of 4064 cases studied. Before the profiles were computed each of the eight total scales was separately standardized to a mean of 50 and a standard deviation of 10, the score report system used for other WPC tests. This standardization was based on the sample of four thousand juniors.

For each of 13 groups having different educational goals or majors a unique mean profile was found and each of these profiles provided a measure of early, concurrent validation for the VII. These mean profiles were reported in the VII Booklet for Students in terms of highs and lows. After the standardization mentioned above, percentile norms (N = 4064) were found for the eight scales and highs and lows for the mean profiles indicate a mean for a group which is above the 66th percentile (for most scales a score of 55 or higher) or below the 33rd percentile (usually a score of 45 or lower) in the standardization group.

Nine intended college major groups produced the following mean profiles (see Figure 2): health sciences (N = 335), high Svc and Sci, low Bus; natural sciences (N = 365), high Sci, low Svc and Bus; engineering (N = 282), high Tec, low Svc and Cul; vocational-technical training (N = 223), high Tec, low Cul; business (N = 453), high Bus and Org, low Out and Sci; education (N =712),

WPC Vocational Interest Profiles for Nine Groups of Intended Majors

For 4064 Juniors Tested Spring 1970




Plotted are average scores on each scale for that group of high school juniors intending to major in each area. High averages are those greater than 54, low averages those below 46. Medium average scores occupy the range from 46 through 54. High, medium, and low scores occur approximately one-third of the time on any given scale. (747 students gave "other" as intended major; 91 did not give an intended major.)

Figure 2

high Svc and Cul, low Tec; social sciences (N = 284), high Svc and Cul, low Tec and Sci; humanities (N = 316), high Svc, Cul and Art, low Org, Tec and Sci; and a combination of agriculture, fisheries and forestry (N = 256), high Tec and Out, low Svc, Org, Cul and Art. In addition to these groups of intended majors, three smaller groups of students were identified in terms of their intended attendance at specialized noncollegiate institutions: business college (N = 59), high Org, low Sci; hospital nursing programs (N = 38), high Svc and Sci, low Bus, Tec, and Art; and technical training institutes (N = 63), high Tec, low Cul. Finally 91 students were isolated who intended, in time, to earn law degrees. Their mean profile was high on Bus and Cul and low on Sci and Art.

Factor analysis of WPC battery and VII scales. Total scores on the eight VII scales were intercorrelated with 20 measures from the WPC battery separately for samples of 1000 males and females selected at random from the basic standardization samples. The resulting matrices of intercorrelations were factored by a principal components technique (unities retained in the diagonal of the correlation matrices) and those resulting component vectors with associated eigenvalues greater than unity rotated to a varimax criterion of simple structure utilizing a standard program BMD03M (Dixon, 1968).

For both sexes seven factors were retained for rotation. Three of the factors in each instance were clearly identified with the WPC battery of cognitive measures: high school achievement (loaded by grades earned in six areas of high school study), verbal test performance (loaded by five WPC tests of vocabulary, grammar, spelling and reading comprehension), and quantitative-spatial test performance (loaded by six quantitative aptitude/ achievement measures, spatial ability and mechanical knowledge). These results are consistent with earlier analyses of the WPC battery (Lunneborg, 1966).

The VII scales defined independent factors as was anticipated on the basis of earlier work with a combined aptitude-interest battery (Lunneborg, Greenmun and Lunneborg, 1970). The only noteworthy overlap occurred in the female analysis where Cul had its highest loading, .55, on the verbal test performance factor. Indeed, Cul and Art were least clearly and consistently defined in the two analyses. For both males and females there were interest factors which could be styled Sci vs. Bus (loadings of .79 and -.77 for males and .81 and -.71 for females), Svc vs. Tec (.74 and -.72 on the male factor, .61 and -.70 on the female counterpart), and Org vs. Out (.55 and -.71 for males, .85 and -.59 for females). Loadings cited are the largest for those factors. The Art scale defined a unique factor, loading .91 in the male analysis, and had sizable loadings on the Sci vs. Bus (.41) and Svc vs. Tec (-.57) factors in the female study. The Cul scale had its largest loading on the verbal cognitive factor in the female analysis and, for males, had loadings on the Svc vs. Tec (.46) and Org vs. Out (.55) factors.

Item analyses and test revision. The correlations between the occupations and activities part scores ranged from .22 to .45 among females and from .15 to .52 among males with the Svc parts least well related to one another. The correlations between occupations part and total scores ranged from .82 to .89 among females and from .76 to .90 among males; between activities part and total scores, among females, .73 to .84, among males .75 to .87. While the cited occupations-activities part score correlations were not spectacular, in every instance the highest positive correlation between activities and occupations was between those in the same interest area.

Item intercorrelations and phi coefficients between sex and item endorsement led to rewriting poor items primarily in the occupations section so that a 1972 VII version is now available. Probability of endorsement for items varied from .13 to .88 so that no items had to be rewritten for eliciting an extreme response. Seven items with sex phi coefficients greater than .30 were reworded so as to be less associated with one sex or the other. Possibly accounting for the high Outdoor scores was the observation that ten of the items which had to be repaired had poor alternatives (in terms of correlations with their respective scales) to outdoor occupations or activities.

Appendix 2 is the scoring key for the revised (1972) VII. Major deviations between the present classification scheme and Roe's latest printout (1969) include clergymen (Roe, Cul; VII, Svc), computer programmer (Roe, Org; VII Tec), statistician (Roe, Org; VII, Sci), architect and city planner (Roe, Art; VII, Tec), data processor (Roe, probably Org; VII Tec), agronomist, ecologist, horticulturist, soil scientist and others (Roe, Tec and Sci; VII, Out), technical writer (Roe, Tec and Cul; VII, Cul), industrial designer (Roe, Art; VII, Tec).

Future studies of occupations. Below is a list of the intended occupations of these high school juniors which listings are available for study. The groups vary greatly in size, with small numbers of conservationists and large numbers of prospective teachers. The basis for the groups was a VII item which requested the student to write out his intended occupation. Listings are available of the WPC numbers for each of these groups so that comparisons are possible on all WPC variables and biographic data for

say, psychologists vs. social workers. Only these 35 occupations had sufficient sample sizes to make the listings practical. Note that the 18,000 cases scanned came from the western part of the state only. The "code" refers to Ann Roe's occupational interest groups: A, Service; B, Sales; C, Organization; D, Technological; E, Outdoor; F, Science; G, General Cultural; and H, Arts and Entertainment.

| Code | N | Occupation | Code | N | Occupation |
|---|---|---|---|---|---|
| C | 166 | Accountants | F | 161 | Home economics |
| E | 228 | Agriculture and fishing | G | 261 | Journalism |
| D | 309 | Architecture | G | 499 | Law |
| H | 314 | Artists (including commercial) | F | 209 | Mathematics |
| A | 40 | Beauticians | D | 156 | Mechanics and machinists |
| F | 145 | Biology | H | 259 | Music |
| C | 273 | Business management | F | 589 | Nurses |
| F | 106 | Chemistry | E | 390 | Oceanography |
| E | 92 | Conservationists | D | 240 | Pilots |
| D | 214 | Data processing | A | 207 | Police |
| F | 160 | Dentists | A | 67 | Psychiatry |
| F | 184 | Dental assistants | A | 228 | Psychology |
| H | 248 | Design and interior decoration | B | 115 | Sales |
| F | 362 | Doctors (M.D.) | C | 501 | Secretaries |
| G | 3457 | Education (elem, second, gen'l) | A | 451 | Social work |
| D | 139 | Electronics | A | 461 | Stewardesses |
| D | 903 | Engineers | F | 191 | Veterinarians |
| E | 485 | Forestry | | | |

Reliability of student-coded occupation. As indicated above, students are asked on the VII to write out their intended vocation. They are also asked to code the focus of this vocation using Roe's scheme. Of interest was a comparison of their codings with experienced clerk coding. Twenty-five groups were checked to see the percentage of error in student coding (again, with a view towards rewriting the descriptions of the eight groups so as to be more understandable to high school juniors). The groups which did the best job of coding their prospective vocations were: social workers, salesmen, engineers, dentists, conservationists, lab technicians (best with only 5% error), mathematicians, musicians, and "other Art," i.e., all students intending occupations in this category which were not frequent enough to have a listing made for future study. The worst coders were data processors (84% error--Roe would have them in Org while they placed themselves in Tec), secretaries (79% error--for some reason they saw themselves more in Bus than in Org), "other Org" (67% error--again, they placed themselves in Bus rather than in Org), home economists (83% error--they saw themselves in either Svc or Cul, probably as teachers, than in Sci), and worst of all, architects (91% error--they said they belonged in Tec rather than Roe's Art). Because of these dismal results the descriptions of Roe's eight areas were redone to include examples within the area, e.g., "service: attending to the needs and welfare of others through guidance, domestic, personal and protective services; examples include barber, beautician, clinical psychology, counseling, fireman, ministry, police, social work, stewardess, waiter." The examples were selected partly on the basis of popularity.

Incidentals. Only 25 women (out of 18,000) wrote the focus of their intended occupation was "housewife." The percentages of fathers in the

eight occupational groups compared favorably with those obtained five years ago (Lunneborg & Lunneborg, 1968) also through student coding: then vs. now, Svc 11% vs. 12%, Bus 16% vs. 18%, Org 18% vs. 18%, Tec 34% vs. 35%, Out 14% vs. 7%, Sci 3% vs. 4%, Cul 3% vs. 5%, Art 1% vs. 1%. A decline in outdoor occupations is the only noteworthy shift.

Profiles like those in Figure 2 were drawn for students according to their coding of their intended occupation. The results were disturbingly flat; unlike declaring a major in business administration, coding Group 2 Bus as the focus of one's intended vocation did not result in a profile with a peak on Bus. The groups which did peak in accord with their score profiles were Sci, Cul, and Art. It is hoped that the rewritten descriptions of Roe's eight areas produce better results in terms of score profiles in accord with student coding of intended vocation.

## Discussion

These initial results for a new instrument are heartening both with respect to potential empirical usefulness and to the theoretical vocational interest formulation upon which it was based. Although predictions were not made in advance for the intended training group VII profiles, each of the thirteen provides, a posteriori, not an unreasonable picture. Science interest peaks among those who intend to major in science, with service interest high among the health sciences and low among the natural sciences. Technical interest is high and cultural interest low for engineers-to-be and those entering vocational-technical programs. Future educators, humanists and social scientists reverse this pattern with a heightened interest in culture and a depressed concern with technology. Potential business

administrators peak on organizational and business contact at the cost of scientific and outdoor interests. The authors are encouraged by the degree of clarity in these profiles for groups which are likely still quite fluid in vocational commitment. The VII will now be employed in research with samples in which vocational orientation is progressively more crystalized in the expectation that the resulting profiles will be even more stable.

The results of the two factor analyses, though hardly sophisticated, lend important support to Roe's notion of a circular continuity to vocational interests, particularly as this has been elaborated and tested by Holland and associates (Cole and Hanson, 1971). In simplified form these vocational theorists postulate a two-dimensional or planar distribution of interests so that the Roe interest foci would form a circle with points around the circle representing Svc, Bus, Org, Tec, Out, Sci, Cul, Art, and back to Svc. Adjacent points are hypothesized to be most nearly alike and those on opposite sides of the circle least alike or negatively related. In the Holland version the circle is divided into six sectors by collapsing certain of Roe's categories with the resulting sectors ordered as follows: Social (Svc), Enterprising (Bus), Conventional (Org), Realistic (Tec and Out), Intellectual (Sci), and Artistic (Cul and Art). This ordering (assuming roughly equal-sized sectors) places Social opposite Realistic and Intellectual opposite Enterprising in the interest plane. In the present factor analytic results for both sexes such a plane is tantalizingly well-defined by the two orthogonal factors named Service vs. Technology (Social-Realistic dimension in Holland's scheme) and Science vs. Business (the Intellectual-Enterprising diameter of Holland's circle.)

The third factor found here, Organizational vs. Outdoor, would take interest assessment beyond the plane and disrupt the circular ordering. In this connection perhaps this factor reflects the growing opposition perceived by youth between the interests of ecology (outdoor) and the interests of the Establishment (organization). Certainly outdoor interest was much higher than anticipated. It might just be the Pacific Northwest, but it might also be the Zeitgeist.

The WPC testing program is currently altering its feedback to students so that the results of the VII are coordinated with high school grades and aptitude/achievement test scores to provide better guidance for educational and vocational decision-making. The VII is thus intended to serve much the same function as the Kuder Preference Record and a version of Holland's Vocational Preference Inventory do for the Computerized Vocational Information System (CVIS) at Willowbrook High School in Villa Park, Illinois (CVIS, 1971).

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Appendix 1

Roe's Classification of Occupations:

Coding-by-Example Manual (1971)

ROE CLASSIFICATION OF OCCUPATIONS: INSTRUCTIONS FOR CODING

Occupation is assigned a two digit code. The first digit is the GROUP designation, corresponding to the column of the table of examples, and the second digit is the LEVEL, corresponding to the row of the table. Code the first occupation listed if more than one is given by subject. When an occupation ends with "ing," e.g., "accounting" or "teaching," read it as if it ended as a proper noun, "accountant" or "teacher."

Codes not appearing among the examples are the following:

90 Housewife, homemaker

91 Undecided

92 Unscorable or unknown

93 Retired

94 Deceased

95 Military service (all levels, all branches)

96 Business firm, manufacturing company, etc. unspecified, e.g., "Boeing employee" or "works for Pacific Northwest Bell," or Government, civil service unspecified, e.g., "county employee" or "public work"

97 None or no entry

Basic reference: Roe, A. The psychology of occupations. New York: Wiley, 1956.

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ROE CLASSIFICATION OF OCCUPATIONS: EXAMPLES

Group I: Service (attending to the personal tastes, needs and welfare of others through guidance, domestic, personal and protective services)

| | | | |
|---|---|---|---|
| Level 1 | Clinical psychologist<br>Counseling psychologist<br>Psychiatrist<br>Social work supervisor | | |
| Level 2 | Audiologist<br>FBI agent<br>Homemaking counselor<br>Ministry, clergy (all kinds)<br>Music therapist<br>Occupational therapist | Probation officer<br>School counselor<br>Social worker<br>Speech pathologist<br>Vocational counselor | |
| Level 3 | Case worker<br>Caterer<br>Detective<br>Employment interviewer<br>Fire captain<br>Hotel housekeeper<br>Inspector for city, state, customs | Investigator for government, labor<br>Police chief<br>Recreation worker<br>Sheriff<br>Welfare worker<br>YMCA/YWCA official | |
| Level 4 | Barber<br>Bartender<br>Beautician<br>Chef<br>Cosmetologist<br>Headwaiter | Lifeguard<br>Police officer<br>Practical nurse (LPN)<br>Religious worker (lay)<br>Steward, stewardess | |
| Level 5 | Chauffeur<br>City fireman<br>Cook<br>Custodian, janitor<br>Driver of taxi or bus<br>Group work aide | Home visitor<br>Maid<br>Nurse's aid<br>Occupational therapist aide<br>Orderly<br>Parking lot attendant | Prison guard<br>Psychiatric attendant<br>Recreation aide<br>Service station attendant<br>Train porter<br>Waiter, waitress |
| Level 6 | Baby sitter<br>Bellman<br>Cook's helper<br>Elevator operator<br>Food service helper<br>Garbage collector | Lunch room assistant<br>Mother's helper<br>Street sweeper<br>Usher<br>Watchman | |

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ROE CLASSIFICATION OF OCCUPATIONS: EXAMPLES

GROUP II: Business contact (face to face personal persuasion to sell commodities, services, investments; all sales occupations except retail clerks)

| | |
|---|---|
| Level 1 | Agent for top movie star |
| Level 2 | Advertising agency head<br>Congressional lobbyist<br>Promoter<br>Public relations salesman |
| Level 3 | Auto dealer<br>Business organizer & speculator<br>Insurance agent<br>Manufacturer's representative<br>Public relations manager or worker<br>Realter<br>Salesman of all kinds, auto, insurance, real estate, securities<br>Sales director, manager, sales engineer |
| Level 4 | Auctioneer<br>Demonstrator-salesman<br>Driver salesman (baking, milk) |
| Level 5 | House canvasser<br>House-to-house salesman<br>Poll interviewer<br>Telephone soliciter |
| Level 6 | Peddler<br>Vendor |

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ROE CLASSIFICATION OF OCCUPATIONS: EXAMPLES

Group III: Organization (managerial, ownership, or white collar job in business, industry, or government)

| | | | |
|---|---|---|---|
| Level 1 | High government officials, state and federal (attorney general, lieutenant governor, secretary of agriculture, director of branch of state government, President's cabinet member)<br>International banker<br>Legislator | | |
| Level 2 | Actuary<br>Advertising account executive<br>Banker<br>Bank loan officer<br>City or county public official<br>Comptroller | Corporate officer (company treasurer, secretary)<br>Executive<br>Federal commissioner<br>Hospital administrator<br>Management analyst | Market researcher<br>Personnel relations administrator<br>President of XXX Company<br>Purchasing agent<br>Stockbroker<br>Union official |
| Level 3 | Accountant<br>Administrative assistant<br>Airline traffic agent<br>Appraiser<br>Auditor<br>Bank cashier<br>Businessman<br>Business manager<br>Buyer<br>Claims adjuster | Credit manager<br>Credit union administrator<br>Employment manager<br>Estimator<br>Hotel manager<br>Manager<br>Manufacturer<br>Mortician<br>Office agent<br>Owner of small business | Post office official<br>Proprietor<br>Retail dealer<br>Right of way agent<br>Service representative<br>Supervisor, clerical, office, supplies<br>Teller<br>Traffic manager<br>Wholesale dealer |
| Level 4 | Adding machine operator<br>Apartment, motel operator<br>Bank cashier<br>Bank clerk<br>Bookkeeper<br>Business machine operator<br>Clerk<br>Compiler | Console operator<br>Dispatcher<br>Floorwalker<br>Freight agent<br>Landlord<br>Proof machine operator<br>Property manager | Railroad conductor<br>Receptionist<br>Salesclerk, saleswoman<br>Secretary<br>Station agent, railroad<br>Stenographer<br>Warehouse foreman |
| Level 5 | Bank sorter<br>Box office cashier<br>Checker<br>Clerk typist<br>Duplicating machine operator<br>File clerk<br>Insurance policy writer | Keypunch operator<br>Mail carrier<br>Multigraph operator<br>Notary<br>PBX operator<br>Postal clerk<br>Shipping clerk | Stock clerk<br>Tabulating machine operator<br>Telegrapher<br>Telephone operator<br>Ticket clerk<br>Transcribing machine operator<br>Typist |
| Level 6 | Clerical and stenographic aide<br>Mail machine operator | Messenger<br>Sorting machine operator | Toll collector |

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ROE CLASSIFICATION OF OCCUPATIONS: EXAMPLES

Group IV: Technology (concerned with production, maintenance, and transportation of commodities and utilities)

| | | | | |
|---|---|---|---|---|
| Level 1 | Consulting engineer<br>Consulting scientist | | Inventor | |
| Level 2 | Airplane pilot<br>Architect<br>City planner | Engineer<br>Factory manager or operator<br>Industrial designer | Production manager<br>Production planner<br>Systems analyst | |
| Level 3 | Air traffic controller<br>Air ground radio operator<br>Contractor, builder<br>Draftsman | Flight engineer<br>Foreman or leadman in factory<br>Planner, electrical, tool | Powerplant watch engineer<br>Production supervisor<br>Superintendent of construction | |
| Level 4 | Apparel patternmaker<br>Appliance serviceman<br>Auto body repairman<br>Boilermaker<br>Brakeman<br>Bricklayer<br>Broadcast technician<br>Business machine serviceman<br>Carman<br>Carpenter<br>Computer programmer | Data processor<br>Dressmaker<br>Electrician<br>Electronics technician<br>Engineering aide<br>Finisher<br>Inspector, factory<br>Instrument repairman<br>Installer<br>Jeweler<br>Lineman | Locomotive engineer<br>Machinist<br>Mechanic<br>Millwright<br>Operating engineer<br>Patternmaker<br>Photoengraver<br>Plumber pipefitter<br>Printer<br>Repairman<br>Roofer | Routeman<br>Sheetmetal worker<br>Shipfitter<br>Tailor<br>Tool designer<br>Tool and die maker<br>TV radio serviceman<br>Typesetter, hand<br>Upholsterer<br>Watch repairman |
| Level 5 | Apparel cutter<br>Arc cutter<br>Assembler<br>Baker<br>Bookbinder<br>Bulldozer, crane operator<br>Bus driver | Butcher<br>Cement, stone mason<br>Driver, deliveryman<br>Floor covering installer<br>Garment inspector<br>Glazier<br>Insulation worker | Lather<br>Linotype operator<br>Offset pressman<br>Painter<br>Paperhanger<br>Plasterer<br>Power truck operator | Press operator<br>Sewing machine operator<br>Stationery engineer<br>Teletypist<br>Tire recapper<br>Truck driver<br>Welder |
| Level 6 | Auto upholstery cutter<br>Baking helper<br>Backtender<br>Bench hand<br>Grinder, foundry<br>Hod carrier<br>Laborer | Machine tender<br>Milling machine operator<br>Molder's helper<br>Motor vehicle polisher<br>Packer<br>Rigger<br>Spray painter | Stationery fireman<br>Tinner<br>Trimmer<br>Worker in concrete, factory, laundry, mill, iron and steel | |

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ROE CLASSIFICATION OF OCCUPATIONS: EXAMPLES

Group V: Outdoor (agricultural, fishery, forestry, mining, and kindred occupations)

| | | |
|---|---|---|
| Level 1 | Agronomist | Horticulturist |
| | Botanist | Marine biologist |
| | Climatologist | Mineralogist |
| | Ecologist | Oceanographer |
| | Entomologist | Sedimentologist |
| | Geodesist | Soil scientist |
| | Geologist | |
| Level 2 | Conservationist | Landscape architect |
| | Husbandry specialist | Range manager |
| | Landowner, operator (large) | Wildlife specialist |
| Level 3 | Beekeeper | Lumber camp manager |
| | County agent | Nursery owner |
| | Farm owner | Petroleum scout |
| | Fisherman owner | Rancher |
| | Floriculturist | Surveyor |
| | Florist | Tree farmer |
| | Forester | Tree surgeon |
| | Forest ranger, park superintendant | Truckgardener |
| | Game warden | |
| Level 4 | Agriculture technician | Miner |
| | Farm tenant | Petroleum driller, gager, shooter, crew member |
| | Forestry technician | Soil conservation aide |
| | Horse trainer | Zoo caretaker |
| | Landscape gardener | |
| Level 5 | Chainman | Lumber inspector |
| | Fisherman | Nursery employee |
| | Gardener | Petroleum acidizer, engineman, pumper, rodman, treater |
| | Groundskeeper | |
| | Irrigator | Trapper |
| | Logger | Tractor driver |
| Level 6 | Burner | Lumberjack |
| | Cow puncher | Petroleum roustabout, helper |
| | Farm laborer | Ranch hand |
| | Field hand | Sailor |
| | Longshoreman | Seaman |

Bureau of Testing Project: 1270-175

ROE CLASSIFICATION OF OCCUPATIONS: EXAMPLES

Group VI: Science (Scientific theory and its application under specified circumstances other than TEC and OUT)

| | | |
|---|---|---|
| Level 1 | Museum (science) curator<br>Osteopath<br>Physician (except psychiatrist)<br>University faculty member, all social and natural sciences | |
| Level 2 | Dentist<br>Dietician<br>Home economist<br>Nurse, registered<br>Nutritionist<br>Optometrist<br>Pharmacist | Physical therapist<br>Sanitarian<br>Scientist (anthropologist, chemist, physicist, mathematician, sociologist, etc.; all natural and social sciences except outdoors)<br>Statistician<br>Veterinarian |
| Level 3 | Cartographer<br>Chiropractor<br>Dental hygienist<br>Dispensing optician<br>Laboratory technician<br>Medex | Medical technician<br>Office nurse (licensed)<br>Podiatrist<br>Weather observer<br>X-ray technician |
| Level 4 | Dental assistant<br>Embalmer<br>Laboratory assistant | Museum technician<br>Technical assistant<br>X-ray technician aide |
| Level 5 | Animal technician<br>Diet aide<br>Health services aide<br>Nurses aide<br>Pharmacy aide<br>Veterinary attendant | |
| Level 6 | Dishwasher in laboratory<br>Pet shop helper | |



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ROE CLASSIFICATION OF OCCUPATIONS: EXAMPLES

Group VII: General cultural (preservation and transmission of general cultural heritage)

| | | |
|---|---|---|
| Level 1 | Educational administrator (superintendent, college president)<br>Federal and state supreme court judges<br>University and college faculty unspecified and humanities (English, history, languages, philosophy, political geography) | |
| Level 2 | Columnist, commentator<br>Editor<br>Interpreter<br>Journalist<br>Lawyer<br>Librarian | Linguist<br>School administrator (principal, ass't supt)<br>School teacher (all high school and elementary)<br>State superior court judge<br>Writer |
| Level 3 | Justice of the Peace<br>Law clerk<br>Municipal judge<br>Radio TV announcer, broadcaster<br>Reporter<br>Technical writer | |
| Level 4 | Copy reader<br>Indexer<br>Instructional assistant<br>Library assistant | |
| Level 5 | Library page<br>Proofreader<br>Teacher aide | |
| Level 6 | Newspaper copy boy<br>Proofreader's helper | |



Bureau of Testing project: 1270-175

ROE CLASSIFICATION OF OCCUPATIONS: EXAMPLES

Group VIII: Arts and entertainment (use of special skills in creative arts, entertainment, or sports)

| | | |
|---|---|---|
| Level 1 | Athletic champion<br>Concert artist, symphony musician<br>Museum curator, fine arts<br>Professor, fine arts, music, drama, etc. | Symphony conductor<br>Television director<br>Theater director |
| Level 2 | Actor<br>Apparel designer<br>Art critic<br>Artist<br>Athletic coach<br>Choreographer<br>Composer<br>Dancer<br>Motion picture writer | Music director<br>Music teacher<br>Musician<br>Professional athlete<br>Sculptor<br>Singer<br>Stage designer<br>Teacher of art or music (not public schools) |
| Level 3 | Advertising artist<br>Advertising copywriter<br>Arts specialist<br>Commercial artist | Decorator<br>Layout man<br>Music arranger<br>Photographer |
| Level 4 | Animator artist<br>Circus performer<br>Disk jockey<br>Illustrator<br>Racing car driver | |
| Level 5 | Letterer<br>Monument maker<br>Paste up man<br>Technical illustrator<br>Window draper | |
| Level 6 | Arts specialist aide<br>Athletic aide<br>Photographic technician<br>Pinboy<br>Stagehand | |

Bureau of Testing project: 1270-175

Appendix 2

Scoring Key for

Vocational Interest Inventory (1972)

Roe's eight groups are:

1 Service
2 Business contact
3 Organization
4 Technology
5 Outdoor
6 Sciences
7 General cultural
8 Arts and entertainment

Roe's socio-economic occupational levels range from 6 (low) to 1 (high).

1. Identifies student's intended occupational group

2. Identifies student certainty regarding intended occupational group

3. Student's coding of Roe group of his intended occupation

Section 1 - Occupations

| | Group | Group | Level | | Group | Group | Level |
|---|---|---|---|---|---|---|---|
| 1. | (a) 2 | (b) 1 | 1 | 20. | (a) 7 | (b) 3 | 2 |
| 2. | (a) 3 | (b) 1 | 2 | 21. | (a) 8 | (b) 3 | 3 |
| 3. | (a) 1 | (b) 4 | 3 | 22. | (a) 1 | (b) 4 | 4 |
| 4. | (a) 1 | (b) 5 | 4 | 23. | (a) 4 | (b) 2 | 5 |
| 5. | (a) 6 | (b) 1 | 5 | 24. | (a) 4 | (b) 3 | 6 |
| 6. | (a) 7 | (b) 1 | 6 | 25. | (a) 5 | (b) 4 | 1 |
| 7. | (a) 1 | (b) 8 | 1 | 26. | (a) 4 | (b) 6 | 2 |
| 8. | (a) 2 | (b) 1 | 2 | 27. | (a) 7 | (b) 4 | 3 |
| 9. | (a) 3 | (b) 2 | 3 | 28. | (a) 8 | (b) 4 | 4 |
| 10. | (a) 2 | (b) 4 | 4 | 29. | (a) 1 | (b) 5 | 5 |
| 11. | (a) 5 | (b) 2 | 5 | 30. | (a) 2 | (b) 5 | 6 |
| 12. | (a) 6(L5) | (b) 2(L5) | 6 | 31. | (a) 3 | (b) 5 | 1 |
| 13. | (a) 2 | (b) 7 | 1 | 32. | (a) 5 | (b) 4 | 2 |
| 14. | (a) 2 | (b) 8 | 2 | 33. | (a) 5 | (b) 6 | 3 |
| 15. | (a) 3 | (b) 1 | 3 | 34. | (a) 7 | (b) 5 | 4 |
| 16. | (a) 2 | (b) 3 | 4 | 35. | (a) 8 | (b) 5(L6) | 5 |
| 17. | (a) 3 | (b) 4 | 5 | 36. | (a) 6(L5) | (b) 1 | 6 |
| 18. | (a) 3 | (b) 5 | 6 | 37. | (a) 2 | (b) 6 | 1 |
| 19. | (a) 6 | (b) 3 | 1 | 38. | (a) 6 | (b) 3 | 2 |

VII Key

| | Group | Group | Level | | Group | Group | Level |
|---|---|---|---|---|---|---|---|
| 39. | (a) 6 | (b) 4 | 3 | 48. | (a) 7 | (b) 6 | 6 |
| 40. | (a) 5 | (b) 6 | 4 | 49. | (a) 7 | (b) 8 | 1 |
| 41. | (a) 7 | (b) 6 | 5 | 50. | (a) 8 | (b) 1 | 2 |
| 42. | (a) 8 | (b) 6 | 6 | 51. | (a) 2 | (b) 8 | 3 |
| 43. | (a) 7 | (b) 1 | 1 | 52. | (a) 8(L5) | (b) 3 | 4 |
| 44. | (a) 7 | (b) 2 | 2 | 53. | (a) 4 | (b) 8 | 5 |
| 45. | (a) 3 | (b) 7 | 3 | 54. | (a) 5 | (b) 8 | 6 |
| 46. | (a) 4 | (b) 7 | 4 | 55. | (a) 8 | (b) 6 | 1 |
| 47. | (a) 7 | (b) 5 | 5 | 56. | (a) 8 | (b) 7 | 2 |

Section 2 - Activities

| | | | | | |
|---|---|---|---|---|---|
| 1. | (a) 8 | (b) 1 | 29. | (a) 4 | (b) 5 |
| 2. | (a) 1 | (b) 2 | 30. | (a) 6 | (b) 2 |
| 3. | (a) 4 | (b) 6 | 31. | (a) 2 | (b) 7 |
| 4. | (a) 4 | (b) 8 | 32. | (a) 3 | (b) 1 |
| 5. | (a) 7 | (b) 6 | 33. | (a) 7 | (b) 5 |
| 6. | (a) 8 | (b) 5 | 34. | (a) 8 | (b) 6 |
| 7. | (a) 5 | (b) 8 | 35. | (a) 3 | (b) 5 |
| 8. | (a) 4 | (b) 3 | 36. | (a) 6 | (b) 5 |
| 9. | (a) 1 | (b) 5 | 37. | (a) 4 | (b) 6 |
| 10. | (a) 1 | (b) 4 | 38. | (a) 3 | (b) 8 |
| 11. | (a) 8 | (b) 4 | 39. | (a) 4 | (b) 1 |
| 12. | (a) 3 | (b) 8 | 40. | (a) 1 | (b) 6 |
| 13. | (a) 7 | (b) 6 | 41. | (a) 1 | (b) 6 |
| 14. | (a) 8 | (b) 7 | 42. | (a) 2 | (b) 5 |
| 15. | (a) 6 | (b) 3 | 43. | (a) 5 | (b) 2 |
| 16. | (a) 2 | (b) 3 | 44. | (a) 7 | (b) 1 |
| 17. | (a) 5 | (b) 6 | 45. | (a) 3 | (b) 1 |
| 18. | (a) 7 | (b) 8 | 46. | (a) 7 | (b) 1 |
| 19. | (a) 6 | (b) 8 | 47. | (a) 3 | (b) 4 |
| 20. | (a) 2 | (b) 1 | 48. | (a) 8 | (b) 2 |
| 21. | (a) 1 | (b) 5 | 49. | (a) 4 | (b) 7 |
| 22. | (a) 4 | (b) 7 | 50. | (a) 5 | (b) 3 |
| 23. | (a) 2 | (b) 7 | 51. | (a) 2 | (b) 6 |
| 24. | (a) 8 | (b) 2 | 52. | (a) 7 | (b) 3 |
| 25. | (a) 4 | (b) 5 | 53. | (a) 2 | (b) 4 |
| 26. | (a) 4 | (b) 2 | 54. | (a) 7 | (b) 3 |
| 27. | (a) 2 | (b) 3 | 55. | (a) 6 | (b) 3 |
| 28. | (a) 8 | (b) 1 | 56. | (a) 5 | (b) 7 |

## Vocational Interest Inventory (1972) Scale Scoring Keys

| | Group 1 Service | | Group 2 Business Contact | | Group 3 Organization | |
|---|---|---|---|---|---|---|
| | Item No. | Scored response | Item No. | Scored response | Item No. | Scored response |
| Section 1 | 1. | b | 1. | a | 2. | a |
| | 2. | b | 8. | a | 9. | a |
| | 3. | a | 9. | b | 15. | a |
| | 4. | a | 10. | a | 16. | b |
| | 5. | b | 11. | b | 17. | a |
| | 6. | b | 12. | b | 18. | a |
| | 7. | a | 13. | a | 19. | a |
| | 8. | b | 14. | a | 20. | b |
| | 15. | b | 16. | a | 21. | b |
| | 22. | a | 23. | b | 24. | b |
| | 29. | a | 30. | a | 31. | a |
| | 36. | b | 37. | a | 38. | b |
| | 43. | b | 44. | b | 45. | a |
| | 50. | b | 51. | a | 52. | b |
| Section 2 | 1. | b | 2. | b | 8. | b |
| | 2. | a | 16. | a | 12. | a |
| | 9. | a | 20. | a | 15. | b |
| | 10. | a | 23. | a | 16. | b |
| | 20. | b | 24. | b | 27. | b |
| | 21. | a | 26. | b | 32. | a |
| | 28. | b | 27. | a | 35. | a |
| | 32. | b | 30. | b | 38. | a |
| | 39. | b | 31. | a | 45. | a |
| | 40. | a | 42. | a | 47. | a |
| | 41. | a | 43. | b | 50. | b |
| | 44. | b | 48. | b | 52. | b |
| | 45. | b | 51. | a | 54. | b |
| | 46. | b | 53. | a | 55. | b |

| | Group 4 Technology | | Group 5 Outdoor | | Group 6 Sciences | |
|---|---|---|---|---|---|---|
| | Item No. | Scored response | Item No. | Scored response | Item No. | Scored response |
| Section 1 | 3 | b | 4. | b | 5. | a |
| | 10. | b | 11. | a | 12. | a |
| | 17. | b | 18. | b | 19. | a |
| | 22. | b | 25. | a | 26. | b |
| | 23. | a | 29. | b | 33. | b |
| | 24. | a | 30. | b | 36. | a |
| | 25. | b | 31. | b | 37. | b |
| | 26. | a | 32. | a | 38. | a |
| | 27. | b | 33. | a | 39. | a |
| | 28. | b | 34. | b | 40. | b |
| | 32. | b | 35. | b | 41. | b |
| | 39. | b | 40. | a | 42. | b |
| | 46. | a | 47. | b | 48. | b |
| | 53. | a | 54. | a | 55. | b |
| Section 2 | 3. | a | 6 | b | 3. | b |
| | 4. | a | 7. | a | 5. | b |
| | 8. | a | 9. | b | 13. | b |
| | 10. | b | 17. | a | 15. | a |
| | 11. | b | 21. | b | 17. | b |
| | 22. | a | 25. | b | 19. | a |
| | 25. | a | 29. | b | 30. | a |
| | 26. | a | 33. | b | 34. | b |
| | 29. | a | 35. | b | 36. | a |
| | 37. | a | 36. | b | 37. | b |
| | 39. | a | 42. | b | 40. | b |
| | 47. | b | 43. | a | 41. | b |
| | 49. | a | 50. | a | 51. | b |
| | 53. | b | 56. | a | 55. | a |

Group 7 General Cultural

| | Item No. | Scored response |
|---|---|---|
| Section 1 | 6. | a |
| | 13. | b |
| | 20. | a |
| | 27. | a |
| | 34. | a |
| | 41. | a |
| | 43. | a |
| | 44. | a |
| | 45. | b |
| | 46. | b |
| | 47. | a |
| | 48. | a |
| | 49. | a |
| | 56. | b |
| Section 2 | 5. | a |
| | 13. | a |
| | 14. | b |
| | 18. | a |
| | 22. | b |
| | 23. | b |
| | 31. | b |
| | 33. | a |
| | 44. | a |
| | 46. | a |
| | 49. | b |
| | 52. | a |
| | 54. | a |
| | 56. | b |

Group 8 Arts and Entertainment

| | Item No. | Scored Response |
|---|---|---|
| Section 1 | 7. | b |
| | 14. | b |
| | 21. | a |
| | 28. | a |
| | 35. | a |
| | 42. | a |
| | 49. | b |
| | 50. | a |
| | 51. | b |
| | 52. | a |
| | 53. | b |
| | 54. | b |
| | 55. | a |
| | 56. | a |
| Section 2 | 1. | a |
| | 4. | b |
| | 6. | a |
| | 7. | b |
| | 11. | a |
| | 12. | b |
| | 14. | a |
| | 18. | b |
| | 19. | b |
| | 24. | a |
| | 28. | a |
| | 34. | a |
| | 38. | b |
| | 48. | a |