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ABSTRACT

Presented in this document are "training success" norms developed from data on post-secondary vocational education students as collected by means of the General Aptitude Test Battery (GATB) from students accepted to and graduated from full-time day programs in the 24 cooperating Minnesota schools from September 1966 - July 1970. Included is information on: (1) Project MINI-SCORE Occupational Training Program Groups, (2) Aptitude Score Profiles, Training Success Norms, (3) Aptitude Score Profiles, Employment Success Norms, (4) Aptitude Score Means, Standard Deviations and Number of Observations for Groups Used In Preparing Training Success Norms, (5) Aptitude Score Means, Standard Deviations, and Number of Observations for Groups Used In Preparing Employment Success Norms, and (6) Student Profile Sheet--GATB Aptitude Score. Also included is information on using the prepared profiles in counseling situations. Related documents are available as VT 016 148, VT 016 149, VT 016 151, and VT 016 152. (JS)

PROJECT MINI-SCORE
FINAL TECHNICAL REPORT

GENERAL APTITUDE TEST BATTERY
Training Success Norms and Employment Success Norms

ED 064523

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PROJECT MINI-SCORE FINAL TECHNICAL REPORT:

GENERAL APTITUDE TEST BATTERY
TRAINING SUCCESS NORMS AND
EMPLOYMENT SUCCESS NORMS

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Project MINI-SCORE
(Minnesota Student Characteristics and
Occupationally Related Education)
Department of Industrial Education
University of Minnesota
March, 1972

FOREWORD

This technical report is one of the technical reports of Project MINI-SCORE which summarize the findings of six years of intensive research into possible relationships between standardized test measures and a number of different criteria of vocational student success. The technical reports present a detailed discussion of Project findings. A general discussion of the major findings can be found in the publication entitled PROJECT MINI-SCORE FINAL REPORT.

Through Project MINI-SCORE, test data consisting of measures derived from six separate instruments and test batteries were gathered on individual applicants to the area vocational-technical schools of Minnesota. The tests included in the battery were: (1) the General Aptitude Test Battery (Form B) written portions only, (2) the Minnesota Vocational Interest Inventory, (3) the Sixteen Personality Factor Questionnaire (Form C), (4) the Minnesota Importance Questionnaire (30-scale version), (5) the Vocational Development Inventory, and (6) the Minnesota Scholastic Aptitude Test. In addition, personal descriptive data were obtained from the students through the use of a questionnaire. The data from these instruments were analyzed to determine which of the information gathered would be useful in counseling individuals with reference to full-time, post-high school vocational-technical courses offered in the area vocational-technical schools of Minnesota. Measures of vocational student success included in the Project were: (1) reported graduation versus dropping out of programs, (2) employment status one year after graduation, (3) job satisfaction one year after graduation, and (4) job satisfactoriness one year after graduation.

The titles of all of the final technical reports of the Project can be found on the back cover of this report. Additional publications of Project MINI-SCORE which have dealt with some of the critical issues in vocational education research are listed on the last page. Limited numbers of copies of these reports are available.

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THE GENERAL APTITUDE TEST BATTERY (GATB, B-1002)
AND ITS USE BY THE EMPLOYMENT SERVICE¹

Development

The General Aptitude Test Battery was developed primarily to be used for the evaluation of occupational potentialities. Prior to its development, the United States Employment Service (USES) experimentally developed approximately one hundred separate tests to measure the various abilities that seemed related to success in different occupations. Each time the study of a different occupation was undertaken, new tests were devised if the job analysis of the occupation indicated that some ability seemed to be important and the present store of USES tests did not already include such a test. Each test was constructed with items that were as homogeneous as possible with regard to the abilities they seemed to measure and varied in difficulty. Over a period of time, many tests were developed composed of items such as arithmetic, vocabulary, and form perception. In addition, certain apparatus tests were developed. Through the process of factor analysis, eleven paper and pencil tests and four apparatus tests were selected from the original group of tests as the best measures of ten factors or abilities. These tests formed the first edition of the GATB, B-1001. Thus, through the development of the GATB, it became possible to measure most of the major abilities represented in the entire stock of USES tests which were related to many jobs.

The present form of the GATB, designated as B-1002, is the original GATB converted to a separate answer sheet form that includes twelve tests measuring nine aptitudes. Two forms of the B-1002 edition are available (Form A and Form B) with different answer sheets, scoring stencils, and aptitude score conversion tables. The two forms differ only in the sampling of items in parts one through seven.

Tests and Aptitudes Measured

The following tests and the aptitude or aptitudes measured by each are included in the GATB, B-1002, forms A and B.

Part 1 - Name Comparison

The examinee inspects the names appearing in two adjacent columns of names and indicates whether the names are the same or different. Measures Clerical Perception.

Part 2 - Computation

The test consists of arithmetic exercises requiring the addition, subtraction, multiplication or division of whole numbers. Measures Numerical Aptitude.

¹The information in this section was abstracted from: Manual for the General Aptitude Test Battery: Section III Development, United States Department of Labor, Washington, D. C., October, 1967.

Part 3 - Three-Dimensional Space

The examinee is given a two-dimensional stimulus figure containing bent lines and four three-dimensional response figures. The examinee indicates which of the four response figures can be made from the stimulus figure. Measures Intelligence and Spatial Aptitude.

Part 4 - Vocabulary

The examinee is given sets of four words and must indicate which two words of each set have either the same or opposite meanings. Measures Intelligence and Verbal Aptitude.

Part 5 - Tool Matching

Examinee is given a stimulus drawing and four black and white response drawings and must indicate which black and white drawing is the same as the stimulus drawing. Measures Form Perception.

Part 6 - Arithmetic Reasoning

Examinee must solve verbally expressed arithmetic problems. Measures Intelligence and Numerical Aptitude.

Part 7 - Form Matching

Examinee is given a stimulus and response group of variously shaped line drawings. He must indicate which response figure is exactly the same size and shape as each figure of the stimulus group. Measures Form Perception.

Part 8 - Mark Making

Examinee must draw two vertical and one horizontal line beneath the two vertical lines on a series of squares working as rapidly as possible. Measures Motor Coordination.

Part 9 - Place

Examinee moves two pegs simultaneously, one in each hand, from an upper pegboard area to corresponding holes located in the lower area of the same pegboard in three timed trials. Measures Manual Dexterity.

Part 10 - Turn

Using the lower section of the pegboard, the examinee removes a peg, turns it over and places the opposite end of the peg into the hole from which it was removed using his preferred hand. Three timed trials are given. Measures Manual Dexterity.

Part 11 - Assemble

The examinee is given rivets, washers, and a finger dexterity board. Using his preferred hand, he removes a rivet from the upper segment of the board, assembles a washer on the rivet, and places the assembly in the corresponding hole in the lower segment of the pegboard. One timed trial is given. Measures Finger Dexterity.

Part 12 - Disassemble

The examinee is required to disassemble completed assemblies of rivets and washers in a manner opposite to those actions required for Part 11. One timed trial is given. Measures Finger Dexterity.

The nine aptitudes measured by the GATB B-1002 and the definitions of these aptitudes are stated below. The letter symbol used to identify the aptitude precedes each aptitude name.

Aptitude G - Intelligence

General learning ability. The ability to "catch on" or understand instructions and underlying principles; the ability to reason and make judgments. Closely related to doing well in school. Measured by Parts 3, 4, and 6.

Aptitude V - Verbal Aptitude

The ability to understand the meaning of words and to use them effectively. The ability to comprehend language, to understand relationships between words, and to understand meanings of whole sentences and paragraphs. Measured by Part 4.

Aptitude N - Numerical Aptitude

Ability to perform arithmetic operations quickly and accurately. Measured by Parts 2 and 6.

Aptitude S - Spatial Aptitude

Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. The ability to recognize the relationships resulting from the movement of objects in space. Measured by Part 3.

Aptitude P - Form Perception

Ability to perceive pertinent detail in objects or in pictorial or graphic material. Ability to make visual comparisons and discriminations and to see slight differences in shapes and shadings of figures and widths and lengths of lines. Measured by Parts 5 and 7.

Aptitude Q - Clerical Perception

Ability to perceive pertinent detail in verbal or tabular material. Ability to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation. Measured by Part 1.

Aptitude K - Motor Coordination

Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and swiftly. Measured by Part 8.

Aptitude F - Finger Dexterity

Ability to move the fingers and manipulate small objects with the fingers, rapidly or accurately. Measured by Parts 11 and 12.

Aptitude M - Manual Dexterity

Ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions. Measured by Parts 9 and 10.

Use by United States Employment Service

GATB norms have been determined for adults and for high school grades 9 and 10. They have been established to appraise the aptitudes required in a large

variety of occupations. Employment Service individual occupational norms for the GATB are classified in terms of an Occupational Aptitude Pattern (OAP) structure. The OAP norm structure includes various combinations of the nine aptitudes measured by the GATB B-1002. These norms (OAP's) have been validated on the basis of data collected on various occupational groups. Each OAP for a given occupation or group of occupations having similar aptitude requirements consists of the most significant aptitudes and minimum cut-off scores on these aptitudes. Individual performance on the GATB is evaluated in terms of the OAP's through the use of conversion tables.

Although the validity of the GATB has been established for many current occupational fields, there still remain many emerging occupations for which occupational norms have not yet been established. Test and occupational data are continually being obtained and additional occupations are being added to the norm structure while outdated norm structures are being removed.

The GATB tests and aptitudes possess substantial correlations with other tests which sample the same abilities. For example, the Spatial Aptitude of the GATB has high correlations with the spatial components of the DAT, the Primary Mental Abilities and the Revised Minnesota Paper Form Board. The GATB Verbal Aptitude correlates highly with the DAT Verbal test and Vocabulary subtest of the Cooperative English Test. Many of the correlations between these similar ability tests exceed .70.

Correlations are quite low in studies in which the GATB aptitudes are correlated with the Minnesota Vocational Interest Inventory or the Kuder Preference Record.

Further information regarding the Occupational Aptitude Patterns and the GATB correlations with specific tests can be found in the Manual for the General Aptitude Test Battery, Section III: Development (1967).

Reliability studies have been conducted with the GATB under test, retest conditions with the second testing usually producing an increase in aptitude test scores. Results of these studies, however, indicate that the aptitudes of the GATB are measured reliably in the types of situations in which the battery is commonly used. These studies were conducted with samples from high school, college, and adult populations using test, retest intervals ranging from one week to one year. Reliability coefficients for most of the aptitudes were in the range from .80 to .90. A practice effect was consistently observed for all aptitudes. The mean score increases often exceeded 10 points for some aptitudes, a fact which should be noted by persons who may be involved with interpreting retest scores.

DEVELOPMENT OF PROJECT MINI-SCORE TRAINING SUCCESS NORMS AND EMPLOYMENT SUCCESS NORMS

Occupational Groups and GATB Aptitudes Included in the Study

Project MINI-SCORE has gathered data on sixty-three different occupational training program groups. The training programs were grouped by personnel from the Minnesota State Department of Vocational Education and the Department of Industrial Education at the University of Minnesota into relatively homogeneous groupings. In many cases the specific titles given to training programs in a

given group are different but the training programs are relatively the same. Each of the group names and the specific titles of training programs falling into a group can be found in Appendix A.

Due to test administration time limitations and previous research which questioned the blanket use of manipulative performance tests, only the written portions of the GATB were used in the study. Both Ghiselli (1966) and Prediger (1968), after reviewing many studies concerned with predicting adult and high school vocational training program success respectively, questioned the blanket use of manual dexterity and motor ability tests in vocational counseling.

Training Success Norms Population and Occupational Groups

The "training success" norms (see Appendix B) in this report were developed with data obtained from student who were accepted to and graduated from full-time, day programs offered in the twenty-four cooperating post-high school area vocational-technical schools of Minnesota during the period from September 1, 1966, until July 1, 1970. Aptitude score profiles have been prepared only for those occupational groups for which at least forty-nine individual sets of data were available. The actual sample used in developing each norm profile is indicated in Appendix D.

The initial printing of the Project MINI-SCORE General Aptitude Test Battery (B-1002 Form B) Training Success Norms (Pucel and Nelson, 1969) contained data on eleven different occupational groups. Supplement One (Pucel and Nelson, 1970) added seven additional groups. The present publication includes twenty-seven occupational groups. The twenty-seven groups have been separated into three clusters on the basis of sex. This classification system is based on Project MINI-SCORE research which showed differences on many of the measures included in the Project MINI-SCORE test battery which were due to sex (Pucel and others, 1972a; Pucel and others, 1972b).

CLUSTER I

PRIMARILY MALE CURRICULA

Agri-Technology
Aircraft Mechanics
Architectural Drafting
Automotive
Carpentry
Chefs and Cooks
Diesel Mechanics
Electronics
Farm Equipment Mechanics
Fluid Power Technology
Machine Shop
Mechanical Drafting and Design
Mechanical Refrigeration, Air
Conditioning and Appliance Repair
Plumbing and Sheet Metal
Power and Home Electricity
Printing and Graphic Arts
Welding

CLUSTER II

CURRICULA WITH BOTH MALES AND FEMALES

Accounting
Data Processing
Interior Design and Sales Assistant
Sales

CLUSTER III

PRIMARILY FEMALE CURRICULA

Clerical Training
Cosmetology
Dental Assistant
Medical Laboratory Assistant
Practical Nursing
Secretarial Training

Employment Success Norms Population and Occupational Groups

The "employment success" norms (see Appendix C) were developed on a subset of the population used for training success norms. The population included persons who were accepted to and graduated from the full-time, day programs of the twenty-four cooperating schools and who were followed up on the job one year after training between September 1, 1966 and July 15, 1970. Of the people who were followed up on the job, only those who were employed in a job related to their training (based on the Project MINI-SCORE classification presented in Appendix A) were included in the groups used to generate the employment success norms. (The "employment success norms" in this report could also be called "on-the-job norms".) Aptitude score profiles have been prepared for all occupational groups for which at least fifty individual sets of data were available. The actual sample used in developing each norm profile is indicated in Appendix E.

Employment success norms (on-the-job success norms) have been developed for thirteen occupational groups which have been clustered on the basis of sex.

CLUSTER I

PRIMARILY MALE CURRICULA

Automotive
Carpentry
Electronics
Machine Shop
Mechanical Drafting & Design
Power and Home Electricity
Welding

CLUSTER II

CURRICULA WITH BOTH MALES AND FEMALES

Accounting
Data Processing

CLUSTER III

PRIMARILY FEMALE CURRICULA

Clerical Training
Cosmetology
Practical Nursing
Secretarial Training

INTERPRETING THE NORMS

Description of the Profiles

The profiles were developed from tabular data indicating the percentile associated with each score. The light-weight line represents the range between the 95th and the 5th percentiles. The top and bottom five per cents were eliminated to avoid having to consider extremely high or low scores. The bold bar represents the middle two thirds of the scores that were obtained most often by persons who successfully completed a training program or who were successful on the job. The middle two-thirds was identified by using the percentiles. The top of the bold bar is located at the 83.5 percentile and the bottom of the bar is located at the 16.5 percentile. Table is an example of such a profile for the automotive group. The percentiles were used in developing the profiles rather than the mean and standard deviation because the percentiles are sensitive to skews in the distributions. However, the mean and standard deviation of the scores for each aptitude are presented in Appendices D and E for each occupational group along with the number of scores which went into each calculation.

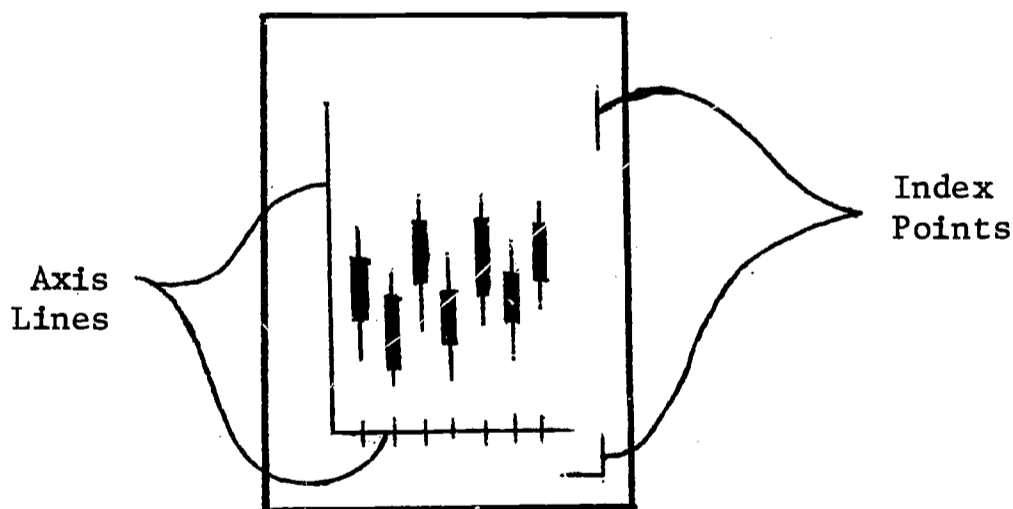
The profiles included in this publication were based upon aptitude scores derived from the written portions of the GATB (B-1002 Form B) using the National Computer Systems (NCS) answer sheet. Raw part scores which are the raw scores obtained from the separate tests or parts of the GATB are not identical when using NCS and IBM answer sheets. However, scores obtained from both the NCS and IBM answer sheets are adjusted to the same scale with a mean of 100 and a standard deviation of 20 through converting them to converted scores when obtaining aptitude scores. It would appear, therefore, that aptitude scores derived from the NCS and IBM answer sheets are equivalent. THE NORMS PRESENTED IN THIS PUBLICATION WERE DEVELOPED USING THE NCS ANSWER SHEET. APTITUDE SCORES OBTAINED THROUGH USING THE NCS OR IBM ANSWER SHEETS ARE SUPPOSEDLY EQUIVALENT.

Preparing the Profiles for Counseling

The profiles are organized in Appendices B and C into the three major clusters for easy reference. A sample student profile sheet is also included as page 65 of this report.

First, transparencies should be made of the profiles. This can be done as follows:

- a. Take the profiles out of the booklet.
- b. Each of the profile sheets has two index points. Match the lower right hand corner of the transparency material with the right angle index point on the lower right hand corner of the profiles. Match the right hand edge of the transparency material with the line index point on the upper right hand corner of the profile sheet. Make the transparency.

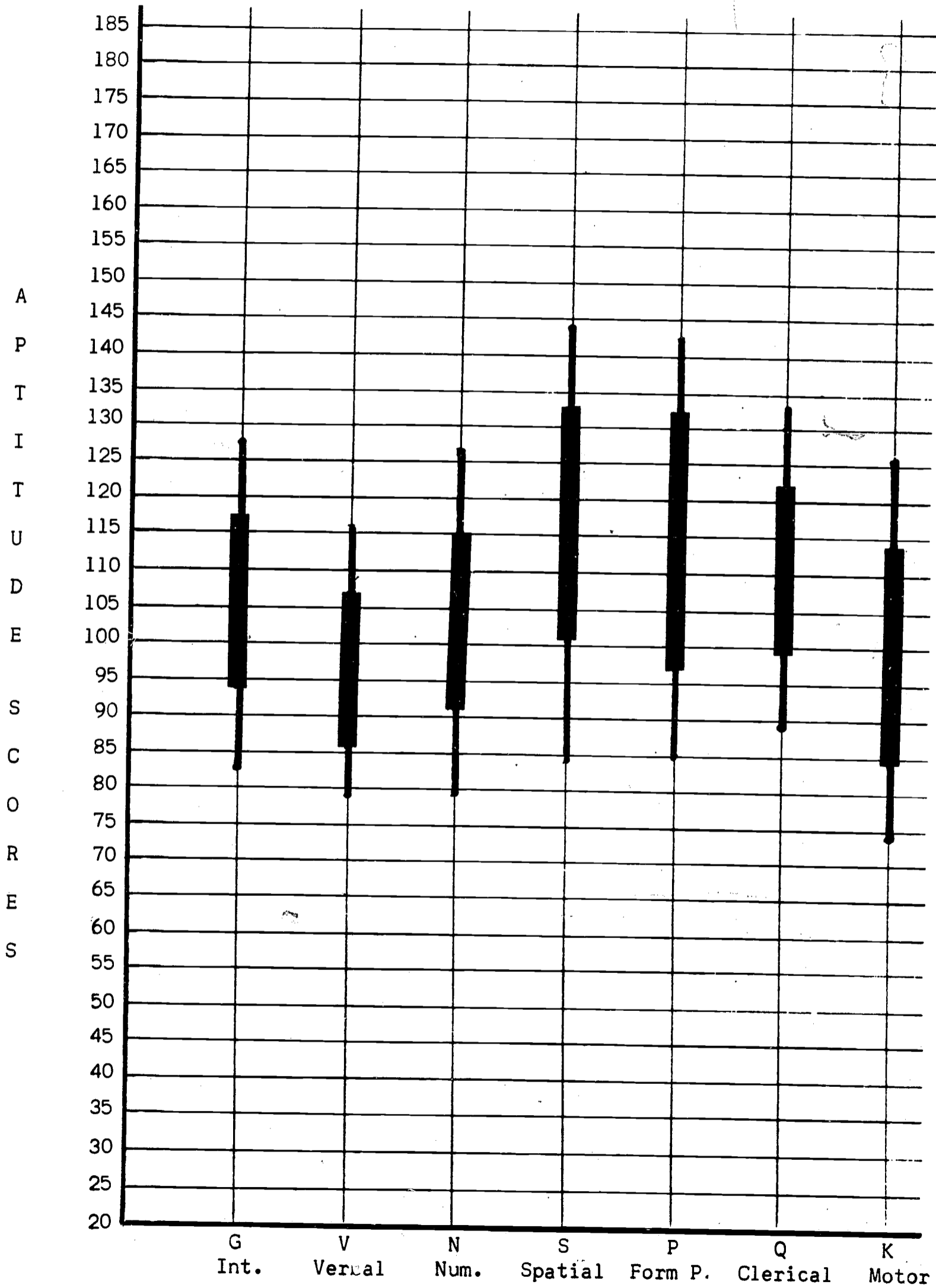


- c. After making transparencies of all of the profiles in a given cluster, punch all of the transparencies at one time with a three-hole punch.
- d. Place the transparencies into a three ring binder. When looking through all of the transparencies in a given cluster at one time, all of the axis lines should match.

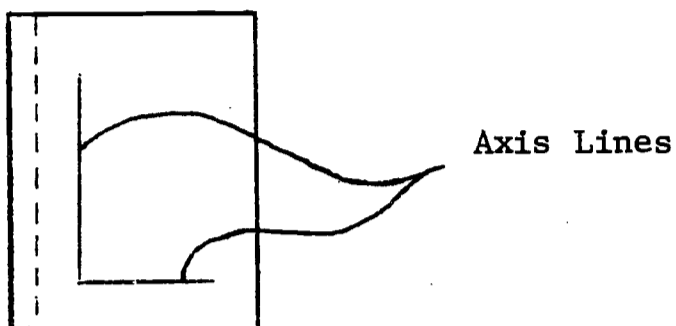
Second, duplicate the student profile sheet. To make additional copies of the student profile sheet, do the following;

- a. Take the sample sheet out of the booklet.

TABLE 1
 PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 AUTOMOTIVE



- b. Trim the profile summary sheet along the dotted line.



- c. Duplicate the sheet after it has been trimmed. Make sure the left hand edge of the new sheets is the same distance from the axis lines as the dotted line is or was on the sample.

Using the Prepared Profiles in Counseling

1. Administer the GATB (B-1002 Form B) in accordance with Employment Service recommendations.
2. Obtain GATB (B-1002 Form B) aptitude scores for a given individual.
3. Plot the individual's scores on a student profile summary sheet.
4. Place the individual student profile summary sheet under each of the transparencies to determine how similar the individual's profile is to that of people who have successfully completed training or have been successful on the job in each of the occupational areas.

It is recommended that each individual be allowed to make such comparisons himself with the counselor. If a person's profile does not fall within the bold portion of all the profile stalks of a given occupational group, this does not mean he could not succeed in the occupation. It only means he is more different on that dimension measured by the GATB than 66 per cent of those who successfully completed training or who were successful on the job in the given occupational area.

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Pucel, D.J., Nelson, H.F., and Mohamed, D.A. The Ability of Standardized Test Instruments to Predict Training Success and Employment Success. Minneapolis, Minnesota: Project MINI-SCORE, Department of Industrial Education, University of Minnesota, March, 1972.

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APPENDIX A

PROJECT MINI-SCORE OCCUPATIONAL TRAINING PROGRAM GROUPS

MECHANICS AND MACHINERY REPAIR

6. Automotive
Auto Mechanic
Auto Body Repair
Automobile Management
Automobile Technician
10. Diesel Mechanics
Diesel Mechanics
Diesel Mechanics Technician
Truck & Diesel Mechanics
13. Farm Equipment Mechanics
Farm Equipment Mechanics
Farm Mechanics I & II
18. Aircraft Mechanics
Aviation Mechanics
19. Service Station Mechanic
Automotive Services
Automotive Service Station
Mechanics Attendant
Mechanical Repair & Servicemen
25. Marine and Small Engine Mechanics
56. Heavy Equipment Operation and Repair

APPLIANCE & REFRIGERATION REPAIR

14. Appliance Repair
30. Office Machine Mechanic
32. Mechanical Refrigeration & Air Conditioning

7. PRINTING AND GRAPHIC ARTS

Graphic Arts
Graphic Arts I, letter press
Graphic Arts II, Photolithography
and off-set printing
Off-set Printing

21. PLUMBING AND SHEETMETAL

22. FLUID POWER TECHNOLOGY

SELLING AND RELATED WORK

41. Sales
Sales Management
Sales & Marketing
Sales Training
46. Business Management

AGRICULTURAL RELATED OCCUPATIONS

37. Agri-Technology
Agri-Chemicals & Fertilizers,
Sales & Service
Agricultural Technician
(Animal Science)
Agricultural Technician
(Plant Science)
Agricultural Sales Technician
42. Farm Equipment Sales
Farm Equipment Sales & Service
Partsman Training
50. Agri-Business
Agri-Business Management
Agri-Business Office Training
51. Farm Management

DRAFTING, ARCHITECTURAL, MECHANICAL AND TECHNICAL

8. Mechanical Drafting and Design
Engineering Drafting
Industrial Drafting
Industrial Drafting Technology
Machine Drafting
Mechanical Drafting
Technical Drafting
Design Technology
Drafting and Design Technology
9. Architectural Drafting
35. Highway Technology
Highway Technician
Highway Technology
Civil Technology
44. INTERIOR DESIGN & SALES ASSISTANT

FOODS

- 15. Chefs and Cooks
Cook, Institutional
Hotel & Restaurant Cooking
- 31. Bakery Procedures
- 52. Food Management
Management & Food Service
- 62. Butcher and Meat Cutting

ELECTRICITY AND ELECTRONICS

- 1. Electronics
Electronics
Electronics, Communications
Electronics, Computer Maintenance
Electronics, Industrial & Home
Entertainment Service
Electronics, Industrial Technical
Electronics, Radio & Television
Electronics, Technician
Communications
Electronics, Technician Industrial
Electronics, Technician
Electronics, Technology
- 2. Power and Home Electricity
Electrical
Electrical, Construction
Electrical Maintenance
Electrical Technology
Lineman Electrician
Power and Plant Operation
- 58. Telephone Communications

CONSTRUCTION INDUSTRY

- 4. Carpentry
Building Construction
Carpentry
- 28. Bricklaying

WOODWORKING INDUSTRY

- 4. Carpentry
Building Construction
Carpentry
- 20. Cabinet Making

MACHINE TRADE OCCUPATIONS

- 5. Tool and Die
Tool and Design Technician
Tool and Die Maker
Tool, Die, and Mold Maker
- 11. Machinist
Machine Operator
Machinist
Production Machinist
- 12. Welding
- 23. Pattern Maker
- 26. Plastic Injection Molding
Technician

BUSINESS, ACCOUNTING, CLERICAL, SECRETARIAL

- 45. Accounting
- 47. Clerical Training
Clerical Record Keeping
Clerk, General Office
Clerk-Typist
Clerk-Typist Machine Operator
- 48. Secretarial Training
Educational Secretary
Hospital Station Secretary
Secretarial Training, General
Secretarial Training, Medical
Stenographic Training
Medical Office Assistant
Medical Office Service
Legal Secretary
- 49. Data Processing
Clerical Training & Data Processing
Clerical Training & Key Punch
Tabulating Machine Operator
(Unit Records)

HEALTH SERVICES

- 3. Practical Nursing
- 33. Dental Assistant
- 39. Medical Laboratory Assistant
- 40. WRITING

JEWELRY AND WATCH REPAIR

27. Watch Repair

55. Jewelry

FURNITURE MAKING

20. Cabinet Making

29. Upholstering

OPTICAL AND MEDICAL LAB

38. Optical Technology

39. Medical Laboratory Assistant

GROOMING

17. Cosmetology

24. Barbering

CLOTHING

53. Needle Arts

54. Tailoring

57. Fashion Merchandising

FOREST INDUSTRIES

36. Paper & Pulp Technology

61. Conservation and Forestry

LANDSCAPE AND FLORISTRY

34. Nursery-Landscape Technology

43. Retail Floristry

16. SHOE REPAIRING

59. INTERNATIONAL DOCUMENTS SPECIALIST

60. LAW ENFORCEMENT

63. BROADCASTING

APPENDIX B

APTITUDE SCORE PROFILES ,
TRAINING SUCCESS NORMS

CLUSTER I

PRIMARILY MALE CURRICULA

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Aircraft Mechanics.	16
Architectural Drafting.	17
Automotive.	18
Carpentry	19
Chefs and Cooks	20
Diesel Mechanics.	21
Electronics	22
Farm Equipment Mechanics.	23
Fluid Power Technology.	24
Machine Shop.	25
Mechanical Drafting and Design.	26
Mechanical Refrigeration, Air Conditioning, and Appliance Repair.	27
Plumbing and Sheet Metal.	28
Power and Home Electricity.	29
Printing and Graphic Arts	30
Welding	31

CLUSTER II

CURRICULA WITH BOTH MALE AND FEMALE

Accounting.	32
Data Processing	32
Interior Design and Sales Assistant	34
Sales	35

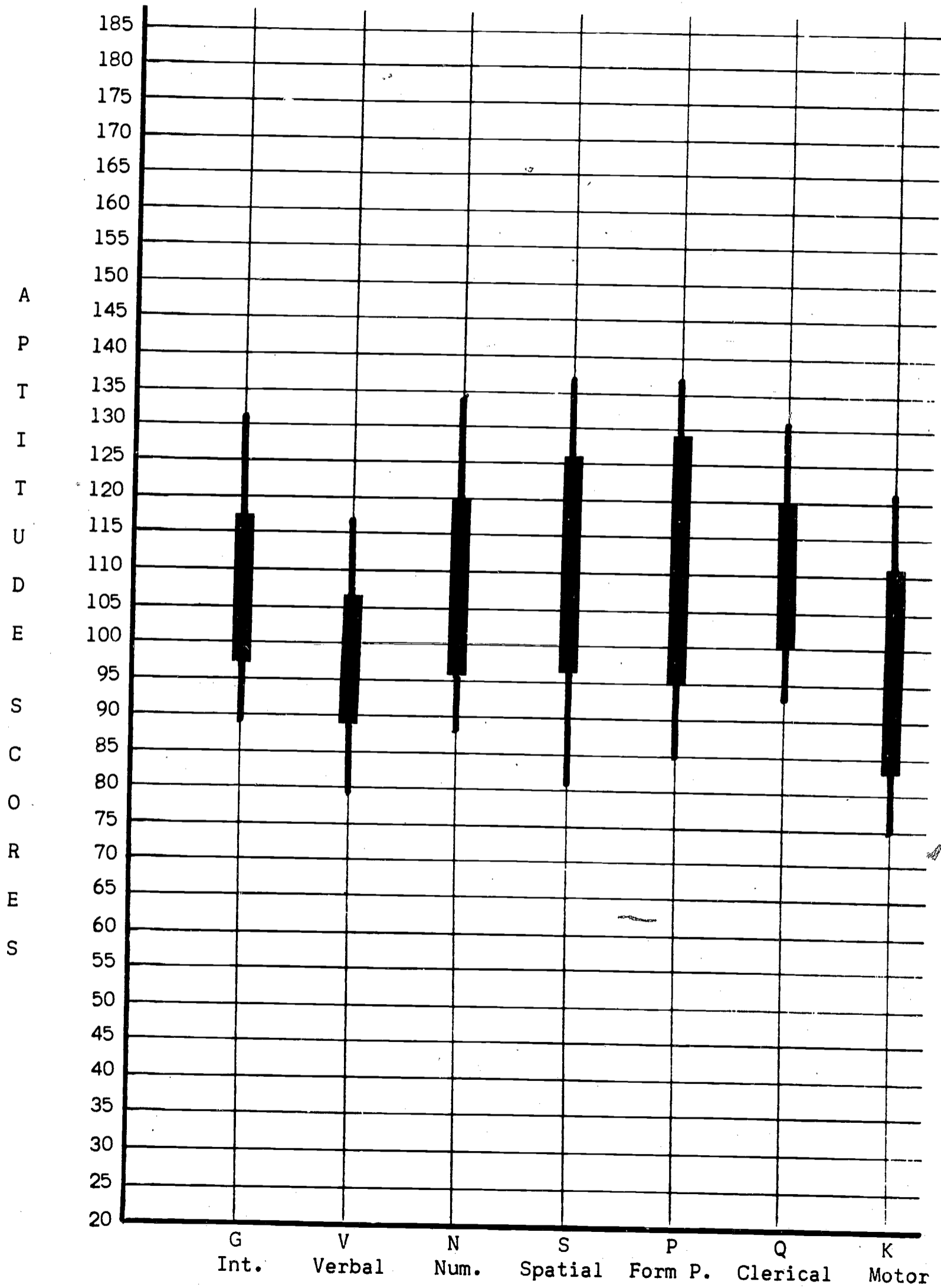
CLUSTER III

PRIMARILY FEMALE CURRICULA

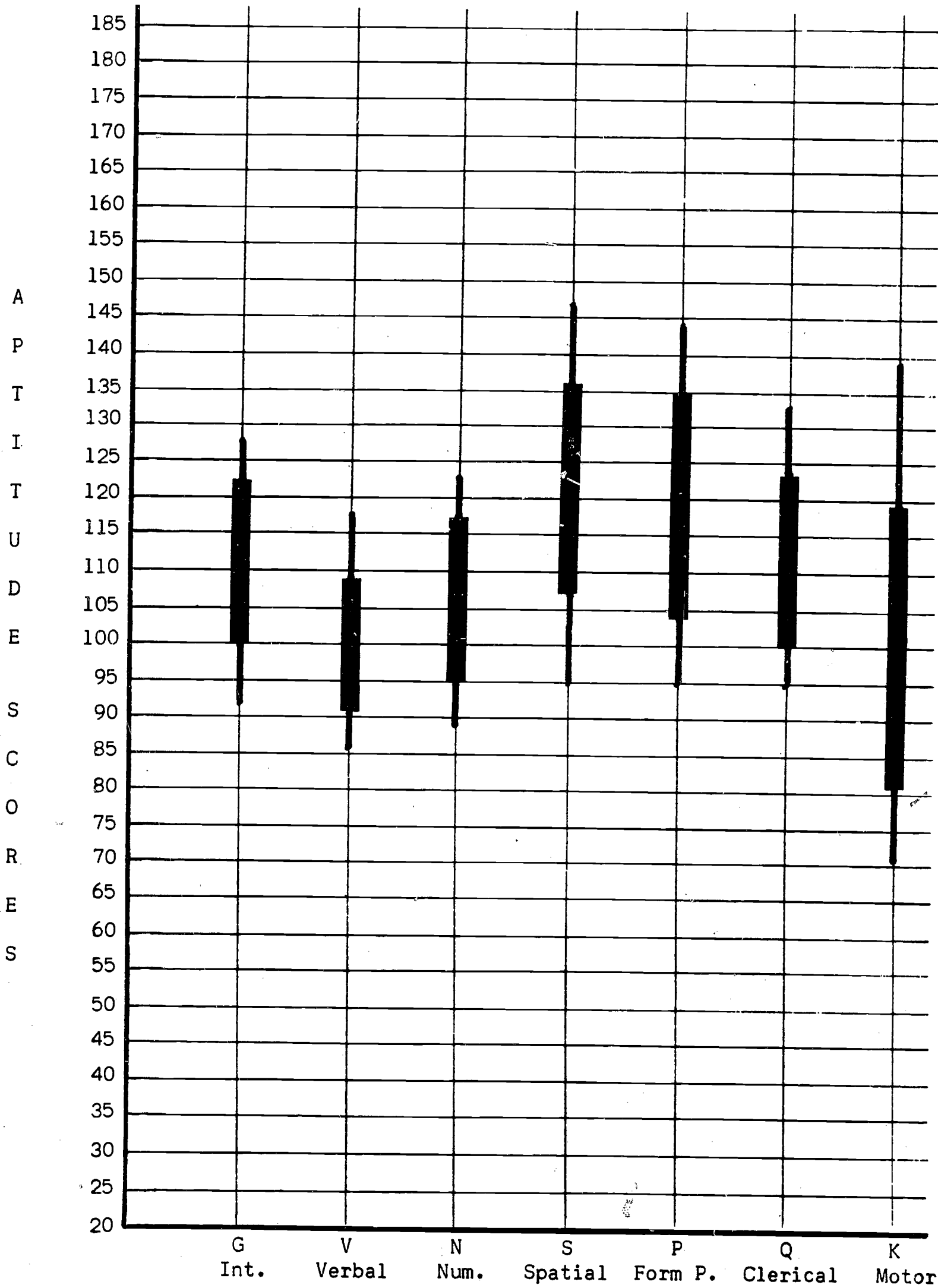
Clerical Training	36
Cosmetology	37
Dental Assistant.	38
Medical Laboratory Assistant.	39
Practical Nursing	40
Secretarial Training.	41

PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 AGRI-TECHNOLOGY

-15-



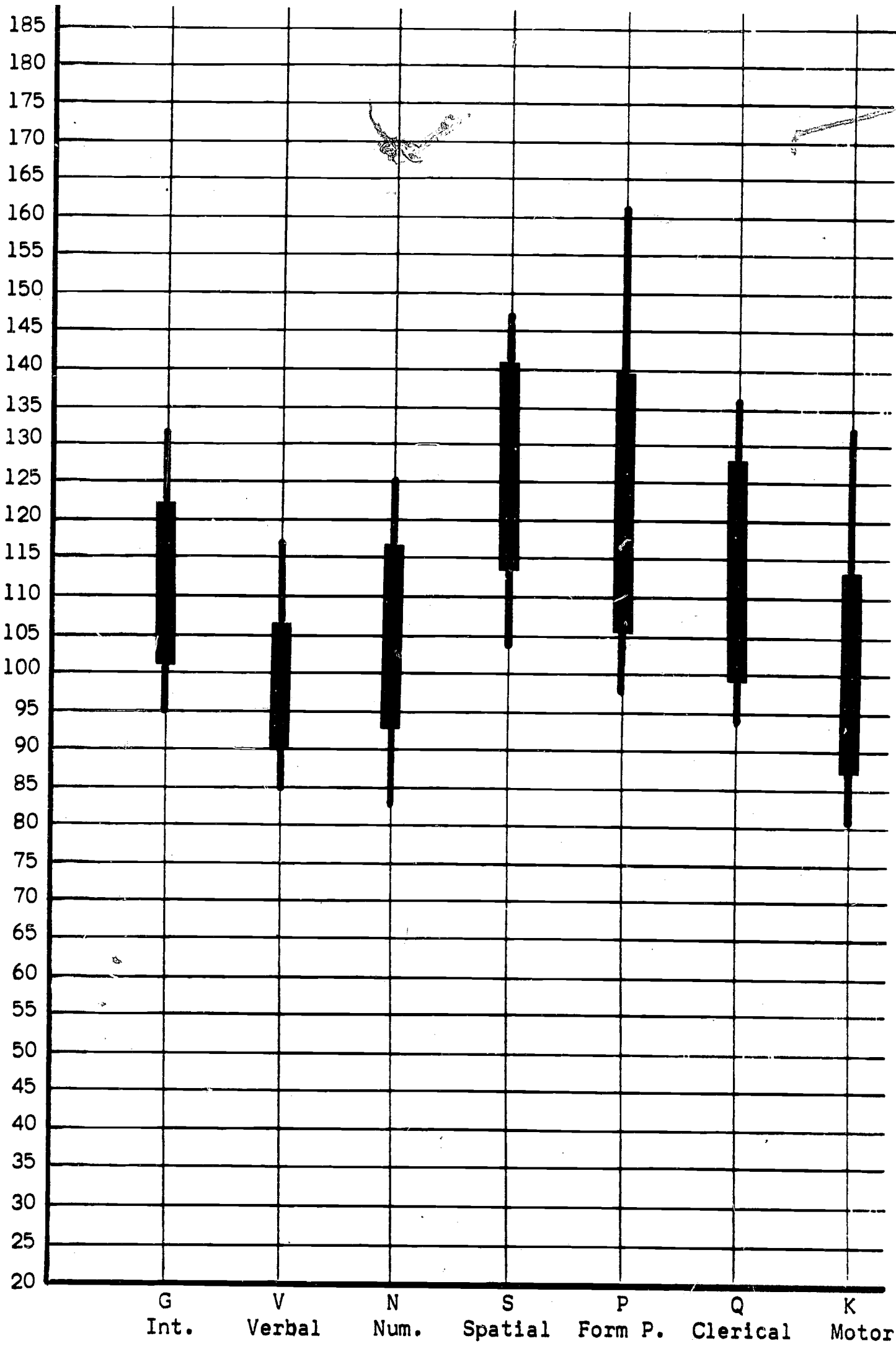
PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 AIRCRAFT MECHANICS



PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 ARCHITECTURAL DRAFTING

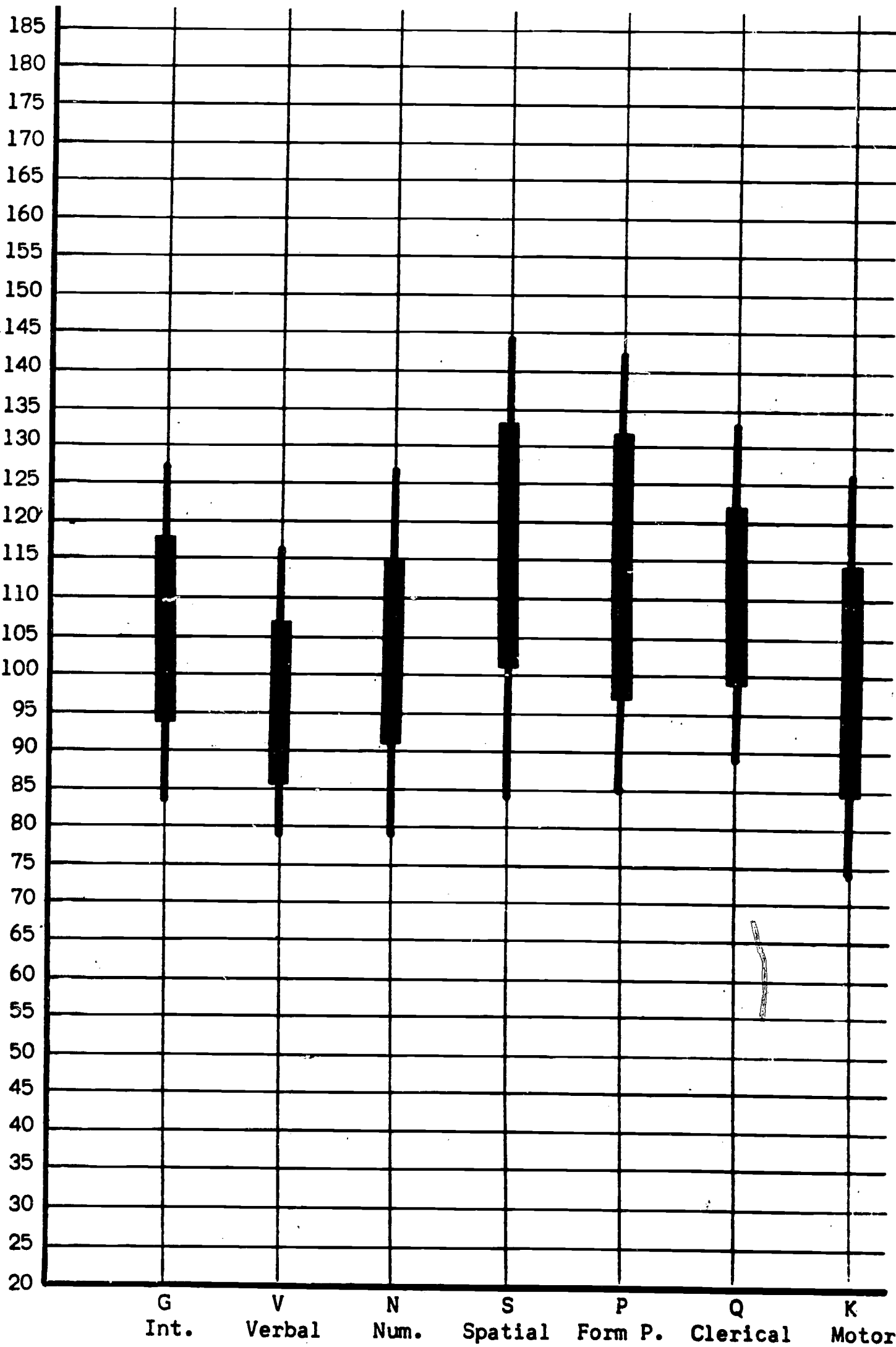
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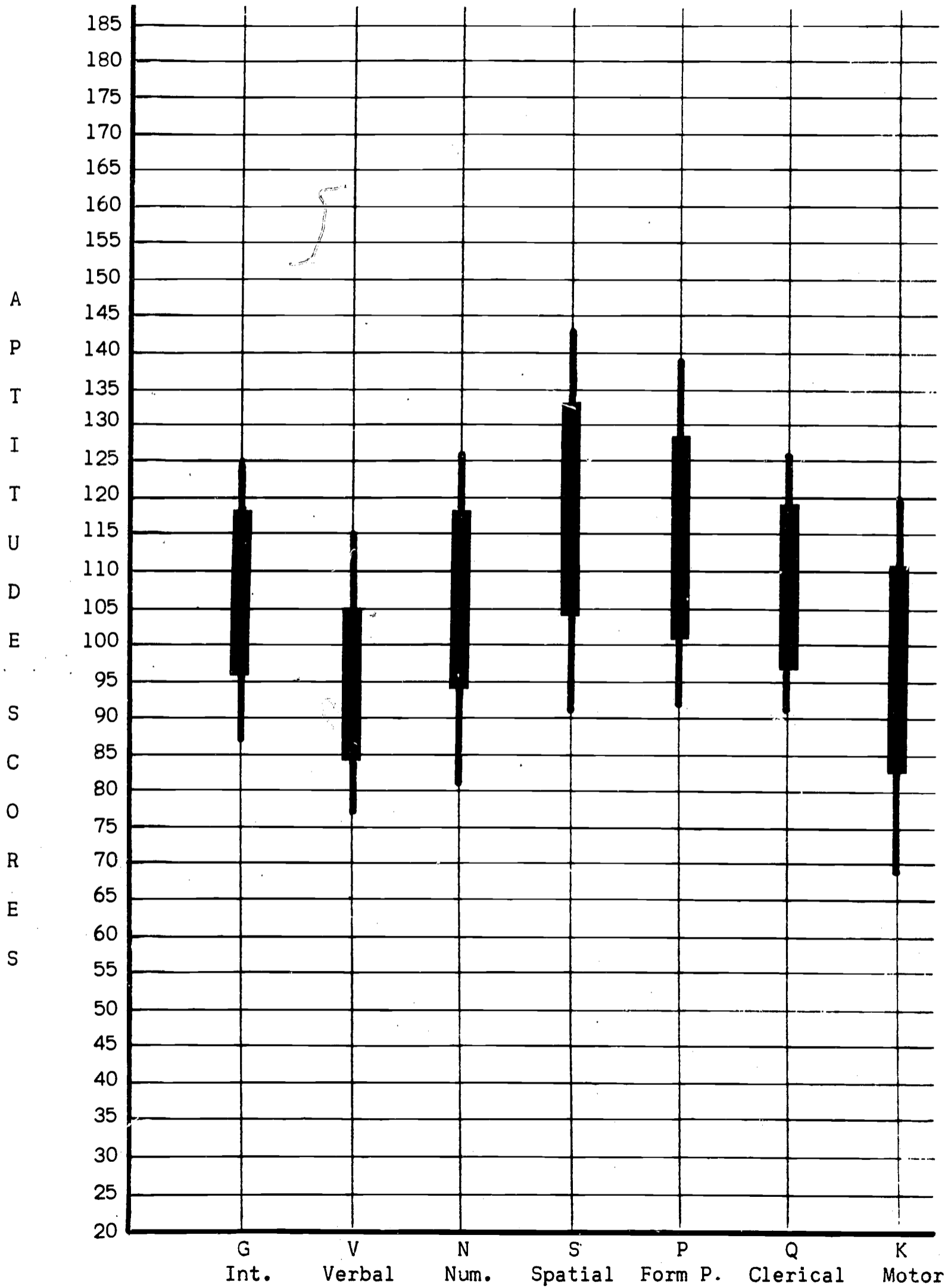


PROJECT MINI-SCORE TRAINING SUCCESS NORMS
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 PROFILE SHEET
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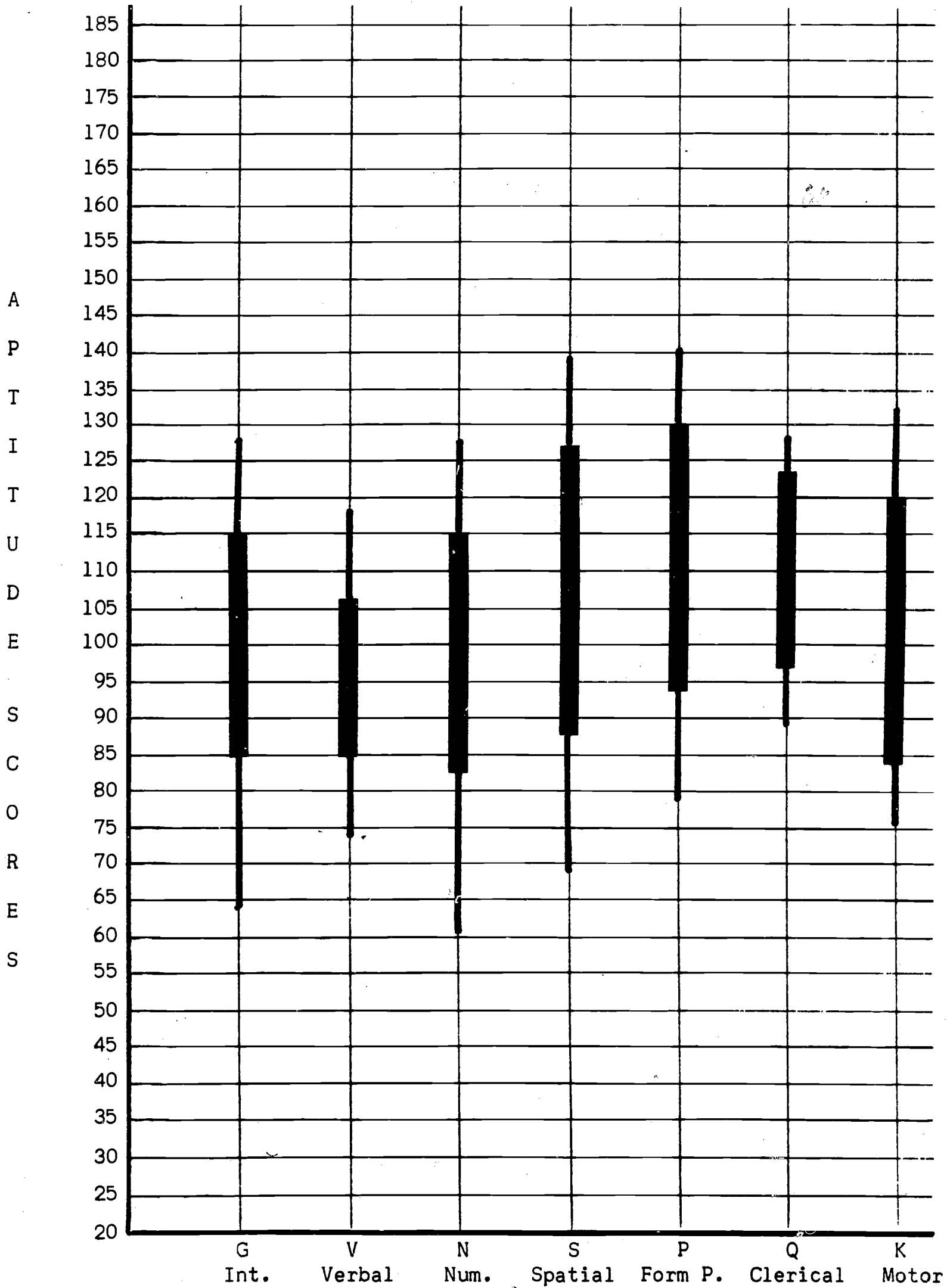


PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 CARPENTRY



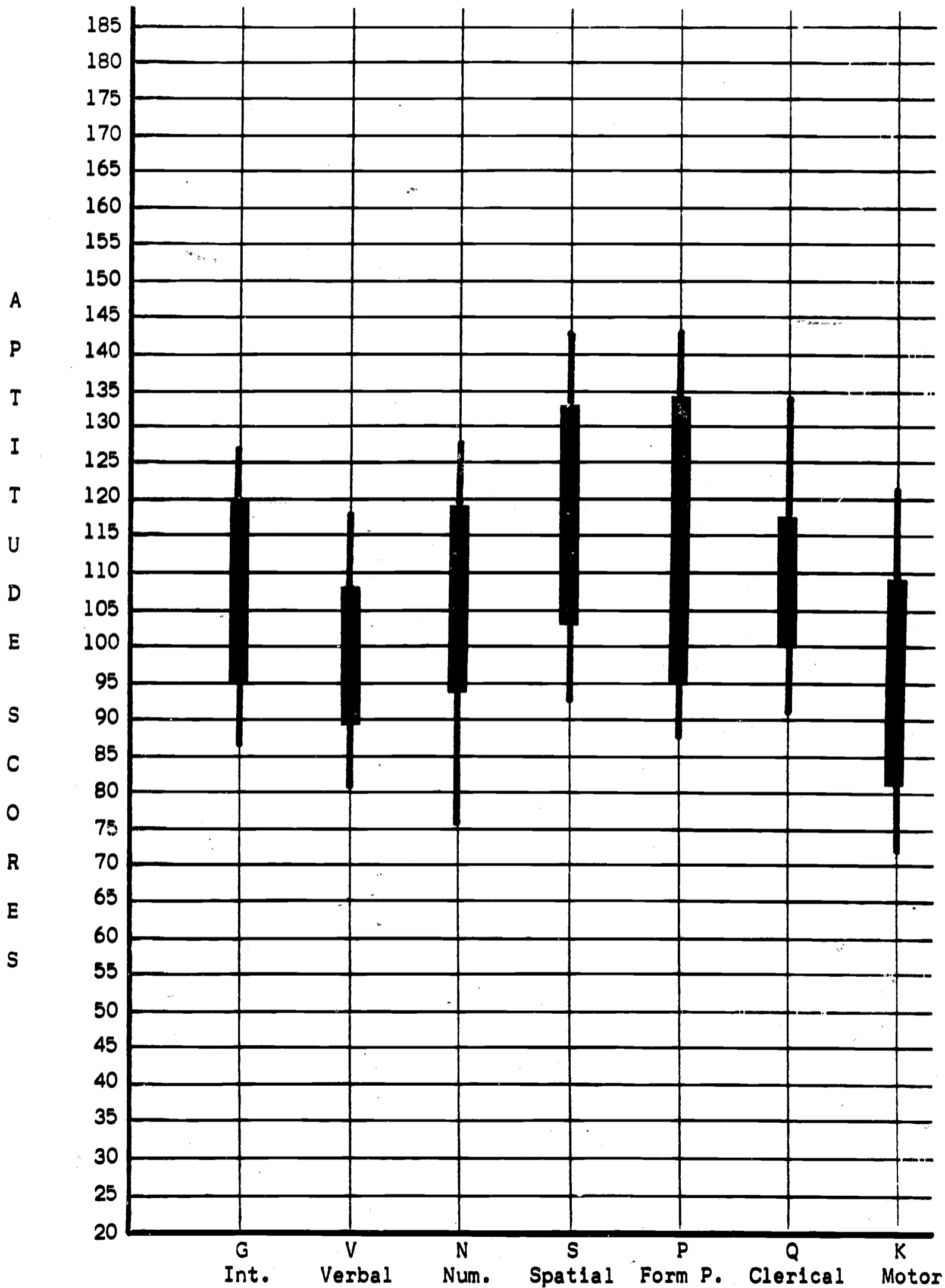
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 GATB APTITUDE SCORE
 PROFILE SHEET
 CHEFS AND COOKS

-20-

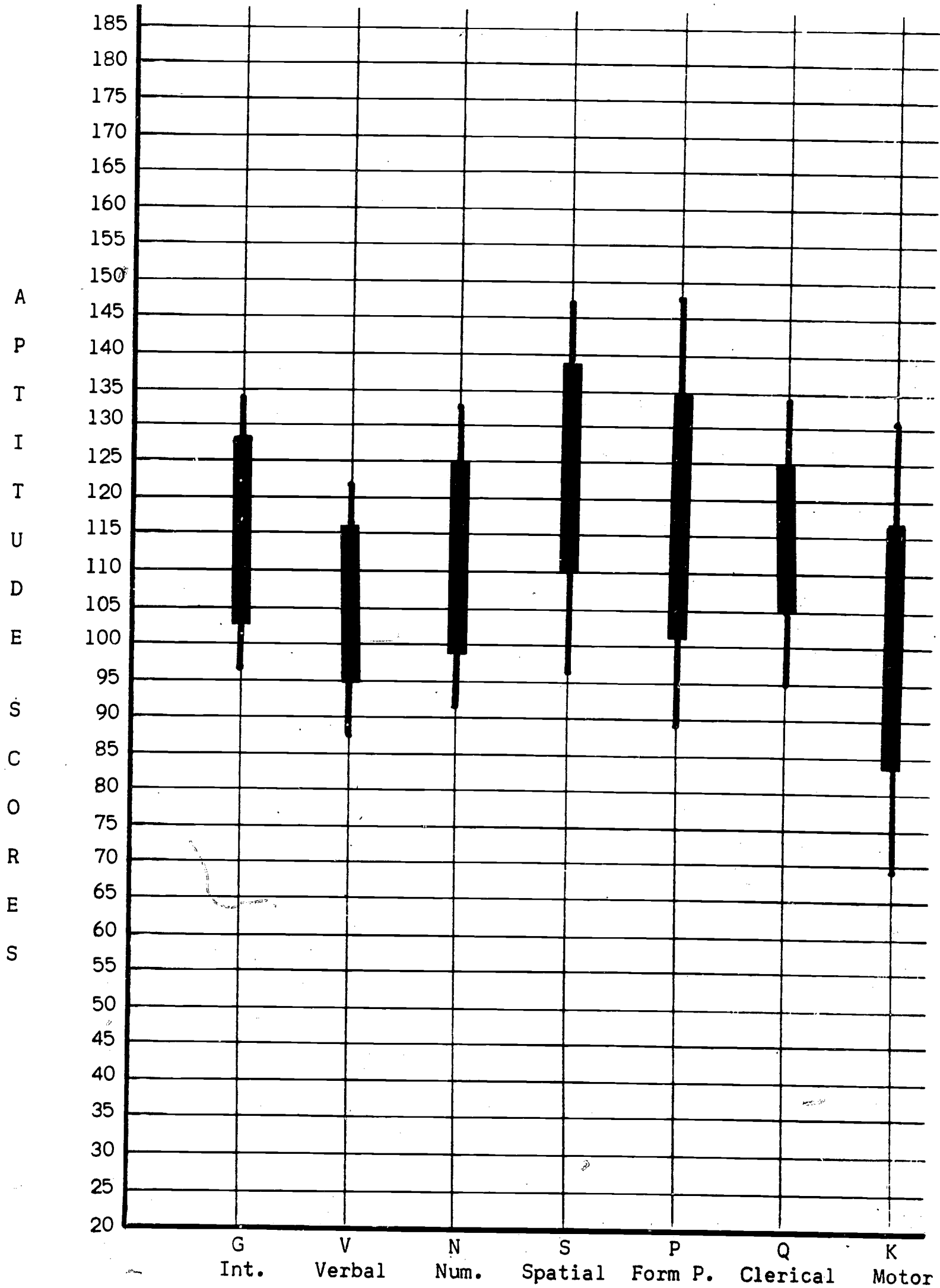


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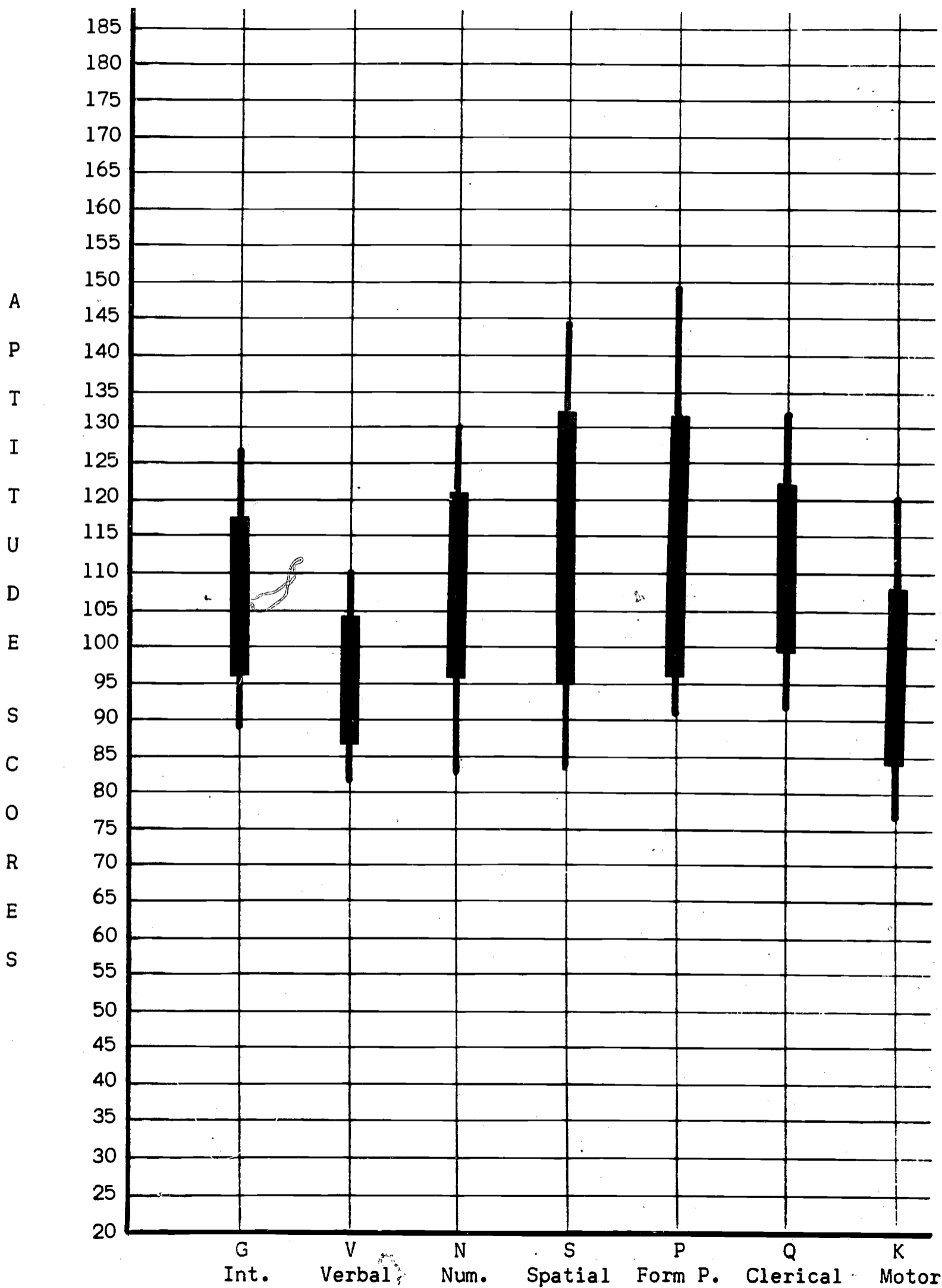
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 GATB APTITUDE SCORE
 PROFILE SHEET
 DIESEL MECHANICS



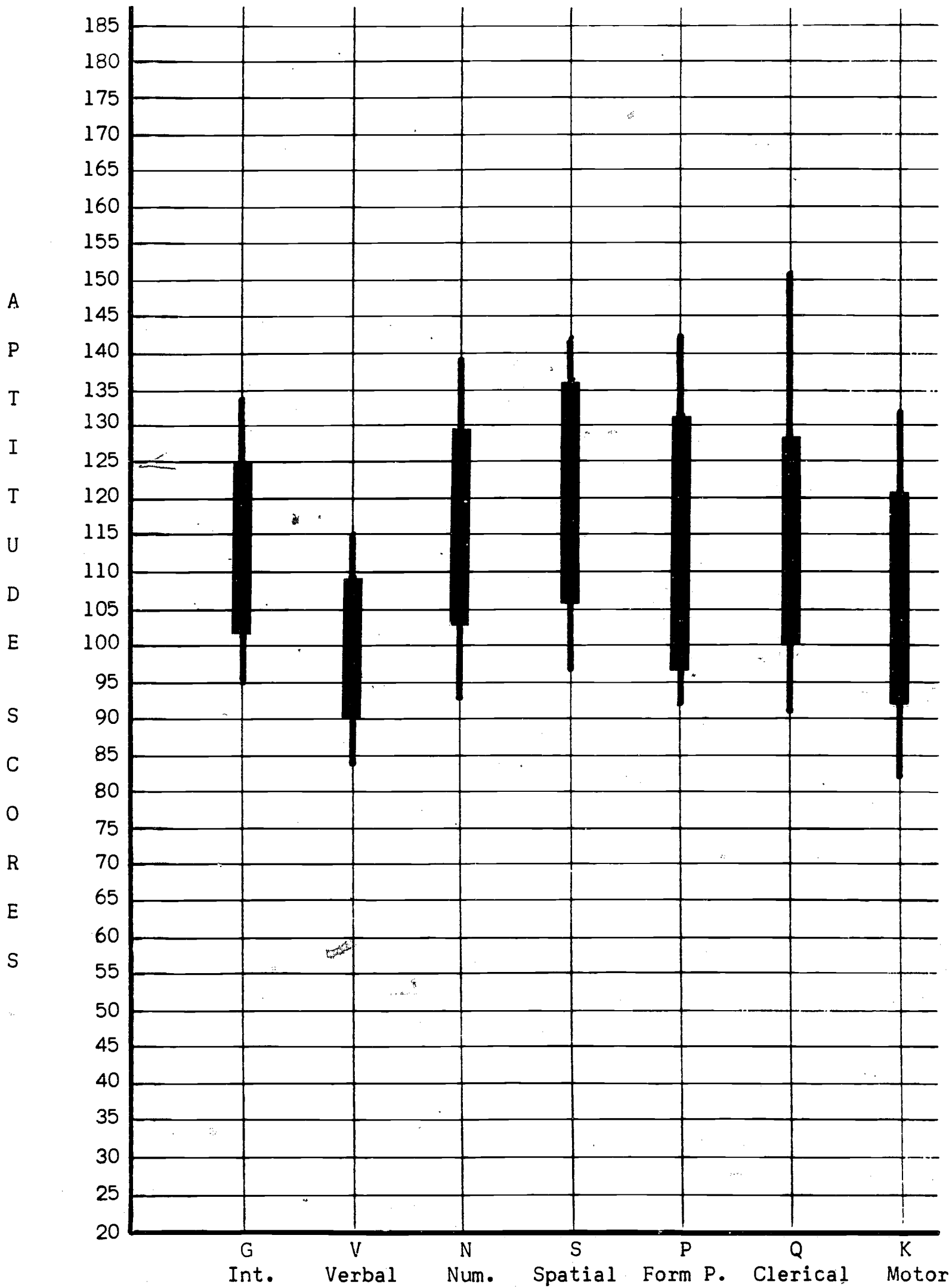
PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 ELECTRONICS



PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 FARM EQUIPMENT MECHANICS

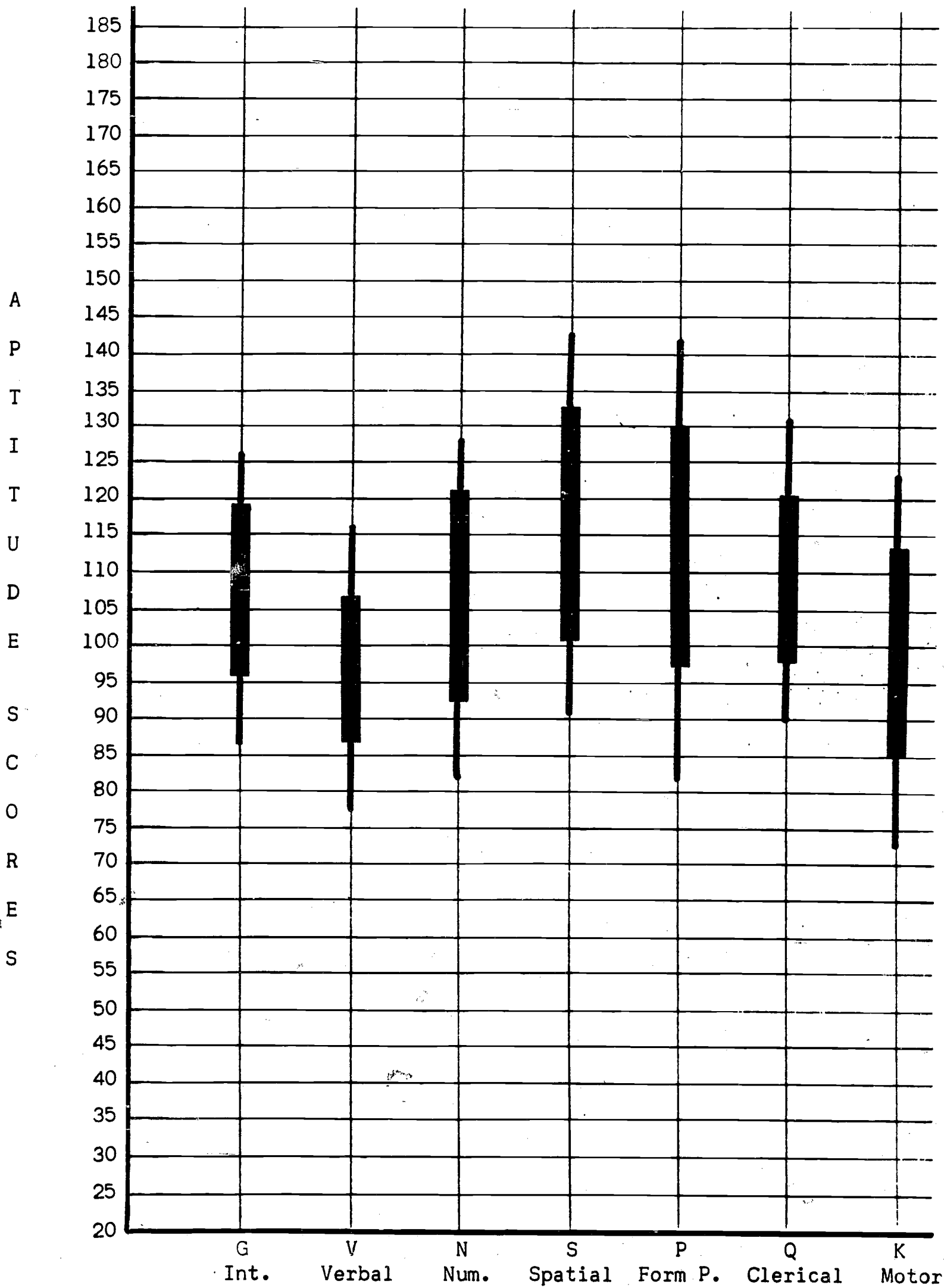


PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 FLUID POWER TECHNOLOGY

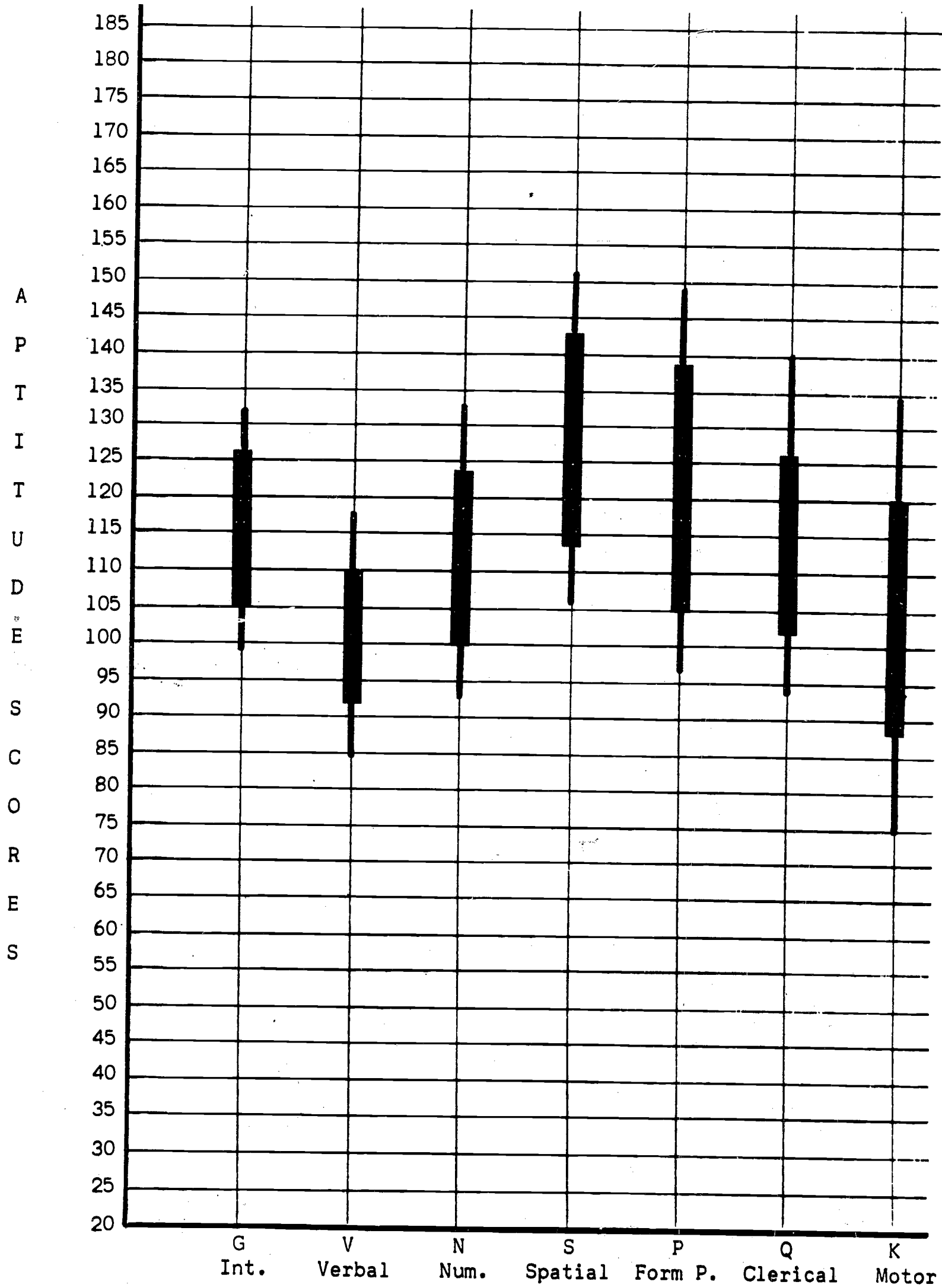


PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 MACHINE SHOP

-25-

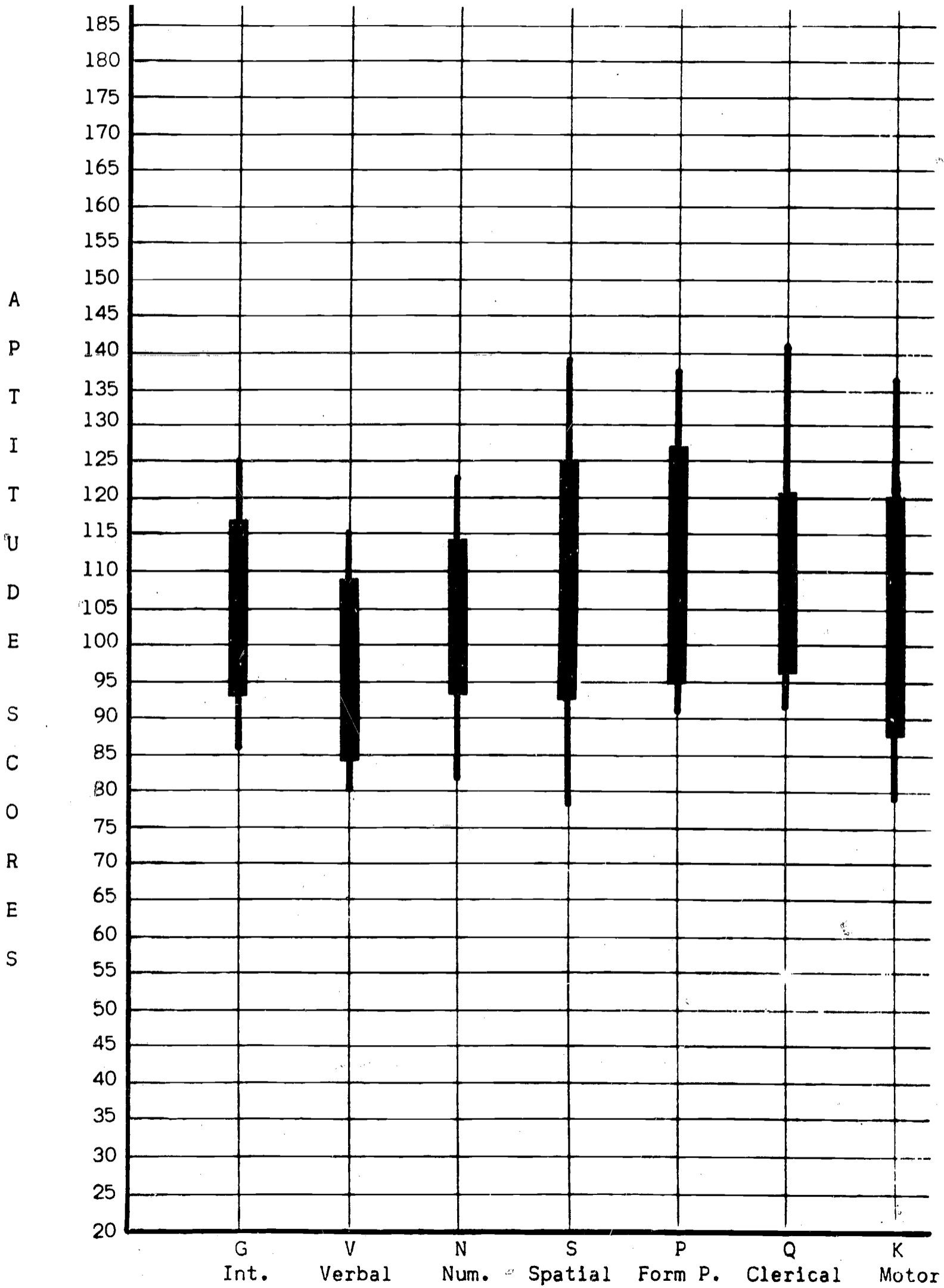


PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 MECHANICAL DRAFTING & DESIGN



PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET

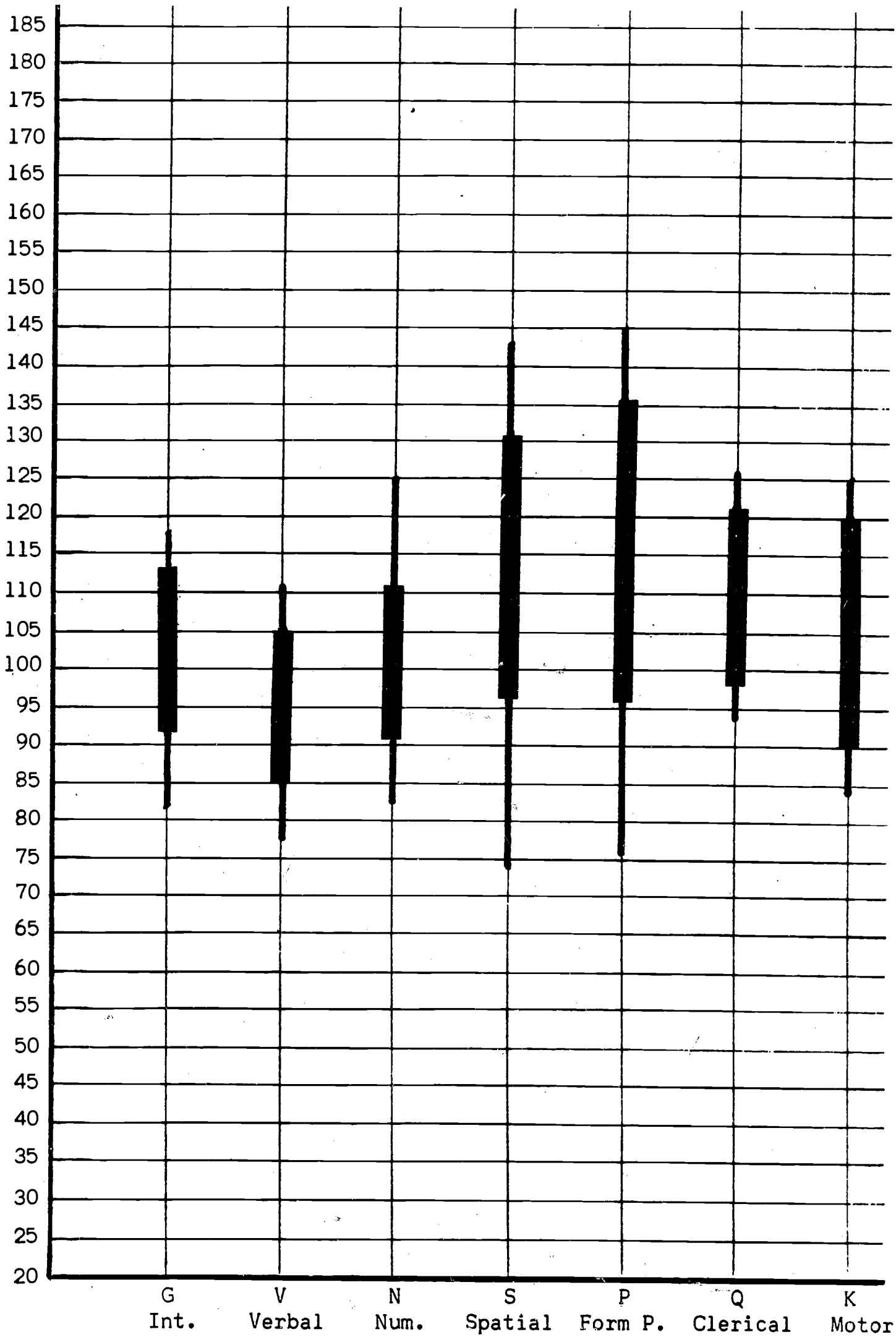
MECHANICAL REFRIGERATION, AIR CONDITIONING, AND APPLIANCE REPAIR



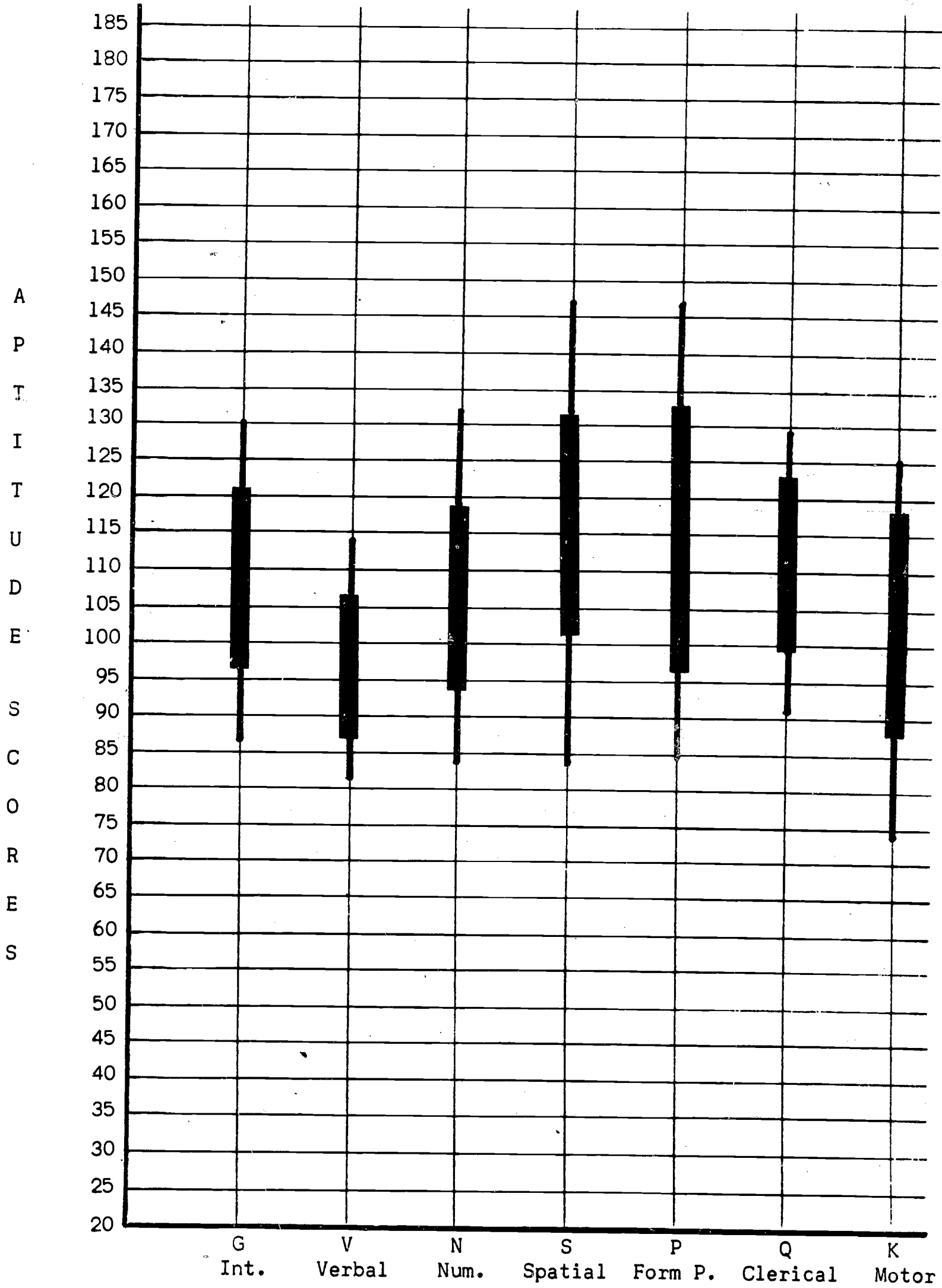
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PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 PLUMBING & SHEET METAL

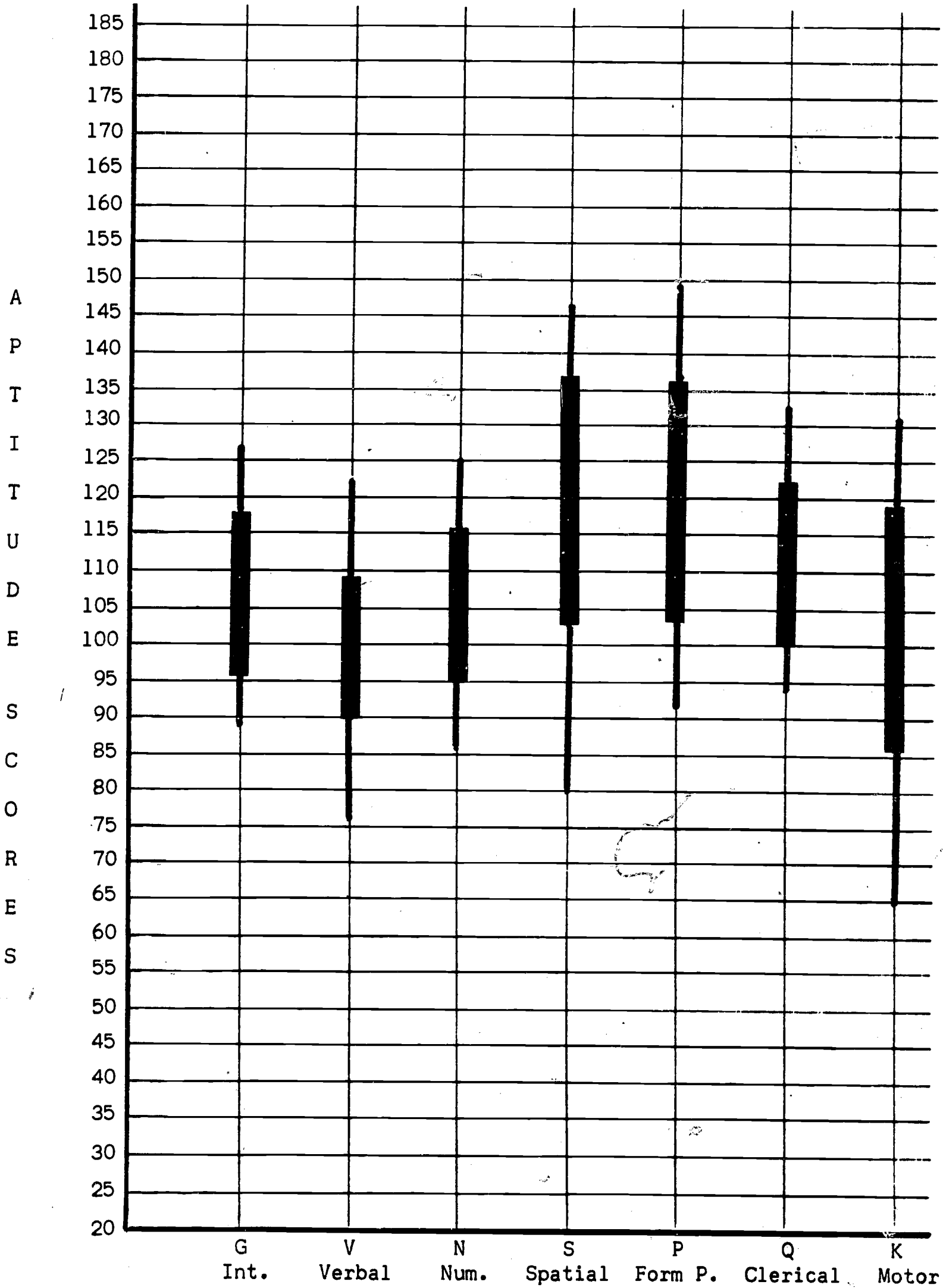
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PROJECT MINI-SCORE TRAINING SUCCESS NORMS
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 PROFILE SHEET
 POWER & HOME ELECTRICITY

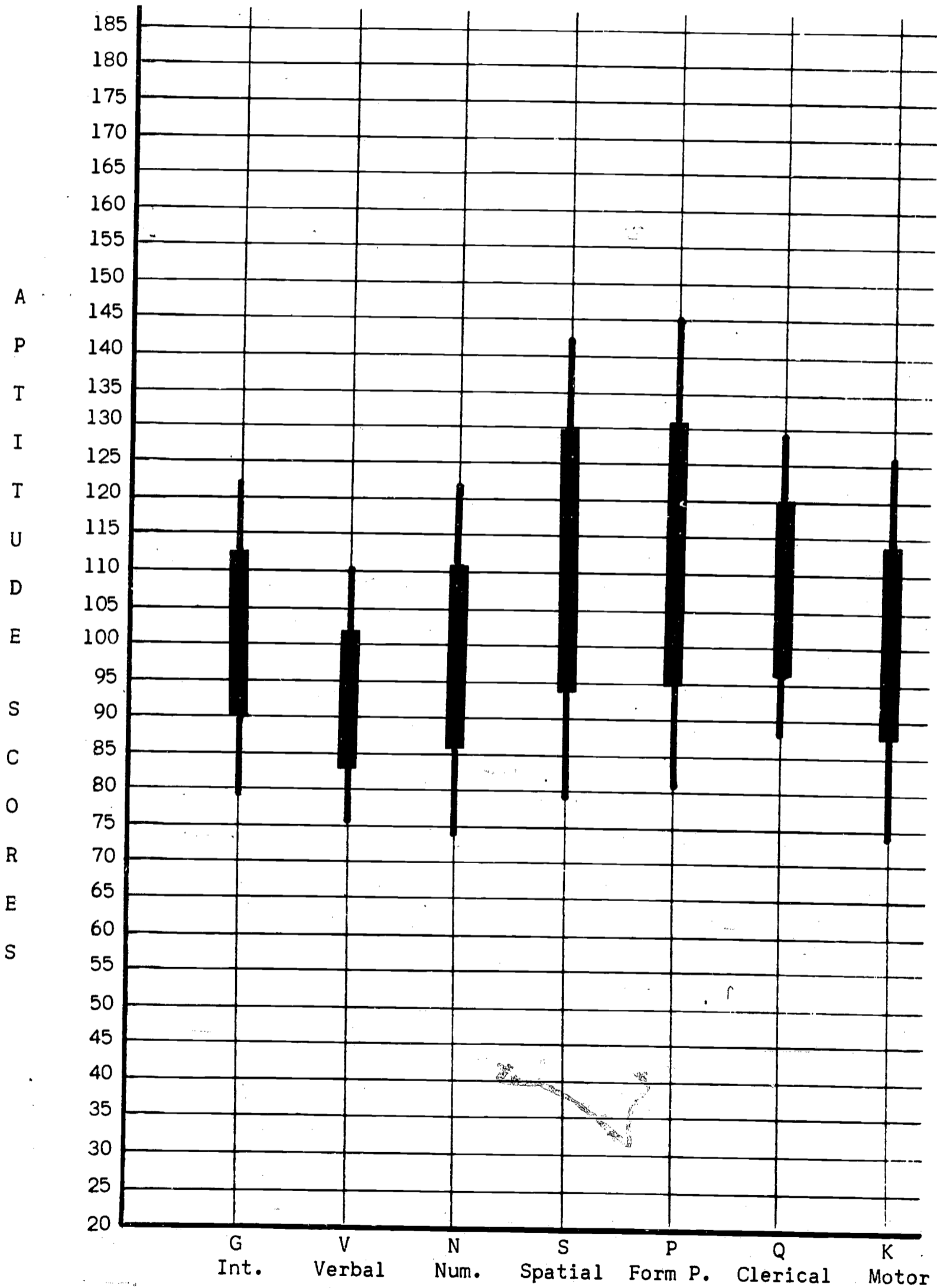


PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 PRINTING & GRAPHIC ARTS

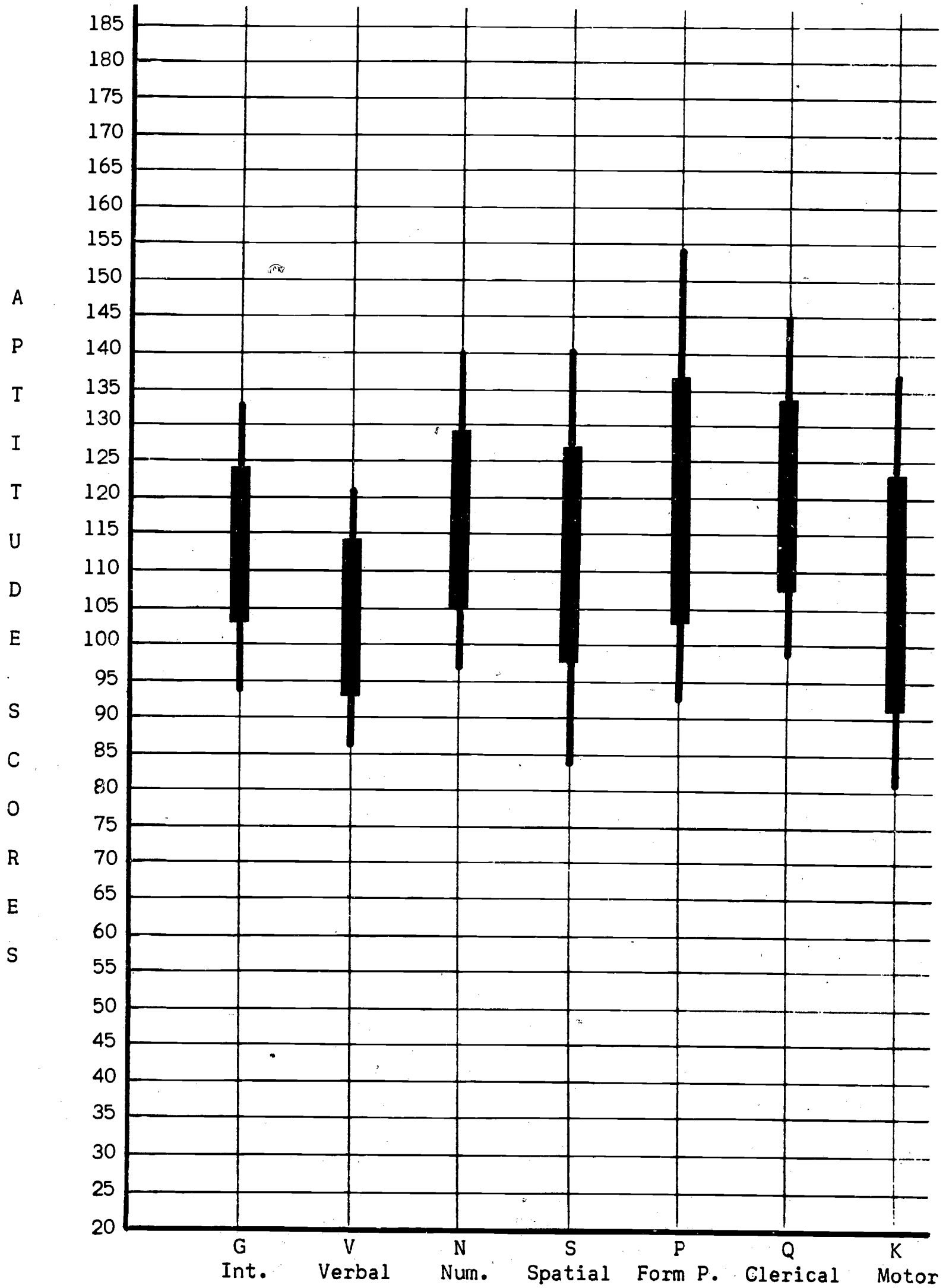


PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 WELDING

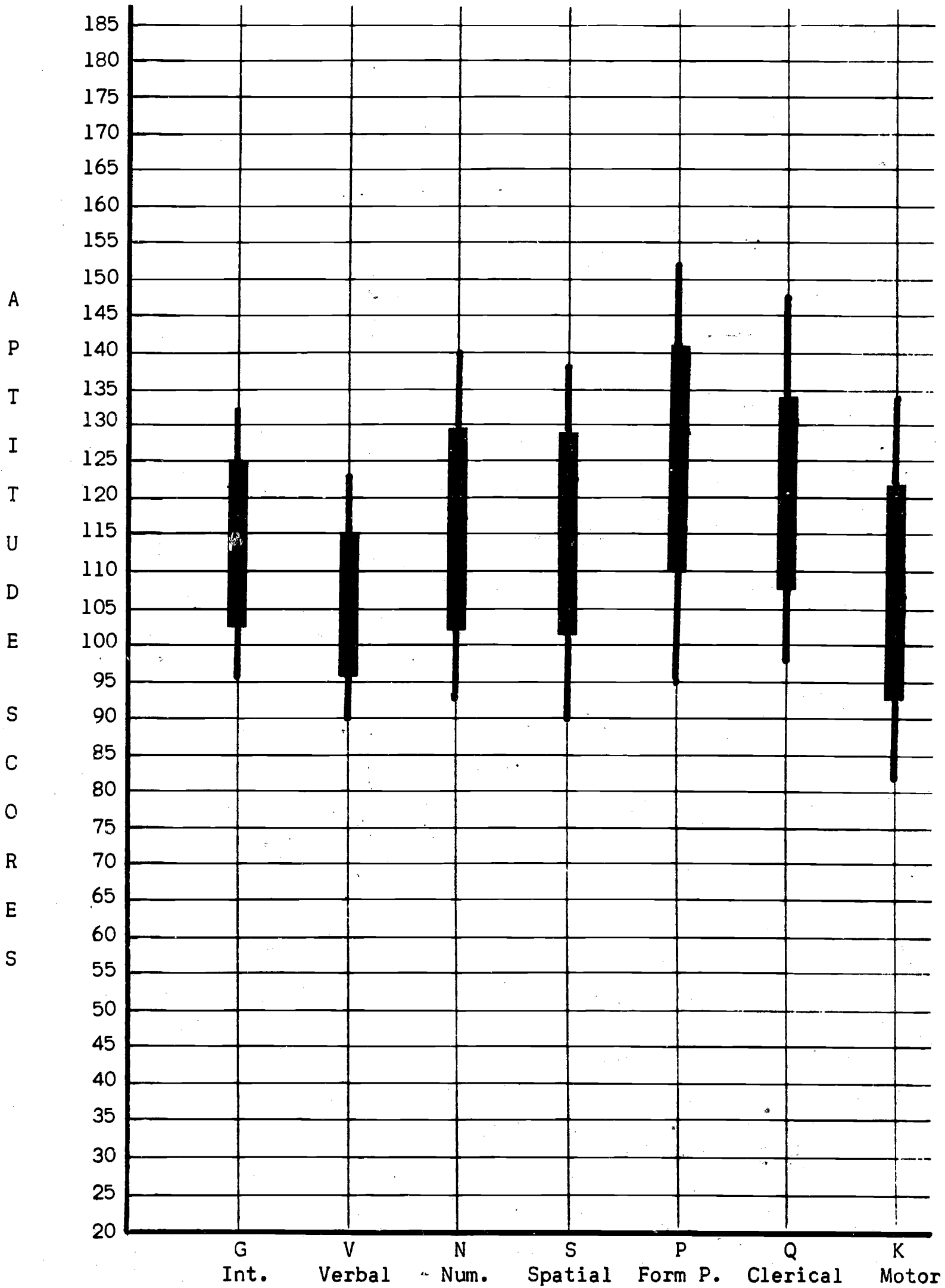
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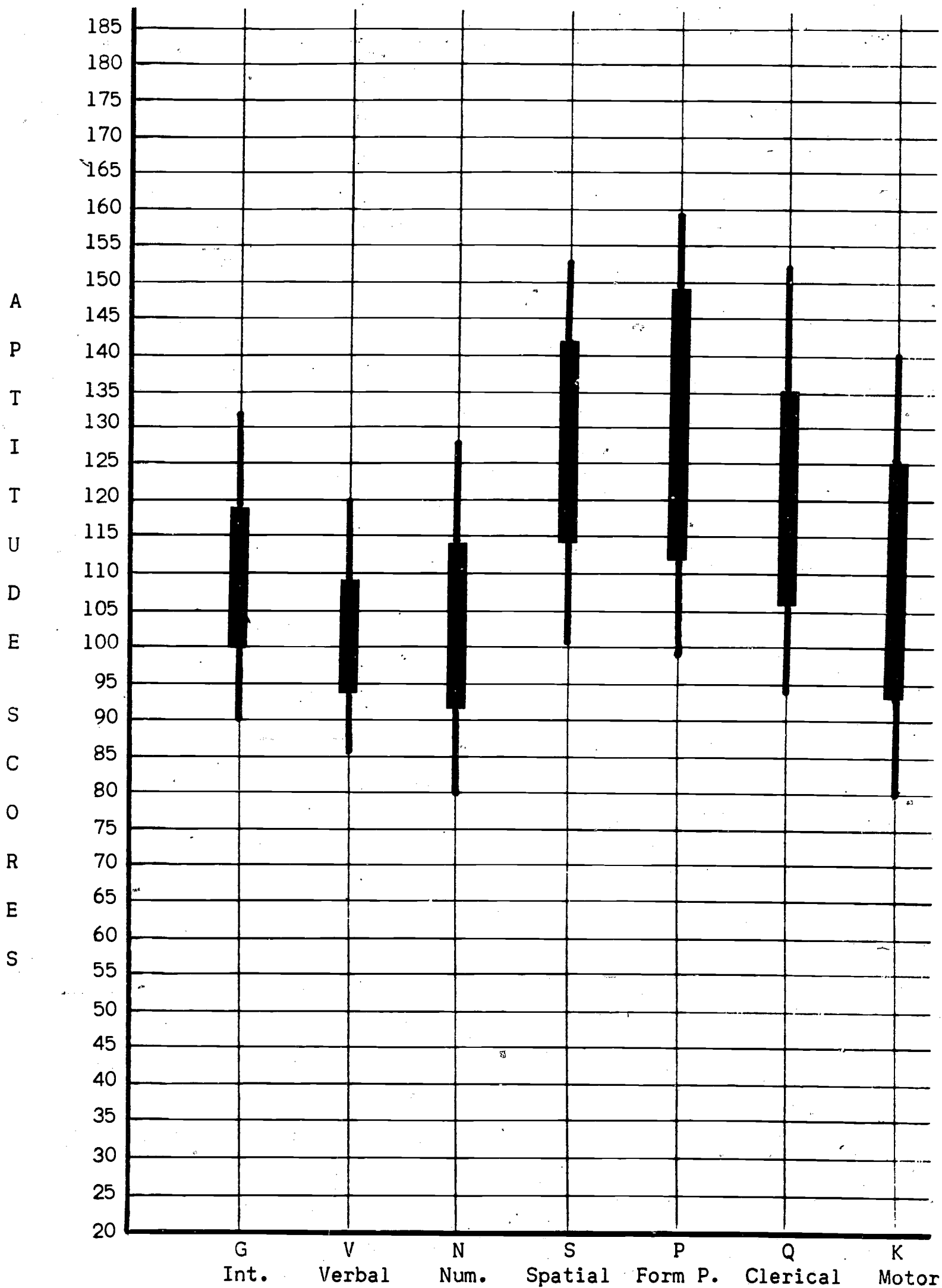
PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 ACCOUNTING



PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 DATA PROCESSING



PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 INTERIOR DESIGN & SALES ASSISTANT

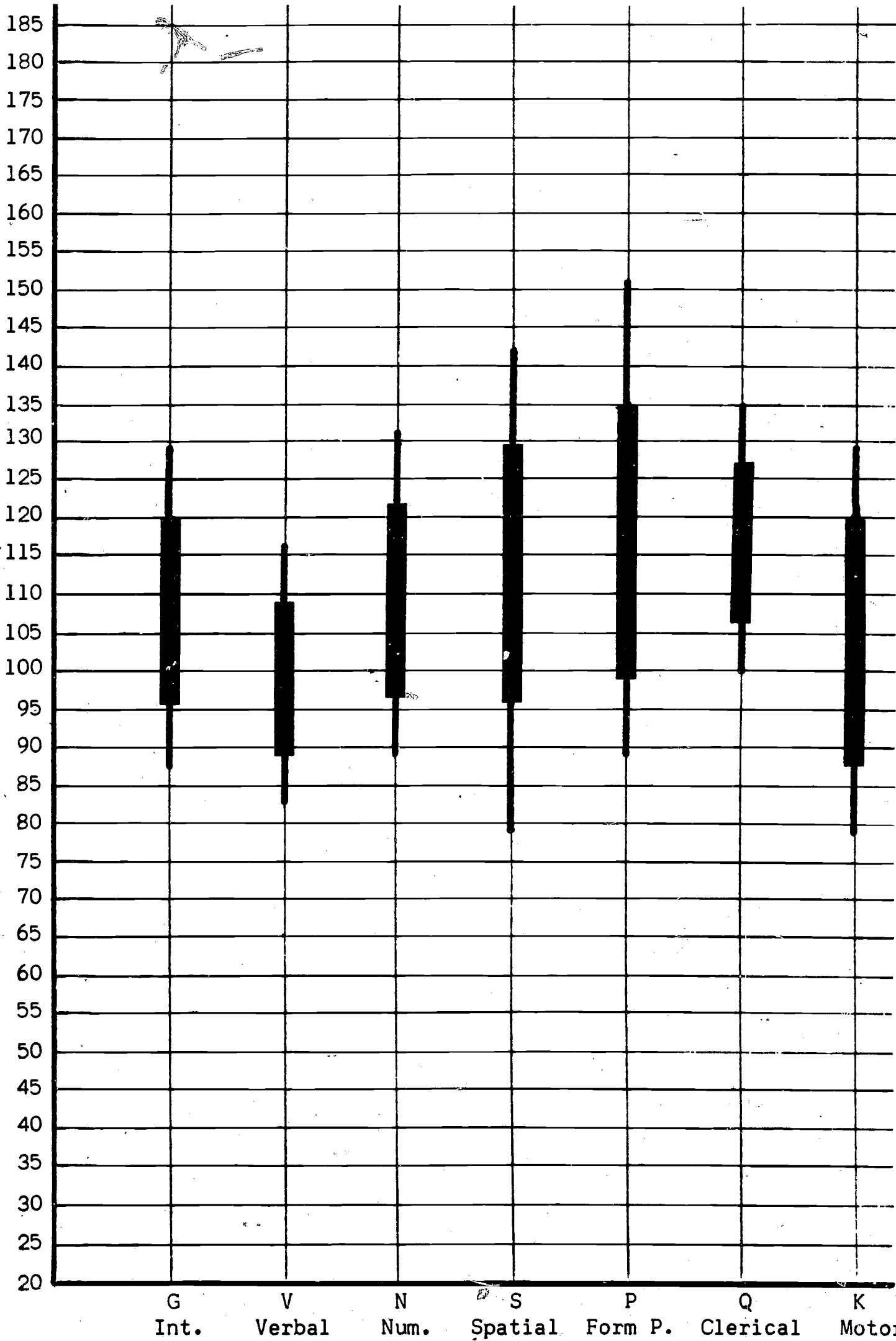


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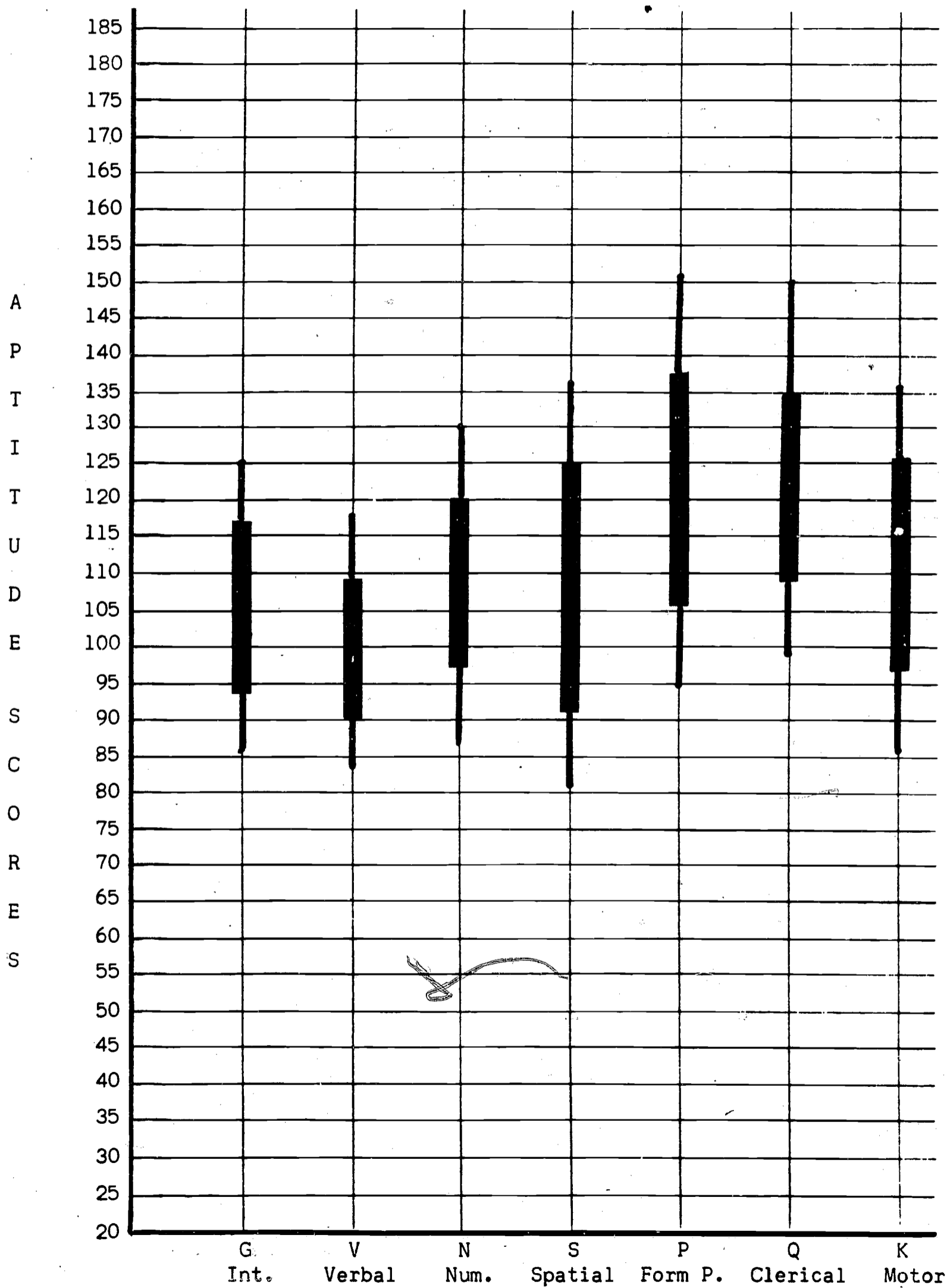
PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 SALES

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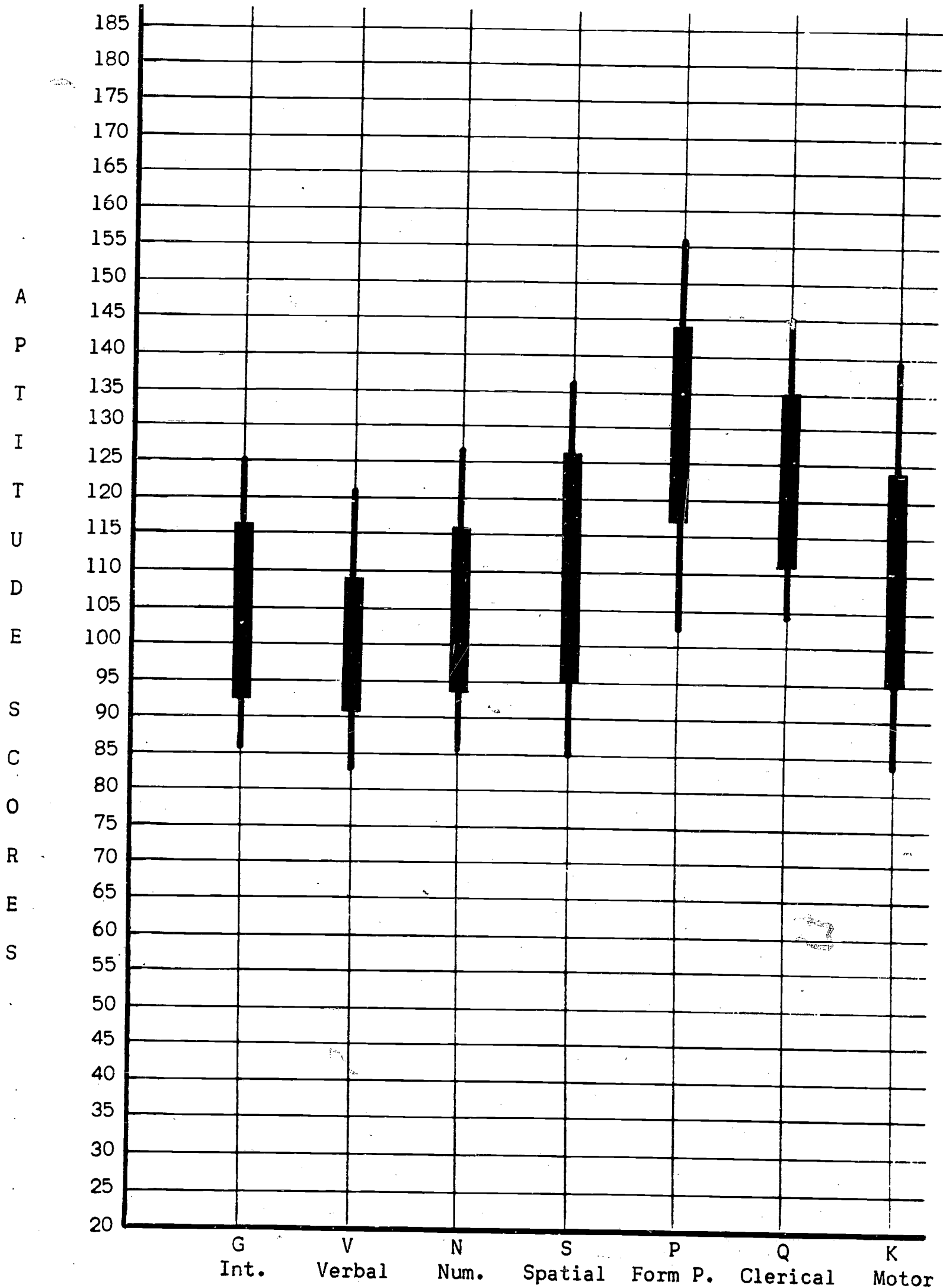


PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 CLERICAL TRAINING



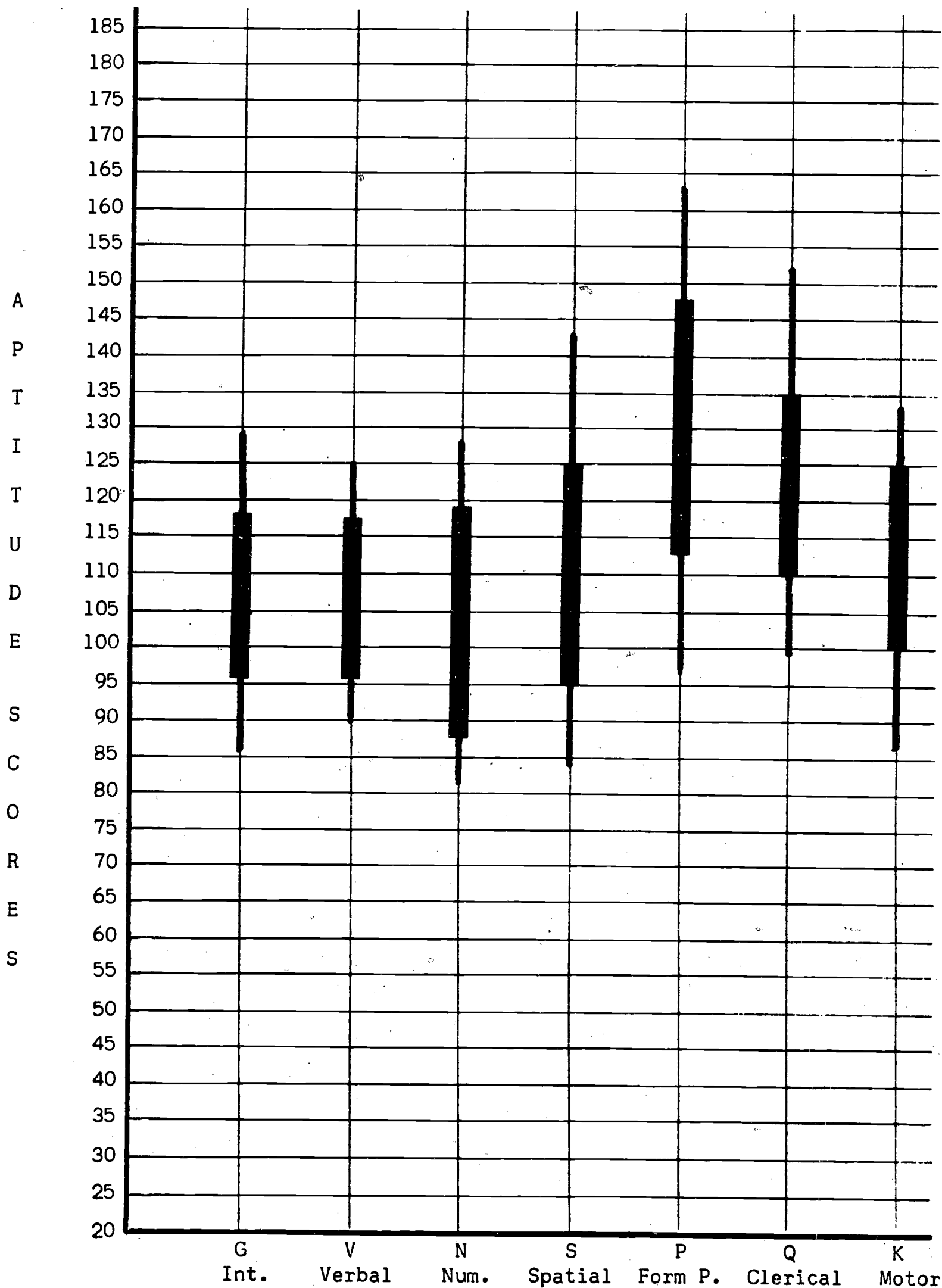
PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 COSMETOLOGY

-37-

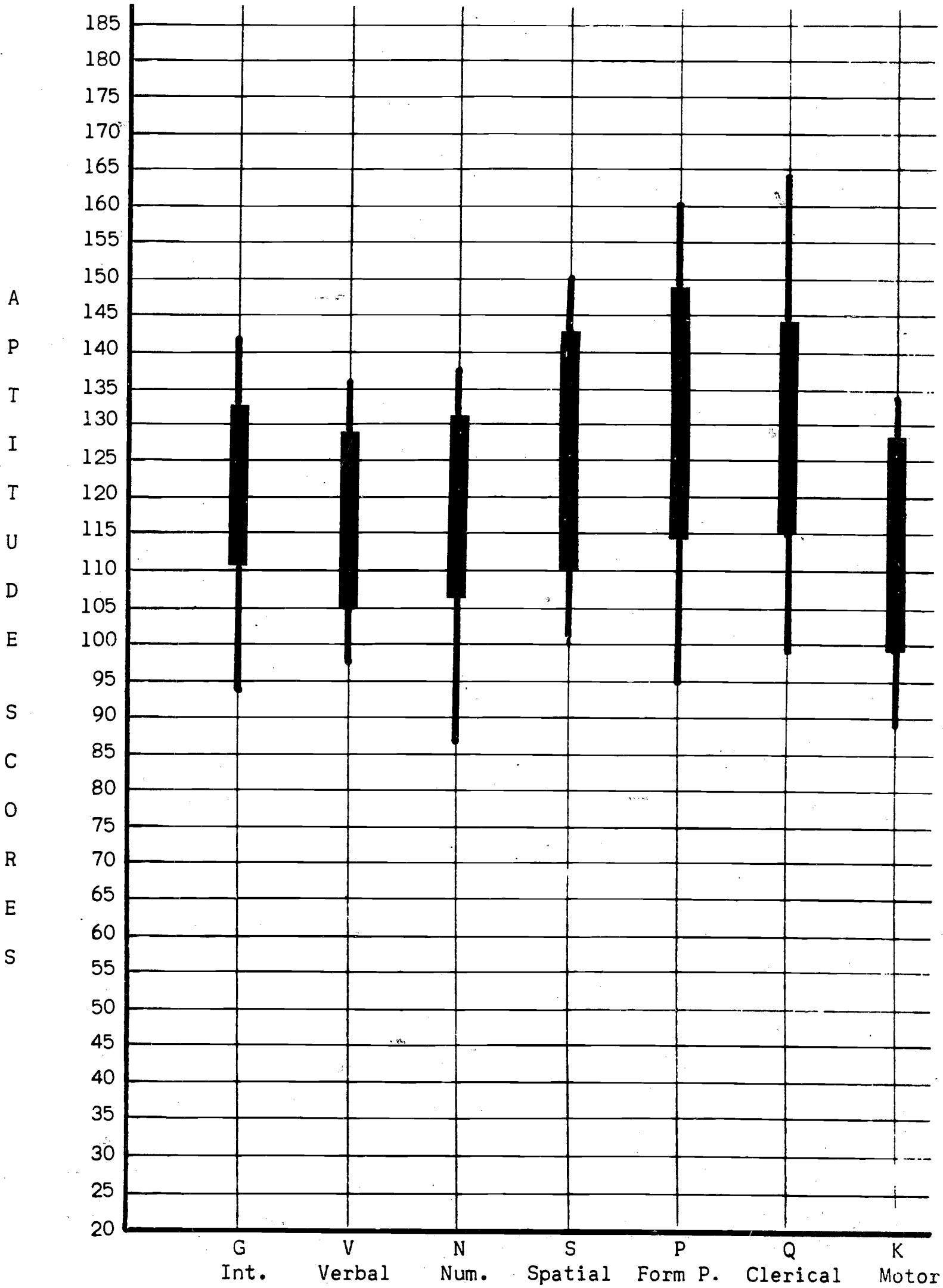


PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 DENTAL ASSISTANT

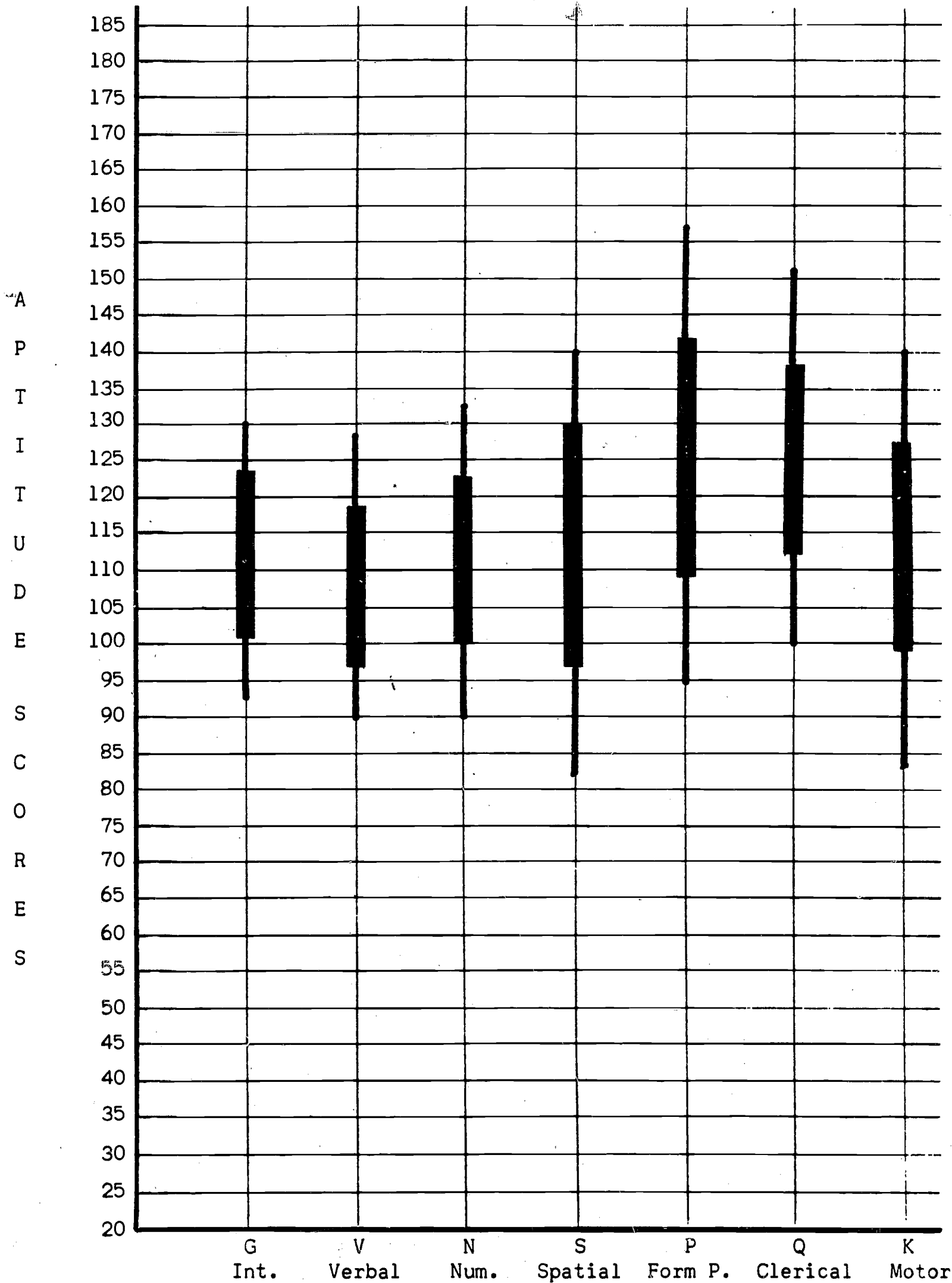
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PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 MEDICAL LABORATORY ASSISTANT

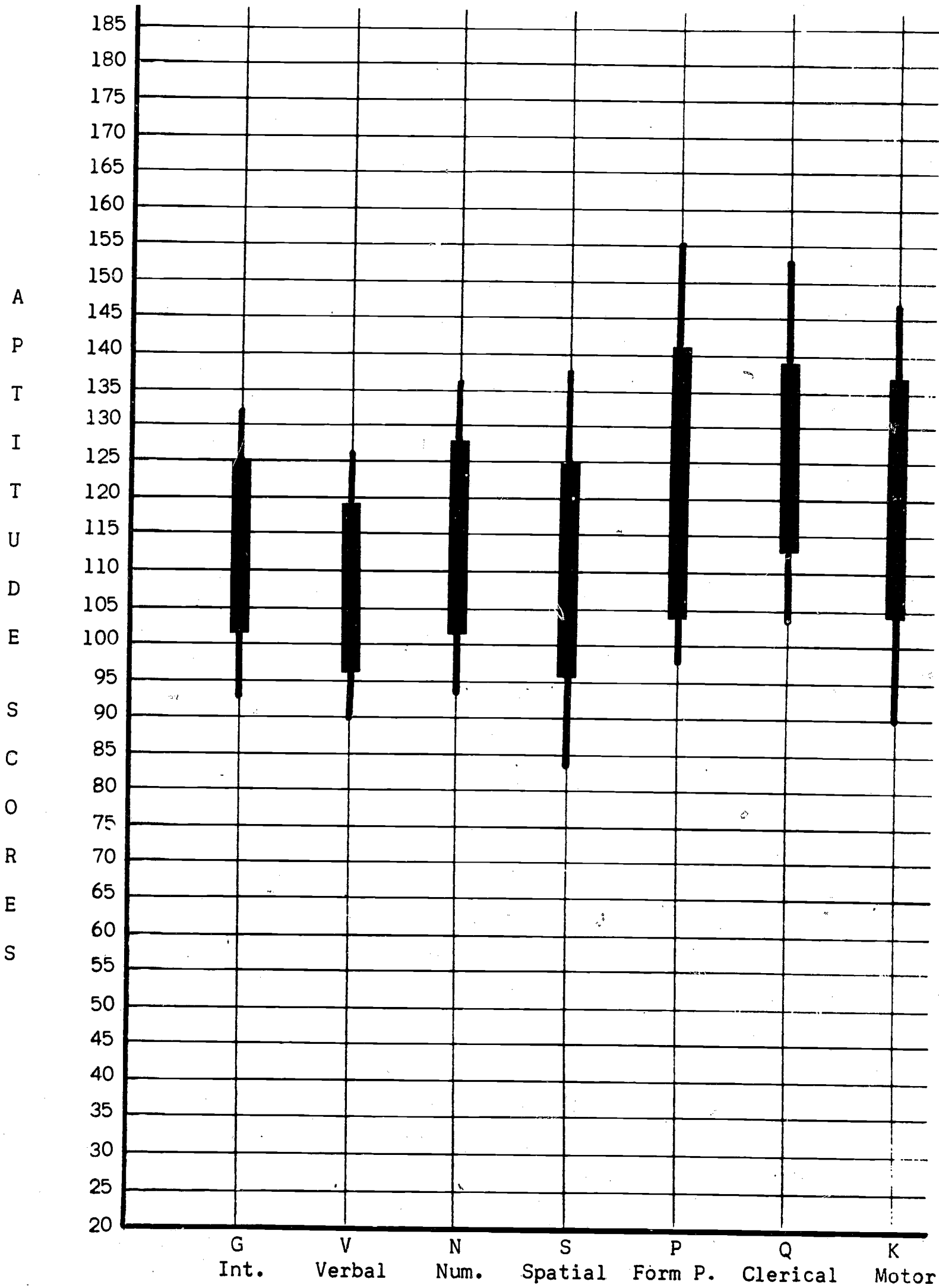


PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 PRACTICAL NURSING



PROJECT MINI-SCORE TRAINING SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 SECRETARIAL TRAINING

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APPENDIX C

APTITUDE SCORE PROFILES,
EMPLOYMENT SUCCESS NORMS

CLUSTER I

PRIMARILY MALE CURRICULA

Page

Automotive	43
Carpentry	44
Electronics	45
Power and Home Electricity	46
Machine Shop	47
Mechanical Drafting and Design	48
Welding	49

CLUSTER II

CURRICULA WITH BOTH MALE AND FEMALE

Accounting	50
Data Processing	51

CLUSTER III

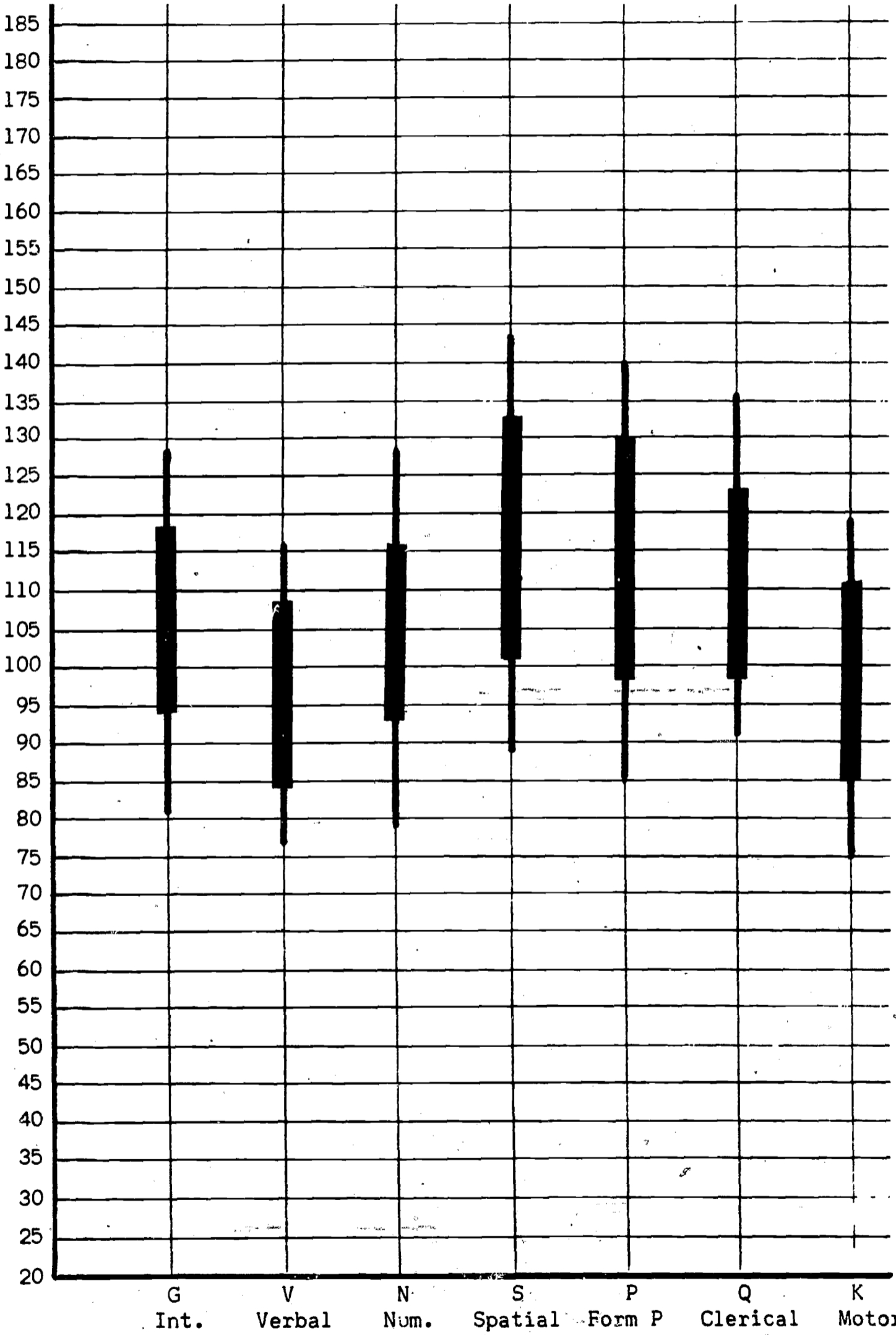
PRIMARILY FEMALE CURRICULA

Clerical Training	52
Cosmetology	53
Practical Nursing	54
Secretarial Training	55

PROJECT MINI-SCORE EMPLOYMENT SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 AUTOMOTIVE

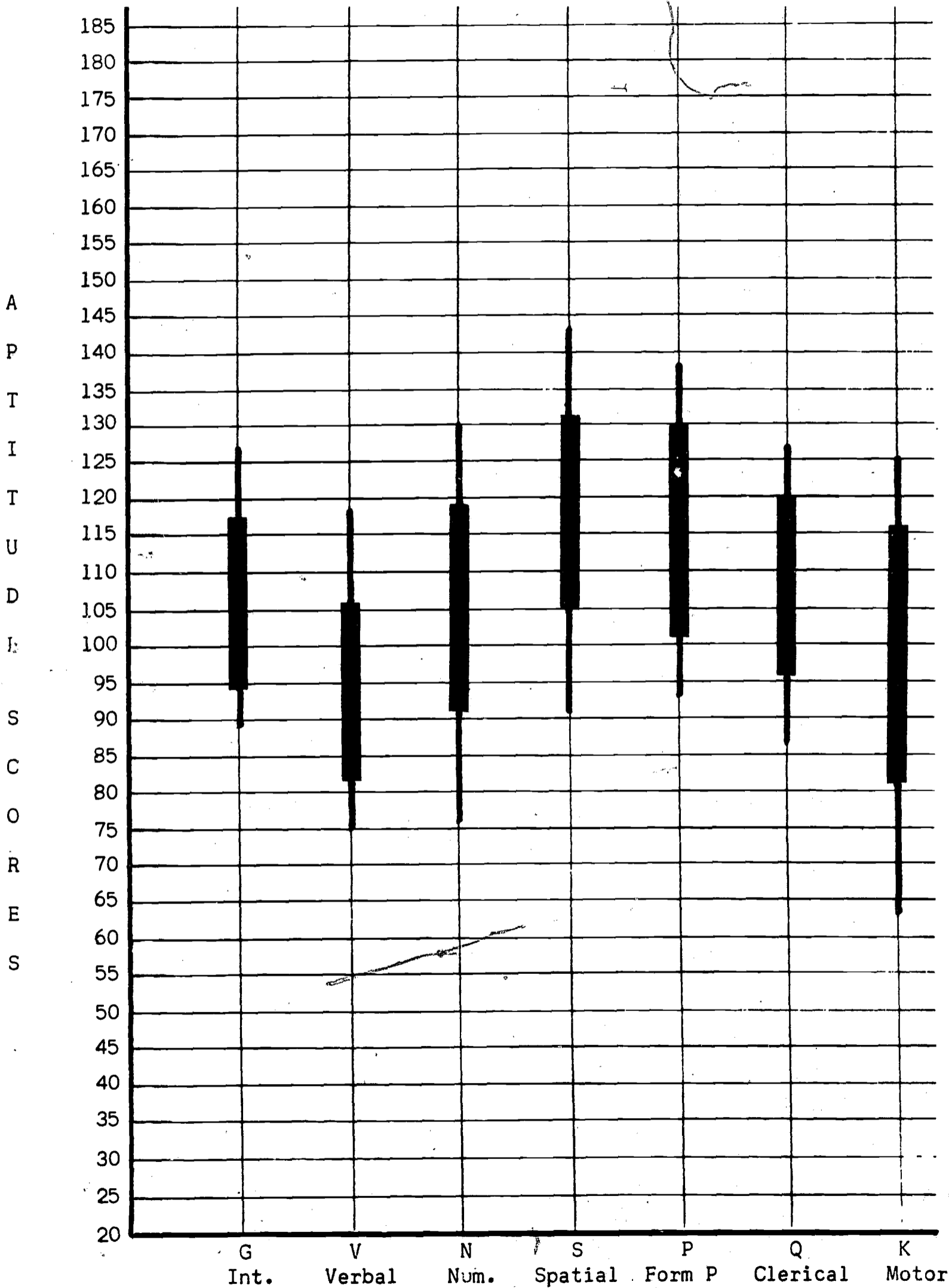
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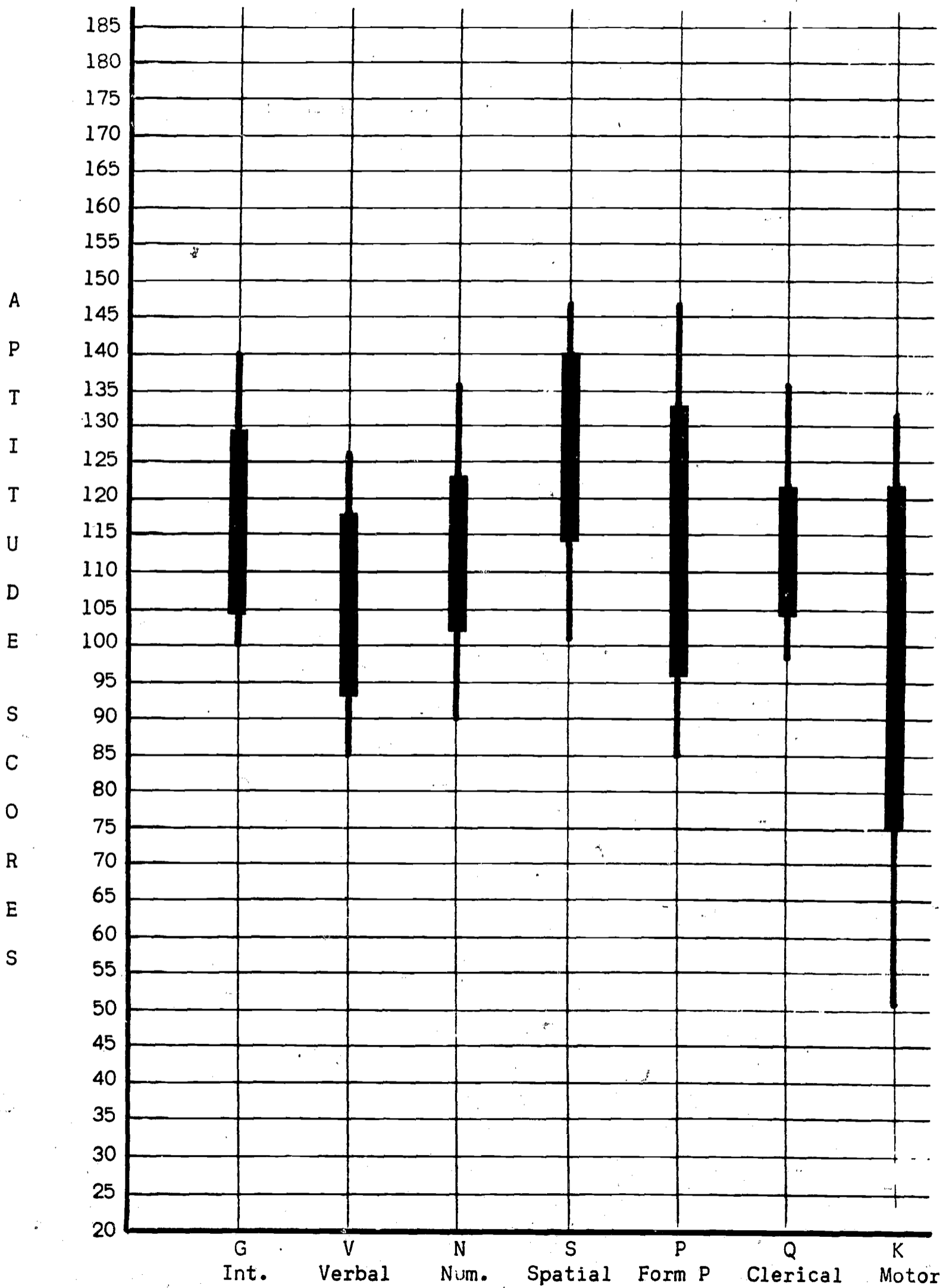


PROJECT MINI-SCORE EMPLOYMENT SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 CARPENTRY

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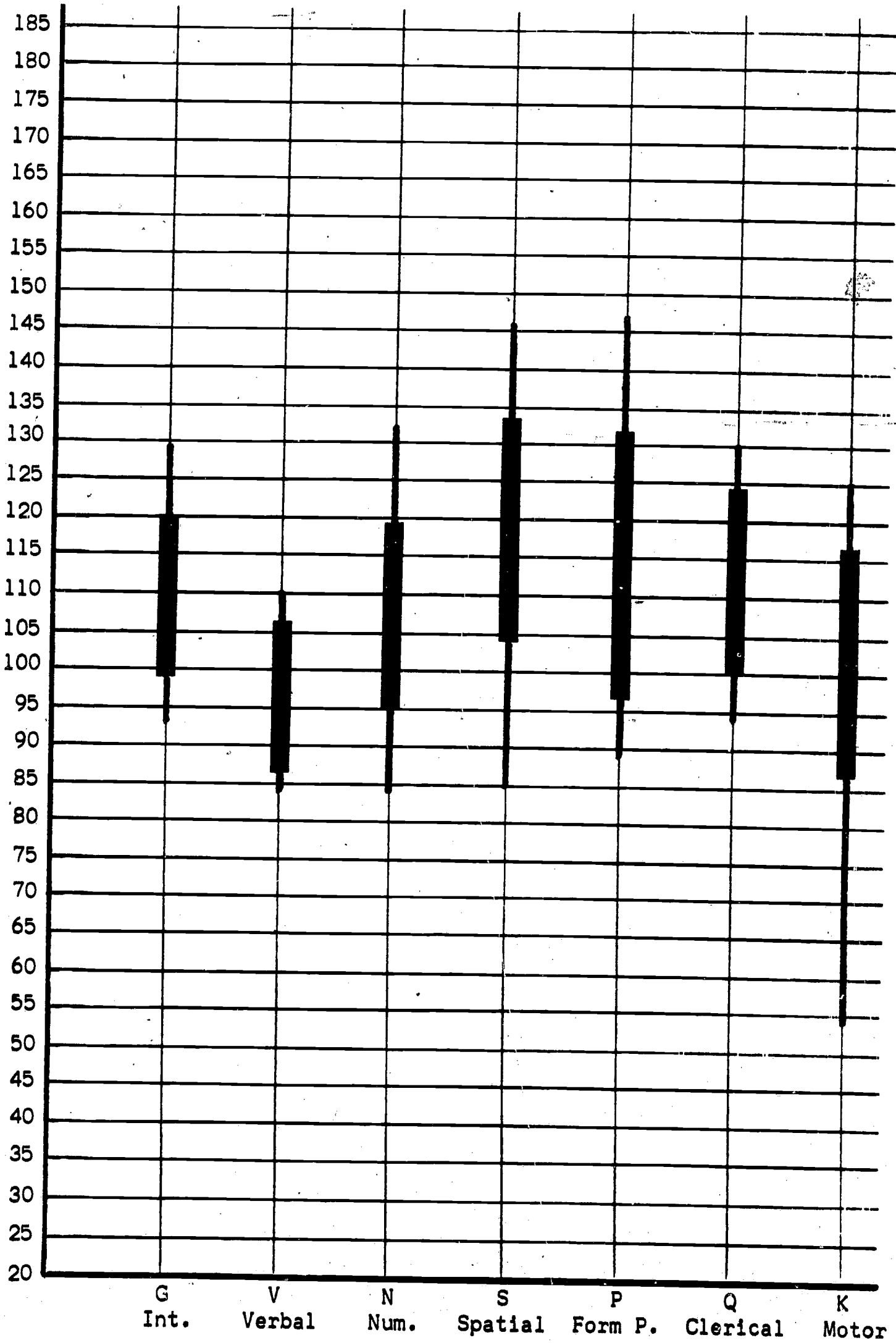


PROJECT MINI-SCORE EMPLOYMENT SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 ELECTRONICS



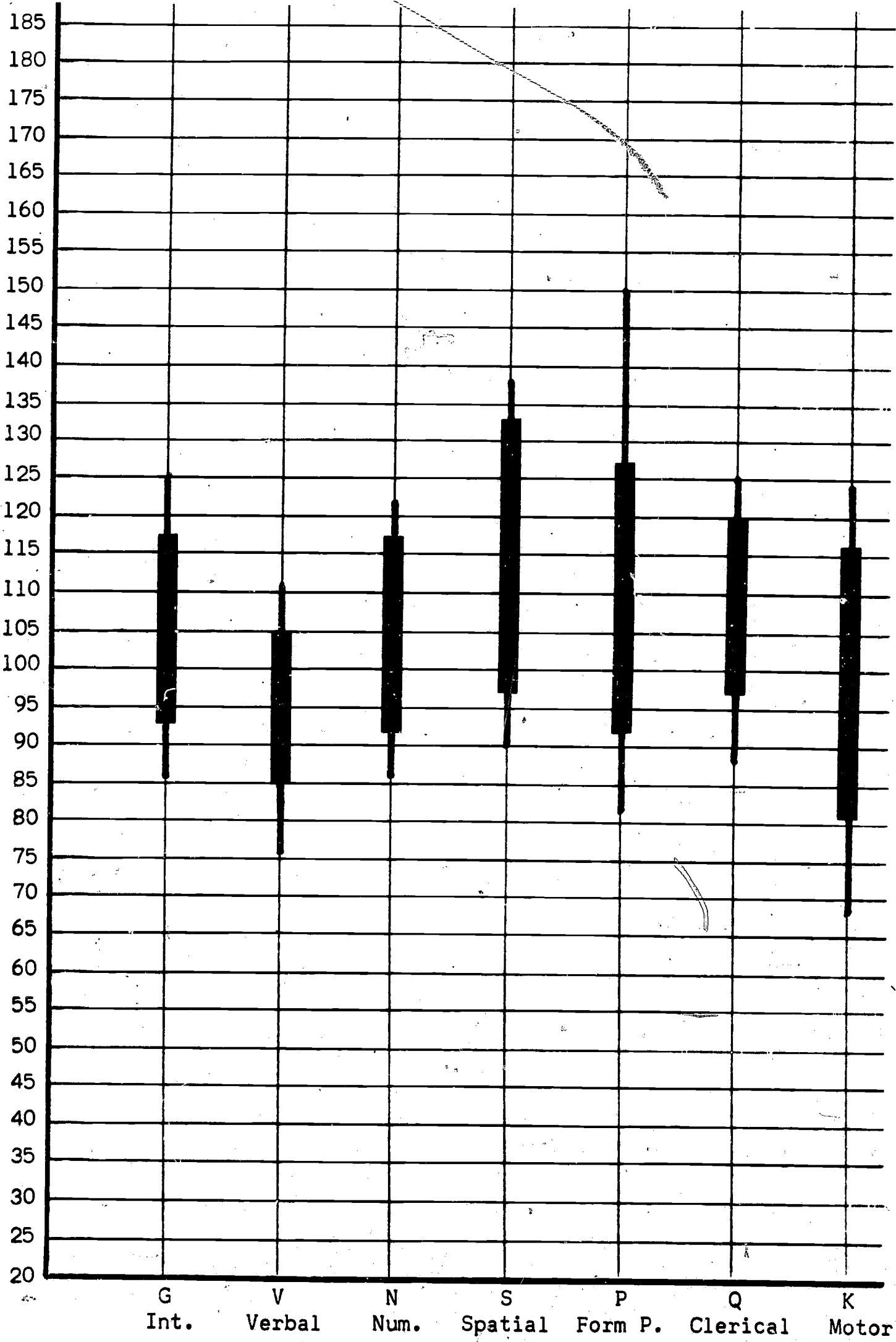
PROJECT MINI-SCORE EMPLOYMENT SUCCESS NORMS
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 POWER AND HOME ELECTRICITY

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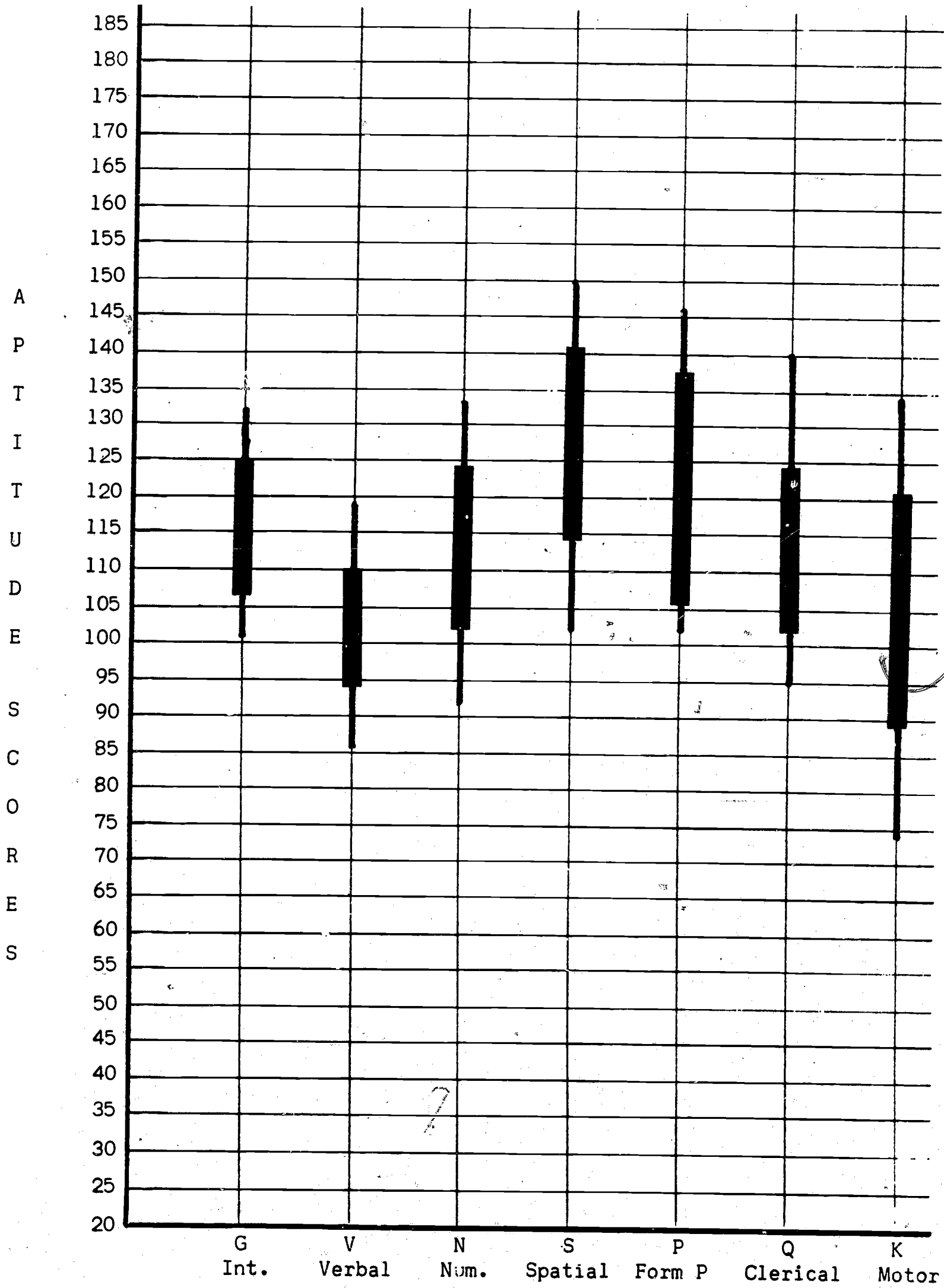


PROJECT MINI-SCORE EMPLOYMENT SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 MACHINE SHOP

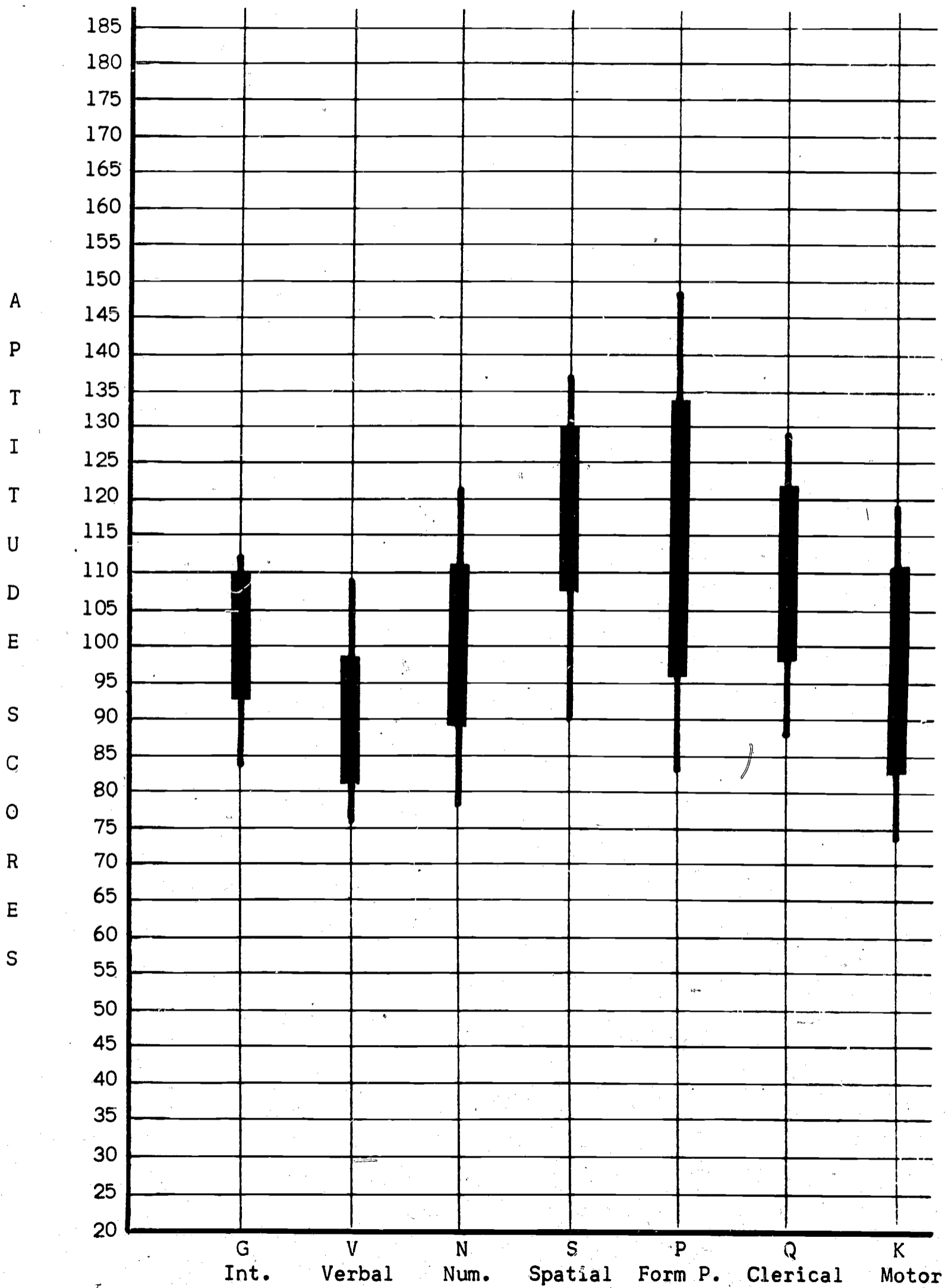
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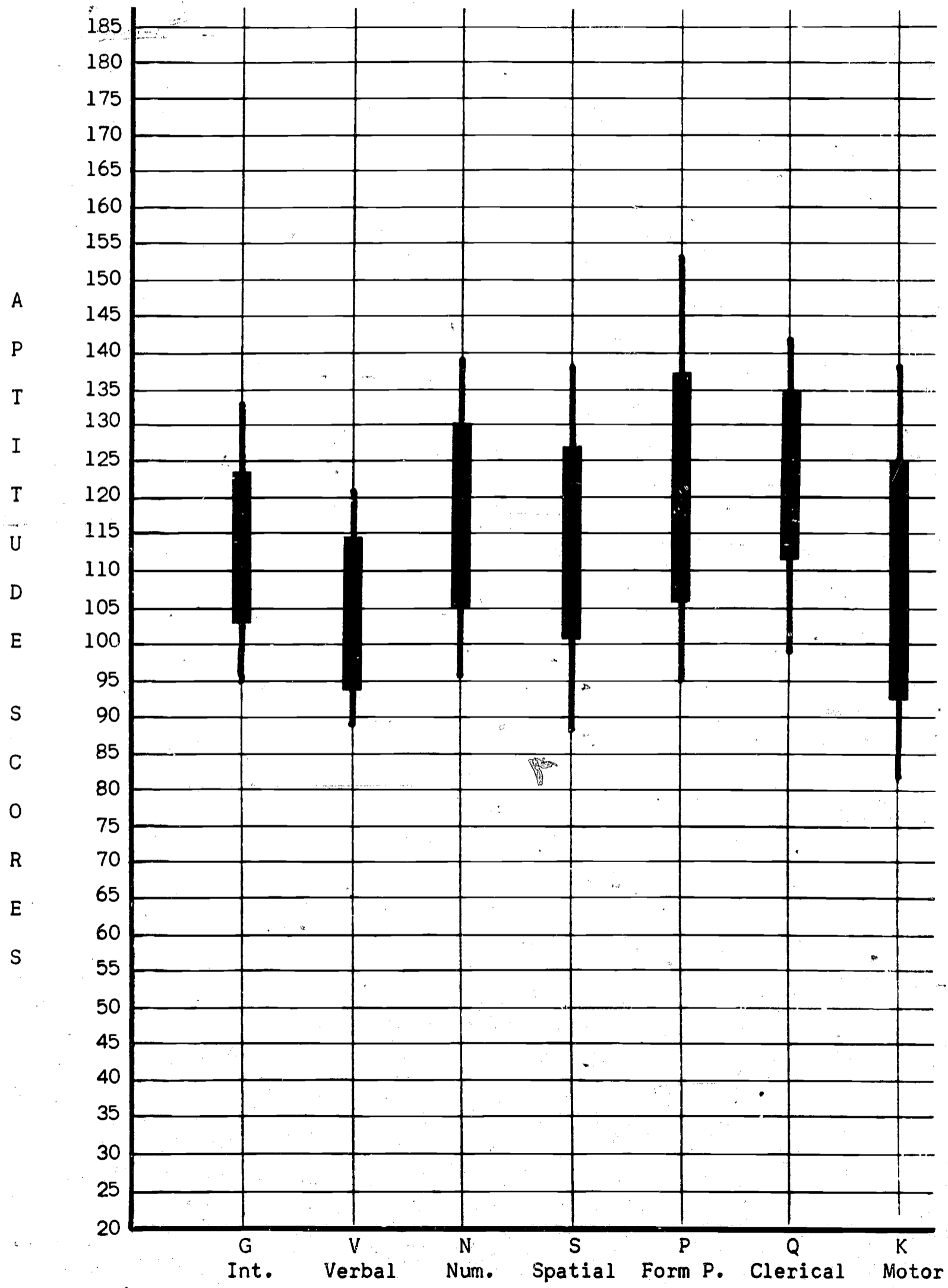
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 GATB APTITUDE SCORE
 PROFILE SHEET
 MECHANICAL DRAFTING AND DESIGN



PROJECT MINI-SCORE EMPLOYMENT SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 WELDING



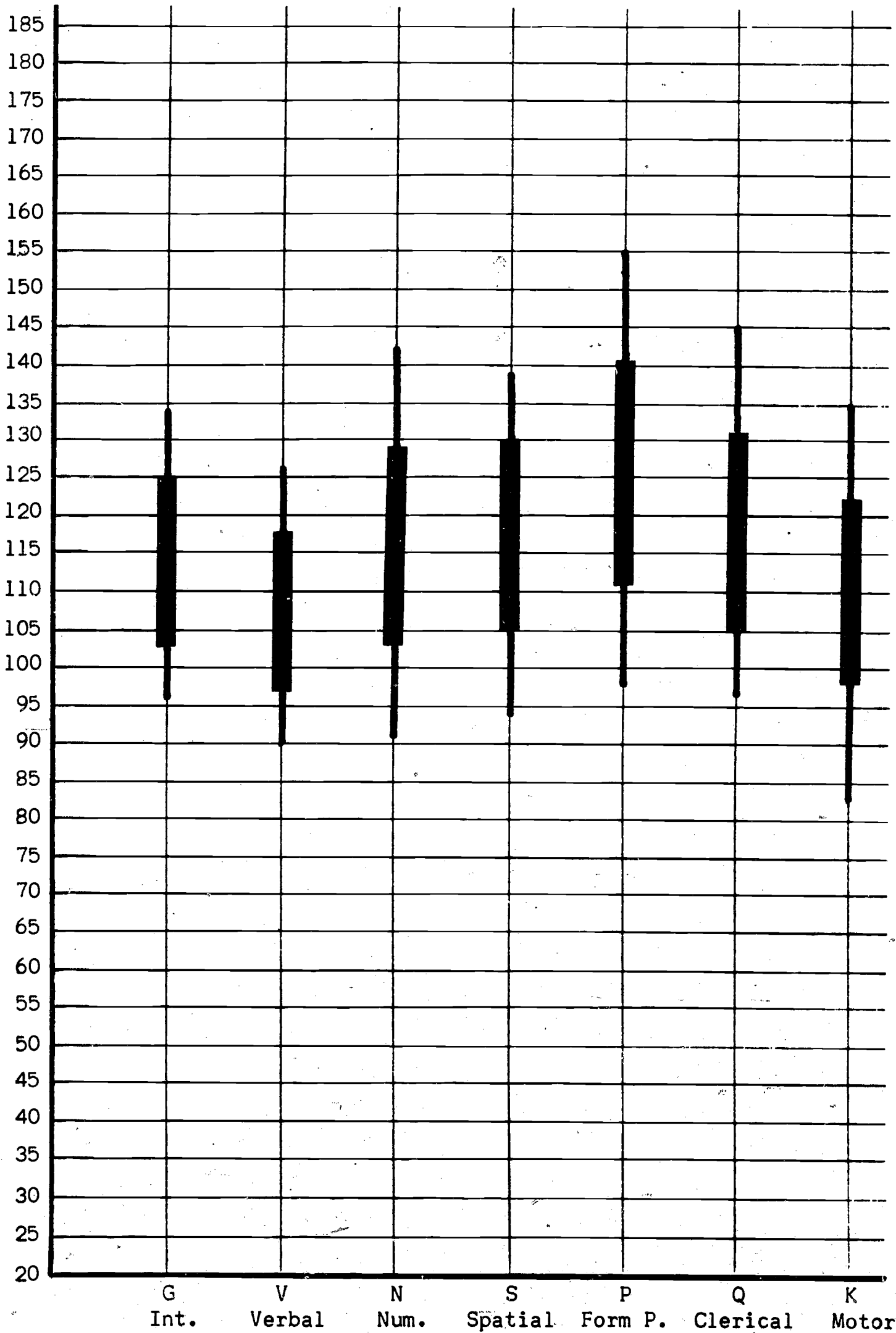
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 GATB APTITUDE SCORE
 PROFILE SHEET
 ACCOUNTING



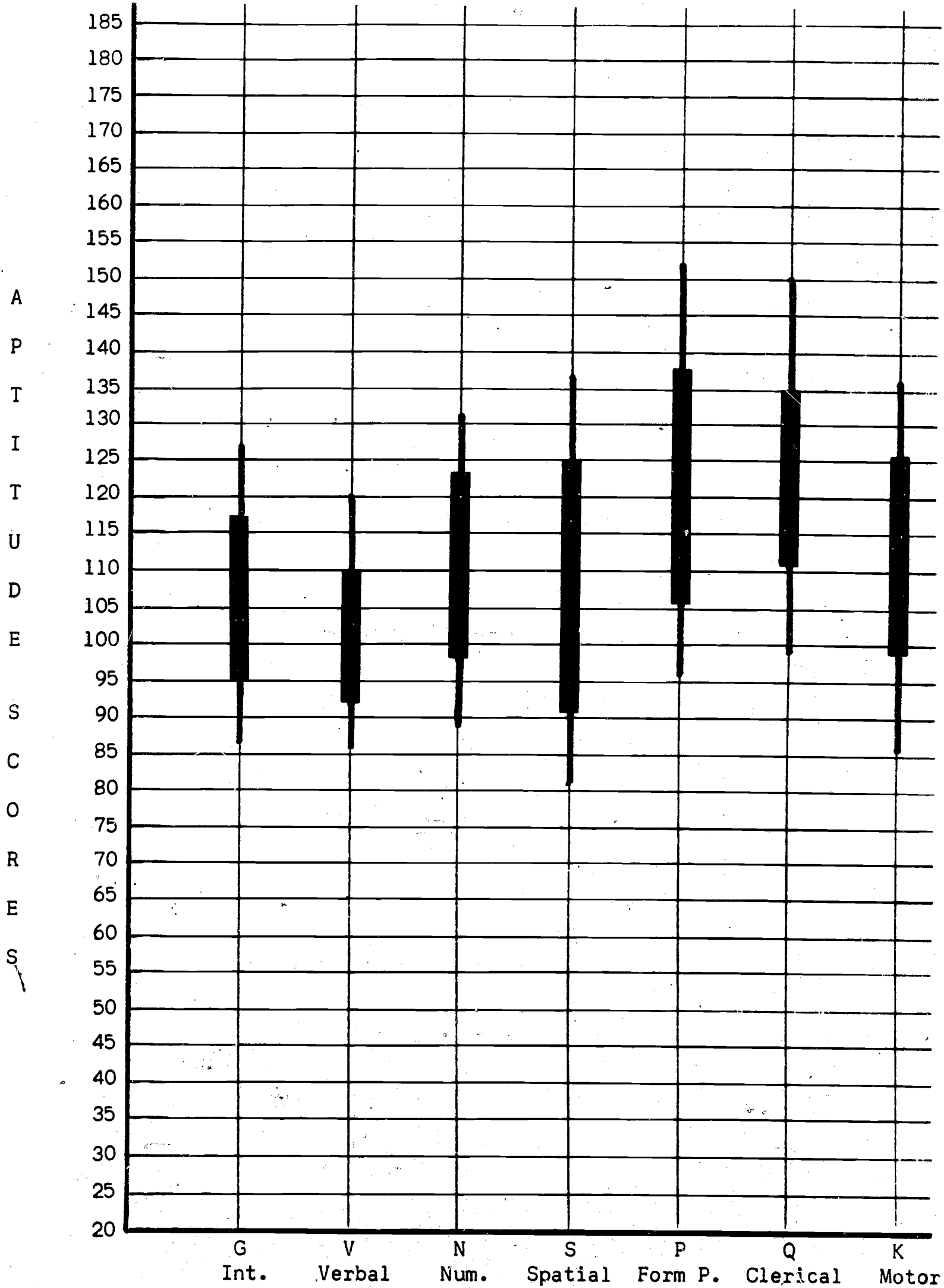
PROJECT MINI-SCORE EMPLOYMENT SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 DATA PROCESSING

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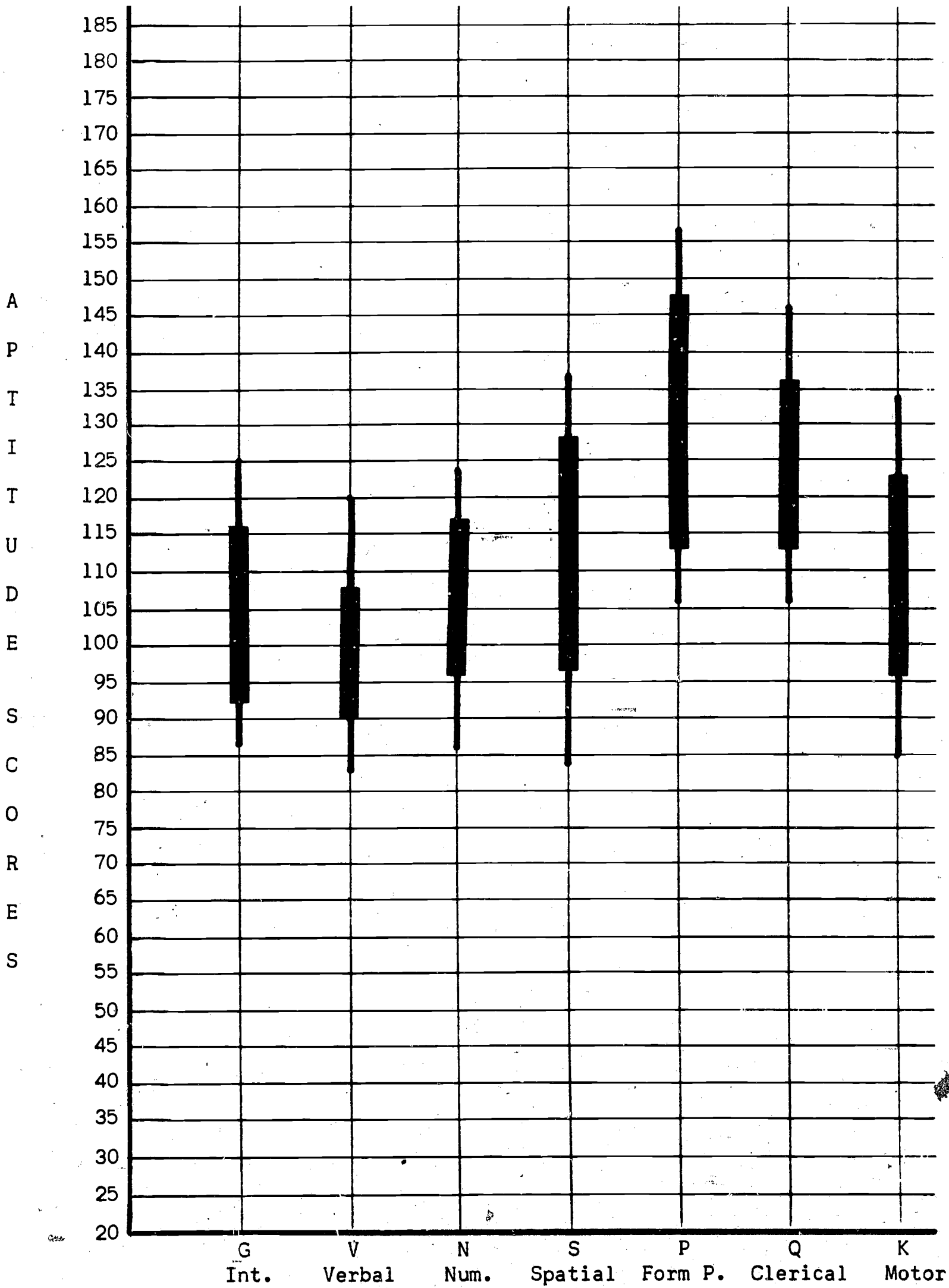
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PROJECT MINI-SCORE EMPLOYMENT SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 CLERICAL TRAINING

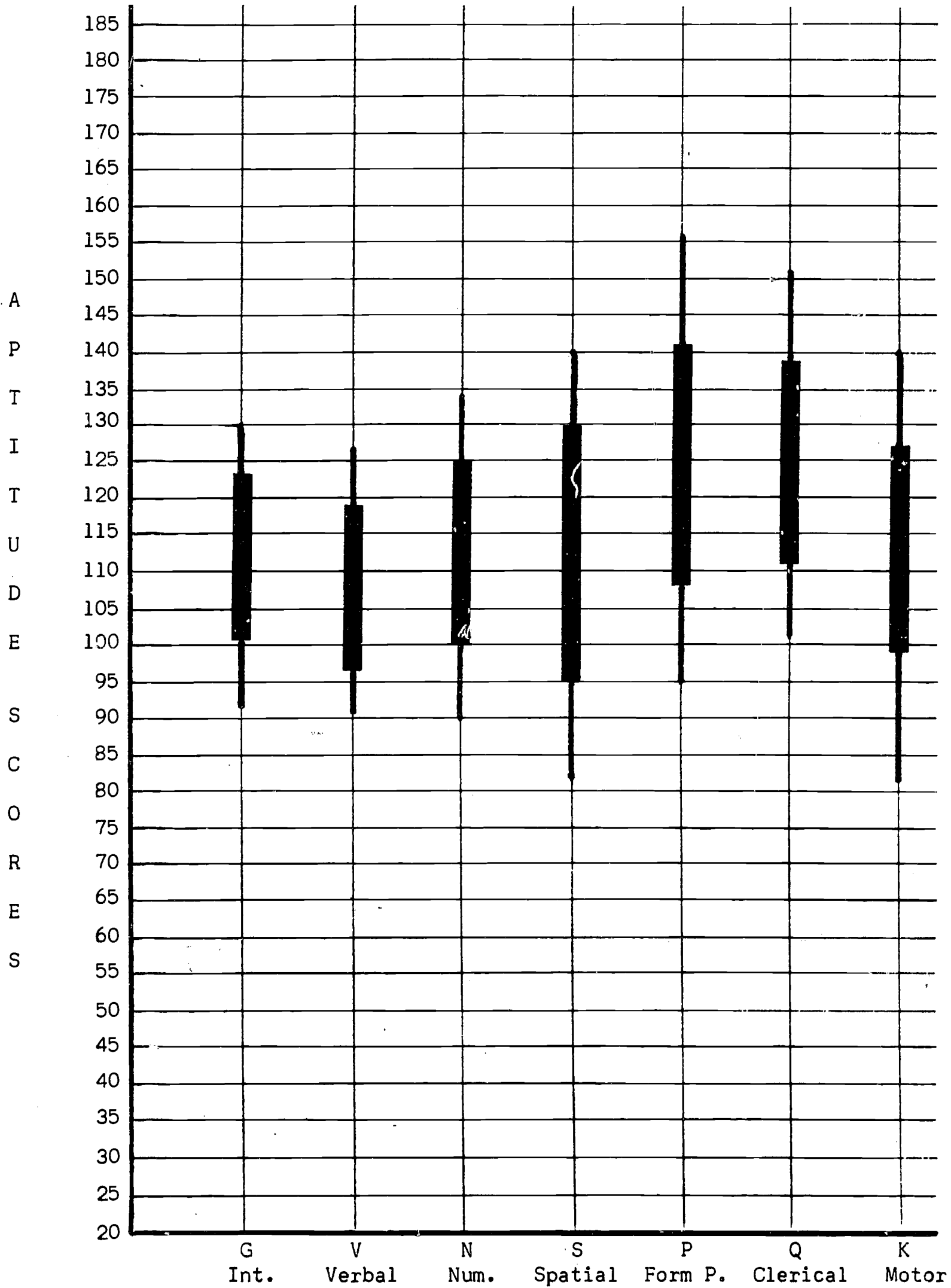


PROJECT MINI-SCORE EMPLOYMENT SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 COSMETOLOGY



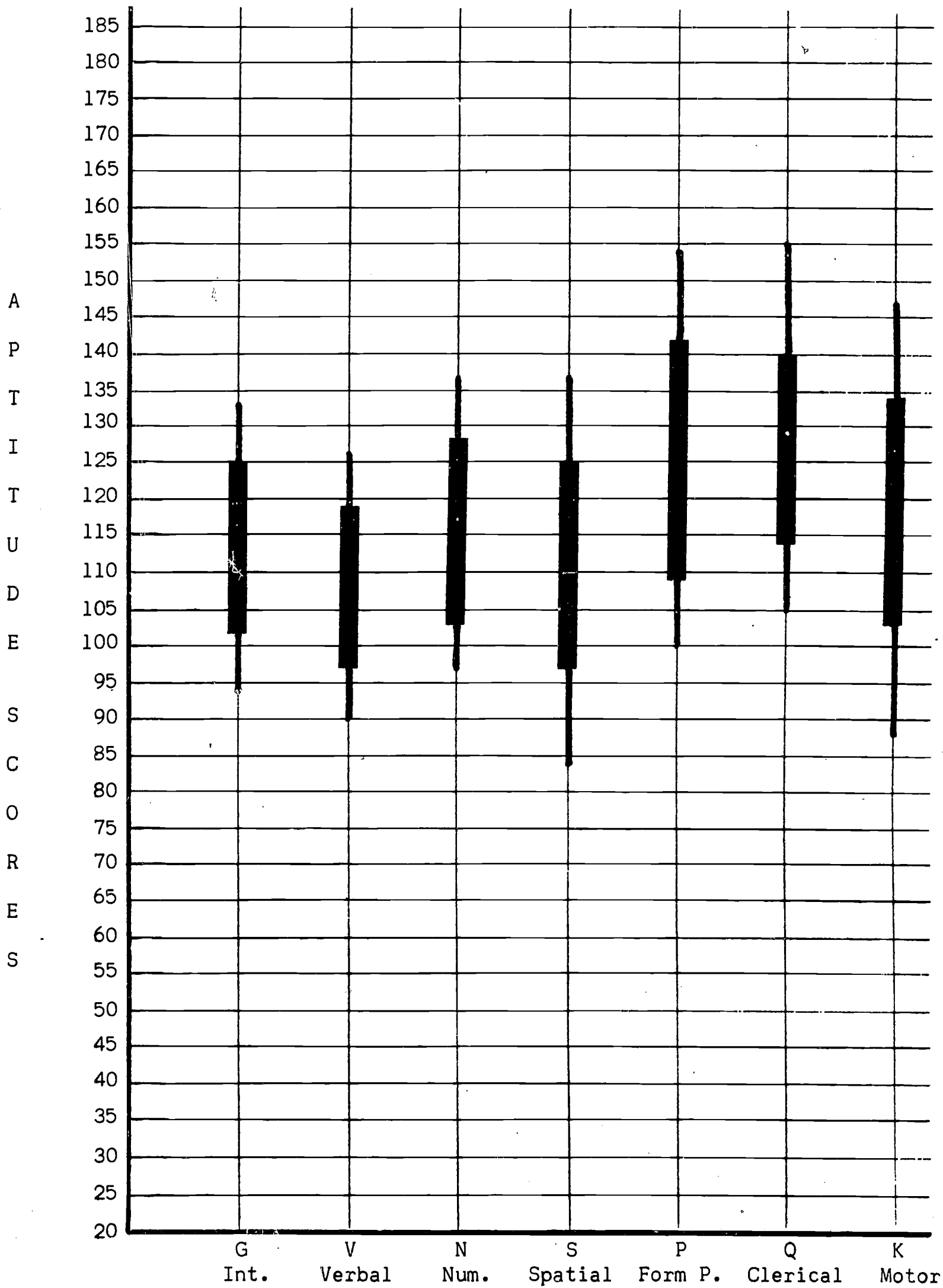
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PROJECT MINI-SCORE EMPLOYMENT SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 PRACTICAL NURSING



PROJECT MINI-SCORE EMPLOYMENT SUCCESS NORMS
 GATB APTITUDE SCORE
 PROFILE SHEET
 SECRETARIAL TRAINING

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APPENDIX D

APTITUDE SCORE MEANS, STANDARD DEVIATIONS AND NUMBER
OF OBSERVATIONS FOR GROUPS USED IN PREPARING
TRAINING SUCCESS NORMS

PRIMARILY MALE CURRICULA 57

- Agri-Technology
- Aircraft Mechanics
- Architectural Drafting
- Automotive
- Carpentry
- Chefs and Cooks
- Diesel Mechanics
- Electronics
- Farm Equipment Mechanics
- Fluid Power Technology
- Machine Shop
- Mechanical Drafting and Design
- Mechanical Refrigeration, Air Conditioning,
and Appliance Repair
- Plumbing and Sheet Metal
- Power and Home Electricity
- Printing and Graphic Arts
- Welding

CUPRICULA WITH BOTH MALE AND FEMALE 59

- Accounting
- Data Processing
- Interior Design and Sales Assistant
- Sales

PRIMARILY FEMALE CURRICULA 59

- Clerical Training
- Cosmetology
- Dental Assistant
- Medical Laboratory Assistant
- Practical Nursing
- Secretarial Training

APTITUDE SCORE MEANS, STANDARD
DEVIATIONS AND NUMBER OF OBSERVATIONS
TRAINING SUCCESS NORMS

CURRICULUM	G Int.		V Verbal		N Num.		S Spatial		P Form P		Q Clerical		
	\bar{X}	S	\bar{X}	S	\bar{X}	S	\bar{X}	S	\bar{X}	S	\bar{X}	S	
	N												
PRIMARYLY MALE CURRICULA													
Agri-Technology	115	107.71	11.96	97.54	10.31	107.74	12.66	111.77	16.40	111.98	16.53	110.65	11.24
Aircraft Mechanics	103	111.52	10.88	101.41	9.61	105.92	11.48	122.26	14.60	119.20	15.40	112.55	11.49
Architectural Drafting	53	111.34	10.21	99.47	10.48	105.43	12.48	126.53	12.93	126.21	18.22	114.32	15.40
Automotive	495	106.05	12.84	96.66	10.99	103.14	13.69	117.29	17.34	114.61	17.92	110.15	12.82
Carpentry	181	107.02	11.95	94.95	10.59	105.12	13.56	119.29	15.51	114.52	14.70	108.13	11.37
Chefs and Cooks	61	100.16	16.60	95.38	12.35	99.82	17.58	106.39	19.20	111.61	17.76	109.30	12.68
Diesel Mechanics	69	107.57	12.03	98.42	10.24	105.04	13.56	118.42	15.88	115.64	17.73	109.38	11.13
Electronics	202	114.93	11.28	105.10	10.20	111.60	12.46	123.23	14.43	117.92	17.71	114.24	11.71
Farm Equipment Mechanics	72	107.49	11.53	96.68	8.55	107.31	13.22	115.81	17.79	115.86	17.08	109.94	12.68
Fluid Power Technology	51	114.51	12.41	100.49	9.63	116.33	13.24	119.04	14.27	113.86	15.53	115.31	14.51
Machine Shop	166	107.47	11.79	96.78	10.54	106.63	14.08	117.39	15.95	114.34	17.49	109.42	11.85
Mechanical Drafting and Design	251	115.16	10.46	101.88	10.22	111.80	12.16	127.50	14.32	122.55	17.34	114.90	12.57
Mech. Refrig., Air Cond., & Appl. Repair	56	104.18	12.88	95.93	11.72	102.14	12.90	111.77	17.51	112.23	14.46	110.70	13.62
Plumbing and Sheet Metal	49	101.47	11.74	94.67	9.42	101.18	12.44	112.06	19.11	113.86	21.48	110.18	10.84
Power and Home Electricity	207	107.88	12.43	97.14	10.19	106.36	13.39	117.73	17.61	115.68	18.13	110.55	11.87
Printing and Graphic Arts	80	107.47	10.93	99.26	12.28	105.01	12.11	117.30	18.19	118.64	17.09	112.34	10.88
Welding	254	101.26	12.52	92.96	10.33	99.49	13.99	113.02	17.78	112.38	18.51	107.76	12.74

\bar{X} = Mean

S = Standard Deviation

N = Sample Size

APTITUDE SCORE MEANS, STANDARD
DEVIATIONS AND NUMBER OF OBSERVATIONS
TRAINING SUCCESS NORMS

CURRICULUM	N	K Motor	
		\bar{X}	S
PRIMARYLY MALE CURRICULA			
Agri-Technology	115	97.07	14.93
Aircraft Mechanics	103	102.71	20.46
Architectural Drafting	53	101.40	14.51
Automotive	495	99.24	16.69
Carpentry	181	96.56	15.70
Chefs and Cooks	61	102.33	19.15
Diesel Mechanics	69	92.62	15.30
Electronics	202	101.45	18.77
Farm Equipment Mechanics	72	96.40	13.21
Fluid Power Technology	51	107.20	15.73
Machine Shop	166	97.42	16.47
Mechanical Drafting and Design	251	103.59	17.54
Mech. Refrig., Air Cond., & Appl. Repair	56	104.80	18.27
Plumbing and Sheet Metal	49	105.42	14.97
Power and Home Electricity	207	101.66	15.74
Printing and Graphic Arts	80	100.57	19.01
Welding	254	98.31	15.76

\bar{X} = Mean S = Standard Deviation N = Sample Size



APTITUDE SCORE MEANS, STANDARD
DEVIATIONS AND NUMBER OF OBSERVATIONS
TRAINING SUCCESS NORMS

CURRICULUM	G Int.		V Verbal		N Num.		S Spatial		P Form P.		Q Clerical	
	N	\bar{X}	S	\bar{X}	S	\bar{X}	S	\bar{X}	S	\bar{X}	S	\bar{X}

CURRICULA WITH BOTH MALE AND FEMALE

Accounting	398	113.52	11.43	103.02	10.48	116.78	12.38	114.38	16.20	120.52	17.54	119.98	13.63
Data Processing	157	114.00	11.47	105.52	10.11	115.04	13.98	115.61	14.66	124.14	17.00	120.77	14.49
Interior Design & Sales Assistant	54	109.65	10.65	102.72	10.08	103.41	13.00	127.13	13.53	128.62	18.35	119.81	16.23
Sales	108	108.22	12.53	99.89	10.12	109.04	12.89	113.67	17.78	118.29	18.38	116.03	11.14

PRIMARILY FEMALE CURRICULA

Clerical Training	551	105.19	11.80	100.27	10.09	107.98	12.98	109.26	16.68	121.95	17.06	121.90	14.31
Cosmetology	249	105.61	11.72	100.53	10.54	105.42	12.18	112.64	15.80	128.27	16.23	122.93	12.74
Dental Assistant	52	107.60	11.97	105.98	11.71	105.46	14.99	111.42	16.05	129.90	18.03	122.92	14.05
Medical Lab Assistant	49	121.29	13.54	116.33	12.19	117.24	13.64	127.71	15.14	131.73	20.72	128.92	17.46
Practical Nursing	509	111.33	11.47	107.36	11.33	111.00	12.47	113.43	16.88	125.77	17.58	125.06	14.95
Secretarial Training	739	112.37	11.78	107.23	11.09	114.15	13.02	112.13	15.38	125.23	16.67	126.49	14.48

\bar{X} = Mean

S = Standard Deviation

N = Sample Size

APTITUDE SCORE MEANS, STANDARD
DEVIATIONS AND NUMBER OF OBSERVATIONS
TRAINING SUCCESS NORMS

CURRICULUM	N	K Motor	
		X	S

CURRICULA WITH BOTH MALE AND FEMALE

Accounting	398	107.18	17.56
Data Processing	157	108.16	15.37
Interior Design & Sales Assistant	54	108.85	16.97
Sales	108	104.28	15.32

PRIMARILY FEMALE CURRICULA

Clerical Training	551	111.25	15.64
Cosmetology	249	109.82	16.11
Dental Assistant	52	113.29	13.63
Medical Lab Assistant	49	114.39	15.71
Practical Nursing	509	112.51	17.55
Secretarial Training	739	117.94	17.94

\bar{X} = Mean

S = Standard Deviation

N = Sample Size

APPENDIX E

APTITUDE SCORE MEANS, STANDARD DEVIATIONS AND NUMBER
OF OBSERVATIONS FOR GROUPS USED IN PREPARING
EMPLOYMENT SUCCESS NORMS

PRIMARYLY MALE CURRICULA 63

- Automotive
- Carpentry
- Electronics
- Machine Shop
- Mechanical Drafting & Design
- Power and Home Electricity
- Welding

CURRICULA WITH BOTH MALE AND FEMALE 64

- Accounting
- Data Processing

PRIMARYLY FEMALE CURRICULA 64

- Clerical Training
- Cosmetology
- Practical Nursing
- Secretarial Training

APTITUDE SCORE MEANS, STANDARD
DEVIATIONS AND NUMBER OF OBSERVATIONS
EMPLOYMENT SUCCESS NORMS

CURRICULUM	G Int.		V verbal		N Num.		S Spatial		P Form P.		Q Clerical	
	N	\bar{X}	S	\bar{X}	S	\bar{X}	S	\bar{X}	S	\bar{X}	S	

PRIMARYLY MALE CURRICULA

Automotive	130	106.53	13.59	95.58	11.06	104.70	14.08	118.88	16.35	114.92	16.68	111.21	13.31
Carpentry	64	106.61	11.90	94.28	11.50	105.19	13.99	119.22	14.70	116.08	13.81	107.64	12.29
Electronics	51	115.55	12.08	105.20	12.03	111.43	12.14	124.82	12.95	115.37	18.81	113.27	10.77
Machine Shop	68	105.65	12.06	94.74	10.27	105.31	12.55	115.22	16.63	111.71	19.43	108.34	12.03
Mechanical Drafting & Design	82	115.93	9.62	102.24	10.11	113.09	12.67	126.59	14.54	122.43	14.84	114.26	11.30
Power and Home Electricity	87	108.06	11.53	97.09	8.92	106.41	13.28	119.13	15.92	116.31	17.76	111.87	11.77
Welding	51	101.76	9.48	91.18	8.75	99.57	12.53	117.96	13.10	113.78	18.98	108.86	13.39

CURRICULA WITH BOTH MALE AND FEMALE

Accounting	162	113.89	10.82	103.23	10.02	117.86	12.19	115.33	14.80	122.14	15.80	122.40	12.59
Data Processing	65	114.98	11.94	107.02	10.47	115.11	14.22	117.66	13.23	125.71	15.74	118.05	13.88

PRIMARYLY FEMALE CURRICULA

Clerical Training	331	106.50	11.95	101.56	10.15	109.50	12.52	109.57	16.90	122.22	16.97	122.35	13.86
Cosmetology	103	106.05	11.60	100.47	10.48	105.60	11.55	113.61	15.69	130.36	16.47	124.37	12.25
Practical Nursing	334	111.31	11.94	107.06	11.30	111.44	13.02	112.97	17.34	125.17	17.65	124.76	15.20
Secretarial Training	480	112.82	11.53	107.15	11.05	115.11	12.33	112.31	15.46	126.10	16.19	127.37	14.28

\bar{X} = Mean

S = Standard Deviation

N = Sample Size

APTITUDE SCORE MEANS, STANDARD
DEVIATIONS AND NUMBER OF OBSERVATIONS
EMPLOYMENT SUCCESS NORMS

CURRICULUM	N	K Motor	
		\bar{X}	S

PRIMARYLY MALE CURRICULA

Automotive	130	97.72	14.89
Carpentry	64	97.27	19.58
Electronics Machine Shop	51	97.75	23.30
Mechanical Drafting & Design Power and Home Electricity	68	96.72	18.33
	82	105.49	17.45
	87	100.24	18.70
Welding	51	95.84	13.17

CURRICULA WITH BOTH MALE AND FEMALE

Accounting	162	109.35	17.30
Data Processing	65	109.44	13.92

PRIMARYLY FEMALE CURRICULA

Clerical Training	331	111.82	15.55
Cosmetology	103	109.97	14.79
Practical Nursing	334	111.95	17.88
Secretarial Training	480	117.49	19.13

\bar{X} = Mean

N = Sample Size

S = Standard Deviation

STUDENT PROFILE SHEET--GATB APTITUDE SCORE

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VOLUMES OF PROJECT-MINI SCORE* FINAL REPORT

PROJECT MINI-SCORE FINAL REPORT

PROJECT MINI-SCORE FINAL TECHNICAL REPORTS:

- Report One - The Ability of Standardized Test Instruments to Predict Training Success and Employment Success
- Report Two - The Ability of Standardized Test Instruments to Differentiate Membership in Different Vocational-Technical Curricula
- Report Three - General Aptitude Test Battery
Training Success Norms and Employment Success Norms
- Report Four - Minnesota Vocational Interest Inventory
Training Success Norms and Employment Success Norms
- Report Five - Minnesota Scholastic Aptitude Test and Vocational Development Inventory
Training Success Norms and Employment Success Norms

*The project was commonly known as Project MINI-SCORE (Minnesota Student Characteristics and Occupational Related Education) but was originally proposed with the formal title: Characteristics of Full-Time Students in Post-Secondary Trade Courses; U.S.O.E. project number HRD 5-0148.