Durham University

Durham E-Theses

The construction of a test of occupational information for use in careers education

Stocks, John C.

How to cite:

Stocks, John C. (1973) *The construction of a test of occupational information for use in careers education*, Durham theses, Durham University. Available at Durham E-Theses Online: http://etheses.dur.ac.uk/8004/

Use policy

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a link is made to the metadata record in Durham E-Theses
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the full Durham E-Theses policy for further details.

Academic Support Office, The Palatine Centre, Durham University, Stockton Road, Durham, DH1 3LE
e-mail: e-theses.admin@durham.ac.uk Tel: +44 0191 334 6107
http://etheses.dur.ac.uk

Thesis submitted to Durham University for the Degree of Doctor of Philosophy

by John C. Stocks

THE CONSTRUCTION OF A TEST OF OCCUPATIONAL INFORMATION FOR USE IN CAREERS EDUCATION

ABSTRACT

This thesis is concerned with the construction of a test of occupational information which may find practical use in careers education, particularly in British secondary schools.

The development of the practice of guidance and careers education is described, with particular emphasis on the place of testing. Previous research on students' reasons for choice and knowledge of occupations is reviewed. The place of occupational information is established in the context of current theories of career development and decision-making. A survey of the practice of careers education emphasises appropriate teaching techniques.

A survey of descriptions of occupational characteristics reveals five systems which contribute to the basic structure of the test. The multiple-choice objective type item is justified as the most appropriate form to fulfil the objectives of developing self-awareness and producing a measure, if required, of the students' understanding of the reality of their occupational information in relation to norms provided by Careers Officers and Participants.

The test is constructed at two educational levels, tried in a pilot investigation, revised and then used by

1420 students in 37 secondary schools of various types throughout Great Britain. Norms are obtained from 311 Careers Officers and 1221 Participants in 29 selected occupations.

The experience of the trials reveals problems which are discussed in terms of the validity of the test, its structure and the use and compilation of norms.

Finally, suggestions are made for further development of the test for practical use in schools. Problems of basic theoretical research are also raised.

December 1973

THE CONSTRUCTION OF A TEST OF OCCUPATIONAL INFORMATION FOR USE IN CAREERS EDUCATION

The copyright of this thesis rests with the author.
No quotation from it should be published without
his prior written consent and information derived
from it should be acknowledged.

Thesis submitted to Durham University for the Degree of Doctor of Philosophy

by John C. Stocks

December 1973

THE CONSTRUCTION OF A TEST OF OCCUPATIONAL INFORMATION FOR USE IN CAREERS EDUCATION

VOLUME I

Thesis submitted for the Degree of Doctor of Philosophy to Durham University.

December 1973.

THE CONSTRUCTION OF A TEST OF OCCUPATIONAL INFORMATION FOR USE IN CAREERS EDUCATION

CONTENTS

Chapter		Page
	Introduction	i
	Acknowledgments	vi
I	GUIDANCE AND CAREERS EDUCATION IN THE SECONDARY SCHOOL	1
	Social and Political Origins of Guidance	2
	Developments in the Youth Employment Service	5
	Deveopment of Guidance in Schools	10
	Definitions of Guidance	13
	Careers Education as a Part of Guidance	20
	Counselling as a Guidance Technique	24
	Use of Tests in Careers Education	30
	British Research on Reasons for Vocational Choice	36
	British Research on Students' Knowledge of Occupations	42
	The Place of a Test of Occupational Information in Careers Education	46
II	OCCUPATIONAL INFORMATION IN GUIDANCE	48
	The Place of Occupational Information in Careers Guidance	49
	Studies of Career Development	55
	Occupational Information in Guidance	63
	Towards Decision Making	76
	Occupational Information in the Practice of Careers Education	92
	Summary	106
III	REVIEW OF DESCRIPTIONS OF OCCUPATIONAL CHARACTERISTICS	108
	Definition of Terms	109
	Occupational Description and Classification	115
	Sociological Studies	115
	Factor Analysis and Stereotype Studies	122
	Functional Classifications of Occupational Characteristics	125
	Summary	159

IV CONSTRUCTION OF TEST OF OCCUPATIONAL INFORMATION 163

Definition of Scope and Purpose 164
Rationale of Test Construction 167
Selection of Test Technique 182
Type of Objective Test 185
Description of Students for whom the Test is appropriate 191
Item Content 197
Occupational Description 197
Word Selection 205
Scalarity of Items 211
Format and Instructions 216

V PILOT ADMINISTRATION OF THE TEST 219

Purposes of Pilot Administrations 220
Word Usage and Understanding 221
Occupational Description 239

VI EXPERIMENTAL TRIALS AND RESULTS 243

Definition of Terms 244
Need for Norms 246
Selection of Occupations for Norming 248
Production of Norms by Careers Officers 264
Production of Norms by Participants 267
Presentation of Norms 278
Trial of Test Material in Schools 294
Determination of Reliability 307

VII USES OF THE TEST IN CAREERS EDUCATION 308

Uses of the Test in Learning 310
Uses of the Test in Guidance 312
Administration of the Test 319
Types of Testing Situation 319
Selection of Norms 323
Appropriate Stages in Guidance 326
Other Uses of the Test 329
Computer Assisted Guidance 329
Curriculum Evaluation 331
Summary of Uses 336

VIII PROBLEMS ARISING IN THE CONSTRUCTION AND USE OF THE TEST 337

Validity of the Test 339
Construct Validity 339
Predictive Validity 340
Concurrent Validity 342
Content Validity 343
Structure of the Test 359
Objective Type Structure 359
Multiple Choice Item Structure 360
Vocabulary and Understanding 363
Occupational Titling 368
Norms 379
Use of Norms 379
Compilation of a Norm 381
Presentation and Administration of the Test 394

IX SUGGESTIONS FOR FURTHER DEVELOPMENT OF THE TEST 399

Summary of Current Work done on the Test 400
Outline Proposals for Development 405

REFERENCES 410

INTRODUCTION

This project arose from the personal interest and experience of the investigator in careers education.

It was recognised that many students embark upon careers with very little knowledge of the occupation they are entering. In fact it may even be suggested that their knowledge is not only lacking but also perhaps inaccurate. Very little evidence exists on the reality of occupational information as it appears to those in the stages of career choice.

In recent years testing in education and guidance has developed rapidly. Measures which reveal occupational interests have been validated and published. Tests of attainment have been used particularly for purposes of selection in education and employment. Personality inventories have been introduced for normal as well as abnormal individuals and for educational as well as medical purposes. These trends in testing along with the growing momentum in careers work in schools, drew attention to the need for some measure of occupational information which may be used in careers education.

This thesis describes one attempt to construct and validate such a test for use in careers education. It was intended from the outset that a practical tool should be devised. Reference to the contents shows that this thesis discusses the structure of a test of occupational information in the context of current developments in

careers education. The field of guidance is surveyed against the historical background and its contemporary place in the curriculum. Theories of career development have been established, notably in America. These are considered in relation to vocational decision-making. Within these frameworks the place of occupational information is established in the context of careers education.

The structure of the test is discussed in terms of the descriptions of occupational information appropriate to those involved in guidance. Different forms of test are considered and the most appropriate form is justified in relation to its use. Trials are described and the experience gained produces evidence for the validation of the structure proposed. Problems are recognised and, where possible, solutions and consequent improvements to the test are suggested.

Within the time available no amendments to the material were actually effected, apart from those resulting from the experience of the pilot investigation. The predictive validation of the test in terms of subsequent career development would have taken at least a further two years and involved many factors in the school curriculum and in the work environment which the investigator would have found difficult to control.

However the work is presented in a form which points the way to the production of an instrument which should be useful in careers education.

Since the project began in September 1968 there have been considerable developments in the field of careers education. In fact the phrase "careers education" was not even used at that time. These have necessitated continuing reappraisal of the content and even the rationale on which the test is based. In parts it may appear almost that subsequent judgments affected the early decisions on the structure of the test. The Classification of Occupations and Directory of Occupational Titles is referred to in the early stages, although it was not published until November 1972. The writer is very grateful for private access to details of this classification. Discussion with members of the Department of Employment and Productivity who were engaged in its compilation took place in October 1968.

The whole of the content of the first four chapters describing the underlying rationale of the test in relation to careers education has been reviewed in the light of evidence appearing since the test was initially structured in November 1968. The experimental evidence from other sources has tended to be additional and complementary to that reviewed initially. The significant changes have appeared in the focus of the practice. Vocational choice, seen as an isolated event, has become a part of the more extensive process of careers education. The test is justified within this newer context.

At the present time (November 1973) the Department of Education and Science has just published a National

Survey of Careers Education in Secondary Schools. This shows the inadequate conception of the objectives and practice of careers education. Only 15 of the 87 schools visited by H.M.I.s realised some of the important aspects of the work (Department of Education and Science, 1973).[1] Nevertheless this work is developing rapidly. An interesting aspect is that 71% of the schools now use an occupational interest questionnaire (Department of Education and Science, 1973).[2] Perhaps, then, some complementary instrument in occupational information may be useful.

Those involved in careers education may be variously titled. The educands may be boys or girls, pupils or clients. A standard term "student" is used irrespective of age or relationship in the guidance process. The author personally feels this to be justified not only by the trend towards earlier maturity, but in the belief that if status is not ascribed it is less likely to be achieved. In counselling the student may be in the situation of the client. The discussion of guidance within education and of counselling as a guidance technique (Chapter I p. 24) shows that the same individual takes part in different aspects of the process of careers education and only in certain situations could he justifiably be termed a "Client". For convenience, then, the term "student" is used throughout.

---

1. Department of Education and Science, Education Survey 18: Careers Education in Secondary Schools, H.M.S.O., p.61.

2. Ibid., p.12.

The educational agent involved in guidance may be a tutor, lecturer, teacher, adviser or counsellor. Since the rationale of the test is justified as an educational tool within the guidance process the term "guidance teacher" is used throughout. It may appear that "careers teacher" might be more precisely appropriate but it is felt that this artificially narrows the role of the teacher when there is strong justification to pursue careers education as part of the wider curriculum in personal guidance. The author is well aware of the work being done in careers education by Careers Advisory Officers and by the use of the term "guidance teacher" does not in the least wish to imply that they are not involved fully in this work or would not use this test. In some schools this work is part of the responsibility of the school counsellor. However in the careers educational aspect of his responsibility he is likely to teach as well as counsel. Thus for convenience throughout this thesis the educational agent is referred to as the "guidance teacher".

It will become clear that this project has involved many individuals with a wide range of interest and involvement in careers education. Without their help this work would not have been possible.

ACKNOWLEDGEMENTS

The project described in this thesis has directly involved in different ways, 3051 persons. 1420 students tried the material in schools and colleges. 311 Careers Advisory Officers and 1221 participants provided norms in 29 occupations. The remaining 108 have given me considerable personal help through discussion, encouragement and guidance. I am very conscious of the influence of some whose inspiration and encouragement have been the underlying factors in the presentation of this thesis.

Mr. B.B.Hartop, Lecturer in Education in the University of Durham, has tutored this work throughout. His infectious enthusiasm, his penetrating questioning and his unstinting generosity in sharing his insights and experience have had a very profound effect upon it. He has provided not only academic tutorship but personal guidance and involvement in the work far beyond what I had any right to expect. I count it a real privilege to have been associated with him in this work.

The project owes its existence to the support I have received from Chester College. From the outset Sir Bernard de Bunsen, then Principal of the College, granted me secondment for one year to begin the work. His successor, Mr. M.V.J. Seaborne has encouraged and supported me in the later stages. Throughout the whole time, Mr. Leon Boucher, Head of the Education Department, has taken a great interest in the work and has most willingly and enthusiastically granted me freedom to execute it when he might most reasonably have expected me to devote greater energy to the work of his Department. Miss Jane V.T.Mellor, a former B.Ed.

student of Chester College, now Assistant Mistress at Boston Spa Comprehensive School, near Wetherby, gave me considerable insight into the historical background of guidance and I am also indebted to her for increasing my awareness of guidance practice through visits and discussions.

The remaining [redacted] contributors to this work are listed below. My gratitude to them is none the less sincere. They have shared their knowledge and experience, provided me with information and given valuable time to discussion and completion of the test material.

I wish to express my gratitude to the following for the valuable help they have given me in discussing the structure and the use of this test of occupational information:

A.W. Durham	Department of Employment, Manpower Research Unit, London.
J.C. Houston	Central Youth Employment Executive, Department of Employment, London.
P.A.L. Parker	Department of Employment, Manpower Research Unit, London.
S.J.Closs	Department of Management Studies, University of Edinburgh.
J. Hayes	Vocational Guidance Research Unit, University of Leeds.
Mrs. J.M. Haystead	Department of Management and Social Studies, Dundee College of Technology.
F.A. Hewitt	Department of Education, University of Durham.
B. Hopson	Director, Vocational Guidance Research Unit, University of Leeds.
Miss P.A. Hough	Vocational Guidance Research Unit, University of Leeds.
M.J. Kirton	Research Fellow, Hatfield Polytechnic.
Mrs. R.D. Lancashire	Director of Vocational Guidance, National Institute of Industrial Psychology.
D. McMahon	Director, Applied Psychology Unit, University of Edinburgh
B.M.Moore	Senior Research Officer, National Foundation for Educational Research.
P.W. Musgrave	Department of Sociology, University of Aberdeen

P. Barnes	Deputy Principal Careers Officer, Bolton.
A.M. Butler	Deputy County Careers Officer, Cheshire.
K.H.J. Cook	Principal Careers Officer, Chester.
R. Hummer	Principal Careers Officer, Bolton.
A. Pickup	Area Careers Officer, Pickering. Yorks. North Riding.

Librarians in many Universities have efficiently attended to my requests, but I would particularly like to thank :

F. Rutherford	Librarian, University of Durham Institute of Education.
Mrs. J. Rogers	Librarian, Chester College.
P.F. Williams	Librarian, Chester College.

The following Careers Advisory Officers not only assisted in providing norms but also took part in discussions on the structure and use of the test:

V.S. Ahier	Principal Careers Officer, Southampton.
J.D. Allen	County Careers Adviser, East Sussex.
A. Barlow	Area Careers Officer, Cupar, Fife.
T.D. Black	Principal Careers Officer, Edinburgh.
V.B. Bray	County Careers Officer, Cheshire.
Miss S. N. Caink	Senior Careers Officer, Worcestershire.
J. Campbell	Deputy County Careers Officer, Hampshire.
A.A. Edmondson	District Careers Officer, Ellesmere Port, Cheshire.
H.M.C. Galbraith	late Principal Careers Officer, Fife.
D. Gothard	Senior Careers Officer, Wolverhampton.
R.M. Gourlay	Deputy Principal Careers Officer, Inner London.
H.J. Hooper	Principal Careers Officer, Haringay.
R. Hudson	Principal Careers Officer, Sunderland.
E.W.Hunt	Deputy Principal Careers Officer, Sunderland.
Miss S.S. Lyon	Area Careers Officer, Dunfermline. Fife.
J. Morrison	Principal Careers Officer, Fife.
Mrs. C.J. Parker	Research Officer, Careers Service, Leicestershire.
C. Roberts	Area Careers Officer, Coalville. Leicestershire.
W.P.C. Smith	Careers Officer, Halesowen. Worcestershire.
C.P.Walton	County Careers Officer, Worcestershire, and formerly Hon.Secretary, Institute of Careers Officers.
Miss E.K. Wilson	Area Careers Officer, Cowdenbeath. Fife.
W. Witherspoon	Industrial Liaison Officer, Careers Service, Leicestershire.

It is evident that the norms were collected through substantial help of a large number of individuals in Colleges and firms throughout the country. I am particularly indebted to the following:

D. Bond	Senior Lecturer in Liberal Studies, School of Fine Art, Leicester Polytechnic
R.M. Boothroyd	Vice-Principal, Lindsey College of Agriculture, Lincoln.
J. Brennan	Lecturer in Journalism, Richmond College of Further Education, Sheffield.
J.M. Burgess	Head of Food, Fashion and Health Department, West Cheshire Central College of Further Education, Eastham.
E.G. Davies	Senior Lecturer in Electrical Engineering, Denbighshire and Wrexham Technical College.
J. Gardner	Head of the Department of Humanities, Bradford Technical College.
J.L. Ingham	Head of the Department of Librarianship, Manchester Polytechnic.
G.R. Lewis	Director of Research Studies, Waltham Forest Technical College and School of Art, Walthamstow.
A.T. Merritt	Head of the Display Department, College for the Distributive Trades, London, W.C.2.
J.E. Moore	Principal Lecturer in Architecture, Northern Polytechnic, Holloway, London, N.7.
J.M. Nicholson	Deputy to the Head of Department of Civil and Structural Engineering and Building, Teesside Polytechnic.
C. Perkins	Lecturer in Liberal Studies, Denbighshire and Wrexham Technical College.
G.S. Pickering	Department of Business Studies, Kirby College of Further Education, Teesside.
K. Pickett	Head of Department of Child Care and Social Studies, North-Western Polytechnic, London, N. 5.
J.A.R. Roberts	Designer and Lecturer in Display and Exhibition Design, Bolton College of Art and Design.
A.T.C. Robinson	formerly Head of Textile Department, Bolton Institute of Technology.
W. Steele	Principal, Cumberland and Westmorland College of Agriculture and Forestry, Newton Rigg, Penrith.
A. Thompson	Department of Mechanical Engineering, Garretts Green Technical College, Birmingham.
N. Upfold	Lecturer in Complementary Studies, Cardiff College of Art.

Of the many participants in industry and commerce who provided both valuable suggestions and enabled norms to be collected, I am particularly indebted to the following:

A.J. Chamings	Assistant Manager, Staff and Training Department, North West Securities Ltd., Chester.
T. Charlton	H.M. Inspector of Taxes, Morpeth, Northumberland.
J.P. Cross	Assistant Personnel Manager, T. Wall & Sons (Meat and Handy Foods) Ltd., Hyde, Cheshire.
Miss P.A. Crowe	Employment Department, Cadbury Bros.Ltd., Birmingham.
J. Dingwall	Head of Management and Supervisory Services, Boots Pure Drug Co.Ltd., Nottingham.
L.A. Foulner	Personnel Officer, Post Office Telephones, Chester.
Rev. H.G. Hayes	Minister, Hoole Congregational Church, Chester.
R. Hine	Assistant Area Industrial Training Officer, National Coal Board, Ashington, Northumberland.
W.J. Hodges	Personnel Manager, Birkenhead and District Co-operative Society, Birkenhead.
G.N. McKenzie	Hon.Secretary, Associate Members Group of the Law Society.
C.F. Page	Senior Training Adviser, Northern Region, Printing and Publishing Industry Training Board.
E.C. Raeburn	Manager, Group Staff and Training Department, North West Securities Ltd., Chester.
R. Ransome	Chief Training Officer, North West Gas Board, Altrincham.
K.R.C. Rew	Training and Development Department, Boots Pure Drug Co. Ltd. Nottingham.
J.A. Stewart	Telephone Manager, Middlesbrough.
A. Stockwell	formerly Town Clerk, Thornaby-on-Tees.
B.P. Stockwell	Claims Inspector, Commercial Union Assurance Co., Birmingham.
J.B. Stokes	Senior Tutor, National Westminster Bank Ltd., Staff College, Ware. Herts.
J. Storey	Work Study Officer, Cheshire County Council.
Miss M.M. Strong	Nursing Careers Officer, United Manchester Hospitals.
Miss A.P. Vale	Women's Employment Officer, Rowntree & Co. Ltd., York.
H.T. Wheeler	Principal, Barclays Bank Ltd., Staff Training Centre, Wimbledon.
Chief Supt.A. Whittle	Director of Training, Lancashire County Constabulary, Hutton, Preston.
Major D.W.Williams	Army Apprentices College, Chepstow, Monmouthshire.

Mr. S.R. Taylor, printer with the City Press Chester, gave most valuable professional advice on the possible lay-out of a printed version of the test.

The trials in schools involved the co-operation of many Headteachers and their colleagues. I would like particularly to record my indebtedness to the following:

A. Chadwick	Housemaster, Blue Coat School, Oldham.
B.J. Cooper	Housemaster, Hylton Red House School, Sunderland.
D.J. Courtman	Counsellor, Walbottle Grammar School, Northumberland.
R. Davidson	Senior Sixth Form Master, Hylton Red House School, Sunderland.
T.W. Dowson	Careers Master, The Grammar School, Reigate, Surrey.
K.J. Dyos	Headmaster, Hylton Red House School, Sunderland.
P. Gartside	Housemaster, Hattersley Comprehensive School, Hyde. Cheshire.
G.C. Hanson	Headmaster, Malton County Secondary School, Yorks. North Riding.
B.W. Heap	Careers Master, Hutton Grammar School, Preston.
R.P. Heppell	formerly Careers Master, South Shields Grammar Technical School for Boys, now member of Schools Council Careers Education and Guidance Project, Impington Village College, Cambridge.
C. Heycock	Academic Registrar, Sandfields Comprehensive School, Port Talbot, Glamorgan.
D. Jones	Headmaster, Dinas Bran School, Llangollen, Denbighshire.
D. Leeming	late Careers Master, Wanstead County High School, Redbridge.
J.S. Peddie	Careers Master, Thomas Sumpter Comprehensive School, Scunthorpe.
Miss A.C. Sharples	Headmistress, Ellesmere Port Grammar School forGirls, Cheshire.
A.C. Wynne	Headmaster, Hayward Lever High School, Bolton.

Mrs. June Driver has provided the highly professional expertise in typing. I am most grateful for her meticulous care and interest in the work.

The shortcomings, errors and expressions of opinion in this thesis are mine, and mine alone, but without the help outlined above, it could not have been presented.

Finally, to my wife Katherine and our children, David, Paul, Janet and Helen, I should like to record my very real

thanks for their patience on innumerable occasions when I ought to have been involved in the many activities normally expected of a husband and father.

John C. Stocks
Chester
December 1973

PRESENTATION

A number of problems have arisen in the presentation of this thesis. The most difficult has been the typing of some of the tables. In order to present the horizontal comparison necessary a number of them have been typed on two or more sheets which have been taped and folded into the text. Table 4.3 - a useful display showing the sources of items in the test - is too complex to be presented in this form. It therefore appears written and photo-copied in a pocket in the back cover.

The Appendices are presented in smaller type compared with the main text. This was necessary in order to set out the norms which appear as Appendix 7 on single sheets.

References are shown at the bottom of each page. A complete reference is presented once in each chapter and any further mention of the same text in that chapter is referred to by the symbols ibid., op.cit., or loc.cit., as appropriate.

Page references have been included in ink since the cross references could not have been conveniently typed in later.

The top two copies of this thesis are bound as two volumes each. The main text appears in Volume I and the Appendices in Volume 2.

C H A P T E R I

GUIDANCE AND CAREERS EDUCATION IN THE SECONDARY SCHOOL

SOCIAL AND POLITICAL TRENDS TOWARDS GUIDANCE

Guidance, like education, is a complex term. It has no simple single definition, nor distinctive development. "Guidance, if anything is a kind of help." (Langeveld, 1955).[1] In the educational sense it has been broadly described in the Underwood Report (Department of Education and Science, 1955)[2] as "synonymous with the process of nurturing and bringing up children - in fact with education itself." This view may be characteristic of current practice of some educationalists today, but it differs radically from the paternalism of Victorian teachers.

Mellor (1973)[3] suggests that Victorian philosophies were individualistic in character.

---

1. M.J.Langeveld, The Year Book of Education 1955, R.K.Hall and J.A. Lauwerys (eds.), Evans, 1955, p. 31.

2. Department of Education and Science, "Report of the Committee on Maladjusted Children," H.M.S.O., 1955, p. 41.

3. Mellor, J.V.T., "Factors influencing the Development of Guidance in Secondary Education," unpublished B.Ed. dissertation, University of Liverpool, 1973,pp.1-2.

> "Enormous importance was attached to the individual's right and duty to look after his own business and there was an intense suspicion of interference by the state in private affairs. This individualism was deeply ingrained into nineteenth century thinking on all matters. It had two aspects: there was a moral objection to interference with a person's affairs and it was thought to be a man's duty to be responsible for himself and his family. In addition there was an acute fear of increasing the power of the government by allowing it to assume responsibility for the private lives of the people."

There was a tendency to think in terms of "the poor" and the "working classes" and to forget the individuals who were lost in these generalisations. One of the important developments in the latter part of the nineteenth century was the growing acceptance of collectivism as a respectable political doctrine. At this time also there was a growing concern for the physical and mental development of children. This can be seen in the proliferation of philanthropic societies and the many humanitarian individuals who were working for the welfare of children at this time.

Social policies of this century have centred on the evolution of the Welfare State, based on the Beveridge principle that it was the duty of a civilised community to ensure that all its citizens had a minimum income to live on, a minimum of health, education and housing and that all social policy should be designed with that end in view.

> "From the premise that the individual should be completely independent with the right and duty to look after his own affairs, there was a move towards collectivism which has evolved to the logical conclusion of the existing welfare and social service provision." (Mellor, 1973)[1]

---

1. Ibid., p.6.

Guidance in British education owes much to the Child Study Movement originated by Galton as the genius behind the methodology of the study of individual differences. (Hughes, 1971).[1] Mental tests were established on an operationally sound basis. Emphasis was laid on the observation of child behaviour and particular attention was paid to the sub-normal.

> "As early as 1892 Sully had proposed that a new kind of specialist was needed for the schools, a psychologist who would approach the new problems of childhood and education in the scientific spirit of the new evolutionary psychology." (Hughes, 1971)[2]

The School Psychological Service developed following Burt's appointment to the L.C.C. as the first educational psychologist in the country. This service revealed the importance of the environmental, developmental, educational and social factors as the basis of educational problems. It provided help for the "feeble-minded", the dull and the backward, the neurotic and the delinquent. Lack of money and trained personnel and the attitude of some Local Authorities hindered the development of the Service to attend to the wider needs of the school population as a whole. Its activities were restricted to the diagnosis and remedial treatment of problem children. Although this could be regarded as positive advance in the child psychological field, perhaps it deflected interest from the aims of guidance in its wider sense.

---

1. P.M.Hughes, Guidance and Counselling in Schools, Oxford, Pergamon, 1971, pp. 4 and 141.

2. Ibid., p.145.

DEVELOPMENTS IN THE YOUTH EMPLOYMENT SERVICE

As part of the social services, a specific service has evolved to help school-leavers in the transition from school to work. The Youth Employment Service has developed from the Labour Exchanges Act of 1909 and its origins could be traced into the latter part of the last century. The Labour Exchanges were established largely to attempt to deal with the problems of unemployment. It was recognised that the problems of young people entering employment for the first time were different from those who were older and more experienced and who had family and domestic responsibilities. The young person needed advice and guidance about the types of occupation to enter. His type of work was likely to be different from the older man.

From the outset some Education Authorities and the Board of Education argued that the guidance of young people was, at least, partly an educational task, which the Labour Exchanges were not ideally fitted to perform. Those who came into contact with a young person during his school life were better fitted to understand his needs and to provide guidance and therefore the guidance service should have firm links with the educational system. The Education (Choice of Employment) Act of 1910 was passed as a response to these arguments. After 1918 the central government reimbursed 50% of the cost to local authorities running the employment bureaux in their areas and by 1919 28% of the authorities were exercising the permissive powers allowed by the 1910 Act.

In 1948 the Employment and Training Act implemented proposals which had been put forward by the Ince Committee

in 1945. The division between the guidance work done by Education Authorities and the placement work of the Ministry of Labour had been integrated into one Service which authorities were now required to decide whether they wished to assume total responsibility. The central government grant was increased to 75% of the costs and this included the administration of national insurance benefits. (Roberts, 1971).[1]

As a result of this Act, the Youth Employment Service was, in 1970, run by 144 of the 197 Local Education Authorities. There were 1741 Careers Officers and 285 officials of the Department of Employment. This constitutes a considerable strengthening of the Service. Since 1950 the establishment has risen from 770 posts and the case loads of 15-year olds per Officer have dropped from 731 in 1956, to 533 in 1965 and to 419 in 1970 (Central Youth Employment Executive, 1971).[2] This Service will become mandatory on all Local Education Authorities in April 1974.

In the early days the functions of the Service were largely based on placement. Work in schools was limited. Guidance was offered by a few teachers, but unemployment was serious. A social survey of Merseyside in 1930 showed that

---

1. K. Roberts, From School to Work, Newton Abbot, David & Charles, 1971, pp.16-22.

2. Central Youth Employment Executive, Careers Guide, H.M.S.O., 1971-72, p.3.

20% of the boys and 30% of the girls who had left school at 14 were unemployed after 6 months and 74% of those who found work were in blind-alley jobs. (Roberts, 1971)[1]

Now the situation has changed radically.

> "A complete breakthrough has taken place in our work. Previously, due mainly to the economic situation, finding work for school leavers had to be considered our main function. Today finding jobs for young people hardly presents a problem at all and careers guidance is accepted as the basis for our work." (A Principal Careers Officer on Merseyside in Roberts, 1971)[2]

This change of emphasis from placement to guidance is also reflected in the professional title. Up to 1968, officers were known as Youth Employment Officers. In 1968, the professional organisation was re-named the Institute of Careers Officers. Although the service they operate is still statutorily the Youth Employment Service, they are professionally known as Careers Advisory Officers.

This change of emphasis required a re-orientation of the skills and facilities of the Service. Galbraith (1971)[3] in an address to the Scottish Branch of the Institute of Careers Officers a few days before he died in April 1970 made a number of practical suggestions on six aspects of the work:

---

1. Op.cit., p.37.

2. Ibid., pp. 44-45.

3. H.M.C. Galbraith, The Youth Employment Service: a Perspective, Institute of Careers Officers, Icon Series No. 1., pp. 3-7.

"a) Search and Information Systems. Information has mushroomed. A documentation system must be efficient. Computer-assisted guidance may help the careers counsellor to use his skills more efficiently.

b) Placement will continue to be part of the Careers Officer's work but he should be fed with occupational information from a centralised agency so that he can build broad, rather than minutely detailed, occupational concepts and attempt to interpret these in terms of the client's self-concept and occupational goals.

c) Psychometric Test Programmes. Precision testing (Chapter VII, p. 320) is more appropriate than saturation testing. Particular tests of some specific aspect of the client's self-knowledge may be interpreted through the counselling procedure.

d) Counselling. The Careers Service may offer a vocational consultancy to a School Counselling Service. School Counselling is in its infancy, but there are signs that it is growing.

e) Cumulative Records - an indispensible instrument for promoting educational and vocational progress.

f) Occupational Information needs to be perceived in terms of its meaning to the individual. "It is not what exists 'in reality' which enters into occupational thinking, but what comprises the individual's personal perceptions of it."
(Rusalem, 1954)[1]

It will be shown in the subsequent discussion in this thesis that all these skills and procedures bear to some extent on the functions and interpretation of the test of occupational information. Personal contact of the author with many Careers Officers during this project suggests that many are developing these skills and some are beginning to use a computer-based information system. Others are developing Careers Education courses within the schools.

---

1. H. Rusalem, New Thoughts on the Role of Occupational Information, Journal of Counselling Psychology, Vol.I, pp.84-88.

The Youth Employment Service is criticised not least by its own professionals and by surveys (e.g. Jahoda and Chalmers, 1963).[1] Nevertheless it makes a strong contribution to guidance in British Secondary Schools today.

---

2. G. Jahoda and A.D.Chalmers, 'School-leavers recall of the interview with the Youth Employment Officer', Occupational Psychology, Vol.37, pp.112-129.

DEVELOPMENT OF GUIDANCE IN SCHOOLS

How has guidance developed in the schools?

Public schools were founded on the ideal of "godliness and good learning" or the interdependence of religion and education of which Thomas Arnold was such a forceful exponent. Emphasis was laid on the development of "character". Thring of Uppingham expressed the aims and methods of public schools as

> "the learning to be responsible, and independent, to bear pain, to play games, to drop rank and wealth, and home luxury, is a priceless boon. I think myself that it is this which has made the English such an adventurous race; and that with all their faults....the public schools are the cause of 'manliness'." [1]
> (Parkin, 1898)

The public schools usually managed to make their mentors conform to the patterns of life which authorities prescribed. This is also reflected in the restricted range of professional occupations which they entered. (Bamford, 1967)[2]

Guidance of boys on personal matters appeared to be the province of headteachers and house masters.

> "Maths masters could not discuss welfare or moral questions with boys even if they were in holy orders." [3]
> (Bamford, 1967)

---

1. G.W.Parkin, Edward Thring, Life, Diary and Letters, 1898, quoted in D. Newsome, Godliness and Good Learning, Murray, 1961, p.222.

2. T.W.Bamford, The Rise of the Public Schools, Nelson, 1967, pp. 209-222, and 319-326.

3. Ibid., p. 118.

If pastoral care was neglected by some heads, others, perhaps more individualistic like Benson of Wellington, may not have been the type of person whom a boy would naturally approach.

> "I watched him as a mouse watches a cat and for exactly the same reasons." Remarks by a distinguished Old Wellingtonian, Sir Ian Hamilton on E.W. Benson (Newsome, 1959)[1]

But the public school headmaster had, and still has, many roles to perform:

> "He is, at one and the same time, the manager of a business, a public relations officer, a teacher and a man with pastoral responsibility. One has the suspicion that the greatest of these duties - pastoral care - does not get the attention it deserves, and that the best headmasters are often laid to rest unsung. The achievements of Arnold, Temple and Benson rest far more on their achievements in the adult world than in the child's world. The strength of Thring and Sanderson lies in this very fact that their reputation rests entirely on their work in schools."
> (Bamford, 1967)[2]

Public Schools established the House System as the communal living unit and developed it as a basis for competitive games. The grammar schools have emulated this latter function. Evidence of guidance in both types of schools is not easy to trace. Help in personal matters is certainly available from House Masters in public schools and many grammar schools pride themselves on "knowing every pupil."

---

1. D. Newsome, A History of Wellington College, 1859-1959, Murray, 1959, p.158.

2. Op.cit., p.163.

There is also an educational element in guidance. Both public and grammar schools offer academic curricula where choices of subject need to be made at certain stages. (Davis, 1967)[1]. The secondary modern school, in attempting to achieve parity of esteem, established academic as well as technical and non-vocational courses. Thus there is a need to provide educational guidance so that suitable choice of courses may be made. These courses have vocational implications and thus career and educational guidance cannot be provided in isolation from each other. Taylor (1963)[2] argues that because the secondary modern school teacher's background is different from his pupils' and his occupational knowledge is limited, his vocational guidance is not found to be significant. The Newsom Report (Central Advisory Council, 1963)[3] draws attention to the need for guidance in matters of personal behaviour and career. Many secondary schools responded to this Report by establishing courses in personal and careers education.

---

1. R. Davis, The Grammar School, Penguin, 1967, pp.42-57.

2. W. Taylor, The Secondary Modern School, Faber & Faber, 1963, p.72.

3. Central Advisory Council for Education (England), "Half our Future (Newsom Report), 1963, H.M.S.O., pp. 60-79.

DEFINITIONS OF GUIDANCE

The previous sections of this Chapter have briefly sketched influences on the development of guidance in education. It can be seen that although guidance may have existed it had not been clearly defined. In this section an attempt is made to describe contributions to a more precise definition than those indicated earlier (p. 2).

The subject-based teaching of the public schools and grammar schools emulated by the secondary technical (Edwards, 1960)[1] and the secondary modern school (Taylor, 1963)[2] tended to stand almost as the "raison d'etre" for education. Education was regarded as fact-centred and was largely examined as such, at least in schools. (Montgomery, 1965)[3]

Alongside this academic bias has developed a growing responsibility for personal guidance of the individual. This may have been implicit in the purpose of the public and the residential schools. In the grammar schools it was predominantly educational rather than personal or

---

1. R. Edwards, The Secondary Technical School, University of London Press, 1960, pp. 70-141.

2. Op.cit., p.72.

3. R.J.Montgomery, Examinations: an account of their evolution as administrative devices in England, Longmans, 1965, pp.261-263.

vocational guidance. However the development of comprehensive secondary education has revealed an opportunity and a need for careful consideration of the social organisation within the school (Benn and Simon, 1972).[1] The "form and form-teacher" structure of the grammar and the secondary modern schools was inadequate and the head teacher could not know all the pupils in these larger schools. The organisational problem has resulted in the establishment of house and year tutorships with some teachers specifically appointed for "guidance" functions.

As the academic and the guidance roles have become clarified (Heycock, 1970)[2] so has the distinction between education and guidance within the curriculum. Education (vis a vis guidance) is regarded as being fact-centred. It is concerned with knowledge in the widest sense. It includes information about the environment, history, language and communication, religion, science and mathematics. In their taxonomy of educational objectives, Bloom and his co-workers (1956)[3] classified these as the

---

1. C. Benn and B. Simon, Half Way There, Penguin, 1972, pp. 341-347.

2. C. Heycock, "A Study of some aspects of the Internal Organisation and Management of the mixed All-through Comprehensive Schools with Eight Hundred or More Pupils," Port Talbot, Sceptre Publishing Co.,1970, pp.76-78.

3. B.S.Bloom, (ed.), Taxonomy of Educational Objectives, Handbook I: Cognitive Domain, Longmans, 1956, p. 18.

cognitive domain and described a hierarchy of processes (knowledge, comprehension, application, analysis, synthesis and evaluation) which the objectives may describe. Examples of this type of behavioural educational objective are given by Wood (1968):[1]

Knowledge:	of the fact that the area of a triangle equals half the base multiplied by the height.
Comprehension:	ability to re-code 11 in denery numbers as 1011 in binary numbers
Application:	ability to draw a graph to illustrate the journey of a bus through a town on a busy day.

These objectives are concerned with the development of knowledge and intellectual skills. A teacher who has set these objectives will need to select content and devise learning experiences which will develop the appropriate concepts and skills.

Guidance is regarded as a complementary element to this cognitive aspect of the curriculum. Hall and Lauwerys (1955)[2] distinguish guidance as

> "a process of helping individuals through their own efforts to discover and develop potentialities both for personal happiness and social usefulness".

It is concerned with the pupil as an individual, with the person he is, and with the personal decisions he will need to make.

---

1. R. Wood, Objectives in the Teaching of Mathematics, Ed. Rev.10: 1968, pp. 90-92.

2. R.K.Hall and J.A.Lauwerys, (eds.), The Year Book of Education, Evans, 1955, p. 17.

In terms of Bloom's taxonomy this gives rise to objectives in the affective domain (Krathwohl, Bloom and Masia, 1956).[1] This area is concerned with feelings and the organisation of values: receiving, responding, valuing, organisation, characterisation by a value or value complex. Examples of this are found in the Schools Council Careers Education and Guidance Project (1973).[2] The objectives of the first of their newspapers, Framework 1, may be analysed as:

Awareness (or Receiving):	To examine the dreams of the life-style.
Responding:	To begin to assess likes and dislikes.
	To show the need for team-work.

Within the context of this study guidance is referred to in relation to personal and social decisions. For convenience the guidance process has been defined to have three components:

Vocational guidance: A continuous and careful assessment of interest, aptitude and potential over a period using a variety of sources of data in order to assist individuals in solving problems related to occupational choice. (International Labour Organisation, 1949).[3]

---

1. D.R.Krathwohl, B.S.Bloom and B.B.Masia, Taxonomy of Educational Objectives, Handbook II: Affective Domain, Longmans, 1956, p.35.

2. Schools Council, "Careers Education and Guidance Project: Foundation Course Trial Materials," Schools Council Publications, 1973.

3. International Labour Organisation, I.L.O. Recommendation (No. 87) Concerning Vocational Guidance, in B.Hopson and J. Hayes, The Theory and Practice of Vocational Guidance, Pergamon, 1968, p.283.

Educational guidance: Advice to pupils, parents and teachers on the choice of courses in the light of a variety of objective and impressionistic data: test scores, teachers assessments over a period, classroom performance, emotional adjustment and level of aspiration. (Lytton and Craft, 1969).[1]

Personal counselling: May be concerned with social behaviour and emotional difficulties. (Lytton and Craft, 1969).[2]

These distinctions are a matter of convenience in definition rather than differences in function for the teacher or counsellor. Personal, educational and vocational decisions are all influenced by needs, values, interests and abilities of the individual. All three types of decision are interdependent (Vaughan, 1970).[3] When set out in terms of objectives for school guidance work (Daws, 1968)[4] these divisions disappear:

1) To acquaint the pupil with the total range of choices (particularly educational and vocational choices) and their implications as they confront him during the later stages of school life.

---

1. H. Lytton and M. Craft, Guidance and Counselling in British Schools, Arnold, 1969, p. 9.

2. Ibid., p. 9.

3. T.D. Vaughan, Education and Vocational Guidance Today, Routledge and Kegan Paul, 1970, pp. 9-17.

4. P.P. Daws, "A good start in life", Cambridge, Careers Research and Advisory Centre, 1968, p.57.

2) To develop his decision-making skill in respect of those choices so that he will leave school with a fully developed capacity for reaching decisions and making wise choices.

3) To identify and understand the "misfits", indeed, all exceptional, atypical children, to help them to adjust effectively to their educational and social environments and to meet successfully the demands that are made upon them.

4) To facilitate the development of every pupil's uniqueness, recognizing such individuality, respecting it, and assuming that it has social value, and that its acceptance and development will enhance the quality of the pupil's later life.

5) To bridge the social divisions in our complex, pluralistic society, to promote mutual understanding of cultural predicaments - the haves and have-nots, the young and old, children and parents, black and white, girls and boys.

6) To develop in pupils an enquiring and constructively critical appreciation of the society whose arrangements make demands upon them, to question the appropriateness of those arrangements and the moral soundness of the demands they make.

7) To develop moral awareness and ethical judgment, and sensitivity to all aspects of moral issues that arise in the personal relationships of pupils and in their community.

This list, apart from the seventh objective, was developed as a result of discussion at a Strasburg Conference between prominent international representatives engaged in guidance. Guidance in school is concerned with the development of pupils' awareness. They need to understand information about life and society which enables them to make personal decisions, moral judgments and a critical appraisal of societal issues. Decision-making is a skill which should be developed by analysing information, realising its consequences and relating it to personal values. Guidance is concerned with the individuality of pupils, their uniqueness and their personal problems, particularly if they are exceptional in any way.

CAREERS EDUCATION AS A PART OF GUIDANCE

Reappraisal of the secondary school curriculum has led to greater concern for the widening of its objectives into a field of personal education. The school curriculum is now concerned with many aspects of personal development: sex education, health education, education in personal relationships, education in community living and political awareness, consumer education and budgeting, moral education. Within this "individual centred" part of the curriculum, careers education is a part. Curricular experiments during the last few years have developed courses on these themes e.g. Topical (Boothman, 1967)[1], Interdisciplinary Enquiry (James, 1968)[2], Schools Council Humanities Project (Stenhouse, 1971).[3] Recently attention has been directed towards curriculum development in careers education and the Schools Council has established the Careers Education and Guidance Project (Field, 1972).[4] Objectives for this type of curriculum were set out by the Schools Council Working Party on the Transition from School to Work (Schools Council, 1972)[5] and formulated as:

---

1. D.B.Boothman, Topical, Longman, 1967, pp. 20-103.

2. C. James, Young Lives at Stake, Collins, 1968, pp.125-229.

3. L. Stenhouse,"The Humanities Curriculum Project," in R. Hooper (ed.): The Curriculum: Content, Design and Development, Edinburgh, Oliver & Boyd for Open University, 1971, pp. 336-344.

4. R. Field, "Schools Council Education and Guidance Project", No. 4, Careers Quarterly, 1972, pp. 44-46.

5. Schools Council, Working Paper 40, Careers Education in the 1970s, Evans/Methuen Educational, 1972, p. 31.

1) To help pupils develop a sense of personal worth which is independent of their scholastic achievement;

2) To offer a sound general education in which an understanding of the adult world takes an important place;

3) To provide conditions for each pupil to grow in self-understanding and in the capacity for self-directiveness and decision-making;

4) To help each pupil to understand the full range of opportunities which will be open to him;

5) To try to ensure that he acquires some understanding of the conditions and values that he finds when he leaves school.

(My underlining is intended to emphasise those aspects which are more specific to a careers education course relative to the objectives which may be achieved in other aspects of the school curriculum (see Chapter IV, p. 165)).

The emphasis of this curriculum is not upon developing specific vocational skills. These are likely to become obsolete in a very short time and in any case industry can do this training much more effectively and economically. The need is for a good education which is primarily concerned with social issues, personal choices and the stresses involved in living and working in modern society. Within this broad approach will be some elements of the curriculum which will be related to employment. It will be concerned with learning about work and preparing for decisions of the choice of work or further education. But the preparation for this decision-making will involve consideration of the wider issues of living. Career in this definition is used to refer to a person's total life pattern, which will

involve both work and non-work factors. (Hayes and Hopson, 1968).[1]

A school careers education programme will be concerned with helping to foster a child's self-knowledge, helping him to understand and develop his interests and to realise his abilities. In Super's words "to develop his self-concept" (Super, 1957)[2]. Vocational development may be regarded as one of the implementation of the self-concept. It is a process of compromise between the ideal which the individual would like to achieve for himself and the reality of the world of work. In order to approach this compromise the individual needs to be aware not only of himself but of the range of occupations and what is involved in working in them.

> "The degree of success an individual will achieve in finding an occupational role which suits his personality, interests and aptitudes will be determined, at least in part, by the information he possesses about himself and the information he possesses about occupations".
> (Hayes and Hopson, 1971)[3]

Careers education is part of a specific guidance process. An individual's needs, ambitions, interests and abilities form a basis on which vocational decisions are made. One objective of guidance is to develop this

---

1. J. Hayes and B. Hopson, "Occupational information and the process of vocational development", Tech.Ed. Abstracts 9: 1968, p. 6.

2. D.E.Super, The Psychology of Careers, New York, Harper and Row, 1957, pp.80-100.

3. J. Hayes and B. Hopson, Careers Guidance, Heinemann, 1971, p. 47.

awareness of himself. Equally important is the individual's concept of the environment in which work is done, i.e. his occupational concept. He needs to be aware of the features of different occupations and thus be enabled to see the advantages and disadvantages in relation to his own expectations. Thus an individual will be able with increasing clarity to see himself in an occupational role, i.e. his occupational self-concept. (Hayes and Hopson, 1968)[1]

Careers education is "fact-centred" and involves cognitive skills in that understanding of the adult world is essential if the student is to prepare himself adequately for life after school. It is "individual-centred" in that the emphasis is on the individual's personal adjustment to the adult situation. It is concerned with self-development of the student towards personal happiness and social usefulness and is appropriately regarded as part of the guidance work of the school.

The stages in the secondary school curriculum at which careers education programmes are appropriate are discussed more fully in Chapter VII, (p. 326).

---

1. Op.cit., pp. 6-9.

COUNSELLING AS A GUIDANCE TECHNIQUE

Table 1.1 shows a convenient model of the relationship of the two major curricular components and the professional agents involved:

Table 1.1

CURRICULAR COMPONENTS AND THE ASSOCIATED EDUCATIONAL PROCESSES AND AGENTS

Curricular Component	Process	Technique	Agent
Fact-centred information (cognitive)	Instruction	Teaching	Teacher
Individual-centred development (affective)	Guidance	Counselling	Counsellor

In "fact-centred" instruction the teacher is engaged in developing in the students the skills appropriate to the understanding and interpretation of knowledge. In "individual-centred" guidance the teacher is concerned in developing the individual's self-concept and helping him to interpret this in terms of the life he wishes to lead. The guidance teacher's technique in this process is counselling. He is acting as a counsellor.

Daws (1967)[1] suggests that the aim of a counsellor is

> "to promote the development of his client, to help him to become mature, independent and autonomous, and both able and skilled in handling the crises that life confronts him with and which demands choices, decisions and action".

---

1. P.P.Daws, "What will the School Counsellor Do?", Educational Research, 9, 1967, p. 86.

This is a non-directive, client-centred view of the work, which may seem to be the polar extreme from the view of a teacher who may be directive, information-centred and authoritarian. Whilst confusion may be experienced by a person undertaking both roles, there may be situations where a teacher would use counselling techniques and a counsellor may be required by a client to impart information, thus using some of the instructive techniques of the teacher. A counsellor within the school may well have some responsibility for careers education and may, on occasions, feel obliged to use teaching, rather than counselling techniques. Particularly the pressures of time and limited opportunities with individuals may compel him to select the questions he asks pupils about themselves and their futures rather than wait for them to raise the issues themselves.

The teacher involved in careers education may thus be required to use both teaching and counselling techniques. Teaching involves a wide range of techniques. Some of these are appropriate to the teaching of occupational information and are briefly described in the section on the practice of careers education in Chapter II, (p. 92). As teaching involves a wide range of methods, so counselling may involve different approaches. Boy and Pine (1963)[1] suggest there are three approaches:

---

1. A.V.Boy and G.J.Pine, Client-Centred Counselling in the Secondary School, Boston, Houghton Mifflin, 1963, pp.10-45.

1) Client-Centred Counselling

This is a process through which the client gains sufficient understanding of himself in order to take positive steps to make his own decisions. (Boy and Pine, 1963).[1] The counsellor operates on the principle that the client is basically responsible for himself and that he must retain that responsibility. He recognises that the client has the right to agree or disagree, to give information or withhold it, to act or not to act. In fact, the purpose of counselling is to allow the client to grow so that he can cope with the present problem and later problems in a better integrated fashion (Rogers, 1942).[2] The counselling technique requires a sensitivity to the client's emotions rather than the intellectual content of his expression. Critics of this approach include Williamson (1951)[3] who questioned whether a counsellor could be neutral and impersonal, and Gustad (1951)[4] who doubted whether the client has the information and skills within himself to solve the problems or make the necessary decisions.

---

1. Op.cit., p.13.

2. C.R.Rogers, Counselling and Psychotheraphy, Boston, Houghton Mifflin, 1942, p. 28.

3. E.G.Williamson,"Directive versus Non-Directive Counselling," Educational Digest 16, p. 35.

4. J.W.Gustad,"Test Information and Learning in the Counselling Process", Educational and Psychological Measurement 11, 788-95, p.788.

2) Directive Counselling

This is the opposite extreme to client-centred counselling. Williamson (1950)[1] defines counselling

> "as one of the personalised and individualised processes designed to help a person to learn school subject matter, citizenship traits, social and personal values and habits, and all other habits, skills, attitudes and beliefs which make up a normally adjusting human being."

This is essentially an intellectual process in which the counsellor has superior information and experience and is competent to give advice about how a problem may be solved. This approach is criticised as being too counsellor dominated. Rogers (1942)[2] says that the counsellor selects the desirable and socially approved goal which the client has to attain and then directs his efforts towards helping him to attain it. The problems selected by the counsellor may not be those on which the client needs help. Once the problems have been defined, the client may believe that he has that difficulty and accept the counsellor's statement of it. Dangers arise as the client becomes dependent on the counsellor.

3) Eclectic Counselling

Counselling that is based on different methods, concepts and techniques based on different schools of thought. Eclecticism recognises the complexity and variety

---

1. E.G.Williamson, Counselling Adolescents, New York, McGraw Hill, 1950, pp.2-3.

2. Op.cit., p.126.

of society and individuals and implies that no one set of techniques - non-directive or directive - can necessarily deal with every problem and individual. This approach is based on the directive process to the extent that the counsellor takes the responsibility of guiding the client through an examination of all the relevant data, testing information and implications and making plans for decision-making. The relationship is client-centred since the client is expected to do most of the talking, he makes the decisions and takes responsibility for himself and his future. (Boy and Pine, 1963).[1]

Thus it is the professional responsibility of the counsellor to choose his position in relation to the client on the non-directive - directive continuum. Atdifferent times and with different clients his position will vary. A teacher of careers education has to fulfil the dual roles of teacher to his students and counsellor to the same students who may assume the client relationship. The personality of the teacher will also affect the degree of directiveness which he uses in the teaching as well as the counselling role. As compared with a counsellor who is solely concerned with personal guidance a careers teacher is bound almost by the dual nature of his work to adopt an eclectic approach.

Testing is an essential part of effective counselling

---

1. Op.cit., pp. 26-30.

since the client needs some external comparison of himself with others. Testing helps the client to become more fully aware of his potential and enables him to make more effective use of his capabilities. Even the client-centred counsellor agrees that there is a point in counselling when tests could be used. This is the point where a client, in seeking more information about himself or about issues related to his future (e.g. occupational information), asks to take a test.

In careers education, tests of interest, ability and personality have a part to play. They help to reveal information to the student about himself and so help to develop his self-concept. In this context a test of occupational information may help to develop his awareness of the reality of life in occupations.

Before describing such a test it is appropriate to discuss more fully the uses of tests in careers education.

USES OF TESTS IN CAREERS EDUCATION

There has traditionally been a suspicion surrounding testing in education. A discussion of criticisms and a justification of its place, particularly within careers education are appropriate at this point.

Many teachers are critical of examinations. They are associated with selection for grammar schools or universities. They maintain the elite in an age of egalitarianism. They doom to failure a large proportion of our child population, and, with children,"nothing fails like failure". (Short, 1972).[1] This is a criticism of the institutional structure of the use of tests rather than of the tests themselves. Yet "eleven-plus selection by objective test has been proven to be the most efficient and fairest method of selection possible when compared with any form of subjective assessment". (National Foundation for Educational Research, 1963).[2]

For some, tests are ridden with mathematical and statistical manipulation which to the uniniated appear as being interpretable according to the wishes of the tester rather than the testee. The lack of training of teachers in test construction and interpretation may account for this

---

1. E. Short, "Positively Prejudiced", The Guardian, 4th October, 1972,

2. National Foundation for Educational Research, "Procedures for Allocation of Pupils in Secondary Schools", Slough, 1963.

suspicion. Reappraisal of the objectives and content of teacher training emphasise that for the majority this is a basic element of their work. (Stones and Morris, 1972).[1] Nevertheless it is essential that the authors of tests ensure that their material is readily and simply interpretable by those who are in a position to use them. Testing within careers education has been limited until recently to a very small number of careers teachers who may have used interest guides, and to a few local Careers Services (e.g. Birmingham) which have introduced a systematic testing service of attainment, aptitude and interest. Recently the Central Youth Employment Executive has trained many groups of Careers Officers in the use of the Edinburgh A.P.U. Interests Guide.

Perhaps the strongest objection to testing is based on the widespread belief that measurement can only be applied to the more assessible aspects of human behaviour and this has been confined mainly to the cognitive aspects. Teachers are also concerned with qualities and attributes of personality, understanding and personal values which are not quantifiable objectively. (Pidgeon and Yates, 1969).[2]

---

1. E. Stones and S. Morris, Teaching Practice: Problems and Perspectives, Methuen, 1972, p.61-62.

2. D.A.Pidgeon and A. Yates, An Introduction to Educational Measurement, Routledge and Kegan Paul, 1969, pp.11-12.

One answer to this viewpoint may be presented through this thesis. Briefly the reply is that testing improves the efficiency both of teaching and guidance. The teacher has constantly to re-evaluate his teaching against the objectives he is attempting to fulfil. He needs to know what his students have learnt and what changes have taken place in their behaviour as a result of the curriculum unit for which he is responsible. A teacher is continually concerned with curriculum decision-making-decisions about appropriate teaching methods, grouping of pupils or individual pupil behaviour. These decisions may be made on the basis of intuition, on various comments made by the children, colleagues or parents, on impressions gained from observations of behaviour, written work or personal appearance. If these decisions are to be made rationally and with professional objectivity, the teacher needs to use methods of assessment which are carefully constructed and validated to provide evidence which can contribute to the decision-making process.

Cronbach and Gleser (1965)[1] distinguish between two types of decision-making situation:

Institutional Decisions which are made by individuals acting for an institution who choose or reject people according to the expressed needs and values of the

---

1. L.J.Cronbach and G.C.Gleser,"Psychological Tests and personal Decisions", Urbana, 2nd Ed., University of Illinois Press, 1965, pp. 7-9.

institution. Examples are: selection of courses within school, selection for streaming or setting by ability, selection of a limited number of police officers for accelerated promotion. In this type of decision, a single person makes a large number of comparable decisions, or a group of people select the most suitable applicant(s) from comparable evidence about a number of candidates.

Individual Decisions are decisions determined by the individual's own value system and varies from one individual to another. Examples are marital choice and vocational choice. The decisions are unique to the particular individual.

Tests may be devised to serve either or both of these purposes. Within a careers education programme, institutional decisions may relate to curricular content. This content may, for example, relate to local employment opportunities. Comparison of the results of a pre-test and a post-test reveal aspects of the course where there has been the greatest increase in knowledge. The pre-test may also reveal areas of knowledge which are understood by the majority of the course members and need not absorb much of the time or other resources. However tests used in careers education will more generally be directed towards individual rather than institutional decisions.

Since careers education is concerned with the personal development of individuals, it is normally inappropriate to compare knowledge or abilities between students. It is important, however, for a student to be able, if he wishes,

to assess himself as part of the development of his self-concept and occupational concept. A student may say he is "interested in mechanical things" but a measure of comparison of his mechanical interest related to his artistic, literary or other interests reveals a more comprehensive and objective profile which helps him to a deeper and more realistic insight of himself. Similarly, tests of aptitude, attainment, or motor skills may be used for development of self-awareness.

An instrument which helps a student to a more realistic appreciation of the occupational environment has a place in careers education since it should help to develop his occupational concept. He is concerned with knowing what life is really like being a joiner or a plumber or an architect. A test may be a learning process directed to self-assessment.

Careers education is a developmental process. Within it students are encouraged to develop in ways which help them to make decisions. Testing in guidance is primarily directed towards developing the self-concepts of the individual students to the stage where they can make appropriate decisions on the basis of evidence they collect and evaluate in terms of their own personal conceived style of life. This thesis describes an attempt to devise one such test to be of use in the guidance process, mainly in schools. It is concerned with occupational information and is intended to help students to a realistic appraisal of their knowledge of work in occupations which they may be considering.

Before discussing the place of such a test in careers

education it is relevant to review briefly research findings on students' reasons for career choice and in particular their knowledge of occupations.

BRITISH RESEARCH ON REASONS FOR VOCATIONAL CHOICE

Many studies of reasons for vocational choice have been concerned with students' attitudes to work (Jahoda, 1949;[3] 1952;[5] Wilson, 1953;[6] Gordon, 1964;[13] Schools Council, 1968),[16] or reasons for choice (Valentine and Ritchie, 1927;[1] Hood, 1951;[4] Swanston, 1954;[7] Stephens, 1957;[8] Veness, 1962).[12] In these studies questionnaires have generally been used to draw up lists of attitudes or reasons for choice of career. Patterns of occupational characteristics regarded as important have been revealed along with factors of motivation, interest and influence of parents and friends. Quantitative assessment and comparison between these studies is difficult, their designs being so varied. They are undertaken on very different groups at different times for expressly different purposes:

e.g. Valentine and Ritchie (1927)[1] questioned 87 fifth and sixth formers "some years" before 1927 on their reasons for choice of career. Wilson (1953)[6] investigated the relationship between the occupation and the reasons for its choice by 1625 boys and girls in Ealing

---

All references to works mentioned on this page appear on p.39+40 after Table 1.2.

> secondary modern schools in 1948. The Schools Council (1968)[16] surveyed 4825 13 - 16 year old pupils in 149 randomly selected English secondary schools in 1966 in order to produce a comprehensive picture of school-leavers attitude to school.

Techniques used included structured questions (Schools Council, 1968)[16] and open-ended essays describing work (Jahoda, 1949[3] and Vaness, 1962).[12] Analysis of the results of these studiesproduces a list of the features of occupations which various groups have regarded as important or worthy of mention. Quantitative comparison of the relative importance of these reasons, by percentage or rank scores, is of little value since in some of the studies these occupational characteristics were rated alongside other factors such as "liking the job", "being independent" and parental influence. Table 1.2 lists occupational characteristics mentioned in these studies under three main headings of physical, economic and social aspects. This Table gives only an indication of the extent of occupational characteristics which students regard as influencing their vocational choice. This is not a comprehensive list of occupational characteristics. It has been compiled from students' responses rather than analyses of occupations. Statements such as "influence of people", "initiative" and "skill" lack precision in definition and are likely to be variously interpreted by

TABLE 1.2 OCCUPATIONAL CHARACTERISTICS

MENTIONED IN STUDIES INVOLVING BRITISH SECONDARY SCHOOL STUDENTS

Author(s)	Valentine & Ritchie 1	Lingwood 2	Jahoda 3	Hood 4	Jahoda 5	Wilson 6	Swanston 7	Stephens 8	Chown 9	Basu 10	Carter 11	Veness 12	Gordon 13	Doherty 14	Ford 15	Schools Council 16	Starkey 17	Waystead 18	Kirton 19
Year	1927	1941	1949	1951	1952	1953	1954	1957	1958	1959	1962	1962	1964	1965	1965	1968	1969	1972	1973
Sample Type of school	Sec.	Sec.	Sec.Mod.	Sec.Mod.	Sec.Mod.	Sec.Mod.	Junior Sec. Aberdeen & Banffshire	Sec.Mod.	Grammar	Sec.Mod. Kent/ North London	Sec.Mod.	Mod.Tec. Home County London,W.Country.	Sec.Mod. Herts.	Jnr.Sec.& Comp. Glasgow	Grammar Sec. Mod.Comp.	Various National sample in England	Sec.Mod. Merseyside & Cheshire	Jun.Sec. Aberdeen	Ind.Comp. National sample of 6th Form boys
Location	Midlands	Urban	London suburb	3 different	Lancashire	Ealing		London Suburb	2 unnamed areas		Sheffield								
Number M	87		*)	154	56	824	140	0	96	313	100	702	179	216	) 320	) 4825	133	297	1505
Number F		186	)	131	77	801	122	145	96	0	100	600	145	234	)	)	146	296	
PHYSICAL ASPECTS																			
Working Physical setting/conditions			✓			✓			✓	✓		✓	✓				✓		✓
Material/equipment used													✓						
Work tasks		✓								✓									
Variety/monotony					✓	✓			✓	✓	✓	✓	✓			✓	✓		
Travelling							✓	✓		✓		✓						✓	
Location/local opportunity								✓				✓							
Cleanliness							✓	✓			✓	✓					✓		
Health					✓		✓	✓											
Attractive clothes/uniform																		✓	
Skill/use of ability	✓				✓	✓	✓	✓	✓	✓		✓	✓		✓		✓	✓	✓
ECONOMIC ASPECTS																			
Hours	✓	✓	✓		✓				✓								✓	✓	
Free time/Holiday/Leave															✓	✓		✓	
Pay/salary	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
SOCIAL ASPECTS																			
Discipline			✓					✓											
Status/prestige/glamour					✓	✓					✓	✓		✓					
Influence of people/psnl.rel.			✓		✓	✓	✓	✓	✓	✓		✓		✓	✓	✓		✓	✓
Social service/helping people							✓					✓	✓	✓		✓			✓
Promotion/prospects	✓			✓	✓	✓	✓		✓			✓	✓	✓	✓		✓		✓
Security	✓				✓				✓			✓		✓			✓	✓	✓
Trade Unions											✓								
Training		✓						✓			✓	✓						✓	
Apprenticeship												✓		✓					
Initiative																✓			✓

* not stated

References: to p.36, 37 and Table 1.2)

1. C.W.Valentine and F.M.Ritchie, "Reasons for choice of occupation among secondary school pupils (I)", Forum of Education, 5, 85-101.

2. J. Lingwood, "The Vocational Information possessed by Secondary School Girls", Occupational Psychology, 15: 185-198.

3. G. Jahoda, "Adolescent Attitudes to starting Work", Occupational Psychology, 23: 184-188.

4. H.B.Hood, "Occupational Preferences of Sec.Mod.Schoolchildren", Educational Review (Birmingham), 4: 55-64.

5. G. Jahoda, "Job Attitudes and job choice among secondary school leavers", Occupational Psychology, 26: 125-140.

6. M.D.Wilson, "Vocational preferences of secondary modern schoolchildren,"British Journal of Educational Psychology, 23: 97-113 and 163-179.

7. T. Swanston, "Investigation into the reasons for vocational preference and choice of rural and urban school leavers", Unpublished Ed.B. thesis, University of Aberdeen, 1954.

8. M. Stephens, "Vocational preferences of secondary modern school girls in a London suburb", Unpublished M.A. thesis, London University, 1957.

9. S.M.Chown, "The Formation of Occupational choice among grammar school pupils", Occupational Psychology, 32: 171-182, 1958.

10. C.K.Basu, "A study of occupational information possessed by secondary modern school boys of school leaving age", Unpublished M.A.thesis, University of London, 1959.

11. M.P.Carter, Home, School and Work, London, Pergamon, 1962

12. T. Veness, School Leavers, London, Methuen, 1962, pp.67-87, and 182-185.

13. W. Gordon, "A comparative study of the occupational stereotypes of secondary school leavers and first year apprentices," Unpublished M.A. thesis, University of London, 1964.

14. J. Doherty, "An Investigation into the vocational aspirations, expectations and incentive priorities of second and third year junior secondary and comprehensive school children", Unpublished Ed.B. thesis, University of Aberdeen, 1965.

15. J. Ford, "Social Class and the Comprehensive School", Unpublished Ph.D. University of Kent, Canterbury, 1967.

16. Schools Council, Enquiry 1: Young School Leavers, H.M.S.O., 1968, pp. 2, 135-158, 300.

17. H.F.Starkey, "Factors influencing Occupational Choice among Secondary Modern School Leavers," Unpublished M.Ed. thesis, University of Manchester, 1969.

18. J.M. Haystead, "Certain Aspects of the Process of Job Choice and Entry into the Labour Market of a group of Scottish Junior Secondary School Pupils," Report to the Scottish Council for Research in Education, 1972, pp.22-23.

19. M.J. Kirton, "Careers Knowledge of Sixth Form Boys,"The Hatfield Polytechnic, Report to Leverhulme Trust, 1973, p. 80.

students and researchers. Nevertheless inspection of this Table suggests aspects of occupations which are likely to have a place in a test of occupational information, e.g. Working conditions, Variety/monotony, Pay/salary, Influence of people, Promotion/prospects. These are more fully discussed in the context of the test (Chapter IV, p. 197).

BRITISH RESEARCH ON STUDENTS' KNOWLEDGE OF OCCUPATIONS

Investigators have also been interested in pupils' knowledge of occupations. Questionnaires have revealed the extent or lack of occupational information and the relative importance of different aspects of this information.

Jahoda (1949)[1] used a semi-projective technique through a study of responses given by secondary modern boys and girls in an essay entitled "My First Day at Work". He suggested that their knowledge is fairly realistic in a limited number of the more popular occupations in their London suburb.

Chown (1958)[2] attempted to assess the accuracy of occupational knowledge of a group of grammar school boys and girls. Answers were obtained to the questions "What do you do exactly in that job?". The descriptions were generally brief and contained inaccuracies. Among girls, knowledge of the job desired appeared to increase with form level, but among boys, form level made no difference to apparent knowledge. Accuracy of knowledge was measured by reference to "Choice of Career" booklets. The number of "mistaken ideas" decreased with rise in form level. Chown concluded that the knowledge of jobs was poor at all levels. Descriptions were inaccurate and inadequate and

---

1. Op.cit.

2. Op.cit., p. 175.

recognised to be so by the pupils themselves.

Carter's study (1962)[1] of factors affecting choice in 200 secondary modern school children in Sheffield suggests that their limited knowledge of occupations revealed at interview was largely due to their parents restricted experience and outlook. Yet the parents had the greatest influence on their choice. When teachers gave information, this was appreciated, but it was very limited. In the context of this lack of knowledge, pupils tended to accept the suggestions and recommendations which were offered.

Haystead (1972)[2] confirmed the finding of limited occupational knowledge in her study of occupational choice of Aberdeen schoolchildren. However she found that more boys and girls expecting to leave school at 15 years of age had had personal contact with people doing a chosen job and had seen the job done than had those leaving school aged 16 years. In order for students to retain significant amounts of occupational information, they must first perceive it as a possible occupation for themselves.

Kirton (1973)[3] devised a Job Knowledge Index consisting of about 10 critical questions on 17 different occupations. These were scored on a three-point - no, don't know, yes - (0 - 2) scale and the Job Knowledge Index

---

1. Op.cit., pp. 89, 94, 110, 125.

2. Op.cit., p. 2.

3. Op.cit., p. 31.

has a theoretical range of 0 - 20 on the 10 questions. Norms were produced by a small group of senior professionals in each occupation. On analysing the responses of 1505 sixth form boys, the mean score for all occupations fell in the range of 9 - 14 with an overall mean of 11.1 (S.D. = 0.9). These were critical questions asked of boys who were at the stage of making consequential career decisions.

In their assessment of the Youth Employment Service interviews in schools in Lanarkshire, Jahoda and Chalmers (1963)[1] found knowledge of the local employment which was both narrow in breadth (only 1 in 10 could mention more than 5 different "jobs") and shallow in depth (one-third of them mentioned such titles as "steel works" or "offices"). Even within two months before starting work only 62% of the group who had chosen an occupation could name both the title of the job they were entering and a product which the firm produced.

It is notable that of these studies only Kirton's set out with the main objective of measuring the accuracy of students' knowledge of occupations. The first four studies were primarily concerned with reasons for and influences on choice and the sixth on the effectiveness of the Youth Employment Service.

The accuracy of the students' occupational knowledge has not been measured against the first-hand reality of

---

1. G. Jahoda and A.D. Chalmers, "The Youth Employment Service - a consumer perspective", Occupational Psychology, 37:20-43, 1963, p. 24.

the working situation, but rather against the judgments of advisers and researchers. This lacks a degree of objectivity. There is no real evidence to show that advisers' knowledge of occupations corresponds accurately in all respects to reality. Discussion with Careers Officers who were interested in this present project showed the modest degree to which they regarded the accuracy of their occupational information, In any case, reality varies from time to time, and from place to place. Occupations may have titles which are interpreted differently in different industries and perhaps in different parts of the country. The reality of the working situation is not easy to define and describe, yet it is an important and essential element in careers education.

THE PLACE OF A TEST OF OCCUPATIONAL INFORMATION IN CAREERS EDUCATION

Careers education has been shown to include knowledge of occupations.(p. 21). A student needs to know the details of the work environment and its requirements of him. He must then evaluate for himself how the work would satisfy his particular needs and values.

A test of occupational information would provide an opportunity for a student to reveal to himself how much he knew about the reality of an occupation, it could be related to descriptions provided by those who worked in the occupation or had detailed knowledge of it. Thus a student would be able to see how realistic was his knowledge in these terms. An equally essential part of the occupational self-concept is the realisation of personal values through the importance to him of different aspects of the work situation. Table 1.2 shows items which students regard as worthy of consideration in choosing an occupation. If the test was constructed so that they could also compare their occupational values with the values of workers who are in the early stages of their careers, the students may be further helped to see themselves realistically in terms of the wider life-style of the occupation.

A test of this type would reveal issues which could be discussed in a counselling session. Perhaps a student's knowledge of a particular occupation may be unrealistic in

an aspect (perhaps, pay) which he regarded as very important. Discussion with the guidance teacher will help to darify the situation. It may reveal that there were other aspects of the work which were so much more important that the student may be prepared to accept that he would earn a lower wage. Through discussion, perhaps in groups or individually with the teacher, the occupational self-concept would develop.

If, then, a test of occupational information has a contribution to make to careers guidance, its construction and validation need to be carefully considered. Examination of the literature suggested that no such test exists either in the British or American field. Since there was no established structure or experience on which to build, consideration began with the basic theoretical principles.

C H A P T E R II

OCCUPATIONAL INFORMATION IN GUIDANCE

THE PLACE OF OCCUPATIONAL INFORMATION IN CAREERS GUIDANCE

Many educational research projects start from the base of a theoretical model, pose certain questions and analyse the responses from appropriate sources. Ginzburg et al. (1951)[1] were the first investigators to attempt to establish a framework which described the stages of vocational choice. They interviewed students in the 6th, 8th, 10th and 12th grades in high school, freshmen and senior years in college and first year and advanced graduate students. Each individual was interviewed eight times in order to probe in depth his capacities, interests, goals and values and the time dimension of the vocational choice process. From this investigation they established a framework which described the stages of vocational choice which is described in greater detail later in this Chapter (p. 55). Super's Career Pattern Study (Super and Jordaan, 1973)[2] used extensive interviewing and test instruments to produce evidence on the development of the self-concept and the components of vocational maturity. In these and other researches in vocational psychology theoretical structures

---

1. E. Ginzberg, S.W.Ginsburg, S. Axelbrad and J.L.Herma, Occupational Choice: An Approach to General Theory, New York, Columbia University Press, 1951, pp. 26-38.

2. D.E.Super and J.P.Jordaan, "Career Development Theory", British Journal of Guidance and Counselling 1: 3-16, Cambridge, CRAC.

have evolved from an analysis of empirical investigation.

A different type of approach is illustrated by Coxon and Jones' (1973)[1] project on Occupational Cognition. Their research investigates the appropriateness of statistical models - the distance and vector models - in representing factors which influence the judgments of the prestige of occupations.

For this present project no model existed. Its purpose is not to explore or propose theory, but to try to produce a practical tool for use in careers education. An attempt is made to devise test material which is useful to pupils who are learning about occupations. If they wish to have some measure of the reality of their knowledge of occupational information, then norms may be available for them to use.

Whilst this work is not designed to test any theoretical concept or "model", it is not without justification both in theoretical and practical terms. Since the work began in September 1968, many developments have taken place particularly in the practice of careers education and guidance. As this project has continued the writer has become aware of many related pieces of work e.g. the investigation by Kirton (1973)[2] into the information of sixth formers in certain occupations; the tests of Vocational Maturity developed in America by Westbrook (1971)[3]

---

1. A.P.M.Coxon and C.L.Jones, "Occupational Rankings: Cognitive Implications of Models for Representing Prestige Judgments, Project on Occupational Cognition: Working Paper No. 2, University of Edinburgh, Dept. of Sociology, 1973.
2. M.J. Kirton, "Career Knowledge of Sixth Form Boys" The Hatfield Polytechnic, Report to Leverhulme Trust, 1973.
3. B.W.Westbrook, "The Cognitive Vocational Maturity Test" Raleigh: North Carolina: North Carolina State University, 1971.

and Sheppard (1971)[1]; and the curriculum project sponsored by the Schools Council on Careers Education and Guidance. In theoretical work Haystead (1971)[2] has investigated a sociological model of the vocational decision-making.

Consequently, in the light of "established theory" and developing practice in this country it is possible to relate this investigation to the work of others. In this Chapter relevant developmental theories will be described. The place of occupational information will be discussed and models of decision-making will be outlined. A brief description of the sources of occupational information in the practice of careers education will provide some basis for the context in which a test might be constructed and used.

Theories of vocational choice have developed piecemeal. Before the publication of Ginzberg and his associates' famous book "Occupational Choice: an Approach to a General Theory" in 1951 little attempt had been made to organise the

---

1. D.I. Sheppard, "The Measurement of Vocational Maturity in Adults", Journal of Vocational Behaviour, 1:399-406, 1971.

2. J.M.Haystead, "Social Structure, Awareness Contexts and Processes of Choice", Sociological Review, 19: 79-94.

literature or survey the evidence to produce a general theory of vocational development.

Earlier guidance work had been based on a talent-matching model. This theory suggests that people have different strengths and different weaknesses, different abilities and different interests. Occupations have varied requirements. The purpose of vocational guidance was to match the individual to the occupation at a particular point in time. Guidance only operated when decision-making was imminent. This "crisis-oriented" guidance was static in that it assumed the personal and occupational factors influencing the choice were operating only at the time of the decision. This approach had been the cornerstone of vocational guidance. (Hayes and Hopson, 1971)[1] The talent-matching model may be criticised on a number of counts:

1) It is not developmental. It fails to take account of continuing changes concerning both the individual and the occupational environment.
2) It tends to lead to delay in the guidance to the latest possible moment.
3) An individual's capacities were matched with the aptitudes required by the occupation. Little account was taken of personality needs or values

---

1. J. Hayes and B. Hopson, Careers Guidance, Heinemann, 1971, p. 13.

which play an important part in occupational satisfaction (Daws, 1968).[1]

Since the major purpose of this present investigation is concerned with test construction in one particular component of careers education, namely occupational information, it is not appropriate to describe in detail all the varied contributions to the theory of vocational development. However, some of these theories have particular relevance to the structure and use of this test.

Theories which have superseded the talent-matching model have emphasised the developmental nature of guidance. A guidance programme must be determined by the "progressive series of orderly and coherent changes" (Hurlock, 1964),[2] through which all aspects of personal development take place. Careers education is concerned with personal development towards vocational choice. Reference to the objectives of guidance (Chapter I, p.17, 18) and careers education (Chapter I, p. 21) emphasise development and understanding. An individual's understanding of his own development is crucial in the guidance process. The description of the self-concept, particularly the stages propounded by Ginzberg (1951)[3] and its

---

1. P.P.Daws, "A Good Start in Life", Cambridge, Careers Research & Advisory Centre, 1968, p.29.

2. E. Hurlock, Child Development, New York, McGraw-Hill, p. 1.

3. Op.cit., p.60.

implementation emphasised by Super (1953)[1] laid the foundations of the developmental theory of guidance.

---

1. D.E.Super, "A Theory of Vocational Development", American Psychologist, 8: 185-190, 1953.

STUDIES OF CAREER DEVELOPMENT

Ginzberg et al. (1951)[1] hypothesised that the period of occupational decision making can be divided into three distinct stages:

1) Fantasy period. At this stage the child has only a very dim awareness of how one attains an occupational goal. Ideas are based on a fantasy of becoming a space-man, a model, an air hostess or a professional footballer. From evidence of his interviews of young people Ginzberg suggests that from about 10 or 11 years these choices become a little more realistic and tend to be based on a limited knowledge of self and reality.

2) Tentative Period. Early adolescence is the stage at which a child is beginning to realise himself as an adult. He begins to appreciate that what was very enjoyable as a child he may not enjoy sufficiently as an adult to make a full-time occupation. The adolescent begins to create for himself a future image and the tentative selection of an occupation is the first step forward to its realisation. Because the adolescent realises he does not have control over factors which commit him to a final choice, his actions and decisions have a tentative quality until he develops a greater awareness of his assets and the liabilities and limitations imposed on him by the environment. Adults may retain this tentative stage of vocational development.

---

1. Op.cit., pp. 60-117.

They lack the initiative or knowledge to change from early choices and recognition may only come when it is too late to effect a change). Conflicts and tensions arise within the individual. The adolescent is unsure of himself and of his place in society. His knowledge of life is limited - yet he is beginning to feel adult and independent. Choices may be changed in the light of information and experience of the world as the individual becomes more aware of himself.

3) Realistic Period. Pressures of education, leaving school, choice of further or higher education exert influences on the individual which force a resolution of the conflicts. The individual is forced by circumstances to recognise that he cannot remain undecided any longer. As a young adult of eighteen or nineteen he looks backward on his past and endeavours to come to terms with it. He realises he must assess himself and his role in the future. Whilst perhaps he need not irrevocably commit himself he needs to select the broad path he intends to follow. This period is the careful re-appraisal of himself in relation to the developmental stages through which he has passed. The individual also has an image of the working world and his future within it. The more realistic this knowledge, the more mature will be the decision which is made and the more likely that the work will satisfy his needs.

Thus Ginzberg suggests three periods of vocational development through the fantasy, tentative and realistic stages of choice. The theory cannot be tested by attempting to fit any one case precisely into the proposed

stages. Many people do not approach this process in a deliberate manner. Others have difficulty in expressing their knowledge and feelings verbally. Nevertheless it is possible to describe their behaviour in terms of this framework, although they may not fully express realistic choices.

Super (1953)[1] sets out ten propositions in his theory of vocational development. This theory emphasises, even more strongly than Ginzberg, a continuum of preference, choice, entry and adjustment which Super defines as vocational maturity.

1. People differ in their abilities, interests and personalities.
2. They are qualified, by virtue of these characteristics, each for a number of occupations.
3. Each of these occupations requires a characteristic pattern of abilities, interests and personality traits, with tolerances wide enough, however, to allow both some variety of occupations for each individual and some variety of individuals in each occupation.

---

1. Op.cit., pp. 189-190

4. Vocational preferences and competencies, the situations in which people live and work, and hence their self-concepts, change with time and experience (although self-concepts are generally fairly stable from late adolescence until late maturity), making choice and adjustment a continuous process.

5. This process may be summed up in a series of life stages characterized as those of growth, exploration, establishment, maintenance, and decline, and these stages may in turn be subdivided into (a) the fantasy, tentative, and realistic phases of the exploratory stage, and (b) the trial and stable phases of the establishment stage.

6. The nature of the career pattern (that is, the occupational level attained and the sequence, frequency, and duration of trial and stable jobs) is determined by the individual's parental socioeconomic level, mental ability, and personality characteristics, and by the opportunities to which he is exposed.

7. Development through the life stages can be guided, partly by facilitating the process of maturation of abilities and interests and partly by aiding in reality testing and in the development of the self-concept.

8. The process of vocational development is essentially that of developing and implementing a self-concept: it is a compromise process in which the self-concept is a product of the interaction of inherited aptitudes, neural and endocrine makeup, opportunity to play various roles, and evaluations of the extent to which the results of role playing meet with the approval of superiors and fellows.

9. The process of compromise between individual and social factors, between self-concept and reality, is one of role playing, whether the role is played in fantasy, in the counselling interview, or in real-life activities such as school classes, clubs, part-time work, and entry jobs.

10. Work satisfactions and life satisfactions depend upon the extent to which the individual finds adequate outlets for his abilities, interests, personality traits, and values; they depend upon his establishment in a type of work, a work situation, and a way of life in which he can play the kind of role which his growth and exploratory experiences have led him to consider congenial and appropriate.

The first three propositions (1 - 3) draw upon the trait-and-factor theory of the matching process of guidance, but Super emphasises the wide tolerances within personalities and occupations in which a mature choice can take place.

Super (1957)[1] in propositions 4 - 6 identifies a series of life-stages through which an individual passes as part of the realisation of his self-concept. In adolescence, for example, he develops a greater awareness of himself and his potentialities and begins to translate them into vocational terms. He is making tentative explorations into work roles. Exploration develops into a series of vocational tasks (c.f. Havighurst's developmental tasks):

Crystallising vocational preferences,
Specifying " " ,
Implementing " " ,
Stabilising " " ,
Consolidating " " ,
Advancing in an occupation.

(Super, 1970)[2]

Super suggests that vocational maturity is shown by the

---

1. D.E.Super, The Psychology of Careers, New York, Harper & Row, 1957, pp. 80-82.

2. D.E.Super, "Vocational Maturity in the Secondary School, Psychology of Careers Course, Keele University, (15-20/9/70).

success with which an individual copes with these developmental tasks. Adjustment depends upon a series of compromises (propositions 7 - 9) between himself and his environment, between his self-concept and his occupational life. Guidance has a mediating influence in this process by helping the individual to test his understanding of himself in relation to the social and environmental factors of work.

The development of self-awareness is an important part of any careers education programme. If a person is to make a realistic decision of choice of job, he must have a realistic picture of himself (i.e. a self-concept). He needs to know

i) what he enjoys doing i.e. interests;

ii) what he is capable of doing i.e. abilities;

iii) what he wants from life in general, i.e. values.

By knowing himself he will then be able to judge future alternatives and define his life-style and goals at times when decisions are necessary.

The concept of vocational maturity is central to career development. Super and Jordaan (1973)[1] define this as the readiness to cope with the developmental tasks of one's life stage, to make socially required career decisions and to cope appropriately with the tasks with which society confronts the developing youth and adult. Super's

---

1. Op.cit., p. 4.

investigation of the vocational maturity of the 9th and 12th grade boys in American High Schools shows that occupational preferences at 15 years are relatively uncrystallised and lacking realism. In the 12th grade (18 years) preferences become more persistent and realistic. Super concludes that the planning of the tasks and the availability of realistic information are the principal factors in vocational maturity (Super 1970).[1]

Hayes and Hopson (1968)[2] postulate that the discovery and entry into the occupational role depends upon four inter-related processes: development of the self-concept, the occupational concept, the occupational self-concept and the extra-occupational concept. Some evidence that vocational development is determined by a realistic compromise between self-concept and occupational concept is found in a number of studies. The most pertinent of these in the present context are by Brophy (1959)[3] and Morrison (1962)[4]. Brophy using adjective check-lists and a job satisfaction

---

1. Op.cit.

2. J. Hayes and B. Hopson, "Occupational information and the process of vocational development," Technical Education Abstracts 9: 6 - 9, p. 6. 1968.

3. A.L.Brophy, "Self, Role and Satisfaction", Genetic Psychological Menograph, 1959, pp. 263-308.

4. R.L.Morrison, "Self-Concept Implementation in Occupational Choices", Journal of Counselling Psychology, 9: pp.255-260, 1962.

questionnaire showed that a group of nurses who had a large discrepancy between self- and job-concepts tended to have lower satisfaction scores than those who saw self and job as being more alike. Morrison used Q methodology to compare subjective perceptions of self and occupational roles. A group of nursing trainees and a group of comparable teacher trainees described themselves, their chosen occupational role and an occupational role they had not chosen. Both groups showed a significantly greater similarity between their self-perceptions and their perceptions of their own occupation rather than their perceptions of an occupational role they had not chosen.

The occupational concept is developed from the young person's interpretation of occupational information. Theories of the development of occupational concept do not yet have an empirical foundation comparable to that of the self-concept. They have mainly grown out of description of guidance practice. These descriptions will be considered in the next section of this Chapter.

OCCUPATIONAL INFORMATION IN GUIDANCE

Early workers in vocational guidance were concerned with occupational information. Parsons (1909)[1] is frequently referred to as the originator of the vocational guidance movement. He stated briefly and simply three basic requirements for a systematic programme of vocational counselling:

1) a clear understanding of yourself, your aptitudes, interests, ambitions, resources, limitations and their causes;
2) a knowledge of the requirements and conditions of success, advantages, compensations, opportunities and prospects in different lines of work;
3) true reasoning on these relations of two groups of facts.

As Paterson (1938)[2] noted in his discussion on the genesis of modern guidance "Parsons knew what was needed, but when he went to the psychological laboratory for techniques, he found the cupboard was bare."

Whilst Paterson drew attention to the importance of occupational information, Shartle (1959)[3] was one of the early workers in the counselling service to pay particular

---

1. F. Parsons, Choosing a Vocation, Gay & Hancock, 1909) p. 5.

2. D.G.Paterson,"The Genesis of Modern Guidance", Educational Record, 19, pp.36-46, 1938, Reprinted in Brayfield A.H. (ed.), Readings in Modern Methods of Counselling (pp.13-20, New York, Appleton-Century-Crofts, 1950.

3. C.L.Shartle, Occupational Information, 3rd ed., Englewood Cliffs N.J., Prentice Hall, 1959, p. 2.

attention to the definition and description of occupational information. He defined occupational information as

> "Essentially a description of man's work and related conditions. Not primarily a study of man himself, but of his environment..... Occupational information is not merely an aid in counselling or decision making at a particular time; it represents information relevant to the occupational development of an individual and his adjustments throughout his life span."

Shartle suggests that a child's normal experience of the information of life through family, neighbours and friends, newspapers, books and T.V. provides the basis of the development of occupational information. As the child passes through periods of tentative and realistic choice, (Ginzberg, et al., 1951)[1] it should be the aim of the educational and counselling system to enable the pupil, student or adult to make a wise decision in the fullest knowledge of the prevailing conditions and information. Specific occupational information should be incorporated in the course when the individual is ready to think in terms of a vocational plan, when he has some idea of his own abilities, values and potential. Shartle then provides a detailed description of methods of classification of occupational characteristics. His contribution is essentially a practical guide to the compilation and use of occupational information.

Hoppack (1967)[2] presents a developmental theory of

---

1. Op.cit., p. 60.

2. R. Hoppack, Occupational Information, 3rd edition, New York, McGraw-Hill, 1967, pp. 111-114.

occupational choice which relates particularly to occupational information. He also sets this out in ten postulates which are presented with comments:

1) Occupations are chosen to meet needs.

These needs may be physical or psychological i.e. social contact, security, success. Each individual has needs in varying measure and his reaction to them influences his choice of occupation.

2) The occupation we choose is the one which best meets the needs that most concern us.

A person will be influenced in the choice of occupation by all his needs probably in proportion of the importance of each one to him.

3) Needs may be intellectually perceived, or they may be only vaguely felt, as attractions which draw us in certain directions. In either case they may influence choices.

4) Occupational choice begins when we first become aware that an occupation can help to meet our needs.

As a person becomes aware of the occupations or work situations he gradually comes to realise that certain of these provide experiences which are satisfying to him and others which are displeasing and frustrating. This causes attraction to some jobs rather than others. At this point, Hoppock believes, occupational choice starts. This emphasises the developmental aspects of career choice since early experiences and attitudes may exert influences later. The dangers of misinformation and misconceptions become apparent.

5) Occupational choice improves as we become better able to anticipate how well a prospective occupation will meet our needs. Our capacity to anticipate this depends on our knowledge of ourselves (our self-concept), our knowledge of occupations (our occupational concept) and our ability to think clearly.

Selection by trial and error is not usually the most appropriate way of effecting choice, since training is often highly specialised and long term. An individual, therefore, needs to be aware of his own personal characteristics and the nature and characteristics of occupations generally so that these two vast areas of knowledge have to be integrated into the process of making a choice.

6) Information about ourselves affects occupational choice by helping us to recognise what we want, and by helping to anticipate whether or not we will be successful in collecting what the contemplated occupation offers to us.

As an individual develops an insight into his own desires, ambitions, goals, values and philosophy of life, he knows better what he wants to be. When this is parallelled by insight into abilities, interests, aptitudes and personality characteristics, an individual is then in a better position to match himself to an occupation.

7) Information about occupations affects occupational choice by helping an individual to discover the occupations which meet his needs, and helping him to anticipate how well satisfied he may hope to be in one occupation as compared to another.

Basing choice on lack of knowledge can result in dissatisfaction and failure. An individual cannot evaluate fully an occupation and what it can offer without an understanding of the occupation which is as complete as possible. Two or more occupations cannot be compared unless each is thoroughly understood.

8) Job satisfaction depends on the extent to which the job which is held meets the needs which we feel it should meet. The degree of satisfaction is determined by the degree of compatibility between what is experienced and what is wanted.

This is the subjective definition of job satisfaction - judged entirely by the individual. Satisfaction involves much more than just money, it includes how a worker sees himself in the job, how he senses others see him, his status and his self-respect.

9) Satisfaction can result from a job which meets an individual's needs today or from a job which promises to meet them in the future.

"Delayed gratification" is often applied to this willingness to postpone until the indefinite future the meeting of certain needs which are important to the individual. For some the sight of a goal in the future is sufficient incentive or reward for work in the present. When the goal appears unattainable the worker is likely to turn to an occupation which offers either immediate satisfaction of the need or satisfaction within a shorter

period." (Kohout and Rothney, 1964).[1]

10) Occupational choice is always subject to change when we believe a change will better meet our needs.

Needs change for a number of reasons. Passage of time with its growing experience changes abilities, personality, goals and aspirations. Marriage, illness, accident also cause change which affects occupational life. Technology, economics and personal decisions can change occupations and these processes are certain to accelerate in the future. Suggestions are made that occupations will change to such an extent that re-training will be necessary several times during a life-time (Entwistle, 1970).[2] Hopson and Hough (1973)[3] point to the necessity for educators to teach their students to cope with change. They estimate that in the United Kingdom a working man can expect three or four occupational changes in his working life-time. As needs change, so will the satisfaction an individual receives from an occupation.

Hoppock presents these postulates on the basis of counsellor experience as a series of speculations of why people behave as they do when trying to reach vocational

---

1. K.A.Kohout and J.W.M. Rothney, "A longtitudinal study of the consistency of vocational preferences," American Educational Research Journal, 1: 10-21, 1964, p. 20.

2. H. Entwistle, Education, Work and Leisure, Routledge and Kegan Paul, 1970, p. 69.

3. B. Hopson and P.A. Hough, Personal and Career Development, Cambridge: Careers Research and Advisory Centre, 1973, p.22.

decisions. This theory draws upon many other theories of vocational choice from psychological, sociological and economic viewpoints. It provides a complement to Super's theory of the development of the self-concept in emphasising certain features of occupational information which contribute to the formation of the occupational concept:

i) An individual concerned in the process of vocational choice needs occupational information which portrays ways in which the occupation meets his needs (postulates 2 and 7).

ii) Information will be compared so that the individual may discover the occupation which best suits his needs (postulate 5).

iii) Occupational perceptions may be viewed in relation to the present and the future. An individual may be prepared to accept employment which is incompatible with his immediate needs, realising that this experience may prepare him better for the occupation he would eventually like to enter (postulate 9).

iv) Occupations change and occupational information has a developmental element (postulate 10).

Hayes (1970)[1] suggests that the role of occupational information is to provide the individual with the means of assessing whether a work role and its associated extra-

---

1. J. Hayes,"Occupational Choice and the perception of occupational roles, University of Leeds, Department of Management Studies, Unpublished Ph.D., 1970, pp. 44-45.

occupational roles are in harmony with the role he would like to play and the way of life aspired to. It must enable the individual to develop realistic expectations about his occupational role in terms which will test out its congruency with his self-concept. To some degree these will be incorporated with the self-concept to form the occupational self-concept (Stavishevsky and Matlin, 1963).[1]

Work provides the individual with an opportunity to express himself and find an identity. An occupation affects the person's whole style of life and is an important determinant to the ways in which personality needs are met. Occupational descriptions must take account of all the characteristics of the work which are related to the social and emotional aspects of the life of the worker and the prospect of satisfying the individual's needs.

Samler (1961)[2] criticises occupational information in careers literature. He searched in vain for a dynamic appreciation of work in terms of the individual's role, his

---

1. R. Stavishevsky and N. Matlin, "A model for translation of self-concepts into vocational terms", 1963, in B. Hopson and J. Hayes, The Theory and Practice of Vocational Guidance, London, Pergamon, 1968, p. 30.

2. J. Samler, "Psycho-social aspects of work: a critique of occupational information", Personnel and Guidance Journal, 39: 458-465, 1961, pp. 459-460.

self-concept or identity, the exercise of his attitudes and fulfilment of his values, status considerations and other factors. Occupational information "is one of Economic Man.....information that would characterise the Psychological Man at work is deficient or non-existent."

Hayes (1970)[1] in his content analysis of interviews of 68 apprentices of the Yorkshire Electricity Board sustained the hypothesis that experience in the job emphasises a greater importance of the psycho-social aspects of work as a source of satisfaction than they anticipated before commencing work. These psycho-social aspects are defined by Samler (1961)[2] as

> "the worker's role, his ability to work at a task that is congruent with his identity, the exercise of his values and attitudes, considerations of status, ways of meeting anxiety, patterns of interaction with others, out-of-work style of life and totally, the way in which his personality needs will be met."

Although all occupations are unique in the nature of the tasks performed, the environment in which they are performed and the way of life associated with them, there are many features which are common to work in contemporary society. Hayes (1970)[3] classifies these under four main headings:

---

1. Op.cit., p. 250.
2. Op.cit., p. 460.
3. Op.cit., pp. 71-102.

Work Setting	(economic aspects)
Social Situation	(psycho-social aspects)
Content and Nature of Work	(economic aspects)
Global Life-Style Implications	(psycho-social aspects)

A fuller description of occupational characteristics is deferred until Chapter III, but this discussion, in particular of the importance of the psycho-social aspects, emphasises the many facets of occupations which require consideration, and which may contribute to the formation of the occupational concept.

Understanding of work is developed from many sources. Parents, teachers, Careers Officers, work experience, careers literature and the mass media are amongst the most influential. There are many wide differences of opinion of what work involves. Musgrave (1967)[1] suggests that occupational information is often in the form of stereotypes built up as a result of adventitious experience of the individual and may bear little resemblance to reality. The influence of occupational stereotypes on the choice of occupation must be considerable, but their accuracy as measured by the congruency of their description with reality, may be disturbingly discrepant. Hayes and Hopson (1968)[2] regard job stereotyping as a subtle and perhaps insidious

---

1. P.W.Musgrave, "Towards a Theory of Occupational Choice," Sociological Review, 15: 33-46, p. 40, 1967.

2. Op.Cit., p. 7.

process which is one of the main causes of disappointment in work. Again the social implications may not be emphasised in the picture of the work which is propagated. Certain elements are unattractive, but their implications are considerable. The shift work of a bus driver, the restricted friendships of a policeman, the social activities expected of a bank manager are examples of this type of information. Pupils need to know what it is like to live the life of a doctor, a shop assistant, a fisherman, a teacher or a..... Much information which is officially publicised relates only to the content, nature and environment of the work (economic aspects) and needs to be supplemented by the social situation and life-styles (psycho-social aspects) of the people working in it.

Involvement in work differs enormously. The crew of a trawler may work up to 90 hours per week (Fraser, 1969)[1]. On the fishing grounds they may work 18 hours per day for 10 to 12 days. The physical conditions, the necessary exertion and the weather combine to produce an occupational death rate twice that of coal mining. A production line worker in a cigarette factory works 8 hours a day, 5 days a week. He neither gives anything to the work nor expects anything, except pay, from it. (Fraser, 1968).[2] A child care

---

1. R. Fraser, (ed.)., Work 2, Penguin, 1969, p. 77.

2. R. Fraser, (ed.)., Work, Twenty Personal Accounts, Penguin, 1968, pp. 11-12.

officer mentions neither money nor physical conditions. Every day is unlike any other and the unpredictability is exciting (Fraser, 1969).[1] Work, per se, may mean something, nothing or everything to the worker. An important function of careers education is to enable the individual to work out for himself what work means to him. The values of the school or the teacher may not be his, neither are they likely to be those prevalent in industry. The individual has his own framework of values - and the occupational environment has its framework of values to offer him.

The occupational environment may be described relatively objectively in terms of certain characteristics such as place of work, hours of work, pay and personal relationships. It may also be described by individuals subjectively in terms of their likes and dislikes, or important and unimportant aspects.

From this evidence and discussion the occupational concept may be defined as:

> "a student's understanding of all the factors involved in living as a member of a particular occupation."

The more realistic the appreciation of the breadth of occupational information, the more mature will be the occupational concept. One of the objectives of careers education (p. 21) is to develop occupational concepts in a range of occupations which may be appropriate to the individual's vocational thinking.

---

1. Op.cit., p. 205.

The purpose of learning about occupations and gaining a knowledge of the self is to be able to use this understanding in making rational decisions at the appropriate time.

TOWARDS DECISION MAKING

Super (1953)[1] has suggested that the self-concept develops through a series of life-stages (proposition 5, p. 58). Alongside this is the growing impact of occupational information from different sources. Hayes (1970)[2] provides evidence that occupational concepts at school are changed by experience at work. Aspects of the work students believe will be satisfying sometimes do not turn out to be so after a period of full-time employment. Psycho-social aspects thought before entry to be of lesser importance may turn out to be a more important source of satisfaction than anticipated. Both the self-concept and the occupational concept develop through a series of stages.

Blau et al. (1956)[3] provide a theoretical framework which shows these two interrelated sets of factors in the determination of vocational choice (Table 2.1). They see the process of choice as the individual's valuation of the rewards offered by the different alternatives and his appraisal of his chances of being able to reach these alternatives. These appraisals are acquired through, and modified by, social experience. The course of action will reflect a compromise between preferences and expectations.

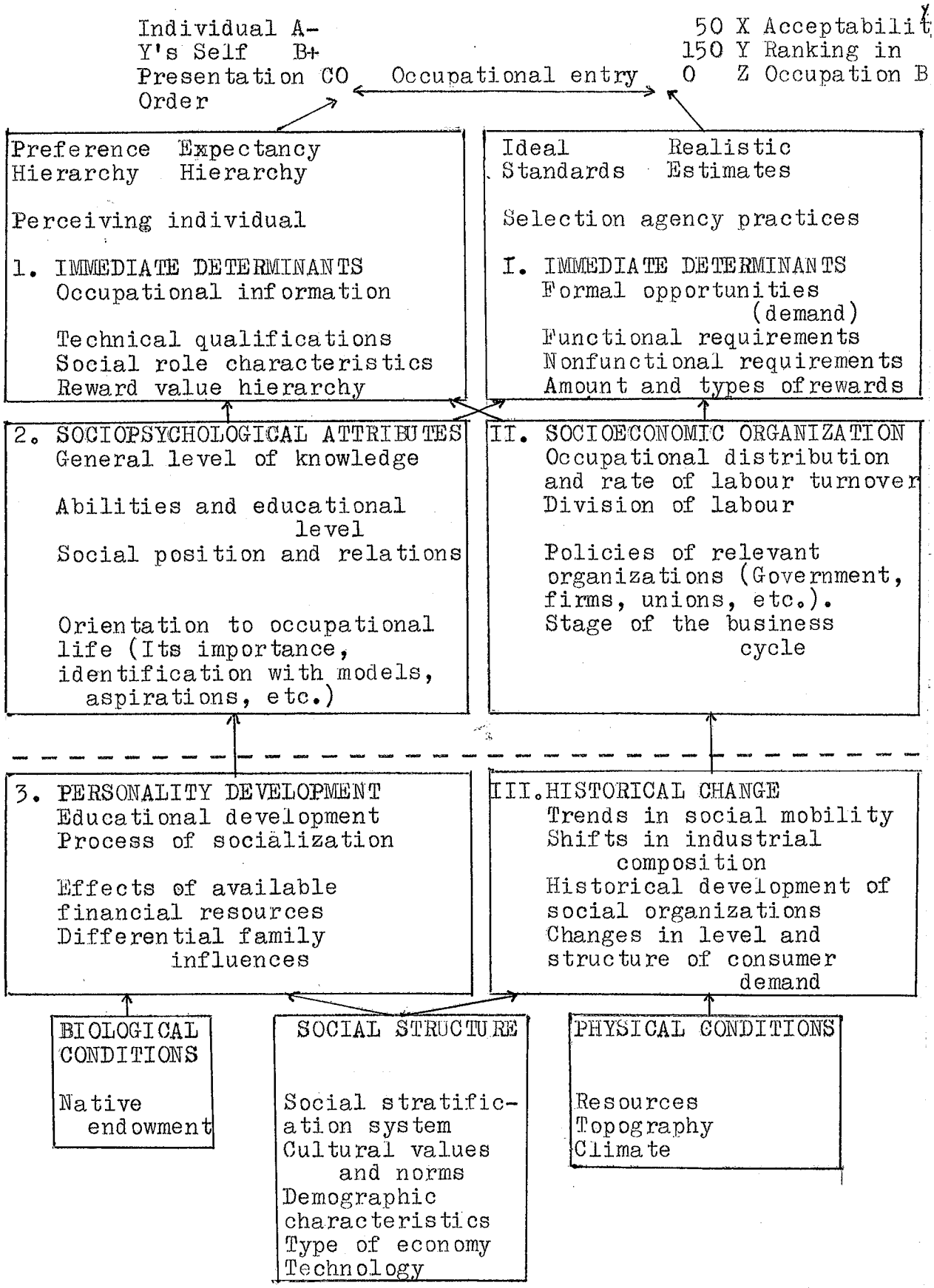
---

1. Op.cit., pp. 187-189.

2. Op.cit., pp. 182-185.

3. P.M.Blau, J.W.Gustad, R. Jesser, H.S.Parnes and R.C.Wilcock, "Occupational Choice: a Conceptional Framework", Industrial and Labour Relations Review, 9: 531-543, 1956,

Table 2.1. SCHEMA OF THE PROCESS OF OCCUPATIONAL CHOICE AND SELECTION



Source: Ibid., p. 534.

Occupational choice is not only limited by abilities and opportunities but also by lack of knowledge. The process does not necessarily involve rational deliberation and weighing of alternatives. The compromise is constantly modified up to the point of actual entry. Recurrent experiences after entering employment cause changes in expectations, compromise, and possibly changes in occupation and place of work. Blau and his discussants (1956)[1] emphasise the importance of knowledge of the socio-economic organisation (Table 2.1, Box II) in their influence on the immediate determinants of choice (Table 2.1 , Box I). But in order to make a rational judgment necessary for satisfactory compromise between the individual's aspirations and their realistic fulfilment in occupations, occupational information is essential. The vital information necessary about the occupations which lie within the individual's range is classifiable under four headings:

1) Formal opportunities - the demand for new members of the occupation and the future prospects;

2) Functional requirements - the technical qualifications necessary for optimum performance of occupational tasks;

3) Non-functional requirements - e.g. religion, good looks and other aspects not relevant to performance, but may be prejudicial to selection;

4) Rewards - income, prestige, power, opportunities for advancement, congenial fellow-workers, emotional gratification and other desirable employment conditions.

---

1. Ibid., pp. 533 and 536-7.

Blau suggests that research should be undertaken based on this conceptual framework. The use of this test of occupational information may provide some evidence of school-pupils' knowledge of occupations and their reward value hierarchy, (Table 2.1 Box 1) and information from participants in the occupation (Table 2.1 Box I). However, it is not part of the present thesis to publish and analyse these results in terms of Blau's framework.

Blau's model has a close parallel to the self - and occupational - concept pattern. The occupational concept is the individual's interpretation of the occupational information exemplified by the sequence from Box III → II → I on the right of Table 2.1. The self-concept is influenced by personality development, socio-psychological attributes and the immediate determinants of the situation (Box 3 → 2 → 1).

The model emphasises the choice process as a constantly modified compromise between preferences and expectations. Preferences arise from the self-concept, expectations from the occupational information as the individual interprets it i.e. the occupational concept.

Blau suggests that the decision-making process has a degree of rationality ranging from complete indifference, where in fact no choice between occupations takes place, to the rational limit of conscious deliberation of weighing up all the appropriate alternatives in the light of a realistic self-concept. Haystead (1971)[1] defines this in

---

1. J.M. Haystead, "Social Structure, Awareness Contexts and Processes of Choice", Sociological Review, 19: 79-94, 1971, pp. 84-85.

degrees of open and closed awareness. "Open" awareness occurs when an individual is aware that choice has to be made and has knowledge of job requirements and characteristics and of his own characteristics. A "closed" awareness obtains when he is unaware both of the choice situation and the factors involved. Haystead (1971)[1] suggests that a number of factors affect the degree of awareness of occupational choice:

1) The position in the social structure occupied by the individual.
2) The age at which choice must be made.
3) The amount of time before definite commitment is required.
4) Whether the individual has previously or regularly made important decisions and thus implicitly worked out some decision-making procedure. (See footnote)

Anappropriate programme of careers education will attempt to encourage an open awareness of the factors involved in choice. It will be "keyed to the important moments of decision in a pupil's career" (Schools Council

---

1. Ibid., p. 92.

Footnote: Evidence on these suggestions has yet to be analysed - June 1973.

1972).[1] Programmes designed to develop both self-awareness and occupational awareness will lead to decision-making. This process itself is developmental.

Crucial to the growing awareness is the continuing compromise made between the needs of the individual and the needs of society through the work situation. Society continually confronts people with situations where they must choose between alternative courses of action. In making these choices a person is shaping his life at successive stages (Tyler, 1958)[2]. Decision making is a continual interaction between the specific decisions of the present and the future, and between vaguer decisions of the distant future. This process is certainly appropriate to vocational choice and a fuller discussion of this process is now developed.

---

1. Schools Council, Working Paper 40, "Careers Education in the 1970s", Evans/Methuen Educational, 1972, p. 113.

2. L.E.Tyler, "Theoretical principles underlying the Counselling process," Journal of Counselling Psychology, 5, 3-10, p. 6.

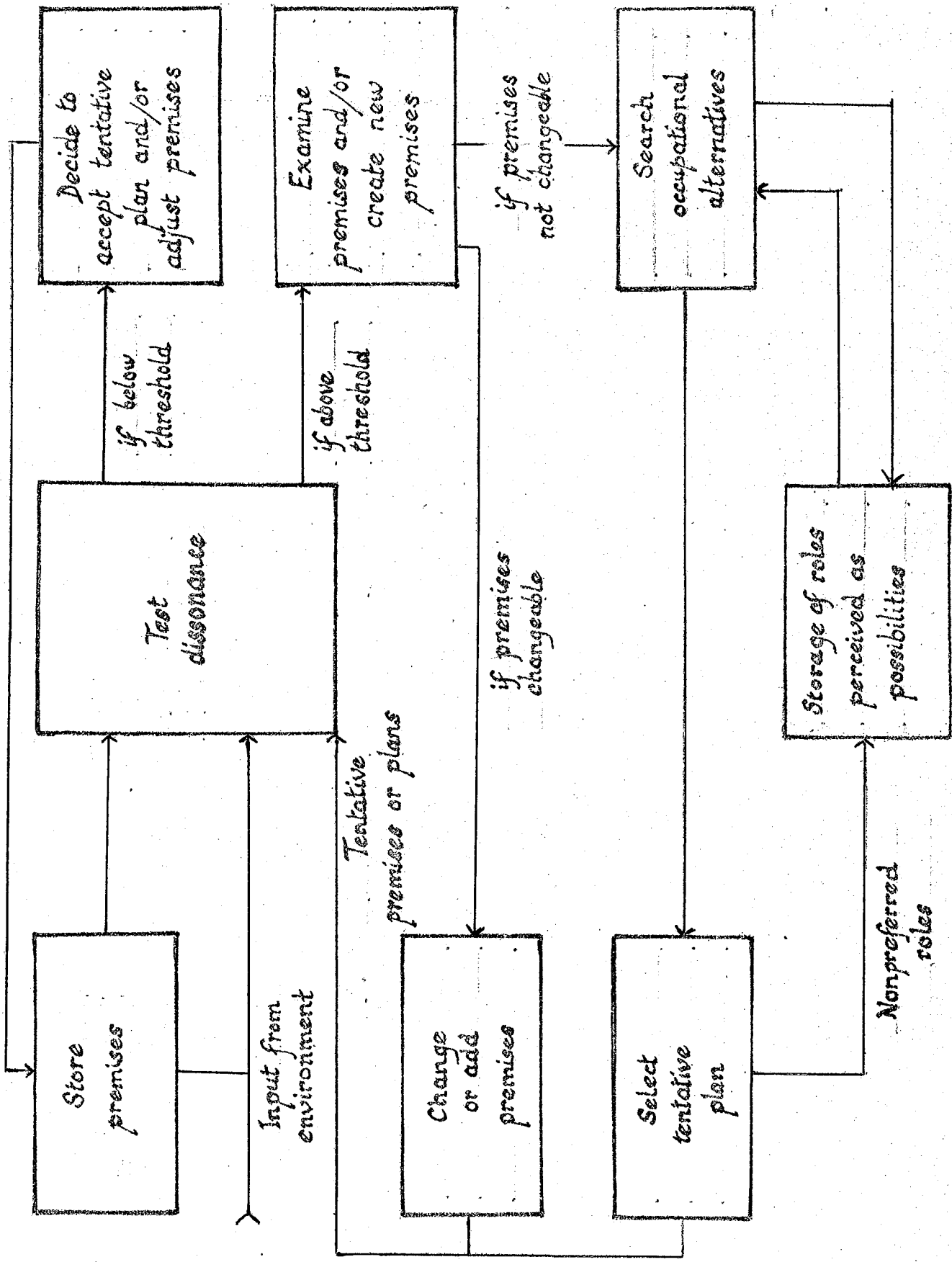
Whilst decision making theories have been formulated in economics and other related areas, it is only during the last fifteen years that they have been applied to psychology and even more recently to vocational psychology. Two theories have been advanced which relate to decision making in vocational choice.

Hilton (1962)[1] produces a model of decision making which draws strongly on the information processing approach to human problem solving. The "flow" of information is illustrated in Fig. 1 . Information is received from the environment. It may be a warning that a career decision is approaching; that a particular career does not provide the anticipated level of pay or involves frequent absences from home. This warning signal produces a level of dissonance within the individual in relation to the way in which he sees his behaviour in career terms. If this dissonance is raised above a threshold level of toleration, the individual examines his beliefs and values and perhaps re-creates new premises against which he judges the information and responds to the decision-making. Alternatively he may decide to review the occupational alternatives from which, after careful consideration of the occupational roles involved, he selects another more appropriate career and

---

1. T.L.Hilton,"Career Decision Making", Journal of Counselling Psychology, 9: 1962, p.

Figure 1: THE VOCATIONAL DECISION-MAKING PROCESS AS SCHEMATIZED BY HILTON



Source: Ibid., p. 295.

then tests this against his expectations in the hope that the dissonance will be reduced. The process is frequently repeated. The environmental situations change - the labour market, the occupational requirements and other factors shown by Blau (Boxes I → III, Table 2.1). The individual also changes. Thus the whole system is in a continual state of flux. Hilton lists the factors which reduce dissonance - many of them features of the occupational role - e.g. the individual decides he does not want the intrusion into his private life which the life-style of a Family Case Worker demands. Clearly those individuals with well-developed self-awareness and informed occupational concepts are likely to be more effective in reducing the dissonance at the times of decision-making.

James (1963)[1] criticised Hilton's dissonance model as applying only to the stage at which choice is made between two occupations. How does the individual resolve the greater dissonance arising from crystallising his choice from a wide range of occupations to the two or three he is seriously considering? A student has already made many decisions relating to priorities of values before he reaches the stage of vocational choice. Is not dissonance involved here on a much larger scale? Alternative models may be more appropriate.

---

1. F. James, "Comment on Hilton's Model of Decision Making", Journal of Counselling Psychology, 10: 303-4, 1963.

Gelatt (1962)[1] presents a model for decision-making which is related more to counselling, than to the information-processing described by Hilton. Diagrammatic representation of Gelatt's model is shown in Fig. 2 . He takes as his starting point that all decisions have two characteristics:

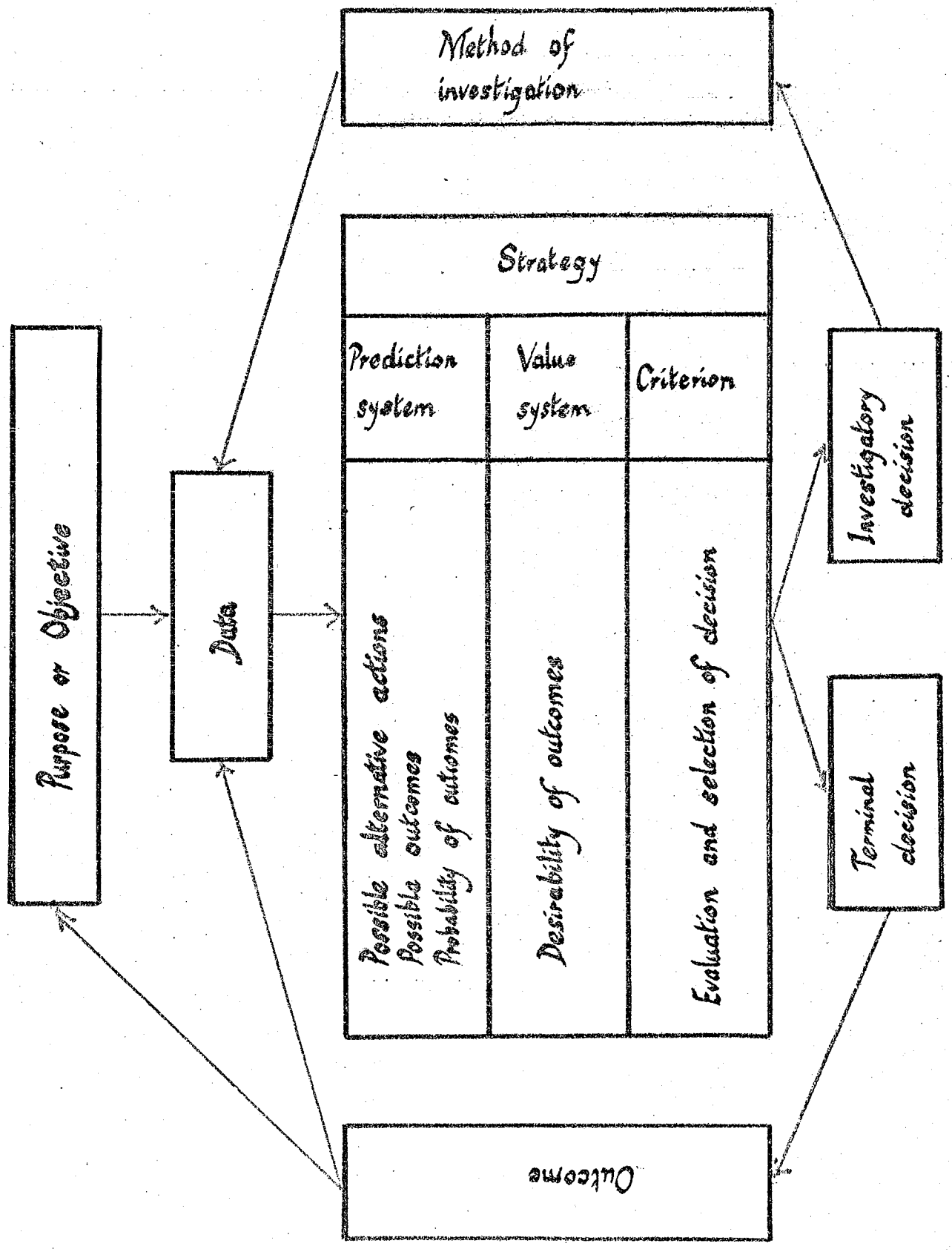
i) there is an individual who has to make a decision; and ii) there are two or more courses of action from which he must select one on the basis of the information he has about them. The decision may be either terminal (final) or investigatory (calling for more information). "The investigatory decision becomes a cycle, since the outcome of such a decision may yield additional information which would serve to modify the result of the final decision". (Gelatt, 1962)[2] Fig. 2 shows the cyclic nature of the process and the interconnections between the data, the strategy and the outcome. The strategy is the central component of decision-making. It involves three processes:

---

1. H. Gelatt, "Decision making: a conceptual frame of reference for counselling", Journal of Counselling Psychology, 9: 240-245, 1962, pp. 240-245.

2. Ibid., p. 241.

Figure 2: THE VOCATIONAL DECISION-MAKING PROCESS AS CONCEPTUALIZED BY GELATT



Source: Ibid., p. 242.

1) A predictive system, which estimates the probabilities of success associated with the outcomes of alternative courses of action. In order to assess the outcome in terms of vocational choice, it is important to be able to test the reality of the individual's occupational information against the knowledge and experience of those involved. This may be done in a number of occupations so that informed occupational concepts will grow. The occupational information will be part of the content of the careers education programme developed through various media and methods - works experience, role play, discussion, films, visits, etc.

2) Equally part of this programme will be development of an individual's value system which is a basic part of his self-concept. It may be developed through educational media e.g. the newspaper, Framework (Schools Council Curriculum Project), through discussion and perhaps interview to the stage where an individual can realise where his value priorities lie in relation to vocational choice.

3) The third part of the strategy is the evaluation of the evidence or the interpretation of the main contributions of the self- and the occupational concept in relation to the vocational decision under consideration. This may be a tentative decision to make further investigation of certain occupations and to make a later decision in the light of more information.

It may be that a decision of more permanent significance is reached i.e. a terminal decision (see Fig. 2). However "a decision can be final only in that an intermediate goal is reached". (Gelatt, 1962)[1]

Thus the decision-making process proposed by Gelatt (Fig. 2) shows the flow of information, the factors involved and the types of decision which may be made in vocational choice.

An individual has objectives which may imply an achievement of personal happiness or satisfaction in life. In many school-pupils these will not be explicit. To some they may amount only to an immediate desire for some money, implying the need for some employment regardless of any other occupational factors or implications. For others this is a very careful and rational achievement of the type of work which they will find fully satisfying. Careers education courses, personal experience, influences of home and friends will provide information about the individual and possible occupations. An individual approaching decision making will then attempt to predict how personal satisfaction can be achieved by considering possible occupational alternatives and how he would see himself in them. His value system then provides the framework against which he evaluates the alternatives. As an example, consider a 17 - year old with artistic ability at present in a sixth form. If he wishes to use his artistic talent and accept the

---

1. Ibid., p. 241.

consequences of insecure and inadequate financial rewards, he may decide to become a free-lance painter. If however he is prepared to provide drawings to others' specifications, to supervise and advise on building work and perhaps incidentally use his artistic talent and creative flair, but ensure for himself a secure professional future, he may choose architecture.

These decisions may be terminal i.e. a definite decision is reached and the outcome is either to apply for entry to an appropriate course at a Polytechnic or University, to produce some paintings or apply to a firm employing trainee architects. Alternatively the decision may be investigatory i.e. the student may feel he needs more information about the alternative occupations or may need more time to consider the financial implications of the choice. So the process returns to the stage of data collection as the pupil seeks further information, assesses the desirability of each occupation against his values and expectations and finally reaches a terminal decision on which he acts. Gelatt (1962)[1] suggests that this model has six implications for guidance practice:

1) The model is built on the basic assumption that collection and utilisation of reliable information is essential to realistic decision making. A test of occupational information may be useful to support this.

---

1. Ibid., p. 244-245.

2) Guidance in secondary schools is also concerned with developing students' capacity for decision-making. Thus involvement in this process in making vocational decisions may contribute to decision-making in other areas e.g. education, sex, housing etc. Equally the development of this extra-occupational concept may help vocational decision-making. (Hayes & Hopson, 1971[1]; Hartop, 1966)[2]

3) Students are not able to fully assess accurately the probabilities of given alternatives and lack knowledge of the complete range of possibilities. Here education and guidance programmes should attempt to provide knowledge and help the student to form his own evaluation of its possible vocational outcomes.

4) Counselling will help the student to utilise the more important decisions facing him for the purpose of reality testing. This experience, as depicted by the investigatory pathway of the scheme (Fig. 2) helps the student to modify his self-concept and thus influence his decisions about ultimate goals.

5) Guidance personnel need to be aware of alternative outcomes, to be able to supply or locate information, to analyse its relevance and reliability and to assist the student in evaluation of outcomes in relation to their own value systems. Again a test of occupational information may be useful here.

---

1. Ibid., pp. 33-34.

2. B.B.Hartop, "Careers Work in Sixth Form Minority Time", Journal of the Careers Research and Advisory Centre, Vol. 2, 1966, pp. 18-23.

6) The decision-making framework offers a base-line against which the guidance programme and its practice can be evaluated. Effectiveness can be evaluated by determining the degree to which students develop the capacity for subsequent decision-making and take responsibility for the decisions. This implication raises very pertinent and interesting issues on the evaluation of decision-making. At present this field has not been explored.

OCCUPATIONAL INFORMATION IN THE PRACTICE OF CAREERS EDUCATION

> "The change in emphasis in theory during the last few years has not been matched by a noticeable change in the practice of vocational guidance". [1]
> (Lancashire and Cohen, 1970)

It is not easy to establish a picture of the practice of guidance in British education. Surveys have shown the inadequacy of the provision in terms of time, finance, facilities, personnel and status in the curriculum (National Union of Teachers, 1969;[2] National Association of Careers Teachers, 1970;[3] Department of Education and Science, 1973).[4] The need for careers education was most convincingly demonstrated in the Schools Council Enquiry into attitudes of school-leavers. "Getting a job they liked" was regarded by the 15 year old leavers as the most important issue (Schools Council, 1968).[5] They were asked to suggest ways in which the school could have better prepared them for life. "Help in choice of career" was mentioned more than twice as many times as any other issue by leavers of all ages from 15 to 18 years (Schools Council, 1968).[6] On this evidence the need is not being met.

---

1. R.D.Lancashire and B.T.Cohen, "Developments in Vocational Guidance," Occupational Psychology, 44, (Jubilee Vol.), pp. 223-227, 1970, p. 227.

2. National Union of Teachers, "Annual Guide to Careers for Young People", N.U.T., 1969. centre pages.

3. National Association of Careers Teachers, "Time and Facilities for Careers Work in Seconary Schools," The McIntyre Report) Cornmarket Careers Centre, 1970,pp.16-18.

4. Department of Education and Science, Education Survey 18: Careers Education in Secondary Schools, H.M.S.O.,1973,p.34.

5. Schools Council, Enquiry 1: Young School Leavers, H.M.S.O., 1968, p. 169.

6. Ibid., p. 238.

Whilst it is not possible adequately to describe what actually happens, an attempt is made here to set out the objectives and practice of careers education. The place of occupational information will be emphasised in this description.

Objectives of Careers Education, particularly in relation to Occupational Information

Career development is concerned with the working out of a synthesis of the individual's self, his values, interests and abilities with the reality of occupational opportunities and the limitations of time. A person should be encouraged to consider his total life pattern, past, present and near future at least and to see the place of work within it. As he adjusts to the working environment he may attempt to accommodate it to suit himself and at the same time become part of it.

A programme of careers education will include exploration of life-styles and what they mean to the people who live them. This is not solely concerned with occupational description but with wider issues of normal everyday life in leisure, home-life, friends, marriage, etc.

Students need to be able to assess how much of themselves they wish to involve in occupational terms. Are they only interested in drawing a wage for a job e.g. on a production line, which demands little mental or physical effort? Or do they wish to extend and continue to develop their skills and be satisfied for the present to draw a low salary in anticipation that they will be compensated eventually by intrinsic satisfaction in their work?

An essential framework for the analysis of life styles will be knowledge of occupational characteristics. This does not necessarily involve a detailed knowledge of a long list of occupations, but rather an understanding of aspects of occupational description and an awareness of the sources of information about a range of types of work. This framework will then enable them to process new occupational information in a way which will help them at any appropriate time to make decisions.

Training in decision-making skills is an integral part of careers education. This is the experience of accumulating evidence, considering its validity and analysing its value in terms of career choice. The occupational evidence needs to be analysed in terms of the self-concept and the self needs to be identified in terms of the occupational life-style. This process will be repeated for a range of possible occupations. The congruency of the self and the occupation will be determined as the person sees himself working and living as a member of a particular occupation. Preference will be made for one occupation rather than another and decisions will emerge.

Hopson and Hough (1973)[1] suggest that training in "occupational survival" skills is also a part of careers education:

---

1. Op.cit., p.16.

i.e. (i) how to find job vacancies;

(ii) how to apply for a job;

(iii) how to cope with a selection interview;

(iv) how to hold down a job;

(v) knowledge of resources available for help when employed;

(vi) how to cope effectively with occupational failures and successes (e.g. unemployment and promotion).

Many of the skills developed from these objectives are appropriate to other aspects of personal and social development. Decision-making skills are used in courtship and marriage and choice of housing. The ability to know where to search for information is appropriate to many activities. Understanding of life-styles is most relevant to everyday social interaction with the shop-keeper, policeman, bus-driver, etc.

Thus careers education is part of preparation for life. The skills developed are personal skills which are vital to the mature development of the individual to an independent adult. Any course of careers education which does not recognise the breadth and significance will not satisfactorily achieve even the narrowly conceived objective of job selection.

The models of decision-making proposed by Hilton (p. 82) and Gelatt (p. 85) are based on theory rather than practice. Research on how young people reach decisions is negligible. The feeling is that it is a very haphazard

and often very irrational process - at least as interpreted by teachers and other adults. There is much scope for empirical research which may lead to a revision of the theory on which practice may be based.

Sources of Occupational Information used in Careers Education

It is not proposed to discuss in great detail the teaching and learning techniques which are developing in careers education. However it is appropriate to describe sources of occupational information frequently used in schools and colleges to develop awareness of the work situation.

i) Careers Literature

Although perhaps a more traditional form of acquiring information, this nevertheless provides much "factual" information which is basic to careers education.

Careers literature, in the broadest sense, is any publication giving information about work people do. (Sadler, 1972)[1]. It includes books which are produced specifically to describe particular occupations, literature disseminated by employers and professional bodies and books giving more personal descriptions of "My Life and Work". In the broader definition of careers education (p. 21) many novels and pseudo-sociological studies (e.g. Fraser, 1968;[2]

---

1. J. Sadler, The Careers Library, in Heppell, R.P. (ed.): A Practical Handbook of Careers Education and Guidance, Careers Consultants Ltd., 1972, p. 143.

2. Op.cit.

Fraser, 1969:[1] Blythe, 1969)[2] may be used.

In the first category is material produced by the Central Youth Employment Executive. It includes careers leaflets, based largely on pictorial presentation for those whose reading level is not that of the Choice of Career Series. In addition the C.Y.E.E. produce a set of index cards arranged alphabetically in both careers and subject headings which young people can consult and be directed to appropriate files and books in the school Careers Library. The "Choice of Career" Series provides descriptions of the work, qualifications and training in about 100 occupations.

Careers literature produced by employers varies from leaflets describing particular vacancies to substantial expensively produced books which illustrate the variety and scope of a career in that firm or organisation. Whilst the tendency is obviously to recruit to a particular firm and to bias the information towards that end, more employers now are realising the indirect recruiting value of giving a more objective appraisal of the work from the employees' viewpoint.

Novels and other literature not produced specifically for careers education have a considerable potential in providing stimulus for discussion of decision-making

---

1. Op.cit.

2. R. Blythe, Akenfield: Portrait of an English Village, Allen Lane, The Penguin Press, 1969.

situations. Here the choice for the teacher is virtually limitless. He may choose according to the interests of the pupils, their stage in the decision-making process and the relevance of the content to other aspects of school work.

The effectiveness of careers literature depends upon a number of factors:

i) its appropriateness in language and presentation for the students for whom it is intended;

ii) its availability through an efficient filing system;

iii) its selection and use by the careers teacher.

Recently research has been carried out into the readability of careers literature (Hough, 1972).[1] The results of this research should lead to more effective learning from occupational literature. The measure used was based on a noun frequency count developed by Elley (1969)[2] in New Zealand. Hough found that few of the C.Y.E.E. Choice of Career booklets came within the reading age of the less able (non "O" Level) 4th and 5th year students. She shows, however, that in the series of C.Y.E.E. booklets "If I were a....." 17 out of the 20 analysed came within this readability range. This shows the importance of selection of sources of occupational information suited to the

---

1. P. Hough, "The Readability of Careers Literature", Vocational Guidance Research Unit, University of Leeds, 1972.

2. W.W.Elley, "The Assessment of Readability of Noun Frequency Counts", Reading Research Quarterly, Spring, 1969.

appropriate reading level. Presenting material which is not understood can seriously reduce the motivation of students considering that occupation.

ii) Occupational Visits

The written word may have little impact particularly on those students less inclined towards reading. The impact of work might be more effective on occupational visits. As with any type of educational experience the planning and preparation are essential pre-requisites if there is to be productive learning. (Macleay, 1972)[1] The objectives of the visit need to be carefully analysed. Is attention to be directed to particular aspects of the occupation e.g. the physical demands of the work or the social environment of the young apprentice? Is each student going to look at the same aspect and ask a similar set of questions or are there going to be contributions to a class discussion which will build a more comprehensive picture of the occupation? Macleay suggests the use of questionnaires to be completed by the students either during or immediately after the visits.

Hopson (1967)[2] in a small-scale investigation into the effectiveness of occupational visits showed that the small unaccompanied groups were much more enthusiastic

---

1. D.M.Macleay, Occupational Visits, in R.P.Heppell (ed.): A Practical Handbook of Careers Education and Guidance, Careers Consultants Ltd, 1972, pp. 91-104.

2. B. Hopson,"Occupational Visits - Education, Recruitment or a Lark?" Youth Employment 19: 25-32, 1967, pp. 29-30.

than the larger groups accompanied by teachers. However, visits are only a part of their careers education programme and the effectiveness of a single unit cannot be evaluated in isolation from a continuing course of which it is an integral part.

It is clearly impossible to sample the full range of occupations in any series of visits. Hopson suggests sampling of different types of occupations at the levels appropriate to the groups of pupil. A possible scheme for selecting occupations is devised from Moser, Dubin and Shelsky's Modification of Roe's Classification of Occupations. This is described in Chapter III (p.139).

iii) Work Experience

Work experience is the opportunity afforded to young people whilst still in full-time education, to experience at first-hand work in a particular situation. Impetus to this form of careers education is given in the Newsom Report (Central Advisory Council, 1963)[1] which encouraged "experiments enabling some pupils over the age of fifteen to participate to a limited extent, under the auspices of the school, in the world of work, in industry, commerce or in other fields."

Schemes had earlier been encouraged by large employers such as the National Coal Board, British Rail and the Central Electricity Generating Board who invited a small

---

1. Central Advisory Council for Education (England), "Half our Future", (Newsom Report), 1963, H.M.S.O.,pp.75-76.

number of sixth formers largely from grammar and independent schools to spend a week or so experiencing their activities at first-hand, with a view to applying for industrial apprenticeships or University Scholarships. This was developed by individual schools e.g. Hutton Grammar School, Preston (Heap, 1966)[1], by Rotary Clubs e.g. Wythenshawe, Manchester (Rotary Club Magazine, 1969)[2] and by the Youth Employment Service. A survey in 103 authorities by the Institute of Careers Officers (1971)[3] showed the varied but generally limited development of this form of careers education. Only 3,436 pupils or less than 2% of the 15 year old school population were involved in works experience in 1968/9. The recent survey (1971 and 1972) carried out by H.M. Inspectorate shows that there are nearly 1,900 secondary schools in England and Wales (38% of all secondary schools) in which work experience has been developed for at least some students (Department of Education and Science, 1973).[4] The effectiveness depends very much on the preparation of the students and the

---

1. B.W.Heap, "Operating a Work Experience Scheme", Youth Employment Service Careers Bulletin, Summer, 1966, pp.1-3.

2. Rotary Club Magazine,"Work Experience in Manchester," Rotary Club Magazine, 1969, pp. 61-63.

3. Institute of Careers Officers, "Work Experience in British Secondary Schools, Bromsgrove Works, 1971, p. 8.

4. Op.cit., p. 34.

sensitivity and co-operation of the employers. Legislation at the present time (D.E.S. Admin.Memo.12/69) precludes any student below the statutory school leaving age from participating since they cannot be legally insured. Thus some of its value to students in the earlier stages of formulating their preferences is lost. Pressure is being exerted to continue this opportunity for 15 year olds as the statutory leaving age is raised to 16 in 1973-4. The Education (Work Experience) Act 1973 will enable local education authorities to extend work experiences within their discretion.

As first hand experience of life in the working world, this form of careers education has considerable value. As a source of occupational information it has the essential element of providing the student with the opportunity to feel something of what it is really like to be a farmer, a turner, a packer or whatever.

iv) Other Audio-Visual Sources of Occupational Information

The careers teacher now has growing resources of audio-visual material available.

304 films are listed in the current (1973-4) catalogue produced by the C.Y.E.E. These are available from 67 industrial and commercial distributors. Many are available on free loan and most could be shown in 15 - 30 minutes. Films may lack personal involvement. They may show something of the physical and social environment but they tend to be treated passively by the students unless the evidence is well prepared before the showing.

Radio and Television also provide material for use in school careers work. They have the advantage in drawing on source material throughout the country and not being industrially sponsored. Radio discussions of "The World of Work" raise issues of personal relationships, decisions and working life which will stimulate discussion in class or groups. The television series "Going to Work" explores these issues and shows a range of types of occupation likely to be entered by the 16 year old leaver. "A Job Worth Doing?" is also aimed at "conveying the flavour and quality" of a range of jobs involving training or apprenticeship but not full-time further or higher education.

A recent innovation is the production of video-cassettes which follow the experience of apprentices and students in certain occupations and organisations. Film-strips and slides also provide further visual material which a teacher may effectively use.

v) Games and Exercises in Personal Development

Guidance has become more concerned with the development of decision-making skills (p. 85 and Chapter I Schools Council Project). It involves a growing awareness of self and occupations. Curricular material is now being prepared to help to develop this awareness. The Schools Council Project has initially produced material for a foundation course in careers education for 13 - 14 year olds. It focusses on four areas - Self, Work, Community, Decisions - and presents them in class and individual activities. These take the form of news articles on the imaginary town of Thiston, games as a preparation for decision-making and

TABLE 3.1

Moser, Dubin and Shelsky: a Modification of Roe's Classification of Occupations

Focus of Activity	I Service	II Business Contact	III Business Organization	IV Technology	V Outdoor	VI Science
1. Professional and Managerial (Higher)	Research Scientist (Social)	Sales Director	Principal Civil Servant Company Chairman Stockbroker	Research Scientist (Engineering)	Research Engineer (Mining)	Researc Scienti (Physics Chemist
2. Professional and Managerial (Regular)	Probation Officer Police Supt. Matron (Hospital)	Personnel Manager Area Sales Manager	Bank Manager Company Secretary	Pilot Civil Engineer	Geologist Conservation Officer	Chemist Vet. Physici
3. Semi-Professional and Managerial	Police Inspector Nurse (S.R.N.)	Insurance Broker Sales Rep. Estate Agent	Accountant Owner (small grocery)	Building Contractor Mechanical Engineer	Farmer (small Ind. owner)	Chiropo Physiot apist
4. Skilled	Hairdresser Chef Head Waiter	Salesman (Shop) Market-Research Interviewer	Shorthand Typist Statistical Clerk	Carpenter Electrician Decorator Dressmaker	Landscape Gardener Farm Mechanic	Laborat Assista
5. Semi-skilled	Chauffer Cook Fireman	Sales Assistant Van Salesman (Ice Cream)	Cashier Clerk (File) Telephonist	Crane Operator Fitter's Mate Lorry Driver	Fisherman Gardener	Laborat Steward
6. Unskilled	Watchman Roadsweeper Office cleaner	Newspaper boy	Messenger	Foundry Labourer	Farm Lab. Animal Tender	

I General Culture

Judge
Professor (History, Maths. etc.)
Chief Education Officer

Clergyman
Editor
Headmaster

School Teacher
Librarian

Nursery Teacher

Library Attendant

VIII Arts and Entertainments

Orchestra Conductor
T.V.Director

Architect
Critic

Commercial Artist
Textile Designer
Photographer

Window Dresser

Clothes Model

Stagehand

displays of situations to stimulate discussion. The material is provided as a structural framework for selection, adaptation and evaluation by teachers.

Other sources of material are exercises in personal and career development e.g. Hopson and Hough, 1973[1]; Law, 1973[2]; Macleay and Reid, 1973[3] and business games e.g. Students Business Game (Gamage, 1971)[4], Star River Project, insurance underwriting activities. The main purpose of these games is to put the student in situations where he has to make decisions which simulate those which are made professionally in a number of occupations.

An interesting development incorporating occupational information is SPEEDCOP devised by members of the Vocational Guidance Research Unit, University of Leeds (Hopson and Hough, 1973).[1] SPEEDCOP is a mnemonic representing the initial of eight categories of occupational information believed to be important to young people when thinking about a job:

S urroundings
P rospects
E ntry and Training
E ffects
D escription of Work
C onditions
O rganisation
P eople

---

1. Op.cit.

2. B. Law, "Decide for Yourself", Cambridge: Careers Research and Advisory Centre, 1973,

3. D.M.Macleay and J.R.Reid,"Career Decisions", Cambridge, Careers Research and Advisory Centre, 1973.

4. C. S. Gamage, "The Esso Students Business Game", The Careers Teacher, Autumn, 1971, pp. 9-10.

A teaching programme is built around this basic information about a range of occupations. It aims to develop self-awareness, decision-making and information-seeking and analysing skills. It has been produced as the basis of a game, using techniques common to other family board games, but with a positive educational value particularly in the discussion it provokes amongst players and onlookers (Hopson, Hopson and Hayes, 1973).[1]

Clearly this field is expanding rapidly. Very little of this material was available before September 1972.

This section shows the many techniques which are available to the careers teacher, the vigorous impetus of curriculum change and the central importance of careers choice in the personal development of the individual in preparation for life in all its aspects. Within this, occupational information has an essential part to play. It provides the evidence of the experience of others at work helps the student to make rational decisions appropriate to their needs and opportunities.

---

1. C. Hopson, B. Hopson and J. Hayes, Speedcop Careers Game, Cambridge: Careers Research and Advisory Centre, 1973.

SUMMARY

The need for some means of evaluation of occupational information has been inherent in much of the theory and practice described in this Chapter.

A student passing through the tentative stage towards realistic choice (p. 55) needs some sort of reference against which he can assess the realism of his occupational information. Super in propositions 7 and 9 (p. 58) emphasises the need for reality testing in the process of adjustment of the self-concept to reality. Whilst this may be partially carried out through the media just described, particularly perhaps in works experience, none of these techniques can provide the opportunity for the student to comprehensively assess the range and the accuracy of his Occupational Information.

Super (proposition 8, p. 58) and Hoppock (propositions 1 and 2, p. 65) suggest that occupations are chosen to fulfil personal needs as the individual sees them. The student needs help so that he develops realisation both of his own needs and the degree to which occupations may satisfy them (Hoppock, propositions 3, 6, 7; p. 65+66).

Occupations cannot be precisely described for a number of reasons:

i) Occupational characteristics are constantly changing (p. 68).

ii) There may be different interpretations of the ways in which occupations are described. This issue is discussed in Chapter III.

iii) There are different viewpoints of occupations. These may be shown through various educational media and techniques as part of a course in careers education (pp. 92-105). There are also different personal viewpoints. A Careers Officer, professionally trained to have a broad, relative view of a wide range of occupations, both locally and nationally, will have a different picture from the young employee just entering an occupation straight from school. Each worker views his occupation in terms of his own self-concept and expectations. A student forming his own occupational concepts before entering employment needs to be aware of these different individual interpretations of occupational characteristics.

Before a Test of Occupational Information can be structured, an analysis must be made of the various descriptions of occupational characteristics.

CHAPTER III

REVIEW OF DESCRIPTIONS OF OCCUPATIONAL CHARACTERISTICS

DEFINITION OF TERMS

To produce a useful means of assessing students' knowledge of occupations, it is essential to describe the characteristics of occupations which are relevant to the students concerned at the guidance stage. To do this it is necessary to review the various approaches which have been used to describe occupations and then to define them.

Any attempt to describe the activities of human beings is bound to be imprecise, since activities are never exactly transcribable into words. Any system of classification has such a multitude of dimensions that precise clarity is almost impossible to achieve. Nevertheless any scientific study requires a basis of definition as precise as possible.

Usually occupational definition embraces a group of words, popularly confused and frequently and indiscriminately used. Work, occupation, profession, job, position may be used to describe the human activities with which this thesis is concerned.

Historically, work has changed its meaning through the evolution of the social order. The Greeks and Romans linked work and wealth and imposed an hierarchy from the honour of the landowning farmer to the vulgarity of the craftsman. Primitive Christianity regarded work in a dual capacity, never fully reconciled. Thus on the one hand

it was punishment laid on man from God as the penalty of original sin; on the other, it had the positive function that work helps to share God's riches with other men. In Medieval and Modern Catholicism work acquired a dignity as a means, not an end in itself. Luther regarded work not only as the universal base of society but as the real root of differing social classes. In the last two centuries work has lost most of its religious dignity and has developed an importance of its own. To the Communist work is based on science; and technology is directed towards making it more congenial. Payment is keyed to the value to the community. In the capitalist society more work and greater industry has grown out of goods--seeking purchasers. Work has put individuals into a state of dependence on the external world. Modern technology has brought together the interests and activities of worker and worker, employer and employee, manager, foreman and shop steward. Hence the growing importance of "human relations" as the vital force in industrial production and economic advancement.

The National Institute of Industrial Psychology (1951)[1] in devising a descriptive classification for use in vocational guidance defines an <u>occupation</u> as

---

1. National Institute of Industrial Psychology, "Studying Work", N.I.I.P., Paper No. 2, 1951, p. 2.

"a kind of work, profession, trade or craft without reference to any particular context".

By contrast a job is

"the specific instance of a profession, trade or craft, as carried out by one person or a small group similarly employed".

Shartle (1959)[1] more specifically relates a job to a position. A position is defined as

"a series of tasks done by one worker".

whereas a job is

"a group of similar positions indicating that within an establishment several persons might be in the same job but each would hold a different position."

and an occupation is

"a group of similar jobs found in several establishments."

These distinctions may be clarified by their interpretation in selection and guidance. A personnel officer is predominantly concerned with positions and jobs. He appraises and selects workers for particular functions within a pre-determined organisational system. A careers education course is primarily concerned with occupations and with the broad range of aspects of vocational behaviour which are not specific to particular situations (Crites, 1969).[2]

---

1. C.L.Shartle, Occupational Information, 3rd ed., Englewood Cliffs N J, Prentice Hall, 1959, p. 23.

2. J.O.Crites, Vocational Psychology, New York, McGraw-Hill, 1969, p. 37.

Profession is a word descriptive of occupations with distinctive social connotations. These social characteristics are based on the medieval guilds. They include control over work situation, regulation of relationships among colleagues, maintainance of occupational ethic. A profession is now recognised as a vocation founded upon intellectual training which enables a particular service to be rendered. Greenwood (1962)[1] defines five attributes of a profession based on :

1) Systematic theory - a system of abstract propositions describing the content of the profession
2) Professional authority - relationship of clientele is based on the professional's authority
3) Community sanction - control of entry to the profession which then enjoys privileges such as confidentiality and immunity from community judgment on technical matters
4) Regulative code of ethics - confidence of community based on a code including neutrality towards clients, no competition for clients, e.g. Hippocratic oath of medical profession
5) Professional culture - permeated through a framework of formal and informal groups.

---

1. E. Greenwood, "Attributes of a Profession" in S. Nosow and W.H.Form (eds.), Man, Work and Society: a Reader in the Sociology of Occupations, New York, Basic Books, 1962, pp. 206-207.

Non-professional occupations possess these attributes to a lesser degree and thus occupations are distributed along a continuum from highly professional to the least skilled occupations. Professions may thus be regarded as occupations with particular features.

From the point of view of the young person approaching the stage of transition from school to work or higher education, work may be seen as a position e.g. working sewing machine no. 34 in the local clothing factory along with her friends who fill other positions from 30 to 35. It may be as a job e.g. as a welder perhaps in a ship-yard, a garage or a metal tube factory. Or it may be as an occupation e.g. an agricultural worker, a public health inspector, an accountant or a journalist.

Haystead (1971)[1] suggests that different social classes view the process of choice in different ways and basically the order just suggested - position, job, occupation, - indicates the scale in conceptualisation, from the lower to the upper social classes. Any test of occupational information must take account of the occupational awareness of the client. Evidence of Carter's (1962)[2] study of 200 boys and girls in Sheffield secondary modern schools suggests their awareness was focussed on a particular position rather than a job and certainly not on occupations.

---

1. J.M.Haystead, "Social Structure, Awareness Contexts and Processes of Choice", Sociological Review, 19, 79-94, 1971, p. 87.

2. M.P.Carter, Home, School and Work, Pergamon, 1962, p. 149.

This test of occupational information is concerned with the wide range of variables within the work situation which should concern all students whilst at school, during the period in which they are crystallising vocational choice. Thus the analysis of characteristics must be appropriate to the whole range of occupations rather than focussing on specific activities or a limited range of types of employment. Also, if the instrument is to be used effectively it must be presented in a form which is understandable to the range of students for whom it is appropriate.

In order to determine the scope of such a test it is essential to consider the various approaches to the description of occupations.

OCCUPATIONAL DESCRIPTION AND CLASSIFICATION

Descriptions of occupational content can be broadly divided into three types:

1) Sociological descriptions of particular occupations.

2) Factor analytic descriptions of occupations.

3) Functional systems of occupational classification.

These descriptions are discussed in relation to selection of the aspects of occupations which are relevant to the construction of the test of school-leavers' knowledge.

1) SOCIOLOGICAL STUDIES

The growing interest in social history, particularly that of the last two centuries in Britain has produced a number of descriptions of the workers and their work. Some have been regionally based, others national and international. Examples only can be given of this type of work.

Ginzberg (1942)[1] describes the Welsh miners between the wars as:

> "...largely dependent upon one another above ground, the miners became more closely knit by the ordinary and extraordinary circumstances that occured below...Highly skilled, working without direct supervision, with wages largely being a function of his speed and acumen, the South Wales miner was an individualist. But he could not forget that his safety, in fact his life, depended on the judgment and behaviour of his fellow-workmen and that he in turn was responsible for their safety."

---

1. E. Ginzberg, Grass on the Slag Heaps: the Story of the Welsh Miners, New York, Harper Bros., 1942.

Coleman (1968)[1] distinguishes the work of navvies who built the Woodhead tunnel between 1839 and 1852, from miners, bricklayers, tunnellers, and masons. How was the navvy defined?

> "First, by the nature and severity of the work, which must be excavating, or tunnelling, or blasting, or bridge building on public works. Not necessarily railway construction..... Second, by the working together, the living together in encampments by the line and the inclination to move with the railway to new works. Third, the ability to drink and eat like a navvy. Two pounds of beef and a gallon of beer a day and the man was accepted. The dress too, was distinctive. They wore moleskin trousers, double canvas shirts, velveteen square-tailed coats, hob-nailed boots, gaudy handkerchiefs and white felt hats with brims turned up."

A journalist today contrasts with a manual worker of a century ago. Freeman (1968)[2] contributing to a series of articles on "Work" in the New Left Review writes:

> "The constant changes of shift, the irregularity of time off - even two free days in a week were usually split up - made it difficult to create a life outside work sufficiently dense to keep the job in perspective....It became more than I could do to use the same tools - typewriter and paper - for the spare-time writing I had promised myself."

Sociological research on occupations is growing rapidly. One of these projects is Hallowell's (1968)[3] study of the Lorry Driver. He describes the skills involved and some

---

1. T. Coleman, The Railway Navvies, Penguin, 1968, pp.27-28.

2. R. Freeman, in R. Fraser (ed.), Work, Penguin, 1968, p. 68.

3. P.G.Hallowell, The Lorry Driver, Routledge and Kegan Paul, 1968,

of the hazards of the job. His discussions on the road and in the cafes revealed a higher sense of job satisfaction than that revealed by a factory worker. This is accounted for by the higher degree of autonomy within which the driver works. An interesting aspect of this study is the effect of the occupation on family life and its comparison in this respect with other occupations. A miner's family has its roles very clearly divided (Dennis, Henriques and Slaughter, 1956).[1] The fisherman is more like the lorry driver in being away from his family for long periods. Occupational and family roles are more difficult to maintain in equilibrium. Hallowell (1968)[2] distinguishes three types of driver: (1) a shunter who collects and delivers goods in a local area; (2) a trunker who works on a set number of regular long distance routes and is probably away from home for one or two nights only; (3) a tramper who moves continually from place to place round the country collecting and delivering loads. These three different types of driver tend to have different occupational patterns in terms of family life, independence and status. Hallowell shows these sociological and personal aspects can vary considerably within an occupation. Nevertheless many of

---

1. N. Dennis, F. Henriques and C. Slaughter, Coal is our Life, Eyre & Spottiswoode, 1956, pp. 180-190.

2. Op.cit., pp. 27-29.

the characteristics, skills, hazards, hours of work and responsibilities can be relatively clearly defined for the occupation as a whole, particularly in the early stages of a lorry driver's career.

A popular current field of social research is history of the different trades unions e.g. the Derbyshire miners (Williams, 1962),[1] and the bank clerks (Blackburn, 1967).[2] These contain the descriptions of the physical, intellectual, social and economic aspects of the work.

These more recent detailed studies of occupations are methodologically more rigorous than many earlier American descriptions.

Caution in interpretation and use of sociological studies has been emphasised by Danskin (1955)[3] and Cohen (1954).[4] Many of the studies are geographically limited, usually involving a small number of cases and employing a method of collection of information which may be questionably subjective. Lastrucci (1941)[5] became a dance-band musician

---

1. J.E.Williams, The Derbyshire Miners: A Study of Industrial and Social History, Allen & Unwin, 1962, pp.23-31.

2. R.M.Blackburn, Union Character and Social Class: a Study of white-collar Unionism, Batsford, 1967,

3. D.G.Danskin, "Occupational Sociology in Occupational Exploration", Personnel and Guidance Journal, 34: 134-136, 1955, p. 136.

4. A. Cohen, "Sociological Studies of Occupations as a "Way of Life"," Personnel and Guidance Journal, 43: 267-272, 1964.

5. C.L.Lastrucci, "The professional dance band musician", Journal of Musicology, 3: 168-172, 1941.

to study this occupation. Definitions of "way of life" vary in comprehensiveness and in ordering of items included. These make it difficult to determine similarities and differences of respective accounts.

Cohen (1964)[1] warns against using sociological descriptions in counselling without reference to their methodology and limited reliability. But sociological studies can provide valuable descriptive evidence which adds a more comprehensive psycho-social dimension to the earlier "talent-matching" model in which the physical and intellectual aspects of the work are matched with those of the individual.

Samler (1961)[2] pleads for a more careful analysis, definition and measurement of the psychological and social aspects of men at work. He suggests the use or adaptation of the Edwards Personal Preference Schedule or the Stern Activities Index. Both these offer fruitful possibilities and the former at least has yielded some evidence on the salient personality features in members in certain occupations, particularly teaching (Merwin and Di Vesta, 1959;[3] Gillis, 1964,[4] Stocks, 1967[5]).

---

1. Op.cit., pp. 271-273.

2. J. Samler, "Psycho-social aspects of work: a critique of occupational information", Personnel and Guidance Journal, 39: 458-465, 1961, p.464.

3. J.C.Merwin and F.J.Di Vesta, "A study of need theory and career choice," Journal of Counselling Psychology, 6: 302-308, 1959,

4. J. Gillis, "Personality needs of future teachers," Educational and Psychological Measurement, 24: 589-600, 1964.

5. J.C.Stocks, "An Inquiry into the Choice of Teaching as a Career", Unpublished M.Ed. Thesis, University of Birmingham, 1967.

Several studies have been carried out on the differences of socio-economic groups with respect to the value they attach to the different aspects of the work. Even allowing for criticism on methodological grounds they agree beyond doubt that persons at the lower end of the socio-economic scale are more likely to emphasise the economic aspects of the work, whereas the upper end stress the satisfaction they find in the work itself. Lyman's (1955)[1] findings in interviewing 250 employed men on a socio-economic cross-section are consistent with the above. White-collar workers emphasise the nature of the work itself and its freedom. Blue-collar workers concern themselves with the physically easy nature of the work, the economic rewards and the conditions of work and cleanliness. Even when satisfaction was held constant, the same consistent pattern of likes and dislikes emerges. Perhaps this is a function of their intellectual ability to conceptualise.

Sociological studies have described the different aspects of the occupation. Most are detailed descriptions based on observations or other evidence of one particular occupation. Some studies (e.g. Coleman, 1968)[2] emphasise the physical activities, others (e.g. Dale, 1962)[3] the

---

1. E.L.Lyman, "Occupational differences in the value attached to work," Ameridan Journal of Sociology, 61: 138-144, 1955.

2. Op.cit.

3. J.R.Dale, The Clerk in Industry, Liverpool, University Press, 1962, pp. 13-36.

economic and security aspects. These differences are explained to some extent by Lyman (1955)[1], Hallowell (1968)[2] as an example of an intensive participant research highlighting the social relationships of the workers at work and in their families. To some degree it draws comparisons with other occupational studies.

Allowing for the methodological reservations, many of these later studies make three valuable contributions to the analysis of occupational characteristics:

1) They provide descriptions of the social and economic aspects of occupations in considerable detail as the result of intensive observation and enquiry. These provide valuable information in selecting the aspects appropriate at the guidance stage.

2) They provide information for comparing different firms and environments in which the work is carried out. From this evidence it is possible to distinguish factors which are common to the occupation rather than particular to a firm or organisation.

3) In most of these studies, three important aspects of occupational characteristics emerge: the physical and social environments and the economic rewards. These form the basis for the further discussion of occupational descriptions.

---

1. Op.cit.

2. Op.cit.

FACTOR ANALYSIS AND STEREOTYPE STUDIES

Attempts have been made to isolate characteristics common to groups of occupations by factor analytic methods. Gonyea (1961)[1], Grunes (1957)[2], and Reeb (1959)[3] used job titles and asked qualified raters to give measures of the similarity of occupations as they perceived them. Gonyea's analysis of inter-correlations produced first - and second-order factors but these were very broad descriptions i.e. physical activity, business, artistic, service, scientific-technical. Using slightly different statistical techniques Grunes produced a verbal -social - physical scale and Reeb two orthogonal dimensions of craft and clerical. These studies are based on students' perceptions of occupations and, as Gonyea points out, perception is influenced by the way an individual sees the occupation as meeting his needs. They are at least two interpretations removed from the actual operation of the occupation. Descriptions of factors are only subjective titles given to the common element of a group of occupational titles. As such they give only pointers to the occupational characteristics in the context of this thesis.

---

1. G. Gonyea, "Dimensions of Job Perceptions", Journal of Counselling Psychology, 8: 305-313, 1961.

2. W.F.Grunes, "Looking at Occupations", Journal of Abnormal and Social Psychology, 54: 86-92, 1957.

3. M. Reeb, "How People see Jobs: A Multi-dimensional Analysis," Occupational Psychology, 33: 1-17, 1959.

A more systematic factor analysis of job variables was carried out by McCormick, Cunningham and Gordon (1967).[1] This was based on 162 objective items of job description drawn from a review of job analysis variables. Two groups each of 400 occupations were analysed according to these 162 variables. 43 variables were later rejected because they had low reliability and were not used with sufficient frequency. Analysis of the occupations in terms of the remaining 119 variables produced 31 factors with a high degree of congruence between the two groups. This system has been developed further (McCormick, Cunningham and Gordon, 1967)[2] to show correlations between job characteristics and the personal attributes judged to be reasonably important for successful performance.

Stereotyping of occupations has received attention. Walker (1958)[3] investigated the adjectives which appropriately described a number of occupations by first year psychology students. Davidson, Reisman and Meyers (1962)[4] studied relationships between social class and occupational stereotypes and Dipboye and Anderson (1961)[5] used the needs

---

1. E.J.McCormick, J.W.Cunningham and G.G.Gordon, "Job dimensions based on factorial analyses of worker-oriented job variables", Personnel Psychology, 20: 417-430, 1967.
2. E.J.McCormick, J.W.Cunningham and G.G.Gordon, "Prediction of job requirements by a structured job analysis procedure", Personnel Psychology, 20: 431-440, 1967.
3. K.F.Walker, "A Study of Occupational Stereotypes," Journal of Applied Psychology, 42: 122-124, 1958.
4. H.H.Davidson, F. Reisman and E. Meyers, "Personality characteristics attributed to the worker", Journal of Social Psychology, 57: 155-160, 1962.
5. W.J.Dipboye and W.F.Anderson, "Occupational stereotypes and manifest needs", Journal of Counselling Psychology, 8: 296-304, 1961.

described in Edwards Personal Preference Schedule to describe professional stereotypes held by high school students.

These studies show the existence of occupational stereotypes, but there is no evidence of their actual relationship to occupational characteristics.

Miller (1968)[1] in designing his Interest Blank regards stereotyped conceptions as an important influence on the choice of occupations. However he suggests that they are relatively independent of the knowledge of the occupation and tend to emphasise the spectacular rather than the characteristic aspects. In establishing an objective frame of reference for careers education, stereotypes are lacking the empirical foundation which justifies their evidence being considered alongside other classifications. The establishment of a measure of occupational information may, however, show the relative accuracy of these stereotypes.

---

1. K.M. Miller, Rothmell-Miller Interest Blank (Manual) Slough N.F.E.R., 1968, p. 1.

FUNCTIONAL CLASSIFICATIONS OF OCCUPATIONAL CHARACTERISTICS

Classification systems have been devised to serve particular purposes, notably for census returns, vocational guidance and, more recently, for manpower planning. They differ from the socio-psychological classifications in that they are functional rather than theoretically based.

i) Socio-Economic Classifications

The earliest system traceable was devised by Taussig (1911)[1] for use in economic statistics. It was based on social-class distinctions:

1. Well-to-do class (Higher professional workers, salaried officials, larger proprietors).
2. Lower middle class (lower white collar group of clerks, salesmen and smaller proprietors).
3. Skilled labour (primarily craftsmen.
4. Slightly skilled and semi-skilled labour.
5. Day labour.

Frequent references to the use of this system were made for over half a century.

Beckman (1934)[2] started at the other end of the social scale and equated skilled workers with the lower level of white collar workers:

---

1. F.W.Taussig, Principles of Economics (1st Edition) Vol.II, New York, Macmillan, 1911.

2. R.O.Beckman, "A new scale for changing occupational rank, Personnel Journal, 13: 25-33, 1934.

I Unskilled manual

II Semi-skilled

IIIa Skilled manual
b Skilled white-collar

IVa Sub-professional
b Business
c Minor supervisory

V a Professional (linguistic)
b Professional (scientific)
c Managerial and executive.

Edwards (1943)[1] in his survey of United States occupational statistics, used Beckman's sub-steps, but Taussig's order. This system was developed by bringing together occupations with similar qualifications:

1. Professional persons

2. Proprietors, managers and officials
   a. Farmers (owners and tenants)
   b. Wholesale and retail dealers
   c. Other proprietors, managers and officials

3. Clerks and kindred workers

4. Skilled workers and foremen

5. Semi-skilled workers.

6. Unskilled workers
   a. Farm workers
   b.c. Labourers except farm
   d. Servant classes.

Socio-economic scales have usually been developed on a priority basis and have rarely been tested or tried experimentally, but recognition of their value is shown by their incorporation in sections of more detailed classification

---

1. A.M.Edwards, Population: Comparative Occupational Statistics for the United States, 1870-1940, Washington, U.S.Printing Office, 1943.

systems notably the Dictionary of Occupational Titles (1st and 2nd editions) (U.S. Department of Labor, 1939 and 1949).[1] Caplow (1954)[2] points out that several assumptions must be made to form a basis for socio-economic grouping:

1) White collar work is superior to manual work;

2) Self-employment is superior to employment by others;

3) Clean occupations are superior to dirty ones;

4) Importance of business occupations depends on the size of the business;

5) Personal service is degrading.

During the 60 years since Taussig suggested his system, social and economic conditions have changed - industrial expansion, rise of the trade unions, development of automation, increased educational opportunities and the blurring of the distinction between professional and non-professional work. It is questionable, however, whether the class differences have changed through educational opportunity, at least in Britain. The chances of a fifteen-year old leaver from a non-selective school rising above supervisory level is declining in modern industry. (Goldthorpe and Lockwood, 1963).[3] Studies of prestige ranking of

---

1. U.S.Department of Labor, Dictionary of Occupational Titles, 1st Edition, 1939,; 2nd Edition, 1949.

2. J. Caplow, The Sociology of Work, Minneapolis, University of Minnesota Press, 1954, pp. 42-43.

3. J.H.Goldthorpe and D. Lockwood, The Changing National Social Structure, 1963, quoted in E. Butterworth and D. Weir, The Sociology of Modern Britain, Collins, 1970, p.208.

occupations (Smith, 1962),[1] variations of income by educational level or by type of work and occupational mobility point to the continued existence of some rigidity of the class structure. Nevertheless, educational opportunity has enabled some to achieve the chance of social mobility through entry to higher education (Robbins Report, 1963).[2]

The appropriateness and functional value of socio-economic classification scales is reduced by its lack of clearly defined empirical basis. Differential positions occur in different social structures; religious, governmental, economic. The relative positions of a Nonconformist clergyman, a defeated Member of Parliament facing unemployment, a £200,000 winner on the football pools, illustrate the difficulty in assigning occupations to these scales. Social stratification depends on various rewards: financial gain, advantageous working conditions and honorific value. Some ill-defined combination of these factors adds up to prestige.

ii) Classifications based on Intellectual Demands

Barr (1918)[3] carefully described 121 occupations

---

1. M. Smith, An Empirical Scale of Prestige Status of Occupations, in S. Nosow and W.H.Form (ed.)., Man, Work and Society: a Reader in the Sociology of Occupations, NewYork, Basic Books, 1962, pp. 269-273.

2. Robbins Report, Committee on Higher Education, H.M.S.O., Cmd.2154, 1963, p.42.

3. F.E.Barr, "A Scale for measuring mental ability in Vocations", Unpublished MA.thesis, Stanford University,1918.

and then asked 20 judges - students and teachers of psychology and education - to evaluate them according to the intelligence needed to carry out the work. He then divided the range into 14 equal parts. This was an interesting academic exercise apparently the first of its kind - but it does not appear to have any practical use.

Fryer and Sparling (1934)[1] used the performance on the Army Alpha Test which emphasises "abstract intelligence". They analysed the results of 3,598 enlisted men, selected and therefore weighted towards those of higher intellectual ability, experience and education, and representing 96 occupations. They classified 8 levels of ability based on mental age and exemplified each level occupationally. It is significant that they assumed a correspondence with social scales:

	Mental Age	Social Scale	Occupations (examples)
A Very superior	18.0 +	High professional	Lawyer, accountant, teacher
B Superior	16.5-17.9	Professional	Physician, private secretary
C+ High average	15.0-16.4	Technical	Nurse, photographer

1. D. Fryer and E.J.Sparling,"Intelligence and occupational adjustment", Occupations, 12: 55-63, 1934.

C	Average	13.0-14.9	Skilled	Telephone operator, riveter
C-	Low average	11.0-12.9	Semi-skilled & low skilled	Hospital attendant, sailor
D	Inferior	9.5-10.9	Unskilled	Labourer, loader, lifter
D-	Very inferior	7.0-9.4	Lowest unskilled	Labourer (simplest work)
E	Useless	0 - 6.9	-	None

Stewart (1947)[1] undertook a similar study on 81,553 white enlisted men in World War II representing 227 occupations. She produced 10 occupational categories of half a standard deviation over a full range of ±2.5 S.D. from the mean for the total group. This study is subject to the same limitation as Fryer and Sparling. Whilst it demonstrated the distributions of the median scores for each occupational group it showed overlap of ranges between the groups. Super (1942)[2] emphasised the inadequacy of this type of classification when he suggested that

> "The spread of intelligence of any one occupation is so great that it is impossible to set specific limits of maximum and minimum intelligence for any one kind of work!"

In Stewart's study the top 10% of the lumberjacks had comparable scores with the bottom 10% of the accountants.

---

1. N. Stewart, A.G.C.T. Scores of Army Personnel Grouped by Occupations, Occupations, 26: 1-37, 1947.

2. D.E.Super, The Dynamics of Vocational Adjustment, New York, Harper and Row, 1942, p. 57.

Paterson, Gerken and Hahn (1953)[1] refined this approach in the Minnesota Occupational Rating Scales. They divided "ability" or "intelligence" into 7 different types and 4 levels:

Types of ability	Levels of ability	Percentile range in pop.
Academic	A	> 90
Mechanical	B	76 - 90
Social	C	25 - 75
Clerical	D	< 25
Musical		
Artistic		
Physical		

A total of 432 occupations were rated on these scales by industrial psychologists. This rating pattern emphasises the different characteristics required in various jobs. One-third of the occupations revealed a unique pattern and the remaining two-thirds fall into one of 77 different patterns including two or more occupations.

Clearly the intellectual requirements are an important aspect of any occupation and classification in these terms is bound to be of value, if only to emphasise to clients that although such a hierarchy exists, it is arranged, not in discrete gradations, but has very extensive overlap.

iii) Census Classification Systems

There are at present thought to be between 25,000 and 30,000 different occupations with several thousand

---

1. D.G.Paterson, G. Gerken and M.E.Hahn, The Minnesota Occupational Rating Scales and Counseling Profile, Chicago: Science Research Associates, 1953.

alternative titles by which they may be known. Censuses have been compiled in many of the major countries of the world throughout the last 70 years. Their purpose has changed. Initially they were intended to discover the number of inhabitants in a particular area - now they include manpower forecasting, statistics of type of home, geographical migration and social mobility. These purposes require a number of classification systems.

The current census classification systems used in Britain and U.S.A. are based primarily on the International Standard Classification of Occupations (International Labour Office, 1957).[1] This system was devised by a working party of seven members representing 29 countries working on the following principle endorsed by the Eighth International Conference of Labour Statisticians:

> "The basis of any classification of occupations should be trade, profession or type of work performed by the individual irrespective of the branch of economic activity to which he is attached or his industrial status."

Operations performed, materials worked on, tools or machines used, work place environment and other considerations were observed in groups of related occupations, but it was not possible to develop any single principle which could be followed in all cases. The diversity of characteristics, allied to the difficulty of

---

1. International Labour Office, International Standard Classification of Occupations, Report prepared for the Ninth International Conference of Labour Statistics, Geneva, 1957.

precise definition of occupation are the chief problems of occupational classification. An International Conference provides an opportunity for consideration of a wide spectrum of approaches. Comments from different government representatives showing varying points of view on basic principles:

1) Occupational homogeneity associated in units (most countries)

2) Jobs relating similar functions (Canada)

3) Level of skill and training (Taiwan)

4) Technically related (Germany)

5) Jobs requiring similar tools, machines or materials (Canada, Taiwan and Yugoslavia)

6) Conditions of work and transferability between jobs (Yugoslavia)

7) Level of responsibility (Taiwan)

8) Avoidance of use of skill as a criterion (United Kingdom)

The resulting classification combines social, environmental and status factors. Its major groups are:

0. Professional, Technical and Related Workers;

1. Administrative, Economic and Managerial Workers;

2. Clerical workers;

3. Sales Workers;

4. Farmers, fishermen, hunters, loggers and related workers;

5. Miners, quarrymen and related workers;

6. Workers in transport and communication occupations;

7 & 8. Craftsmen, production process workers and labourers not elsewhere classified;

9. Service, sport and recreation workers;

X. Workers not classified by occupation.

The further sub-division attempts to show homegeneity in occupational categories. There are 71 minor (2-digit) sub-groups of occupations e.g. Teachers; Embalmers and Undertakers. At the next level the minor groups are sub-divided into a total of 201 (3-digit) groups. At this level it is possible to identify individually many of the traditional categories of professional workers and craftsmen (e.g. architects, cabinet makers, plumbers) and others which merit identification because of their numerical importance, socio-economic significance (e.g. stenographers, policemen, detectives) and residual factors not elsewhere classifiable (e.g. medical technicians, bleachers, dyers and finishers of textiles). This system is purely functional. The factors on which it is based are not defined or clearly separated. Its main purpose is to provide an efficient, usable system of classification for statistics, cataloguing and international comparisons. Evaluation of its effectiveness for these functions is beyond the scope of this thesis.

Individual countries have adopted this system to produce classifications more appropriate to their purpose and situation.

The current British census classification is based on the International standard. The 1966 sample census (Registrar-General, 1966)[1] is analysed in four dimensions:

---

1. Registrar-General: General Register Office, Classification of Occupations, 1966, H.M.S.O.

1) Occupation as the kind of work a person performs, due regard being paid to the conditions under which it is performed, but the factory, business or service has no bearing on the classification of the occupation. There are 27 occupation unit groups defined by a short description e.g. Miners and quarrymen, Food, drink and tobacco workers, Sales workers.

2) Industry determined by reference to the business or economic activity in which the occupation is followed (e.g. Metal manufacture; Paper, Printing, Publishing; Insurance, Banking and Finance). There are 24 such categories briefly described.

3) Employment Status distinguishes employed from self-employed and within these categories indicates the relative levels of employment within the occupation e.g. Employers and managers in industry, commerce etc. - small establishments; Foremen and managers - manual; Members of Armed Forces. 17 of these levels are given brief descriptions.

4) Economic Position distinguishes those economically active from the inactive or previously active.

The main purpose of this classification system is to provide groups with at least one common characteristic. The basic common factor is the kind of work done and the nature of the operation performed. Other factors considered are: material worked in, degree of skill involved, physical energy involved, environmental conditions, social and economic status associated with the occupation.

iv) Two-Dimensional Classification Systems

The census systems are basically a more detailed definition of the socio-economic system, although the employment status category would to some degree distinguish between intellectual demands. They are not and cannot be regarded as two-dimensional matrices with orthogonal and

independently defined axes. Attempts have been made to produce such systems.

Hahn and Maclean (1950)[1] implied that occupations can be classified horizontally into fields determined by major area of emphasis in the occupation and vertically on intellectual demands. This approach has value in vocational guidance since it enables the client to see the whole occupational structure and trace both horizontally and vertically the possibilities of both type and level of occupational opportunity.

An early example of this type of structure is the Netherlands Classification of Occupations (Netherlands Ministry of Social Affairs and Public Health, 1952).[2] This system was developed as the result of job analyses. Its intended uses were in labour placement, vocational guidance and job counselling. The horizontal dimension is occupational class. This is divided into seven categories according to required level of intellectual aptitude and degree of complexity. The definition of these categories with occupational examples is illustrated by the extremes (1 and 7) and the middle (4):

---

1. M.E.Hahn and M.S.Maclean, General Clinical Counseling in Educational Institutions, New York, McGraw-Hill, 1950, pp. 73-87.

2. Netherlands Ministry of Social Affairs and Public Health, Classification of occupations according to their mutual affinity, 2nd edition, The Hague: State Labour Office, 1952.

1) Very simple work requiring no reflection and which can be performed after an introductory period of a few days. e.g. potato peeler, wheelbarrow man.

4) Fairly complicated work, requiring reflection and initiative, considerable practical experience and eventually some theoretical knowledge. e.g. bank cashier, hairdresser.

7) Practical work on a scientific basis, or purely scientific work. e.g. pharmacist, solicitor.

Clearly these categories cover very wide occupational differences which are separated by the vertical dimension in a complex and rather ill-defined way. The occupational families are defined as groups of occupations sufficiently related to be utilised in the placement and guidance services. The requirements of the occupations are divided into two aspects:

i) Structural - the kind of problems which arise when various occupations are performed.

ii) Accessory - which serve to define the structure of occupations in greater detail distinctive, in some cases, of particular occupations.

Structural aspects are basically the personal requirements for execution of the work: e.g.

o) Organisational - directed towards organising human work and material means, strongly dynamic in being directed towards attaining an efficient course of events. It is related to other aspects
e.g. organisational - exact: station-master (occupational class-5).
organisational - social: auctioneer (4)

m) Sense of material - directed towards feeling on the basis of observations and previous experience of the possibilities of application and manufacture of particular materials and how given
e.g.- sense of material: stone dresser (3)
sense of material -dexterity: scientific glass blower (5)

There are 13 of these aspects which vary from artistic skills to personal appearance and personality factors such as devotion. The examples show how a number of categories combine to classify an occupation and if extended logically such occupation should contain some measure of each category. This system exemplifies important structural features of occupations which can be shown to be distinctive in degree for each occupation. It can be criticised in the selection of aspects which best describe the occupation.

Roe (1956)[1] developed a two-dimensional system so that horizontal groupings are based on the primary focus of occupational activity e.g. personal interactions, handling or processing of natural resources, development of knowledge. These are listed as eight groups: Service; Business Contact; Organisation; Technology; Outdoor; Science; General Culture; Arts and Entertainment. The vertical dimension is based upon level of function, which includes degree of responsibility, capacity of skill. Where correlation between these factors is lacking Roe gives emphasis to the level of responsibility. The six levels are:

1) Professional and managerial - independent responsibility
2) Professional and managerial - other
3) Semi-professional and small business
4) Skilled
5) Semi-skilled
6) Unskilled

---

1. A. Roe, Psychology of Occupations, New York, Wiley, 1956, pp. 143-152.

Moser, Dubin and Shelsky (1956)[1] showed by experiment that agreement between experienced judges in the classification of occupations was increased if levels 1, 2 and 3 were modified according to three criteria: nature of responsibility; position with respect to policy making; amount of education. (See Table 3.1 p. 140). This system of classification has only been used as a research tool and has not fulfilled the guidance functions for which it might be used. It could show teenagers the scope and relationships in the world of work (Hopson, 1967).[2] The horizontal dimension helps to clarify the primary field of interest. The vertical dimension considers ability, preparation and degree of responsibility. Hopson suggests that this system might be used to select a range of occupations suitable for occupational visits (p. 100). Occupations are chosen according to the professional and skill level appropriate to the group of students. A range of types of activity is then represented at these levels. For definition of occupational characteristics this system, whilst more precise than the Netherlands classification, does not attempt more than a superficial distinction. In terms of detailed content it has little value in this respect.

---

1. H.P.Moser, W. Dubin and I.M.Shelsky, "A proposed modification of Roe's Occupational Classification", Journal of Counselling Psychology, 3: 27-31, 1956.

2. B. Hopson, Occupational Visits - Education, Recruitment or a Lark?, Youth Employment, 19: 25-32, 1967, p. 27.

v) Job Analysis

The foregoing descriptions of functional systems of occupational classification illustrate the lack of precision which is forfeited in the attempt to group together a large number of occupations under relatively few headings. Job analysis is the scientific approach to the classification. As Mace (1950)[1] remarks

> "Job analysis is the most fundamental skill in the application of science to human action".

The study of work is frequently referred to as "job analysis" and the term is taken to cover investigations carried out for a variety of purposes. Clarification of the terms and its connection with others is important. The National Institute of Industrial Psychology (1951)[2] distinguishes two contexts where the term may be used. In one it may indicate a highly detailed study of work in which the material, tools methods, conditions and people concerned are all examined with a view to making improvements. In another it may mean a study undertaken in order to plan the systematic training of people for a given kind of work. This definition is clarified in a working manual of the

---

1. C.A.Mace, "The Analysis of Human Skills," Occupational Psychology, 24: 125-140, 1950, p. 127.

2. National Institute of Industrial Psychology, Studying Work, N.I.I.P., Paper No. 2, 1951, p.2.

Cheshire County Council (1968)[1] which distinguishes between job descriptions, (what is actually done), specification, (what will be done in the future), assessment (comparisons in terms of worker involvement) and evaluation (in terms of time and pay). In terms of classification and characterisation of jobs only the description is specifically applicable here. This is listed in the Summary of the Classification of Occupational Characteristics (Appendix 3) Column 4. p. 438). The other terms deal with the evaluation in terms of economic efficiency and are beyond the scope and purpose of the present study, but the techniques of job description are basic to the study of school-leavers' occupational knowledge of occupational information.

Job analysis may vary in scope from observing a task performed by an individual worker in one establishment to an occupational survey of national or even international proportions.

Shartle (1964)[2] identifies three important techniques:

1) Task, Position and Job Analysis

A task is a unit of work performance. A position is composed of tasks performed by one worker. These can be studies either from oral or written reports given by the

---

1. Cheshire County Council, Job Evaluation: Private communication - J. Storey, 1968.

2. C.L.Shartle, "Occupational Analysis, Worker Characteristics and Occupational Classification Systems", in H. Borow, Man in a World at Work, Boston, Houghton Mifflin, 1964, pp. 287-290.

workers themselves or, more reliably, from the observations of a trained analyst. Job analysis is similar except that it includes two or more positions which are similar enough to be considered as one job. Analysis for the purpose of worker's pay is known as job evaluation.

2) Group, Organisation and System Analysis

Occupational analysis involves the study of a group of dissimilar but inter-related positions e.g. the crew of an aircraft, the members of a production line or a football team. Here job analysis is supplemented by observation of the group at work by film, or still photographs and by qualified work study analysts. Shartle criticises the lack of this type of evidence in published occupational information. Organisational analysis is also used in studying executive positions and human interactions in relation to the organisation as a whole. Systems analysis has similarities to both group and organisational analysis, but is more likely to deal with complex man-machine relationships and communications.

3) Surveys

The survey is a method of securing information on a larger scale necessary for educational or economic planning. It is based on sampling methods and its techniques are usually interviews and questionnaires depending upon the purpose for which the survey is made.

Attention will be primarily directed here to the description and analysis of jobs.

Roff and Watson (1961)[1] list 18 aspects of a job in three categories:

Personal Requirements

1. Education and vocational knowledge
2. Experience
3. Physical effort and skill
4. Adaptability and concentration
5. Intelligence
6. Disposition or temperament

Responsibilities

7. Planning and development
8. Recommendations and decisions
9. Executive control
10. Functional control and company contacts
11. External contacts
12. Confidential information
13. Assets and materials

Special Features

14. Working conditions
15. Difficulties
16. Consequences of errors
17. Supervision received
18. Satisfaction

In terms of vocational guidance this classification particularly in the section on Responsibilities is more appropriate for individuals with experience in the occupation rather than at the stage of choice.

Lawsche and Satter (1944)[2] reduced these to four factors:

1. General schooling } i.e. 2 aspects of skill
2. Learning period of job }
3. Working conditions } i.e. 2 aspects of job conditions
4. Job hazards }

claiming that such a system gives equivalent results for

---

1. H.E.Roff and T.E.Watson, "Job Analysis", Institute of Personnel Management, 1961, pp. 34-37.

2. C.H.Lawsche, Jr., and G.A.Satter, "Studies in Job Evaluation: I Factor Analyses of Point Ratings for Hourly Paid Jobs in Three Industrial Plants," Journal of Applied Psychology, 28: 189-198, 1944, p. 197.

job evaluation purposes. These factors continue to emphasise the two contributing elements to any system of job analysis: i.e. personal skills and job conditions.

The National Institute of Industrial Psychology (1951)[1] has prepared job description schemes which for practical convenience summarise the aspects under seven headings in which they classify personal attributes as in the Seven Point Plan (National Institute of Industrial Psychology, 1952):[2] this may have the advantage in guidance that comparison between the requirements of work and the potentialities of the people can be made. The seven personal attributes are:

1) Physical make-up
2) Attainments and previous experience
3) General intelligence
4) Special aptitudes
5) Interests
6) Disposition
7) General background

In their job descriptions the N.I.I.P. do provide pointers to observation of the work as actually carried out and list six headings under which it is collated (N.I.I.P. 1951)[3]:

1) General details of the place of work, number of employees, etc.
2) Type of work: office, practical, social, artistic
3) Outline of work done: apparent and implicit features
4) Selection and training
5) Working conditions
   (i) physical conditions of work
   (ii) social conditions of work
   (iii) economic conditions of work
6) Opportunities for transfer and promotion

---

1. Op.cit., pp. 14-22.
2. Op.cit.,
3. Op.cit., pp. 14-15.

The N.I.I.P. distinguishes between studies of manual type work (routine to highly skilled or skilled) and executive and professional level work. The chief distinctions being that the former requires a closer analysis of the physical conditions and in the latter most detail of the social conditions is essential. The categories of these descriptions are enumerated in the Summary of the Classification of Occupational Characteristics (Appendix 3, Column 3, p.438).

Job analysis techniques show application of scientific method to occupational classification. By detailed and repeated observation of the worker on the job against pre-determined categories of job content, they provide a description of operations and working conditions. Any systematic description of jobs and occupations must take account of these observations. At the present moment this technique has been applied widely, particularly in large organisations, in the study and evaluation of the work requiring physical rather than mental skills. With the growing complexity of economic activity and technological developments this trend will grow rapidly in this country in the next few years.

vi) Two Major Systems of Occupational Classification

The growing complexity of employment, the need for economic planning with efficient use of manpower and the increasing concern for the well-being of the individual have emphasised the need for a systematic scheme of reference in the classification of occupations. Two major systems have evolved in the English speaking

communities - the American Dictionary of Occupational Titles (DOT) and the British Classification of Occupations and Directory of Occupational Titles (CODOT). Both have grown out of a large number of scientifically conducted observations on the actual work as it is done.

The Dictionary of Occupational Titles was originally published in 1939 and revised in a second edition in 1949 (U.S. Department of Labor).[1] These two editions have been widely used in America as standard reference by counsellors, employment agency personnel, career information publishers, schools and government agencies. Initially work began on observations in the early 1930's when vast numbers of workers were suddenly and unexpectedly unemployed. By the time it was published the real need was for a system which would identify workers in certain occupations. This edition classified 29,744 occupational titles under 17,452 different definitions.

After many years of widespread use of the first two editions it became increasingly clear that a thorough revision of the Dictionary of Occupational Titles was necessary. Many factors contributed to the need for revision. Among these were the increasing proficiency in job analysis techniques and the development of a functional classification system (Fine and Heinz, 1958).[2] This system used a code based on what the worker does,

---

1. Op.cit.

2. S.A.Fine and C.A.Heinz, "The Functional Occupational Classification Structure", Personnel and Guidance Journal, 37: 180-192, 1958.

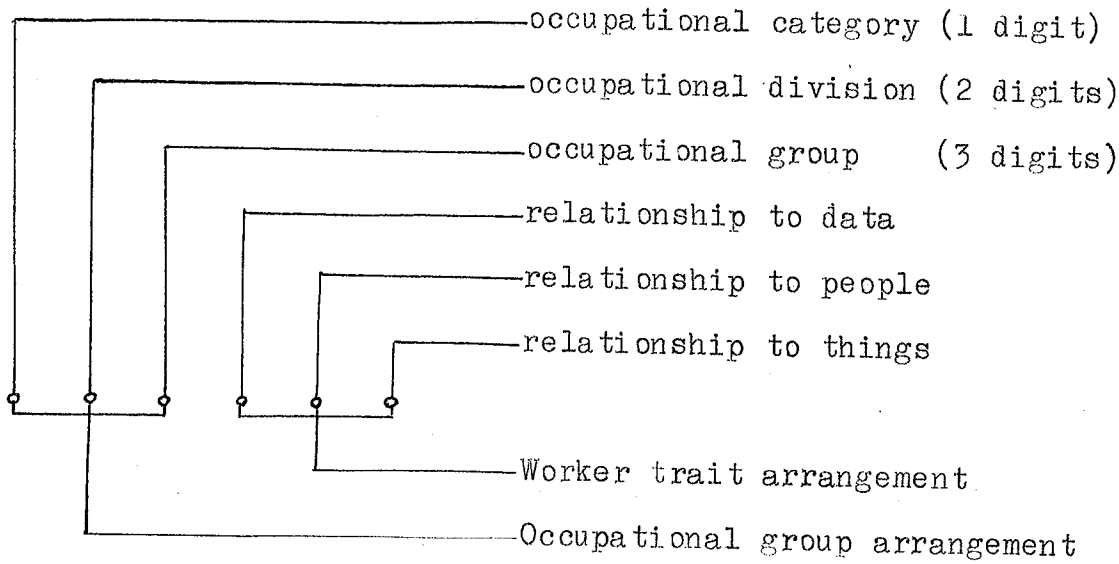
the work that needs to be done and the material, products, subject matter or services involved. In this functional classification system, consideration of what the worker does was based on the assumption that the worker's function could be arranged in a hierarchy of levels of complexity related to what he did with "things", "data" and "people". Within each of these areas a series of functions was developed of increasing complexity so that each higher level included and exceeded the skill required at the next lower level. Simultaneously with the development and refinement of the functional classification system, the United States Employment Service was involved in the study of worker traits and their relationship to success in the worker's activities. The worker trait components considered by this group included the following: training time, aptitudes, temperaments, interests, work performed, physical capacities, working conditions. This work of rating occupations in these terms was carried out by a group of trained analysts and was published as "Estimates of Worker Trait Requirements for 4,000 Jobs" (U.S. Department of Labor, 1956)[1].

Modifications of these two developments have provided the foundations for the third edition of the Dictionary of

---

1. U.S.Department of Labor, U.S. Employment Service, Estimates of Worker Trait Requirements of 4,000 Jobs, U.S.Government Printing Office, 1956.

Occupational Titles (U.S. Department of Labor, 1965).[1] A six-digit coding system is employed signifying the occupational grouping and the worker trait arrangement. Isaacson (1966)[2] illustrates the significance of each digit:



The occupational categories are:

0) 1)	Professional, technical and managerial occupations
2	Clerical and sales occupations
3	Service occupations
4	Farming, fishery and forestry occupations
5	Processing occupations
6	Machine trade occupations
7	Bench work occupations
8	Structural work occupations
9	Miscellaneous occupations

The next two digits extend the occupational description to just over 600 more specific occupational titles:

---

1. U.S.Department of Labor, Dictionary of Occupational Titles, Vol. 1 Definition of Titles: Vol. 2 Occupational Classification and Industry Index, Third edition, U.S. Government Printing Office, Washington, DC., 1965.

2. L.E.Isaacson, Career Information in Counselling and Teaching, Boston, Allyn and Bacon, 1966, p. 94.

e.g. 20. Stenography, filing and related occupations including 207 Duplicating Machine operators
68. Textile occupations including 685 Knitting occupations, except hosiery.

The first three digits thus complete the occupational group arrangement. The following group of three digits are known as the worker traits arrangement. This portion of the code is based upon the functional classification plan and attempts to show the relationship of the job to data, people and things. Both the functional classification structure and the Dictionary of Occupational Titles assume that every job is involved in some degree with instructions and information (data), with people in the form of the public, or supervisors and fellow workers (people) and with materials, equipment or products (things). These three are classified in a hierarchical order denoting the coding and each term is fully defined (see Appendix 1, p. 426). The plan used is the same as the functional classification system except for the reversal of hierarchical order and one or two minor changes:

	Data	People	Things
0	Synthesising	Mentoring	Setting up
1	Co-ordinating	Negotiating	Precision working
2	Analysing	Instructing	Operating/controlling
3	Compiling	Supervising	Drawing/operating
4	Computing	Diverting	Manipulating
5	Copying	Persuading	Tending
6	Comparing	Speaking/signalling	Feeding/offbearing
		Serving	Handling
7) 8)	No significant relationship to data	No significant relationship to people	No significant relationship to things

As an example of the degree to which it is possible to codify an occupation to six-digits consider the Telephone Operator Supervisor.

Digits		
2	Clerical and sales occupations	(Occupational category)
23	Information and message distribution occupations	(Occupational division)
235	Telephone work	(Occupational group)
.		
1	Co-ordinating (Data)	Worker Trait Arrangement
3	Supervising (People)	Worker Trait Arrangement
5	Manipulating (Things)	Worker Trait Arrangement

Thus 235.135 defines the work of the Telephone Operator Supervisor:

235 defines the occupation

and .135 defines the Worker Trait Requirements in terms of Data - People - Things.

The Dictionary of Occupational Titles contains the title, coding, definition and description of the occupations as outlined above. The full occupational description in the Dictionary of Occupational Titles also contains data from the Estimates of Worker Trait Requirements (U.S. Department of Labor, 1956)[1] broadly covering the following psychological and physical factors:

Training time
Aptitudes
Temperaments
Interests
Physical capacities or demands
Working conditions

~~A detailed description of Worker Trait Requirements is also given in Appendix 1. (p.).~~

---

1. Op.cit.

The classification system of the Dictionary of Occupational Titles has been described in detail for two reasons. First, it is the most comprehensive classification system yet attempted. It is based on systematic observations, particularly of the Worker Trait Requirements. Second, whilst it is not used internationally it has been used as a valuable basis of reference for other systems. Many of the detailed definitions here have been adapted in the present study to devise the tests of occupational information. Many of the features of this system have been included in the Summary of Classifications of Occupational Characteristics (Appendix 3, Column 1, p.438).

The most recent classification of occupational characteristics is that devised by the Manpower Research Unit of the Department of Employment and Productivity (1967).[1] This system is designed to replace the Guide to Occupational Classification and Registration of Workers for Employment E.D. 526 (Ministry of Labour, 1960).[2] The Guide was primarily

---

1. Department of Employment and Productivity - Manpower Research Unit, Classification of Occupational Characteristics, Private communication - A.W.Durham and P.A.L.Parker, 1967.

2. Ministry of Labour, Guide to Occupational Classification and Registration of Workers for Employment, E.D. 526, H.M.S.O., 1960.

designed to assist Local Officers of the Department to obtain an adequate picture of an applicant's experience or of an employer's labour requirements. The new system of classification groups occupations according to similarities in the work they involve. There are two main purposes for this type of grouping: (a) to bring together occupations which demand similar types and levels of skill, thus facilitating the placing officer's task of selecting alternative areas of employment in which applicants may be able to employ their skills and (b) to provide a meaningful framework for manpower statistics. The type of occupational grouping is a considerable improvement over the E.D. 526 because it brings together occupations with similar types and levels of skill. The system is also intended to be a consistent and meaningful framework for manpower statistics which will compare with the General Register Office Census Classification (Registrar General, 1966)[1] and with the International Standard Classification of Occupations. It was initially named the Ministry of Labour Occupational Classification (MOLOC) (Department of Employment and Productivity, 1968)[2] but when published (Department of Employment 1972)[3] had been re-named Classification of Occupations and Directory of Occupational Titles (CODOT).

---

1. Op.cit.

2. Department of Employment and Productivity, Occupational Classification - Preliminary Definition, Private communication - A.W.Durham, 1968.

3. Department of Employment, Classification of Occupations and Directory of Occupational Titles, 3 Volumes, H.M.S.O. 1972.

Subsequently the system will be referred to in this thesis as CODOT.

Classification according to skill levels presents a number of difficulties. Research into skill assessment (.e.g. by the Industrial Training Boards) suggests that similar skills may be employed in a wide range of occupations. Great difficulty was experienced in distinguishing any consistent pattern of inter-relationships among different skill levels generally recognised in different industries (Morgan, 1972).[1] Terminology provides no useful guide to genuine skill differences and analysis of the basic constituents of "skill" appears to be the only approach to this very thorny problem. As yet research is not sufficiently advanced to enable this type of classification to be built up. If and when it becomes possible there will be a number of advantages in employment and manpower planning, and in the educational programmes in schools and colleges which aim at developing the skills of the future labour force. Meanwhile a more immediately practical classification has been devised.

The CODOT system is based on 15,000 job analyses of 3,500 occupations. These occupations are grouped at three levels to show occupational relationships:

---

1. R.G.T. Morgan, "Occupational Description and Classification", Staines: Air Transport and Travel Industry Training Board, 1972, pp. 15-17.

Unit Group	a basic group of occupations in which the main tasks are similar or have many similar characteristics. Generally speaking therefore, a unit group has an occupational homogeneity and the occupations in it are more closely related to each other in terms of work performed than to occupations outside the group.
Minor Group	a collection of unit groups which are related in terms of work performed and/or reflect a corporate activity commonly found in the employment field.
Major Group	a convenient collection of minor groups to assist in comprehension of the classification as a whole.

(Department of Employment,1972)[1]

There are 18 major groups, 73 minor groups and 378 unit groups. A decimal system of code numbering is used. Minor groups are given code numbers of two digits within the range 00 to 99 and unit groups three digits within the range 001 to 999. Unit groups are divided into occupational titles using a further two digits after a decimal point, to accommodate the number of different occupational definitions within that unit group. An example illustrates this code numbering:

Display Artist

Major Group IV	Literary, Artistic and Sports occupations (not represented by single digits since there are 18 major groups)
Minor Group 16	Artists, Sculptors and Industrial Designers (2 digit: 16)
Unit Group 161	Artists and Sculptors (3 digit: 161)
Unit Sub-Group 161.70	Display Artist (5 digit: 161.70)

1. Op.cit., Vol.I, p. 8.

The occupational classification system is based on work performed rather than on industrial or socio-economic factors.

In order to compile a practical classification system, it is necessary to describe their common elements in terms of human capacities and experience (Department of Employment and Productivity, 1968).[1] Detailed consideration of other systems, largely those described earlier in this chapter, identified five basic types of occupational characteristics:

Mental requirements
Knowledge requirements
Physical requirements
Personality requirements
Working conditions

The CODOT system defined occupational characteristics in these five aspects. On the evidence of 15,000 job studies the occupational characteristics were described and each occupation was fully defined. Details of the characteristics are set out in Appendix 2 (p. 430), and summarised in comparison with other descriptions in Appendix 3 (p. 438).

Thus the two major classification systems classify occupations according to:

Cognitive (or mental requirements)
Physical requirements
Personality
Working conditions

There remain a number of aspects of occupational information affecting the entry of the young person into employment which are not satisfactorily accounted for in these classifications:

---

1. Op.cit., p. 3.

1) Entrance standards are not considered. They vary from minimal to optimal qualifications according to the supply of applicants and the needs of the employer. They may also reflect the unseen, unpublished standards of race, national origin, age, sex and social conformity.

2) Technological change is so rapid and so pronounced that the worker requirements and conditions of many jobs change frequently. (p. 68)

3) Whilst many occupational classification systems reflect the requirements on entry, many of the critical problems of personal adjustment arise in performing the job itself and in the social environment of the work place.

Shartle (1964)[1] glimpses the future possibilities of occupational analysis and suggests three comprehensive functions it might fulfil:

1) Readily available, flexible, functional classification of occupations to meet the needs of the demographer, the economic statistician, the high school student or college graduate who is entering the labour force, the employed person who wants to know which way is "up", the unemployed worker who is looking for re-training or the disabled person whose problems may require special attention.

2) Occupational groupings that can readily be understood by counsellors.

3) Systems which embody information that not only is up to date but reflects the future to a reasonable extent.

---

1. Op.cit., p. 307.

Such a system needs to be sensitive to the rapid and ongoing changes in technology.

Whilst a test of occupational information may ideally be produced to assist in counselling in these conditions, the present state of experience in testing and counselling suggests initially that a test may be devised for a restricted sample i.e. students concerned with vocational choice.

SUMMARY

Approaches to the description of occupational characteristics reveal various aspects which are relevant to the construction of a test of occupational information.

The sociological studies of particular occupations in depth emphasise the physical, social and economic aspects of the work. These investigations have been carried out by skilled observers and interviewers who have identified themselves with the workers and in many cases have lived and worked alongside them for a considerable time. If the purpose of this project had been to devise a particular instrument for each specific occupation, then evidence from these studies would have been particularly valuable in determining questions or items and in establishing norms. But the test is to be common to a range of occupations and therefore a more generally acceptable systematic classification is the more appropriate basis.

Factor analytic and stereotype studies show the views and judgments of occupations from those who are not involved in the work and may not be personally concerned in entering or working in the occupations. The factor analytic method reveals certain activities which may be features of a wide range of occupations. These may have some bearing on the establishment of a common description of occupations. Stereotypes may be compared to the responses to an instrument rather than providing the basis of the instrument itself.

Functional classifications have emphasised the various

purposes for which they have been designed. Socio-economic patterns have been useful for large-scale studies of social behaviour. They have also provided some structure from which other systems have developed. Systems based on intellectual demands have their uses in selection and the determination of training programmes. Census classificationsprovide demographic evidence valuable for many purposes. Roe's two-dimensional system of classification illustrates the scope of the occupational field which may be useful as a framework in careers education (p. 21). All these classifications lack objective precision in the detail of the work done which is necessary for a student to appraise the accuracy of his occupational information.

Job analysis is the determination of the essential factors in a specific position or job, and of the worker qualifications necessary for its competent performance (Isaacson, 1966).[1] Here emphasis is on the job and what the worker needs to do. The focus is on the work rather than the worker and it isspecific to a particular job within a firm or organisation. This technique emphasises the physical requirements and environment (Cheshire County Council, 1968)[2] and also the social environment and personality requirements (National Institute of Industrial Psychology, 1951).[3] Although limited to jobs rather than occupations this technique has considerable value in establishing aspects of occupations which ~~is~~ may be important

---

1. Op.cit., p. 283.

2. Op.cit.

3. Op.cit.

in the structuring of a test of occupational information for use in careers education.

The most significant and comprehensive systems of occupational classification are those which form the rationale of the Dictionary of Occupational Titles (U.S. Department of Labor, 1965)[1] and the Classification and Directory of Occupational Titles (Department of Employment, 1972).[2] These classification systems categorise descriptions of the working environment and the various personal requirements of the worker.

Summaries of the various classifications (set out in Appendix 3, p. 438) were considered and it was found to be appropriate to classify the systems under the following headings:

<u>Occupational Environment</u>

Physical environment
Social Environment
Economic Environment

<u>Personal Requirements</u>

Physical Requirements
Cognitive Requirements
Social Requirements (Personality).

Appendix 3 shows the comparison of the five systems of classification which most comprehensively described these six aspects of occupational characteristics. These five ~~systems are~~:

---

1. Op.cit.

2. Op.cit.

systems are:

Dictionary of Occupational Titles (U.S. Department of Labor, 1965)[1] (this rationale is fully set out also in Appendix 1 p. 426).

Classification of Occupations and Directory of Occupational Titles (Department of Employment and Productivity, 1967)[2] (summarised in Appendix 2 p. 430).

National Institute of Industrial Psychology Job Studies A and B (National Institute of Industrial Psychology, 1951)[3]

Job Analysis supplied by a practitioner (Cheshire County Council, 1968).[4]

Factor Analysis study by McCormick, Cunningham and Gordon (1967).[5]

The Netherlands Occupational Classification (Netherlands Ministry of Social Affairs and Public Health, 1952)[6] was also considered but it was felt that this system revealed no additional detail to that already shown by the five systems listed above.

The purpose of this Chapter has been to review the various approaches to the classification of occupational characteristics. Evidence is provided here which may form a useful basis for the construction of the test of occupational information.

---

1. Op.cit., Vol.II, pp. 649-656.
2. Op.cit., pp. 3-10.
3. Op.cit.
4. Op.cit.
5. Op.cit., pp. 417-430.
6. Op.cit.

CHAPTER IV

CONSTRUCTION OF TEST OF OCCUPATIONAL INFORMATION

DEFINITION OF SCOPE AND PURPOSE

As noted in Chapter II studies of career development and the practice of careers education have shown the essential significance of occupational information in the process of career decision-making. Similarly study of research into secondary school students' knowledge of occupations suggests that this knowledge is limited to certain aspects (Chapter I p. 36). Evidence from these and other studies (p. 42) gives some indication of aspects which students regard as important, but most of the studies either are based upon a narrow range of occupational characteristics or the important elements were selected by the students. Systems of classification of occupational characteristics outline the extent to which occupations may be described (Chapter III). This shows much more extensive coverage than that shown by the students.

Discussion of aspects of the theory of career development and the practice of education in Chapter II have emphasised the importance to the individual of developing a realistic appraisal of himself and the ways in which occupations can satisfy his needs. Haystead (p. 80) shows the importance of establishing an "open awareness" of the factors involved and Gelatt (p. 85) provides a model of decision-making which necessitates a careful evaluation of the various possible alternatives. On this model decisions are made either to investigate further a group

of occupations or to choose one particular occupation and work out the implications. Decisions require evaluation on the part of the student and this must be realistic in terms of the individual and in terms of the occupations.

The purpose of this test of occupational information is to provide an opportunity for the student of careers education to establish a realistic appraisal of occupational characteristics and of his own needs in relation to them.

It is appropriate that the definition of occupational information for this purpose should be taken from the analyses of the work situation rather than any presumed characteristics obtained from previous investigations of students' occupational knowledge. To fulfil the purpose of this instrument occupational information is defined as

> Characteristics of occupations which may be appropriate to the student as part of the process of careers education.

The test is designed to help to develop the self-concept and the occupational concept of the individual. It attempts to fulfil three objectives in terms of student behaviour:

1) To become aware of the many aspects of the occupational environment,
2) To be informed, if he wishes, of the accuracy of his occupational information in relation to the descriptions of those with knowledge of, and actually engaged in the occupations.

3) To express value judgments about the aspects of the work which the student himself regards as important.

Consideration is now given to the various possible structures of the instrument.

RATIONALE OF TEST CONSTRUCTION

Any test to be used in guidance in the manner outlined must fulfil a number of requirements if its use is to be justified. It must have a sound theoretical basis to its structure and it must employ a technique which can be justified practically. Experience in test construction has accelerated rapidly in the last decade and techniques are constantly being refined in the light of experience. Collected reviews such as the Seventh Mental Measurement Year Book (Buros, 1972)[1] provide valuable sources of experience in the construction of tests. The content as well as the technique must be based on reasonable hypothesis and sound observation. This is particularly essential in objective testing. Many factors influence the structure of a test.

Validity

Validity is an essential feature of all tests. It is vital to have some measure of the extent to which the test fulfils the purpose for which it is designed.

Adams (1964)[2] defines the four types of evidence about a test which users require in order to evaluate judgments which are made on the basis of students' performance on the test:

---

1. D.K.Buros, (ed.), The Seventh Mental Measurement Yearbook, New Jersey: Gryphon Press, 1972,

2. G.S.Adams, Measurement and Evaluation in Education, Psychology and Guidance, New York, Holt, Reinhart and Winston, 1964, pp. 106-107.

Construct Validity:	The extent to which the test measures an hypothesised trait.
Predictive Validity:	The extent to which the test predicts future criterion behaviour.
Concurrent Validity:	The extent to which the test results correlate with present behaviour as determined by other measures of the same criteria.
Content Validity:	The extent to which the test samples the universe of behaviour indicated by the purpose of the test.

Construct Validity depends upon the definition of occupational concept as a psychological trait. Definition, as yet, is limited to the description by Hayes and Hopson (1968)[1] and the definition set out on page 74 of this thesis. There is little other evidence on which to evaluate construct validity. Hayes (1970)[2] has helped to extend the definition of occupational concept by describing and demonstrating the importance of the psycho-social aspects. Comment will be made (in Chapter VIII, p.339) on the construct validity of this test in terms of available evidence.

Predictive validity might relate to other measures of occupational adjustment e.g. Westbrook's Cognitive Maturity Test (Westbrook, 1971)[3] or Sheppard's Adult Vocational Maturity Inventory (Sheppard, 1971)[4] referred to

---

1. J. Hayes and B. Hopson, "Occupational information and the process of vocational development," Technical Education Abstracts, 9: 6-9, 1968, p. 7.
2. J. Hayes, "Occupational Choice and the perception of occupational roles", University of Leeds, Department of Management Studies, Unpublished Ph.D., 1970.
3. B.W.Westbrook, The Cognitive Vocational Maturity Test, Raleigh, North Carolina, North Carolina State University, 1971.
4. D.I.Sheppard, "The Measurement of Vocational Maturity in Adults", Journal of Vocational Behaviour 1: 399-406, 1971.

in Chapter II (p. 50). Correlation here would depend upon the establishment and use of these other measures. This possibility is discussed more fully in Chapter VIII, (p. 342).

Concurrent validity might be established by comparing results of a test of occupational information with other measures of occupational concept. At the present time no other British measure of occupational concept exists, so concurrent validity cannot yet be usefully determined.*

Content validity of the test of occupational information relates to the definition of occupational information which is relevant to the formation of the occupational concept by the student. The occupational concept revealed by the test should be the student's understanding of the factors involved in living the life as a member of the occupation. The selection of content may be determined by the student or the members of the occupation. Reference has been made in Chapter I (p. 36) to the various factors which students regard as important in occupations. Items might be constructed from this evidence or questions and discussion might be focussed on the aspects mentioned. Alternatively studies of occupations (described in Chapter III) might form the basis of the item content. If the content is limited to the student's viewpoint it does not necessarily take account of the whole range of factors experienced by those involved in the occupation. Thus item content should be derived

---

*Very recently (September, 1973) Kirton has suggested the structure of a Job Knowledge Index. This is discussed in Chapter VIII (p. 342).

from the occupational environment. The content validity of the test may be judged by the extent to which its content comprehensively covers occupational factors as determined by experts in this field.

Thus content validity is the important measure at present under consideration. Adams (1964)[1] suggests three types of data are important in considering the content validity of any test (but particularly achievement tests):

i) abilities and skills the test is designed to sample;

ii) basis for selecting items (sources of items and criteria for inclusion);

iii) comments regarding the appropriateness of the item content for the specific purposes for which the test will be used.

This test of occupational information is designed to evaluate:

1) The accuracy of the student's knowledge of occupational characteristics.

2) The student's own values in relation to these occupational characteristics.

The selection and justification of items are considered in detail in later sections of this Chapter (p. 197).

Reliability

Reliability studies give information about the consistency of a person's scores on a series of measurements, (Cronbach, 1966).[2] It may be regarded as a measure of the

---

1. Ibid., p. 157.

2. L.J.Cronbach, Essentials of Psychological Testing, New York, Harper and Row (2nd edition), 1966, p. 126.

interpretation of the test by the student. The correlation of scores on the same test taken after relatively short time intervals will show how consistently a person interprets the items of the test. This measure would normally be made after a few weeks rather than months or years. Over the longer periods of time, it would be presumed that the achievement of the skills being tested would have changed due to learning in which the student was participating. This would certainly be true of a test of occupational information since a careers education programme is designed to increase occupational knowledge in a course lasting up to three years.

A test of occupational information would be regarded as reliable if the correlation of results by the same students over a period of a few weeks was greater than about +0.7. Such a level of reliability would indicate that the student interpreted the items in a consistent manner, showing understanding of the structure and content of the test.

A determination of reliability was carried out on this test of occupational information (Chapter VI p. 307).

Other Factors Influencing Structure

The construction of a test which may be used widely and administered by inexperienced teachers or advisers necessitates simple and clearly defined instructions for teacher and student. Careful selection of precise words which are comprehensible and interpretable in a consistent

manner by all concerned is essential to any widely used instrument. This will be fully discussed in Chapter V (p. 228).

Practical considerations of timing are related to selection of individual or group techniques. Oral or written communication is also involved here.

Any instrument to be used in guidance must fit in to the present and possible future practice. The evidence available (Advisory Centre for Education, 1968);[1] Schools Council, 1968;[2] National Union of Teachers, 1969;[3] National Association of Careers Teachers, 1970;[4] Department of Education and Science, 1973;[5] referred to in Chapter II p. 92) suggests that careers teachers in schools have limited opportunity to do their work effectively, but there is enormous variation in facilities from school to school. The Youth Employment Service is increasing its staff and

---

1. Advisory Centre for Education, The Role of the Careers Teacher, Cambridge, A.C.E., 1968.

2. Schools Council, Enquiry 1: Young School Leavers, London, H.M.S.O., 1968, pp. 126 and 238.

3. National Union of Teachers,"Annual Guide to Careers for Young People", N.U.T., 1969, centre pages.

4. National Association of Careers Teachers, "Time and Facilities for Careers Work in Secondary Schools," (The McIntyre Report), Cornmarket Careers Centre, 1970,pp.2-4.

5. Department of Education and Science, Education Survey 18: Careers Education in Secondary Schools, H.M.S.O., 1973, pp. 16-17.

the Advisory Officer: Young Person ratio is 1: 419 (Central Youth Employment Executive, 1971[1] referred to in Chapter I p. 6). Yet the schools as a whole are unable to offer as comprehensive a guidance service as the staffor students would wish and the Youth Employment Service in spite of expanding contacts both in industry and schools is still in many places pressed to offer a "crisis" interview as the basis of its service. Into this situation any test must be designed to help all parties to achieve maximum effectiveness in the careers education programme strained by limits of time, manpower, knowledge and experience.

Thus a test designed to fulfil the three stated objectives (p. 165) must be valid, particularly in terms of content; reliable; interpretable to all concerned; and appropriate within the limitations of time and professional expertise.

A test designed to assess occupational information could be structured in three possible ways.

i) Projective Type Test

This type of test has traditionally been more widely used by the clinician studying personality than by the teacher assessing learning. However, it has characteristics which should be seriously considered by the cognitive tester, particularly when such a test may include some measure of value judgment:

a) A wide range of stimuli can be employed: a picture, a single word, a title to stimulate imaginative or

---

1. Central Youth Employment Executive, "The Work of the Youth Employment Service 1968-1971, H.M.S.O., 1971, p.3.

realistic writing, an inkblot, a dramatic situation. Veness (1962)[1] tried to discover ambitions of school leavers through imaginative writing looking back from the end of their lives. Musgrave (1968)[2] produced pictures of tools - spanners, screw-drivers, etc. to try to discover associations in young children (9 - 10 year olds) between the tools and the workers who use them.

b) The stimuli are relatively unstructured so as to encourage freedom of diversity of response. In this way a more natural response can be obtained from the student since he is usually unaware of how it will be interpreted. He is much less on guard to display an acceptable image than in self-report tests. The responses cannot be marked as "right" or "wrong", they can only be interpretated qualitatively. The valuable application of this type of test is in personality measurement through the Rersharch and T.A.T. tests. The subject structures his own response to the projective test and thus reveals not so much how he reacts in the real life situations, but rather the underlying mechanism and non-verbalised and unconscious strivings which form the basis of behaviour.

c) These tests are more difficult to score and normally interpretation can only be carried out by a highly skilled clinician. Validity in the psychometric sense is

---

1. T. Veness, School Leavers, Methuen, 1962, pp. 17 and 205.

2. P.W.Musgrave, Private Communication, University of Aberdeen, 1968.

very difficult to assess. Thus proper interpretation by unskilled workers working to a narrow time-scale is impracticable.

By their very nature these tests are non-directive and it may well be that this feature can be of value in careers education in the future. For the present purpose the projective technique of assessment is inappropriate since the test of occupational information is concerned with measuring understanding and knowledge over a field of occupational characteristics, any of which may have some importance to the individual. In terms of learning experience it has relatively little value. Some structure is necessary as a basis for learning in a defined area of knowledge. This test is a measure of understanding of an area where the student necessarily has little or no experience and the learning achieved may be regarded as more important than the assessment.

ii) Concept Formation

Studies of concept formation date from the early work of Piaget on children's language and thought and their conceptions of physical causality, number, space and their moral concepts (Beard, 1969).[1] He used a "clinical" method in which he sought to discover children's reasons for their beliefs and thinking. It involved conversations with children so that the quality of the thinking could be assessed regardless of whether the reasoning was "right"

---

1. R.M.Beard, An Outline of Piaget's Developmental Psychology, Routledge and Kegan Paul, 1969, p.xiv.

or "wrong".

This method has been developed with larger groups of children in different conceptual fields. Lovell (1961)[1] describes the extension of Piaget's studies in mathematical and scientific concepts. More recently Goldman (1964)[2] and Bull (1969)[3] have extended this work into the fields of religious thinking and moral judgments respectively. De Silva (1969)[4] studied concept formation in history. These researchers drew upon teaching experience and previous studies to select examples of knowledge and behaviour which formed stimuli on which the conversations could be based. Goldman used tape recordings of biblical passages and pictures of religious activities. Bull used pictures of children in situations which raised moral questions. The conversations evoked were taped and analysed and the stages of development were identified. In religious thinking these corresponded to the Piagetian stages of intuitive, concrete and abstract thought. Moral judgments were classified as anomy, heteronomy, socionomy and autonomy according to the source of the influence through which the moral judgment is formed. De Silva chose passages in history texts, disguised the concept word and asked the

---

1. K. Lovell, The Growth of Mathematical and Scientific Concepts in Children, University of London Press, 1961.

2. R. Goldman, Religious Thinking from Childhood to Adolescence, Routledge and Kegan Paul, 1964.

3. N.J.Bull, Moral Judgments from Childhood to Adolescence, Routledge and Kegan Paul, 1969.

4. W.A. De Silva, "Concept Formation in Adolescence with special reference to History", Unpublished Ph.D. thesis, School of Education, Birmingham University, 1969.

the subjects the meaning of the disguised word and their reasons for thinking so.

Studies which have grown from Piaget's work have tended to classify children's responses to the stages proposed by him (or modified on the basis of later investigation). Thus, for example, the concrete stage of thinking has been shown to exist in number (e.g. Lovell, 1961),[1] in religious concepts (Goldman, 1964)[2] and historical concepts (Peel, 1960).[3]

The process of occupational choice has been described in developmental sequence by Ginzburg (Chapter II, p. 55). The stages have been proposed but the occupational concepts have not been related to them. Hayes (Chapter II, p. 72) suggests that occupational concepts might have four elements: Work Setting, Social Situation, Content and Nature of Work, Global Life-Style Implications. Perhaps the formation of such concepts might be investigated by methods comparable to those of Goldman, Bull or De Silva.

This type of investigation would provide useful evidence for the structuring of courses in careers education (c.f. the influences of Goldman and Bull on teaching in religious and moral education). Its influence would be related more

---

1. Op,cit., p. 48.

2. Op.cit., pp. 51-57.

3. E.A.Peel, The Pupil's Thinking, Oldbourne, 1960, pp. 117-125.

to the cognitive content and methods of teaching than to the guidance process. The Schools Council Curriculum Project on Careers Education and Guidance is focussed on the tentative and realistic stages of choice. However, no adequate evidence exists on how these pupils form occupational concepts or the degree to which such concepts correspond to Ginzberg's stages.

Piaget's type of clinical investigation is a technique which could make a contribution to careers education. Its purpose, however, is that of investigation rather than learning and personal decision-making.

iii) Objective Tests

Anastasi (1968)[1] defines a psychological test as "essentially an objective and standardising measure of a sample of behaviour". Whilst this may be considered to be a narrow interpretation of the nature of tests it serves to illustrate the importance of the objectivity of all methods of measurement. The non-projective techniques, if they are to be valid and useful in predicting behaviour must possess a degree of objectivity in the sense that they must depend to a much greater extent on the behaviour of the testee than on the test and tester. Methods of evaluating concept formation depend to a degree on the technique, stimulus selection and rapport of the interviewer, but to have value in providing evidence for educational and

---

1. A. Anastasi, Psychological Testing, New York, Macmillan, 1968, p. 21.

vocational decisions, they must be acceptable in sampling procedure, structure and reliability. All these are features of an objective test and the distinction is ultimately a difference in degree rather than in kind. Analysis of the construction of objective tests will reveal situations where subjective judgments are made, but these are minimised.

Lindquist (1950)[1] suggests that there are reasons why teachers prefer standardised tests to their own informal examinations: norms are provided, they are more reliable, more objective, more easily scored and more highly refined technically. They do, however, loose some of their value in that individual differences may tend to be submerged in the desire to make the test appropriate to a wide range of individuals. The present test suffers from this difficulty. If it is to describe a wide range of occupations, measured perhaps in hundreds with a wide variety of characteristics, some precision in description is bound to be lost. Equally if it is to be interpretable to pupils of the range of abilities, social backgrounds and motivations to be found in secondary schools in different parts of the country, no individual will have the maximum opportunity to express precisely what he knows, feels or prefers.

Objective tests, nevertheless, aim at direct measurement

---

1. E.F.Lindquist (ed.), Educational Measurement, Washington DC: American Council on Education, 1950, pp. 125-126.

based on natural behaviour of each individual. In trying to measure the occupational information possessed by school children, behaviour must become to some degree unnatural. Initially the information has to be communicated. This involves a common interpretation of linguistic expression. Reading ability is a determining factor in written tests for the less able. Motivation to respond to the stimulus of written material is also important at this level. Lindquist (1950)[1] distinguishes an objective test from the more subjective techniques as follows:

> "Instead of examining an examinee's behaviour in a sample of situations which present themselves to the examinee in the natural course of events, the examiner must in most cases present to the examinee a number of situations especially selected or designed to elicit such behaviour".

There are various ways in which the situations may be presented:

a) Direct perceptual experience of conditions, requirements or social relationships cannot seriously be regarded as a practicable form of testing occupational information. Lindquist (1950)[2] categorises these as "identical element" or "related behaviour" type tests.

b) Verbalised behaviour is another alternative form. Here selected behaviour is described to the examinee, who responds by saying how he would behave in such situations. The description or presentation may be verbal (oral or written) or visual (pictures, charts, diagrams, films, etc.).

---

1. Ibid., p. 145.

2. Ibid., pp. 145-150.

Oral tests are time-consuming and subjective in terms of interview relationships. Visual presentation would be impossible owing to the wide range of both occupations and characteristics. Written responses to written stimuli are perhaps the most feasible alternative.

The fundamental goal of test construction is to make the elements of the test as nearly equivalent to, or as much like, the elements of the criterion series, in this case occupational characteristics, as considerations of efficiency, comparability, economy and expediency permit. The test, therefore, must endeavour to fulfil these conditions and be as representative as possible of the occupational characteristics understandable by the school child.

A question to be asked of any test which purports to analyse a complex field of occupational information is whether the sum of the parts adds up to the whole. To some degree the classification systems have helped to produce a comprehensive coverage in some items (e.g. thinking, number, language and strength) (Appendices 1 and 2, p.426+430). In others discussions with advisers have helped to draw up the scale and the comprehensiveness has been reviewed subjectively.

A further limitation of objective testing is that the responses may be influenced by social desirability. A subsidiary investigation would have to be planned to determine the extent of this influence. Edwards' method in his Personal Preference Schedule (Buros, 1972)[1] might form the basis of such a study.

---

1. Op.cit., Vol.I, p. 150.

SELECTION OF TEST TECHNIQUE

This project appears to be one of the first to attempt a systematic measure of occupational information. Kirton (1973)[1] produced, in this country, the only comparable piece of work in this field and his work commenced two and a half years later than this project. Kirton used a questionnaire technique based on those aspects of 17 occupations rated as the most important by a small group of experienced members of the occupation. Thus each occupation had a different set of questions which were given to groups of sixth formers irrespective of their interest in these occupations as a career. Kirton's results are referred to in Chapter VIII (p. 351).

The choice of technique in this project rested between an investigation to discover how students form occupational concepts or an objective measure of occupational information.

The first alternative is attractive as an academic investigation which could provide the foundation for curriculum innovation in careers education and influence the informational aspects of careers guidance. It would produce evidence on the information which a student knows and the level at which he understands it. Such an investigation might be based on certain concepts regarded as significant by school-leavers e.g. the aspects shown in Table 1.2 p. 38 . Certain levels of understanding

---

1. M.J.Kirton, "Career Knowledge of Sixth Form Boys", The Hatfield Polytechnic, Report to Leverhulme Trust, 1973.

might also be revealed, which might correspond to the position, job or occupational level of specificity. A parallel investigation among young participants in the occupation might reveal different significant concepts (Hayes has shown the greater importance of psycho-social aspects to the participants (Chapter II, p. 71)). Professional advisers' occupational concepts would differ again and may be at a more general level of specificity than the participants. For the test to be of use in guidance it would be necessary to establish some degree of correspondence between the various viewpoints e.g. the student might be made aware of the labourer's concepts of the physical environment of the building site on which he works. In this way the student may be helped to evaluate his occupational concept of a building labourer. As an academic investigation this could be a most valuable project with implications for teaching. The value in guidance would depend very much on interpretation by the student and teacher or counsellor.

The objective type of test based on verbalised behaviour has certain advantages over the concept evaluation approach.

Validation of the instrument is possible through measures of realism obtained from the responses of competent judges. With a projective or interview technique this would be most complex and administratively very time consuming. It should be possible to devise a relatively

simple method of administration and scoring will make the instrument suitable for use by teachers or advisers not necessarily skilled in test procedures. The concept evaluation technique requires experience, much time for administration and is more difficult to validate.

If an objective test could be shown to be a valid measure of occupational information it will have a valuable use in careers education.

For these reasons the test described is basically of the objective type based on verbalised behaviour.

TYPE OF OBJECTIVE TEST

Many forms of test item were considered in the basic construction of the test of occupational information:

i) Alternate Response

The false-true type of item is probably the most widely used alternate-response item. When employed for testing factual knowledge these items are difficult to answer absolutely and literally. This would be particularly true of a test of occupational information designed to be interpretable in terms of a large number of occupations. The words true/false may suggest that value judgments are involved. In a test of knowledge this should not be implied.

ii) Sealed Choice

This is an extension to the alternate response to three or more (not usually more than five) choices of response. Alternate choices of the Likert type such as agree/disagree can be extended to agree/uncertain/disagree or strongly agree/agree/disagree/strongly disagree. These allow for wider degree of interpretation.

iii) Multiple Choice

These items are of the selection and recognition type, the client choosing the most appropriate from a series of possible responses presented to him. Two fundamentally different types of multiple choice item are distinguished by Gerberich (1956)[1] - those in which

---

1. J.R.Gerberich, Specimen Objective Test Items, New York, Longmans Green, 1956, pp. 244-245.

the possible answers are multiple but only one response is required (multiple-option) and those in which a number of responses may be acceptable (multiple-response). The second type may give a clearer and more detailed pattern of the student's knowledge. A complex scoring technique would have to be evolved. On the other hand the possibility of allowing a number of responses could reduce the care and precision with which the client considers the alternatives. Gerberich lists 55 possible types of multiple choice item. Of these the most important are the selection of the "best" or "correct" answer and the sentence completion.

iv) Matching Exercise

This type is a series of multiple choice items, in so far as the possibilities for pairing a term on one side is limited by the number of terms on the other side of the exercise. It requires a series of multiple-option decisions by the client. Scoring of this type of item could be very involved.

A test of occupational information involves occupational characteristics which are operationally defined and could involve considerable detail in order to achieve clear distinction between a large number of occupations. The multiple-choice type of item offers scope for these alternatives and involves a relatively simple operation of selection of one response.

The selection of test structure has so far restricted the medium of communication to the written word. Other

considered stimuli (pictures, behavioural situations, oral discussion) are rejected on account of impracticability in terms of availability, common interpretation or consistency of stimulus when employed by a large number of testers. Written language has a most convenient common currency, but the assumptions made in using it should not be overlooked.

Morris (1971)[1] considers semantic meaning to be "the relation of signs to their significates". The pattern of stimulation which is a word (or any other sign) is never identical with the pattern of stimulation of which it is the significate. For example the word "factory" can never be the same as the place it signifies. Words are either visual or auditory patterns which have meaning assigned to them. Psychological meaning depends upon communication through mutually accepted meaning being associated with each distinctive pattern. The acceptance of meaning in this way depends upon perceptual recognition and discrimination resulting from learning experiences.

Osgood, Suci and Tannenbaum (1957)[2] developed the semantic differential as an instrument which combines the association of word and stimulus with a scalar measure

---

1. C.W.Morris, Writings on the General Theory of Signs, Paris, Mouton, 1971, pp. 106 and 366.

2. C.E.Osgood, G.J.Suci and P.H. Tannenbaum, "The Measurement of Meaning", Urbana, Illinois, University of Illinois Press, 1957, pp. 76-124.

indicating the intensity and direction of judgment. They employed a seven-point scale where a rating could be given on a given concept in a number of polarised dimensions.

e.g. Father

happy _ _ _ _ X _ _ sad

hard _ _ X _ _ _ _ soft

slow _ _ _ _ _ X _ fast etc.

Each judgment represents a selection from a set of given alternatives and serves to specify a concept at a point in semantic space which is quantifiable and yet not necessarily defined in terms of words. The larger the number of scales and the more representative the number of these scales, the greater validity does the point represent the operational meaning of the concept.

Osgood and his collaborators in developing the semantic differential accepted a seven-step scale for the purpose of identifying student political opinion. They experimented also with the nine- and five-step scales but found the seven-step scale produced the maximum discrimination for their purpose. Their population of college students was likely to exercise a greater discrimination in words than the students for whom this test was devised.

Osipow (1962)[1] experimented with the use of the semantic differential as a measure of attitude towards occupational titles. He presented 96 university students (divided into

---

1. S.H.Osipow, "Occupations as a function of titles and descriptions", Journal of Counselling Psychology, 9: 106-109, 1962.

four groups) with four titles and asked each group to rate a title in terms of 15 semantic differential items. These items were loaded in one of three dimensions of evaluation, potency or activity e.g.

clean _ _ _ _ _ _ _ dirty (evaluation)

large _ _ _ _ _ _ _ small (potency)

fast _ _ _ _ _ _ _ slow (activity)

Two of the groups had job descriptions provided with the titles, the other two groups had no description. Differences on the evaluative and potency dimensions were found between the groups given no description, but not between the groups which were given descriptions. This suggests that responses to the semantic differential may differentiate in terms of occupational information possessed by individuals.

Recently, Moore (1972)[1] has produced an adaptation of the semantic differential for the measurement of vocational interests. This technique was initially developed by Katz and Norris (1970),[2] the novel feature being that the student chooses the adjectives which determine the scale on which they rate statements about the characteristics of certain occupations.

The semantic differential offers advantages in

---

1. B.M.Moore, Private communication, Slough: N.F.E.R.

2. M.R.Katz and L. Norris, "The Measurement of Academic Interests, Part 1 Characteristics of Academic Interest Measures, Research Bulletin, BB 70, p. 57.

evaluation since each item can be regarded as scalar and interpretation can be carried out on the basis of norms and the measure of deviation from them. However when occupational characteristics were considered it was found impossible to produce every item on an exactly consistent linear scalar measure. A non-linear scale would be even more difficult to apply to a large number of items describing a wide range of occupations. An assumption made in the use of the semantic differential is that students are able to make discriminations without the stimulus of words to guide their selection of point on the scale. This instrument has had, as yet, so little application with the younger and less verbally facile population in this country that a subsidiary investigation would be necessary before use could be made of this technique.

Thus as the test structure has to accommodate non-scalar and non-uniform scalar items, there is no alternative but to specify fully each alternative response in every item.

DESCRIPTION OF STUDENTS FOR WHOM THE TEST IS APPROPRIATE

Before the content of the items of the test can be discussed it is essential to describe the students for whom it is intended to be appropriate, as part of a course in careers education.

Traditionally, perhaps, careers education has been regarded as an activity for those students in their final year at school. But reference to the objectives of the Schools Council Project (Chapter I p. 21) suggests that it is a developmental process at least throughout secondary education. Helping students to develop a sense of personal worth, to provide conditions for each pupil to grow in self-understanding and to offer them a sound general education are aims of the school which are particularly appropriate to careers education. Many aspects of the curriculum may contribute towards the achievement of these objectives.

A programme of careers education will attempt to build on the foundations which have been laid in the earlier years of the students' education, particularly in helping to develop the self concept and a wide interest in the world around him.

Objectives which more specifically belong to careers education are concerned with developing self-directiveness and decision-making and an understanding of the opportunities, conditions and values in the world outside school.

This test of occupational information is designed particularly to be of use to the student who wishes to assess the conditions and values within occupations in order to help him in the decision-making process. The stages in his school life when he is most likely to be concerned with these aspects of careers education are:

1) when he is required to make choices of subjects and courses which have occupational implications;
2) as he approaches the stage of applying for employment or courses of further or higher education in colleges or universities.

These are the occasions on which the test is most likely to be used. The test may be used for other purposes in computer-assisted guidance or for curriculum evaluation. These uses are discussed more fully in Chapter VII (p. 329).

In planning the construction it was felt that these two stages were the times when the test was most likely to be used. The first stage is, for many, a preliminary to the second and may take place around age 13 or 14 years, to be followed at 15 or 16 years by choice of employment or sixth form, further or higher education. In terms of the groups of students for whom the test may be appropriate, the distinction comes not in these two stages, but between those who leave full-time education at the earliest possible opportunity (the statutory school-leaving age) and those who appropriately continue their full-time education beyond this stage. In 1968 when these factors were considered the

leaving age stood at 15 years. It has now (in 1973) been raised to 16 years. Evidence for distinguishing these two groups of students was strongly based on the statistics of school-leaving in relation to educational attainment, particularly in G.C.E. Ordinary Level.

Leaving school is, of course, a process which can take place during a period of about five years. Table 4.1 shows the extent of the process through these years. These statistics were current at the time of the construction of the test (November 1968).

TABLE 4.1

NUMBER OF PUPILS IN ALL SCHOOLS AS A PERCENTAGE OF THE AGE GROUP IN ENGLAND AND WALES - JANUARY 1967

Aged	Percentage of Pupils
14	100.8*
15	65.6
16	29.9
17	16.0
18	5.3
19	0.5

*over-estimation by Government Actuary

Source: Department of Education and Science, Statistics of Education (1968)[1]

Table 4.2 shows how the destination of school-leavers related to their achievement in G.C.E. examinations.

1. Department of Education and Science, Statistics of Education 1966 Part 2 G.C.E., C.S.E. and School Leavers, H.M.S.O., 1968, p. 73.

TABLE 4.2

NUMBER OF PUPILS IN THOUSANDS LEAVING ALL SCHOOLS IN ENGLAND AND WALES, THEIR ENTRY INTO EMPLOYMENT AND HIGHER EDUCATION AND ACHIEVEMENT IN G.C.E. 'O' LEVELS 1966

	Destination						G.C.E. 'O' Level					
Age of leaving	Employment		Further & Higher Ed.		Total		At least 1 O Lev.		At least 5 O Lev.		5 O Lev. as % Tot.leave	
S.L.A.	277.59		8.35		285.95		} 7.55		} 2.03		} 0.6	
others aged 15	50.75		6.25		57.00							
16	121.95	450.29	21.50	36.10	143.44	486.39	79.88	81.43	21.11	23.14	14.7	15.3
17	35.85		17.39		53.25		48.68		30.39		57.1	} 78.0
18	23.07		49.09		72.12		} 82.24		} 76.31		} 91.4	
19 & Over	3.23		8.21		11.45							
	508.53		110.75		623.20		218.35		149.84		24,0	

Source: Department of Education and Science Statistics of Education (1968)[1]

1. Ibid., pp. 27 and 39.

Table 4.2 shows that 92.5% (450.29 out of 486.39 thousands) of the students leaving school at the statutory leaving age and up to 16 years, enter employment. Only 15.3% of these leavers have 5 Ordinary Levels and probably a large proportion of this group enter further education. Thus the vast majority of leavers entering employment at 15 or 16 have less than 5 'O' Levels. Of those staying at school to 17 - 19+ years 78.0% leave with at least this attainment.* Examination entry qualifications to occupations (Central Youth Employment Executive Careers Guide, 1968 and 1971-2)[1] suggest that 5 'O' Levels is frequently accepted as the basic minimum requirement for entry into the majority of professional occupations. Skilled and unskilled occupations are normally entered by those with less than this level of attainment and normally at 15 or 16 years of age.

Thus occupations normally entered by school-leavers may justifiably and conveniently be separated into two categories, broadly related to educational attainments. These are defined in this project as:

---

* Analysis of the statistics of school-leavers of 1971 (Department of Education and Science, 1973)[2] maintains this argument:
91.0% (425.58 out of 477.97 thousands) pupils leaving school aged up to 16 entered employment.
22.2% of this group have 5 or more 'O' Levels or 5 or more C.S.E. Grade 1.
78.6% of the aged 17+ leavers have 5 or more 'O' Levels or equivalent.

1. Central Youth Employment Executive Careers Guide (1971-72) H.M.S.O., 1971.

2. Department of Education and Science, Statistics of Education 1971, Part 2 G.C.E., C.S.E. and School Leavers, H.M.S.O., 1973, pp.11 and 28.

<u>Level 1</u> Skilled, semi-skilled and unskilled occupations entered normally by pupils aged 15 or 16 with less than 5 'O' Levels or equivalent (i.e. C.S.E. Grade 1).

<u>Level 2</u> Occupations entered either from school or after further or higher education requiring a minimum entry standard of at least 4 'O' Level passes or equivalent. The age of entry will be at least 16, but many enter at 17 or 18 or after further full-time education.

The Level of the test taken by the student will be determined by the Level of the intended occupation. The selection of the Level of the test will be discussed further in relation to its use in careers education and guidance (Chapter VII, p. 327).

ITEM CONTENT

The structure of the test and the expressions used in the items are of major significance in the interpretation of the test.

The content of the items attempts to fulfil two basic criteria of equal importance:

i) Effective description of occupational characteristics;

ii) selection of words which are understood by the students for whom the test is intended.

1. OCCUPATIONAL DESCRIPTION

Occupational characteristics are divided into a number of items each with a specified heading. Within these headings an attempt has been made to describe as widely as possible the various occupational situations. In considering a range of occupations these descriptions cannot be specific and precise for each one, but an attempt has been made to make each item relevant to most occupations. Where this is not fully possible an alternative is presented which allows the client to make a meaningful selection from the five alternatives.

There is no test previously described in the literature which selects those occupational characteristics appropriate to the knowledge of the student on the point of making decisions of career choice.* The occupational

---

* Kirton (1973) published his Job Knowledge Index when this project was almost complete.

characteristics described in this test have been taken from the systems described in Chapter III and summarised in Appendix 3, (p. 438).

The sections of the test are divided into the occupational environmental description and personal requirements for the work. These are thought to be essential complementary aspects of any occupation. The functional classifications of the Dictionary of Occupational Titles, the Department of Employment, the NIIP Job Studies, the Job Analysis Schedule and McCormick's factor analysis have characteristics in each of these broad categories.

These were then subdivided:

Occupational Environment	Personal Requirements
1) Physical Environment	2) Physical Requirements
3) Economic Environment	
4) Social Environment	5) Personality Requirements
	6) Cognitive Requirements
	7) Training and Prospects

The numbering gives the order in which these sub-divisions are described in the test. Since objective tests are normally constructed so that the earlier items have a higher facility index, it is suggested that the physical aspects of the work are likely to be better known, particularly to Level 1 students. The economic aspects are listed next followed by the social and cognitive aspects and finally the training and prospects in the occupation. The initial draft of the items is shown in Appendix 4, (p. 446). The titles of the aspects were

mainly established with reference to the classifications of occupational characteristics described in Chapter III and summarised in Appendix 3, (p. 438) with fuller details of the DOT and CODOT systems in Appendices 1 and 2, (p. 426+430).

Table 4.3 (pp. *) gives indications of the degree to which the item content is based on the five systems of occupational classification. It shows the source of many of the sentences in the items. The remainder were devised by the author and are the product of discussions with members of the Department of Employment and Productivity Manpower Research Unit, three experienced Careers Officers and members of four different professions (a Town Clerk, an insurance inspector, a clergyman and a work-study officer).

It can be seen that some items e.g. 13 and 35 are substantially based on the wording used in the five descriptions, whereas items 1 and 41 exemplify those devised largely by the author.

The discussion which follows considers the 43 items of the test as initially devised and described in full in Appendix 4, (p. 446). They are grouped in the seven categories of occupational characteristics. Differences between the two Levels of the test are indicated. These differences are due to

a) The use of language appropriate to the students at two different Levels

---

*See footnote p. 200 .

and b) the different characteristics of the occupations which the two Levels are used to describe.

1) Physical Environment (Item Titles 1 - 10)

Item No.	Level 1	Level 2
1	Place of Work - Indoors	Place of Work - Indoors
2	Place of Work - Outdoors	Place of Work - Outdoors
3	Things or People Worked With	Things or People Worked With
4	Working Conditions	Working Conditions
5	Temperature of Work Place	Temperature of Work Place
6	Dryness and Dampness of Work Place	Dryness and Dampness of Work Place
7	Smell	Smell
8	Noise or Vibration	Noise or Vibration
9	Repetition or Variety	Repetition or Variety
10	Dangers of the Work	Hazards or Dangers of the Work

Most of these aspects are listed in the functional classifications and particularly in detail in the job analysis. All the items, except Item 9, are descriptive of conditions. In this item the language is adapted to the two Levels. The content of items dealing with the Place of Work (Items No. 1 and 2) vary slightly between the two Levels, otherwise no distinction is made.

Footnote: Table 4.3 is to be found in the back pocket of this Volume.

2) Physical Requirements

Item No.	Level 1	Level 2
11	Appearance or Clothes (Worn)	Appearance or Clothes (Worn)
12	Strength	Strength
13	Sitting or Standing	Sitting or Standing
14	General Health	General Health
15	Work with Hands and Feet	Work with Hands and Feet
16	Eyesight	Eyesight
17	Talking	Talking or Speech

These items are described in detail in the DOT, CODOT, NIIP and Job Analysis systems. In this section there are a few very minor differences in the use of language between the Levels.

3) Economic Environment

Item No,	Level 1	Level 2
18	Arrangement of Normal Hours of Work	Arrangement of Normal Hours of Work
19	Unusual Hours of Work	Unusual Hours
20	Number of Hours Worked in a Week	Number of Hours Worked in a Week
21	When Workers are Paid	When Workers are Paid
22	Rates of Pay	Rates of Pay
23	Amount of Starting Pay	Amount of Starting Pay
24	Extra Benefits	Extra Benefits
25	Increases in Pay	Increases in Pay
26	Payment at 25 Years Old	Payment at 30 Years Old

The economic environment is only described in the N.I.I.P. Study of Work (1951).[1] Reference to occupational information produced by industrial firms and professional bodies shows that money and hours are very frequently

1. National Institute of Industrial Psychology, Studying Work, N.I.I.P., Paper No. 2, 1951, pp. 15 and 19.

mentioned. There is little difference between the two Levels except in Items 22, 23 and 24 where rates of pay, starting pay and extra benefits are different, particularly between the semi-skilled work and the professional services. Item 26 is concerned with economic prospects. With the longer training required for the Level 2 occupations, the higher age level is more appropriate.

4) Social Environment

Item No.	Level 1	Level 2
27	How Work is done with People	Type of Relationship with People at Work
28	How Much Leadership of Others	Leadership of Others at Work
29	Membership of Unions	Membership of Unions or Professional Bodies
30	How Others see this Job	How Others see the Occupation (Prestige)

These aspects, particularly Items 27 and 28, are described in detail in the Job Studies of the N.I.I.P. Study of Work (1951)[1], which divided the descriptions into Job Study A of routine to highly skilled work (approximating to Level 1 occupations) and Job Study B (high grade executive and professional level (Level 2). The DOT and CODOT classifications categorise the personal relationships described in these two items. The differences between the Levels is also reflected in the appropriateness of the language.

---

1. Loc.cit.

5) Personality Requirements

Item No.	Level 1	Level 2
31	Separation from Home	Separation from Home
32	How Much Work is Done With Others	How Much Work is Done With Others (Sociability)
33	Deciding for Yourself in the Job	Deciding for Yourself in the Job (Initiative)
34	Being Relied On	Reliability

This section raises difficulties, since to a greater extent than any other aspects, personality requirements for a particular occupation cannot be precisely defined. Work situations can accommodate a wide range of personality factors and the experience of work can modify the worker's personality. One aspect of personality which is mentioned (but no more) in the N.I.I.P.Study of Work, the Job Analysis and McCormick's factor analysis is Responsibility. The description of items here has been based on the definition of Responsibility put forward by Brown and Landsberger (1960).[1] They justified the descriptions of various activities as "responsibility" in terms of three sub-categories: Sociability, Initiative and Reliability. These form the basis of the content of Items 32, 33 and 34, language being adapted for the two Levels. Item 31 was included as an aspect related to independence and relevant particularly in geographical areas and to certain occupations e.g. the Forces.

---

1. A.W.Brown and H.A.Landsberger, "The Sense of responsibility among Young Workers," Part I Definition and Measurement, Occupational Psychology, 34: 1-14, 1960, pp. 6-7.

6) Cognitive Requirements

Item No.	Level 1	Level 2
35	Words and Writing	Words and Writing (Language)
36	Clerical Work	Clerical Work
37	Numbers	Number (Mathematics)
38	Thinking and Doing	Thinking
39	Shapes, Drawing, Painting and Music	Shapes, Drawing, Painting and Music
40	Accuracy	Accuracy (Exactness)

These items are described in considerable detail in the DOT and CODOT classifications (Appendices 1 and 2, p.426+430). Verbal, numerical and reasoning ability are adapted to the two Levels. The differences are distinct here since the Levels are based on cognitive attainment. Clerical work is also adapted to the two Levels. Spatial requirements are combined with artistic and musical ability. The item on Accuracy uses slightly different language.

7) Training and Prospects

Item No.	Level 1	Level 2
41	Examination Qualifications	Examination Qualifications
42	Place of Training	Place of Training
43	Future Prospects	Future Prospects

These three aspects are not described in detail in the systems of classification. However they are regarded as essential in careers education. Descriptions of occupations in official careers literature (e.g. Careers Guide 1971-2 and Choice of Career booklets published by the Central Youth Employment Executive) all include indications of the necessary entry qualifications

and the type of training available. Future prospects are included as an aspect which many school-leavers are likely to consider in the choice of occupation. These three items clearly vary according to the Level of the test.

It can be seen that in the total of 43 items the same aspects are included in both Levels of the test. The items are not equally divided between the sections and experience in the validation of the test may reveal some items which have little value and others which could be extended.

2) WORD SELECTION

The test is entirely verbal and involves both reading and understanding in order to make a meaningful response which corresponds to the knowledge which the individual has of the occupation. Selection of language, concept and expression is essential if the test is to fulfil its purpose.

Word selection in the test items is determined by a number of factors. It is necessary to describe the selected occupational characteristics clearly and unambiguously in words which will be understood by the clients. The words selected must be, as far as possible, within the vocabulary of the school-leaver. Burns (1955)[1]

---

1. D.G.Burns, "Vocabulary of the Secondary Modern School Child", N.F.E.R. (Occ. Pub. No. 1), 1955.

investigated the words known by secondary modern school pupils. From the list in the Teachers' Word Book of 30,000 Words (Thorndike and Large, 1944)[1] of the most frequently used words he deleted the very common words, proper names, Americanisms, archaic forms and words known to most children at 11. The remaining 4,154 he tested each on a group of 100 boys and 100 girls in secondary modern schools. The children were asked to write a definition of a word from the context in which it was written. Words scoring over 40% response in this way were regarded by Burns as relatively easy. 20-39% as moderately difficult and less than 20% as difficult.

Table 4.4 shows the words included in this test of occupational information which are used in Burns' investigation.

TABLE 4.4

WORDS FROM BURNS' INVESTIGATION OF VOCABULARY OF SECONDARY SCHOOL CHILDREN USED IN THIS TEST OF OCCUPATIONAL INFORMATION

Level 1 and 2

Word(s)	Item No(s)	% Scores of definition	
		Boys	Girls
accident	10	69	71
accuracy	40	64	61
accurate	15,39	85	80
acid	7	58	60
benefits	24	36	35
bonus	22	78	65
complicated	9, 35	40	50
composing	35, 36	80	90
continual	9, 38	81	70
decided, deciding	8, 25, 33	63	57

1. E.L.Thorndike and I. Large, The Teachers' Word-book of 30,000 words, Columbia, Teachers College, Columbia University, 1944.

Word(s)	Item No(s)	% Scores of Definition Boys	Girls
discount	24*	26	28
disturbing	8	42	44
equipment	3, 8, 34	72	65
foreman	28	37	40
forgetfulness	10	69	77
fumes	7	58	62
grade	41	29	38
handicaps	14	32	33
instructions	35, 38	65	70
maximum	26	30	13
measure	41*	40	27
membership	29	76	70
merit	25	12	6
necessary	40	29	33
noticeable	7	45	50
occasional(ly)	8,12,33,36,37	41	50
permanently	31	51	66
promotion	25,26,43	65	54
protective	11	22	28
qualifications	29,41	14	19
reasonable	14	51	36
relied, reliability	34	62	78
repetition	9	10	16
requires	14,16,41	59	69
responsibility	34	31	37
rhythm	38	12	18
separation	31	56	14
site	2	29	37
supervision	27,28	42	26
supervisor	34*	19	36
typewriter	3	41	54
variety	9,37	36	58
vibrations	8	51	40

* Level 1 only

Level 2 only

abilities	39	39	23
additional	24	53	49
administrative	36	1	5
allowance	24	93	85
appreciation	5	47	47
approval	29	20	24
automatically	25,29	69	63
cataloguing	36	16	10
combination	4	33	37
communication	36	41	42

Word(s)	Item No(s)	% Scores of Definition Boys	Girls
compiling	36	17	13
complex	37	23	26
considerable	9,38	72	79
contact	27	49	37
correspondence	36,42	31	37
deliberate	38	76	75
essential	32	45	47
fluently	17	12	13
hazard	10	21	15
incidental	32	21	19
initiative	33	3	6
instructions	33	65	70
insurance	24	28	29
interpreting	35	40	32
laboratory	1,3	37	32
negotiating	27	14	6
organisation	34,36	25	29
original	38	54	56
pensions	24	51	71
persuading	27	32	33
prestige	30	2	3
professional	22,29	24	6
relatively	37	25	23
significant	32,36	15	16
strenuous	12	65	57

The meaning of the word, rather than the grammatical form in which it appeared in Burns' List was taken as the measure of interpretation by school-children.

Using the mean percentage scores by boys and girls the words used in the test (either in the draft or the later form) can be classified according to Burns' groups.

TABLE 4.5

DIFFICULTY LEVEL OF WORDS USED IN TEST
(from Burns' Table)

	Burns' score	No. of words in Test Levels 1 & 2	Level 2 only
Relatively easy	>40%	26	13
Moderately difficult	20 - 39%	14	13
Difficult	<20%	4	10
	Total	44	36

The difficult words included in Level 1 were:

	Mean score
repetition	13
merit	9
qualifications	16
rhythm	16

The word "repetition" was used only in the title of Item 9. It was interpreted as "repeat" in the sentences. "Merit" may prove difficult to interpret in the test. "Qualifications" appear in the title of Item 41. This word is exemplified by reference to C.S.E. and G.C.E. which will be familiar to the school-leavers even if they are not entrants for these examinations. "Rhythm" is perhaps a modern word in terms of usage by this group. Its low score reflects perhaps the change in behaviour and interest of these groups of school-children during the years which have elapsed since Burns made his investigation. Now it is likely to have a much more general understanding by these pupils.

The levels of difficulty of words used only in Level 2 show the greater extent of the vocabulary employed and the lower degree of interpretation by secondary modern school children. Analysis of the difficult words in this list is not really relevant since this Level is intended for those whose degree of understanding is different (and probably much higher) than the statutory school leavers for whom Level 1 is intended.

This analysis does not cover every word used in the test, but apart from a very small number of rarely used

like "clumsiness" and "vouchers" it covers those which are likely to prove difficult. The rest are used very frequently or will have a very self-evident meaning particularly for those involved in an effective guidance programme.

Whilst the meaning of the words used in the test was equivalent to that required by Burns for satisfactory definition, the two contexts in which the interpretations were required were not in any way comparable. Thus a further test of language was necessary by administration of draft copies of the test to groups of school pupils for whom it was intended. This trial is described in detail in the following chapter.

Since this analysis of language was carried out two other measures of reading level and vocabulary have been developed.

In establishing the items of his test of Vocational Maturity, Westbrook (1971)[1] determined the reading levels for each item by applying the measure described in the Revised Core Vocabulary (Taylor, Frankenpohl and White, 1969)[2]. Hough (1972)[3] in a study referred to in Chapter II (p. 98) has measured the readability of careers literature using

---

1. Op.cit., p. 9,
2. S.E.Taylor, H. Frankenpohl and C.E.White, A Revised Core Vocabulary, Huntington, New York: Educational Development Laboratories, 1969.
3. P. Hough, "The Readability of Careers Literature", Vocational Guidance Research Unit, University of Leeds, 1972.

Elley's measure of Noun Frequency Count (Elley, 1969).[1]

The problems arising from the choice of vocabulary are described more fully in the light of the experience of the use of this test (Chapter VIII, p. 363).

3) SCALARITY OF ITEMS

Each item should, as far as is practicable, be concerned with a single concept or a group of related concepts. The attention of the client should be directed to an aspect of occupational information which should preferably be unidimensional. In dealing with a wide range of occupations in many different aspects, this is not always easy to construct.

Some items are obviously and even uniformly scalar.

e.g. Item 20 Number of Hours Worked in a Week (Levels 1 & 2)

1. In this job a person has normally to work less than 30 hours per week.
2. In this job a person has normally to work between 30 and 40 hours per week.
3. In this job a person has normally to work between 40 and 50 hours per week.
4. In this job a person has normally to work between 50 and 60 hours per week.
5. In this job a person has normally to work over 60 hours per week.

---

1. W.W.Elley, "The Assessment of Readability by Noun Frequency Counts", Reading Research Quarterly, Spring 1969.

Item 23 Amount of Starting Pay (Level 1)

1. In this job people start by earning less than £3 per week.
2. In this job people start by earning between £3 and £8 per week.
3. In this job people start by earning between £8 and £12 per week.
4. In this job people start by earning between £12 and £20 per week.
5. In this job people start by earning over £20 per week.

(Levels 1 and 2 follow the same patterns of scalarity).

Other items may include two dimensions worked together in the same scale e.g. time and degree.

Item 30 How Others See this Job (Level 2)

1. Other people see this occupation as unattractive and useful work.
2. Other people see this occupation as attractive and useful work.
3. Other people see this occupation as very attractive and useful work.
4. Other people see this occupation as very attractive and very useful work.
5. Other people see this occupation as very attractive but not very useful work.

Item 38 Thinking and Doing (Level 1)

1. This job involves work which requires very little thinking at all.
2. This job involves work which requires more doing than thinking.
3. This job involves work which requires thinking and doing about equally.
4. This job involves work which requires more thinking than doing.
5. This job involves work which requires a lot of thinking.

It will be noted that whilst these items may be regarded as scalar the scale in some items is not linear.

Some items are scalar but not uniform in a verbal or numerical sense:

e.g. Item 8 Noise or Vibration (Levels 1 & 2)

1. The place where this job is done is very quiet.
2. The place where this job is done is quiet with occasional sounds.
3. The place where this job is done has normal sounds, for example, talking, quiet machinery, office equipment, traffic.
4. The place where this job is done is noisy.
5. The place where this job is done is very noisy with disturbing vibrations.

Item 28 Leadership of Others at Work (Level 2)

1. This occupation involves working alone.
2. This occupation involves being supervised by employers, foremen or senior staff.
3. This occupation involves working in a team of equals with little supervision.
4. This occupation involves being in charge of and working with, a small team.
5. This occupation involves being in charge of a group of people, without close supervision.

Item 40 Accuracy (Level 1)

1. In this job accuracy is never necessary.
2. In this job accuracy is sometimes necessary.
3. In this job accuracy is often necessary.
4. In this job accuracy is usually necessary.
5. In this job a very high degree of accuracy is always necessary.

These types or combinations of conditions which occur together are referred to as being "semi-scalar",

e.g. Item 6 Dryness or Dampness of Work Place (Levels 1 & 2)

1. The place where this job is done is usually dry.
2. The place where this job is done is usually neither dry nor damp.
3. The place where this job is done is sometimes dry and sometimes damp.
4. The place where this job is done is usually damp.
5. The place where this job is done is usually outdoors.

A third type of item is that which samples a number of common occupational characteristics but leaves the possibility open for none of these alternatives to be the most appropriate in a particular occupation:

e.g. Item 1 Place of Work - Indoors (Levels 1 & 2)

1. This job is done mainly in an office or retail shop.
2. This job is done mainly in a factory.
3. This job is done mainly at home or in a hospital.
4. This job is done mainly travelling about.
5. This job is done in none of these places.

Item 39 Shapes, Drawing, Painting and Music (Level 2)

1. This occupation involves an understanding of space and shape in wood, metal, pottery or stone.
2. This occupation involves an appreciation of colours, shapes and designs.
3. This occupation involves accurate drawing ability.
4. This occupation involves an appreciation of rhythm and musical notes.
5. This occupation involves none of these abilities.

This type of item is regarded as non-scalar.

The 43 items are thus classified broadly into three types:

TABLE 4.6

CLASSIFICATION OF ITEMS IN TERMS OF SCALARITY

Type 1 Scalar Items

13. Sitting or Standing
20. Number of Hours Worked in Week
23. Amount of Starting Pay
26. Payment at 25 (or 30) Years old
30. How Others See the Job
38. Thinking
41. Examination Qualifications

Type 2 Semi-Scalar Items

5. Temperature of Work Place
6. Dryness or Dampness of Work Place
8. Noise or Vibration
9. Repetition or Variety
12. Strength
14. General Health
15. Work with Hands and Feet
16. Eyesight
17. Talking
21. When Workers are Paid
22. Rates of Pay
28. How much Leadership of Others

29. Membership of Unions (or Professional Bodies)
31. Separation from Home
32. How Much Work is done by Others
33. Deciding for Yourself in the Job
34. Being Relied On
35. Words and Writing
36. Clerical Work
37. Numbers
40. Accuracy
42. Place of Training
43. Future Prospects

Type 3 Non-Scalar Items

1. Place of Work - Indoors
2. Place of Work - Outdoors
3. Things or People Worked With
4. Working Conditions
7. Smell
10. Dangers of the Work
11. Appearance of Clothes
18. Arrangement of Normal Hours of Work
19. Unusual Hours of Work
24. Extra Benefits
25. Increases in Pay
27. How Work is done with People
39. Shapes, Drawing, Painting and Music

This composition of the types of items affects the statistical techniques which may be applied to the interpretation of the test results. This difficulty is discussed more fully in Chapter VIII (p. 385).

FORMAT AND INSTRUCTIONS

Part 1 of the test thus consists of 43 objective items describing occupational characteristics appropriate to the student involved in careers education.

In order to work the test the student first names the occupation he is considering and then reads through each item in turn selecting the one sentence out of the five alternatives which he believes most appropriately describes the occupation he has named. These responses are indicated in an answer booklet (Appendix 4, p. 446). The activity of considering each alternative should help the student to become more aware of the many aspects of the occupational environment (Test Objective 1, p. 165).

His knowledge of this particular occupation may then be compared with the description given by others with knowledge or experience of that occupation (Test Objective 2, p. 165). The way in which this is determined is discussed in Chapter VI (p. 278).

Part 2 of the test gives the student the opportunity of considering the relative importance to him of each of these 43 occupational characteristics (Test Objective 3, p. 166). Here the list of titles is displayed so the student can indicate those he regards as "important" and then select the three which are "most important".

The basic principles on which the response sheet has been designed are, of course, the same as those for the items i.e. clarity, unambiguity and, wherever possible, simplicity.

The two Levels are similar in format although a difference is seen in the titles:

Level 1: Test of Information about a Job
Level 2: Test of Occupational Information.

This is justified by the evidence of Haystead (1971)[1] and Hughes (1971)[2] who found that fourth year leavers do not conceive of work in terms of "occupations" or even perhaps as "jobs" but as "positions" e.g. a girl may wish to work in Woolworths or failing that to work "in the Town Hall". In so far as these are specific they relate to positions rather than jobs or occupations. Musgrave (1968)[3] suggests that this is typical of the way fifteen and sixteen year old school leavers view employment. Thus to use the word "occupation" is inappropriate at Level 1 of the test and "job" is used as being more meaningful. This is justified on the basis of understandability of the word "job" to Level 1 students rather than on the definitions of the terms themselves as set out in Chapter III (p. 110).

The titling of the job or occupation on which the test is completed is important. To achieve this the wording of the opening question is such as to leave the student free of other considerations of personal abilities and

---

1. J.M.Haystead, "Social Structure, Awareness Contexts and Processes of Choice", Sociological Review, 19: 79-94, 1971, p. 80-81.

2. P.M.Hughes, Guidance and Counselling in Schools, Oxford, Pergammon, 1971, p.20.

3. Op.cit.

interests or occupational availability. The words chosen were "Which job/occupation do you want to enter?" The student completing the test material is likely to be at some stage of crystallising his preferences (Super, 1970)[1] (p. 59) or making tentative choice (Ginzburg, et al. 1951)[2] (p. 55). The degree of specificity of the job or occupational title may be anywhere on a scale from a specific task to a major occupational grouping (see Chapter III, p. 111). The interpretation of the responses to the title raises issues here if norms are to be used. These are discussed in Chapter VI (p. 248) and Chapter VIII (p. 379) in the light of the experience of the use of the test material with both students in schools and with groups concerned in the norming of particular occupational titles.

The instructions for completion of the material were set out on the front cover of the response booklet and at the beginning of Part 2. This enables the test to be used by individual students without explanation which may be given in the group administration.

The format and interpretation of instructions were investigated in the trial on groups of school students. This investigation is described in the following Chapter.

---

1. D.E.Super, "Vocational Maturity in the Secondary School," Psychology of Careers Course, Keele University (15-20/9/70).

2. E. Ginzberg, S.W.Ginsburg, S. Axelrad, J.L.Herma, Occupational Choice: An Approach to General Theory, New York, Columbia University Press, 1951, pp. 60 and 66-71.

CHAPTER V

PILOT ADMINISTRATION OF THE TEST

PURPOSES OF PILOT ADMINISTRATIONS

The content of the items has been structured in relation to occupational characteristics described professionally for specific functional purposes e.g. work study, manpower planning. The words used are not necessarily understood or interpreted by students at school with the same meaning.

A preliminary pilot administration of the test is necessary in order to discover whether the words in the items are interpretable to students of an age and reading ability comparable to those who may subsequently use the test.

Use of the material with small groups of participants will reveal the extent to which they agree within their group about the description of their occupation. If a wide variation of response was shown here, the validity of the norms might be seriously questioned.

In order to acquire evidence on these issues pilot administrations of the test material were carried out.

WORD USAGE

Since ~~the~~ one purpose of the trial is to ascertain the appropriateness of language used in the test response format and the multiple choice items it was essential to find a range of students to try each level. Initial discussion with the Headmaster and senior staff of a large comprehensive school suggested that this would be possible with a house group of fourth year (15 year old) students for Level 1 and a first-year sixth form group for Level 2. A further suggestion that a group of fifth formers might try to produce evidence of their suitability for both levels was gladly accepted.

The fourth and fifth forms at the school are broadly divided into three main tracks (or sides): academic; technical/nautical/commercial/catering and tailoring; non-examination. The fourth form group participating in the trial was a house group of the non-examination track. These were all students who had opted to leave school at the earliest statutory opportunity. In the opinion of the school some of these were capable of taking C.S.E. subjects into the fifth year but despite advice still chose to leave in the fourth form. Other members of the group were recent transfers from remedial reading sets. The composition of this group is shown in Table 5.1.

TABLE 5.1

FOURTH FORM NON-EXAMINATION GROUP

	Boys	Girls	Proposed leaving date	
			Easter	Summer 1969
Ex-top stream students	1	1	1	1
Remainder of group	10	9	12	7
Ex-remedial students	3	1	2	2
Totals	14	11	15	10

The fifth formers at the school are all preparing for C.S.E. or G.C.E. 'O' Level examinations in a wide range of subjects. The groups selected were the second and fifth (of five) English sets. Most of those in the second set were likely to go into the sixth form but most of the fifth set intended to enter employment immediately after their C.S.E. examinations at the end of the Summer term. The examination aspirations of this group are shown in Table 5.2.

TABLE 5.2

TOTAL STUDENT/SUBJECT ENTRY COMPARING 5th SET 2 and 5th SET 5

	5 Set 2			5 Set 5		
	Boys	Girls	Total	Boys	Girls	Total
G.C.E.	10	8	18	1	0	1
C.S.E.	71	32	103	102	22	124
Total No. of subjects	81	40	121	103	22	125
Total No. of students	11	6	17	15	3	18
Subjects/student Mean	7.4	6,7	7.1	6.9	7.3	6.9
Range	6-8	5-7	5-8	5-8	7-8	5-8
G.C.E. as % of total school entry	12.3	20.0	14.9	1.0	0.0	0.8

In terms of total G.C.E./C.S.E. entry these groups are very similar; the distinction comes in the G.C.E. entry as a

percentage of the total. The only potential entry in the whole of 5 Set 5 was one boy in Navigation.

The sixth formers, most of whom had had the whole of their secondary education at the school, had achieved varying degrees of success in the C.S.E. and G.C.E. 'O' Level examinations and were intending to enter further G.C.E. Ordinary and Advanced Level examinations.

TABLE 5.3

EXAMINATION RESULTS OF SIXTH FORMERS

	Numbers of G.C.E. O Level passes & C.S.E. Grade 1		Lower Sixth	Middle Sixth	Total
	Mean	Range			
Boys	2.8	0-7	11	6	17
Girls	2.7	0-6	6	8	14
Total	2.8	0-7	17	14	31

All students had additional C.S.E. grades (other than Grade 1) in subjects not passed at G.C.E. Ordinary Level or its equivalent. The total number of G.C.E. and C.S.E. grades discounting duplication, varied from 6 to 10 subjects and many of the C.S.E. grade subjects were being re-taken as Ordinary Level subjects in the Lower Sixth. With one exception all members of the Middle Sixth Form were intending to enter Advanced Level examinations after a two-year course.

Administration of Trials

The tests were administered to the Form groups described either as a group or individually on various

occasions between 14 January and 6 February 1969. In all cases the administrative procedure was the same.

A brief introduction was given of the purpose of the test and nature of the trial. For the fourth year group this lasted 15 minutes and included for them an oral description of the instructions; for the other groups this was not thought necessary and the introduction was to establish rapport and to motivate the students to co-operate responsibly. The item and response booklets were distributed to each student suggesting that they read through the instructions and example of Part I and ask orally any questions as they occurred. They were asked to fill in the personal details and continue at their own pace working through the test. Emphasis was given to the titling of the job/occupation rather than to the firm or organisation in which it was carried out. Students were encouraged to ask questions and to underline words they did not understand on the item sheet. Apart from the reading of instructions at the beginning of Part 2 for fourth year students all continued to the end of the test without interruption. In the class administration the time for completion was measured as a practical guide - not as a feature of the construction.

TABLE 5.4

TIME FOR COMPLETION OF TEST

Form	Shortest time mins.	Estimated mean mins.	Longest time mins.
4th	35	45	60
5th	28	35	55
6th	20	27	40

Any interpretation of these times should take into account not only the reading and understanding of the test but factors of motivation and selection of job title for description.

Wording of Instructions

There were no questions about the instructions to Part I from any of the groups although a few of the fourth form pupils became a little confused in transferring their attention between the response booklet and the item booklet. Careful administration and reconsideration of format is indicated here.

The only question arising from the personal details of the sixth formers concerned the inclusion of examinations to be entered with those already taken.

The titling of jobs/occupations showed an interesting contrast between the forms. Of 31 sixth formers four took almost 15 minutes to settle for the occupation they would describe - two had great difficulty in defining even a broad field of interest. Of 17 students in 5 Set 2, 8

could name no job without discussion with the investigator and eventually some of these gave the impression of little enthusiasm for the occupation eventually named. In 5 Set 5 no difficulty in naming was apparent to the investigator and of the 5 fourth formers who did not immediately respond a brief discussion with the careers master or investigator very quickly clarified the title. This suggests that for some first year sixth formers the choice and titling of an actual occupation is deferred perhaps until the necessity for educational decisions forces the issue. Most of the 5 Set 2 students were likely to remain in the sixth form. The guidance in the school was focussed towards the encouragement of this and accounts for 44% (8 out of 17) having difficulty in titling. The only rejected response sheet came from a "male" who interpreted the test for the occupation of a nun. Implications are drawn in Chapter VII (p. 312) on the appropriate use of this test in the guidance process.

A very few questions arose from the instructions for Part 2. Two fourth formers did not "understand" the word "important". One asked "how many" items should be selected as important. An ex-remedial pupil thought that the "most important" items could be chosen only from the first side of this part. Table 5.5 shows the varieties of interpretation of the instructions for Part 2.

TABLE 5.5

INTERPRETATION OF PART 2 INSTRUCTIONS

Form	Exactly as Instructions	Interpretable by Instructions	Slight deviation from Instructions	Uninterpretable	Total
6	24	28	1	2	31
5 Set 2	8	12	0	5	17
5 Set 5	14	16	2	0	18
4	20	21	1	3	25
Totals	66	77	4	10	91

"Interpretable by Instructions" includes those who ranked more than three as "most important".

"Slight Deviation from Instructions" includes those who ranked three as "most important" but did not tick these items as "important".

"Uninterpretable" includes those who did not rank "most important" items and two individuals who only ranked two as "most important".

The high degree of uninterpretability in the upper ability ranges may reflect motivation rather than understanding. The impression gained by the investigator in the school and the evidence of the previous paragraph suggests that the sixth and 5 Set 2 groups contained some individuals for whom the exercise was not appropriate at that particular time.

Understanding of Item Content

The linguistic differences employed in the two Levels of the test have been described in Chapter IV (p. 199). Level 1 was devised to be suitable for those students intending to leave school without sitting any external examinations and those unlikely to gain 5 'O' Level passes. Level 2 was intended for those achieving at least this attainment and probably continuing in full-time sixth form, further or higher education. The investigator was encouraged by the school to try the test also with two groups of fifth year students who were intending to leave at the end of the school year (see p. 221). The school attached a great importance to this group of fifth year students. It constituted 45% of their year entry. The remainder being made up of 10% who entered the sixth form and 45% who left in the fourth form. The policy of the school was to encourage staying into the sixth form where appropriate but local family tradition operated strongly towards encouraging students to enter employment at 15 (then the statutory leaving age) or at the latest 16.

Reading of different Levels

The different levels of the test were distributed between the form groups as shown in Table 5.6. This distribution was determined by the class teacher's estimate of their potential or actual examination performance being above or below 5 'O' Levels.

TABLE 5.6

DISTRIBUTION OF LEVELS BETWEEN FORMS

Form	Level 1	Level 2
6	0	31
5 Set 2	7	10
5 Set 5	10	8
4	25	0
	42	49

It was generally taken for granted that all the words used could be read by sixth formers and the fifth formers in the sample. This could not be assumed for the fourth formers. When questions arose on the meanings of words in this group, the investigator first satisfied himself that the words could be repeated orally by the student. In every case this was satisfactorily and rapidly performed even by the students recently transferred from a remedial group. One possible exception was an ex-remedial student whose broad Wearside accent was made almost unintelligible by a serious speech defect.

Generally it could be assumed the Levels presented no difficulty in terms of reading, as distinct from understanding or interpretation of occupational information.

Understanding of Item Content

Evidence of the student's understanding of the multiple choice item content was available from students' questioning of the investigator and the Careers Teacher whilst they were answering the test and by individual interviewing of

of selected groups of fourth and sixth formers.

The questioning arising during the answering of the test clearly would not account for all the doubts experienced by the students even though they were encouraged to raise their queries and not to regard the test as a competitive exercise. However, it was likely that 91 students in four separate groups would raise many of the difficulties which a larger population of similar pupils would experience. The questions raised could be classified as two types: job or occupational content and understanding of words. Whilst this trial was expressly concerned with the second of these types, valid questions of occupational content at least in minor wording are important in the construction of the test. Many questions of information about particular jobs have been disregarded as irrelevant; only those regarded as valid criticism of the multiple choice alternatives available are listed here.

Questions of Job Content - Level 1

Ques.	Item	
1	3	Does a shop assistant work mostly with things to sell or people? (4th form)
2	13	A motor mechanic will spend most of his time lying? (4th form)
3	21	Different firms pay workers in the same job at different times? (4th and 5th forms)
4	25	Different firms give increases in pay for different reasons? (4th form)

(Reference should be made to Appendix 4 (p. 446) for the full expression of the items).

With the exception of question 2 these were regarded as valid comments on the test items and will be considered later as possible minor amendments.

Questions of Occupational Content - Level 2

Ques.	Item	
1	2	Does a civil engineer work in all these places? (6th form)
2	5	Does a P.E. teacher work indoors or outdoors? (6th form)
3	24	Different firms pay for the same job either weekly or monthly?
4	31	A teacher or customs officer could either live at home all the time or live away from home for long periods frequently? This is determined by the availability of employment and is not readily assessible as occupational content. (6th form)
5	34	Does this item imply responsibility for both materials and money? (6th form)
6	34	Are not teachers responsible for pupils rather than materials or money? (6th form)
7	39	Do art teachers and civil engineers require all the abilities in sentences 1, 2, 3? (6th form)

All these points have justification in some measure. Questions 1, 2, 3 and 7 were regarded by the investigator as a matter of discrimination between the sentences and would not be changed in the revised version. Questions 4,5, 6 were regarded as valid criticisms of the wording and have implications beyond the context of the specific occupational descriptions attempted here. Revision of these items was clearly necessary.

The following table shows words which were either underlined or whose meaning was questioned by the students.

TABLE 5.7

MEANING OF WORDS - LEVEL 1

Item	Word or phrase	No. of times questioned
2	Overhead	3
6	Sometimes dry and sometimes damp	2
14	Physical handicap	1
24	Purchases	2
25	Merit	1
29	Union	1
40	Accuracy	1

All these difficulties were brought forward by fourth formers. In addition other fourth formers found difficulty in choosing the sentence which indicated "none of these things" in items 35, 36 and 37. Each of these items in fact have as their first sentence an opportunity to express this type of response. At Level 2 only one student expressed difficulty of understanding in the following items:

Item	
35	Verbal instructions compiling verbal ideas
36	involves organisation

This pupil was in 5 Set 5 and forms the only evidence available on the question of unsuitability of Level 2 at this stage. No member of the sixth form raised questions of understanding on the items in Level 2.

The pupils' understanding of words was further investigated by individual interview.

For the fourth form group the words and phrases listed in Table 5.7 formed the basis of the discussions. Other related words were added by the investigator to help to complete the context of the item. Of these, five of the words occur in Burns' list (Table 4.4, p. 206).

Item		% scores of definition (Burns' Investigation)		
		Boys	Girls	
14	handicaps	32	33	moderately difficult
24	discount	26	28	
24	merit	12	6	difficult
25	promotion	65	54	relatively easy
40	accuracy	64	61	

Table 5.8 indicated the responses where the ticks and crosses show the satisfactory and unsatisfactory meaning of the words. The students were selected by the House and Careers master as a cross-section of the verbal ability of the 25 who answered the test.

In items 2 and 6 the pupils were asked to name a job or environment appropriate to the words "underground" and "overhead". On health (item 14) they were asked for examples of handicaps or defects. For the words taken from items 24, 25, 29 and 40 students were asked "What do you mean by.....?"

The results show that broadly the understanding of the words is related to the teacher's ranking of verbal ability.

An arbitrary standard of at least 10 satisfactory responses to the item out of a possible 13 is assumed to be acceptable and not to be worth alteration or amendment. Thus

6 of these words or phrases should be considered to lack satisfactory interpretation by this group of fourth form leavers. These are discussed in order of the degree of lack of understanding.

"Purchases" was surprisingly the word which caused most difficulty. Six pupils connected it with "H.P." and interpreted it in terms of "hire" rather than "purchase".

"Sometimes dry and sometimes damp" was a situation which only five could describe in occupational terms and they all thought of a coal mine.

"Neither dry nor damp" was equated mostly with a non-manufacturing type building i.e. an office, shop, school, hospital, but only 7 could identify this type of environment.

"Discount" and "Unions" were inadequately understood by 5 of the pupils. Most of these gave no response at all.

"Reasonable health" was generally understood and probably the 4 students who were asked to "say this in other words" showed lack of vocabulary rather than understanding. The word "fit" was generally acceptable as a substitute.

"Overhead" was difficult to see in occupational terms, even though shipyard cranes were visible from the school.

"Health defects" were already exemplified in the item and this phrase rather than the examples appeared to be the difficulty.

"Merit" and "promotion" were generally understood except by the ex-remedial students.

It was not thought necessary to amend all these items.

Suggested Amendments on Understanding - Level 1

Item	Word or Phrase	Satisfactory Score (max.=13)	Amendment
2	Overhead	10	Not amended
2	Underground	11	Not amended
6	Neither dry nor damp	7	Normal indoor conditions
6	Sometimes dry and sometimes damp	5	Sometimes dry and sometimes damp (indoors)
14	Health defects	10	Not amended
14	Reasonable health	9	Who are fit
24	Discount on purchases	8,3	A reduced price on things I buy
25	Merit	10	Not amended
25	Promotion	10	Not amended
29	Unions	8	Not amended (no other appropriate word)

For understanding of Level 2 the members of the sixth form group were questioned by the investigator on the meaning of items:

6 Dryness and dampness of work place
18 Arrangement of normal hours of work
26 Payment at 30 years old
34 Reliability

In all cases any lack of understanding was due not to the language used or the concept described, but to lack of knowledge of occupational content. No sixth former underlined any word on the item sheet or asked any questions involving understanding.

Thus the trial of linguisticinterpretation revealed a level of difficulty when Level 1 was administered to this group of fourth form students. The number of words selected for investigation because they raised difficulties in the context of the test amounted to 13 of the possible

215 phrases. Of these overall there was a level of 69% interpretability. The unsatisfactory phrases could be regarded as $\frac{13}{215} \times 31\% = < 2\%$. Of these 5 of the least interpretable words and phrases were amended to expressions which were shown to be understood and this level was reduced to less than 1%.

Amendments to Test Material resulting from Pilot Administration in School

As a result of the experiences in the trial in school, certain amendments were made to item booklets:

1) The title was changed from Test of Information about a Job (Level 1) /Occupation (Level 2) to Job / Occupational Information Item Booklet. The material is not a test in the sense that the results may be compared with other testees. It may be used as an individual's personal guide to his own occupational information and values. The word "test" implies the connotation of selection and comparison, whilst the prime purpose of this instrument is individual learning as a part of the careers education programme.

2) The format of the items was criticised by teachers in the trial school. They felt that the reading required, particularly for the less able students could be made easier by reducing each item from five separate, grammatically complete sentences to one sentence with five alternative phrases e.g.

Item 4 Working Conditions (Level 1)

The place where this job is done is

1. clean.
2. dusty.
3. greasy.
4. dirty.
5. dirty and greasy.

By this means the number of words actually read was reduced considerably.

In Level 1 each item was also re-written in the first person singular, giving a feeling of more personal identification. This was not thought to be necessary or appropriate for Level 2 students.

3) The wording of certain items was changed according to the amendments listed on p. 236 . No alteration was made to the description of occupational characteristics.

4) The order of the items was slightly changed:

Item 31 Separation from Home was moved to the end of the group of Personality Requirements i.e. it became Item 34. This meant that the three items describing Responsibility followed immediately after the group describing Social Environment (Items 27 - 30). The section on Personality Requirements was thus constituted as:

Item 31 How Much Work is done with Others (Sociability)
Item 32 Deciding for Myself in the Job/Occupation (Initiative)
Item 33 Being Relied on (Reliability)
Item 34 Separation from Home

The complete amended versions of the Item Booklets are included in Appendix 5 (p. 465).

OCCUPATIONAL DESCRIPTION

Following the amendments resulting from the school trial of the initial draft of the test, it was necessary to discover how occupations are described by those who may produce the norms to the test. It was felt that the two groups who might usefully produce norms by giving their description of certain occupations in terms of the test items would be:

1) Careers Advisory Officers who are the experienced professionals involved in guidance of school-leavers. Their training (Ministry of Labour, 1965)[1] and experience provides them with a knowledge of occupational information appropriate to the school-leaver.

2) Participants in occupations who have experience in the work. Their position should not be so far removed from the entry stage so their descriptions will not be affected by promotion, redundancy or other factors which would not be entirely relevant to the school-leaver.

If the test is to be a useful instrument in guidance, descriptions of occupations should show a definable and acceptable degree of consistency when occupational titles are described by a group of Advisory Officers and participants.

The Principal Careers Officer of a large city authority

---

1. Ministry of Labour, Central Youth Employment Executive, "The Future of the Youth Employment Service",(Albermarle Report), H.M.S.O., 1965, pp. 48-56 and 89-90.

in the North-West, readily agreed to allow the investigator to approach 26 members of his staff with the request that they should describe three different occupations in terms of the test. These occupations were:

Level 1 : Telephone Operator - G.P.O;
Motor Mechanic

Level 2 : Teaching.

These were selected to cover what was thought to be a wide range of activities in occupations entered at both levels by both male and female students. Ten of the 26 officers completed the sheets. The detailed results of this trial are shown in Appendix 6 (p.482).

Co-operation of participants in two different occupations was readily obtained. These occupations were:

Level 1 : Telephone Operator - G.P.O.; Motor Mechanic.

The telephone operators worked in local Telephone Exchange and the motor mechanics attended a College of Further Education for Day Release.

The results of these trials are shown in Appendix 6 (p.482). They were analysed in order to determine the significance of the variation of these responses from chance. If a number of items produced responses which appeared to differ little from chance, clearly these items would have little value in the test.

TABLE 5.9

SIGNIFICANCE OF ITEMS IN TRIAL NORMS

OCCUPATION	SOURCE OF TRIAL NORM	N	NO. OF ITEMS SIGNIFICANT AT p =		
			≤.01	≤.05	>.05
Motor Mechanic	Advisers	10	33	5	5
Telephone Operators	Advisers	10	32	5	6
Teaching	Advisers	10	27	6	10
Motor Mechanic	Participants	15	39	2	2
Telephone Operator	Participants	20	43	0	0

The χ^2 values were calculated in terms of the significance of the differences of the responses from chance i.e. a distribution for the five sentences by chance was taken to be 2 2 2 2 2 (for a group of 10 respondents). Even with groups as small as ten more than half the items showed less than 1% likelihood of chance responses. When the groups reached 20 all items were significant at this level. It is not argued that each item profile should be of the shape 0 10 0 0 0 where all the respondents choose the same sentence. It may well be a feature of the occupation that more than one sentence appropriately describes a particular aspect. Thus some item profiles may well show a wider distribution. Even so, with norms produced by groups of 20 or more the responses should be highly significant.

Review of the trials of the material with the Careers Officers and the Participants suggested that it should be possible to produce norms.

All groups were encouraged to be critical of the

material and the comments received, mainly from Careers Officers, related to the use of the material rather than the content of the items.

As a result of these trials no amendments were made to the items. The response booklets were slightly amended to be appropriate to the participants. The Careers Officers were only expected to complete Part 1 of the test as it was inappropriate for them to indicate their own values in relation to occupations in which they were not personally involved. No analysis was made of the participants' judgments of values at this stage.

Following the experience of the pilot administrations and the amendments arising from them, the experimental use of the test was extended. Two types of norms were produced and the material was completed in a wide range of different secondary schools throughout Great Britain.

CHAPTER VI

EXPERIMENTAL TRIALS AND RESULTS

DEFINITION OF TERMS

The trials of the test material were carried out for two reasons.

Firstly, to produce norms in the 29 occupations from those who are able to make judgments on occupational characteristics either from professional knowledge or experience. These norms were produced by

a) the professional careers advisers

and b) those actually involved in the occupations.

Secondly, to discover problems of administration and interpretation of the test with groups of students to whom the two levels of the test were thought to be appropriate. The test was used mainly in schools. Although all students had had at least three years of secondary education (two years in Scotland) no planned attempt was made in these experimental trials to use their test results in careers education.

Various terms could be used to describe these groups, but in order to be consistent and perhaps to aid the clarity of the arguments a single term has been selected to describe each of the groups.

1) The professional careers advisers were known, prior to 1968, as Youth Employment Officers. Although the service they operate is still statutorily known as the Youth Employment Service, their professional title is Careers Officer (see Chapter I, p. 7). This term is adopted throughout the thesis. There is no other suitable alternative.

2) A number of terms may be appropriate to describe those who are actually engaged in the occupation. "Workers" or "employees" may be the term normally applied to many occupations. Whilst these words may describe a Van Boy or a Fitter, they hardly indicate a Clergyman or a Solicitor. A word which does not have the emotional overtones suggested by the differences of social class and type of work is Participant. This word, although perhaps not common in this sense, is taken as the most appropriate to the whole range of occupations which this test is intended to include.

3) Those who may use the test in order to help their vocational choice may be variously termed. In relation to their stage of occupation they may be "school-leavers", "pupils" or "students". In the experimental trials some were about to leave school, some were in the fourth year of secondary education and unlikely to leave school for a further three or four years, others were students in a College of Further Education. The test is intended to be suitable for all these groups and it is inappropriate to use any of these terms to the exclusion of the others, when referring in general to those who worked the test material. Since it is believed that all those who use this test will be involved in careers education, the most appropriate term for such a person is a Student.

The terms Careers Officer, Participant and Student are used subsequently in descriptions of the trials and use of the test material.

NEED FOR NORMS

The second aim of the construction of the test as set out in Chapter IV (p. 165) states that the student "should be informed of the accuracy of his occupational information in relation to the descriptions of those with knowledge of, and those actually engaged in, the occupations". If the test is to help to develop the student's self-awareness of occupations it is useful if he is able to compare his knowledge with those who have information and personal experience of occupations. Comparison of the importance of different aspects of the occupation with those who are actually engaged in the work may also help him to be more aware of the possibilities of self-fulfilment in the occupation.

Whilst the techniques of careers education briefly described in Chapter II (p. 92) help to develop the student's occupational understanding, most of the techniques necessarily provide "second hand" information. Books, films, visits, games may make some contribution to the occupational concept. This test is complementary to these techniques in providing an opportunity for the student not only to survey the range of occupational characteristics, but also to compare his knowledge with those who have knowledge of a wide range of occupations (Careers Officers) and those actually involved in them (Participants). To fulfil this latter purpose norms need to be established.

The student is in the process of developing his self-concept. He is becoming aware of the extent to which

the characteristics of occupations fulfil his needs (Hoppock, Chapter II p. 65). By completing Part 2 of the test and comparing his "important" and "most important" items with the ratings of participants in certain occupations he will have some measure of the extent to which his needs are likely to be fulfilled.

Thus the student becomes aware of occupational information through various techniques. He then works through Part 1 and Part 2 of the test material and derives from it a sounder basis on which to make either investigatory or terminal decisions (Gelatt, Chapter II p. 85).

SELECTION OF OCCUPATIONS FOR NORMING

It is impossible to define the number of occupations for which, theoretically at least, it might be possible to produce norms. The Dictionary of Occupational Titles (U.S. Department of Labor, 1965)[1] lists about 30,000 different occupations. These are titled to a high degree of detail e.g. production worker - confectionery - chocolate pourer. The Department of Employment Classification of Occupations and Directory of Occupational Titles (CODOT) (Department of Employment, 1972)[2] similarly classifies and specifies down to considerable detail:

e.g.	(Major)	Group VIII	Selling Occupations
	(Minor)	Group 36	Selling Occupations (Distributive Trade)
	(Unit)	Group 361	Salesmen and shop assistants
	(Unit Sub)	Group 361.08	Shop assistant (Antiques and objets d'art)

(See also Chapter III p. 155).

Whilst this classification was discussed with members of the DEP Manpower Research Unit in October and December 1968, the outline and details were only available in November 1972 when most of the experimental work had been completed. For obvious practical reasons it was necessary to make plans

---

1. U.S.Department of Labor, Dictionary of Occupational Titles, Vol. 1, Definition of Titles, Vol.2, Occupational Classification and Industry Index, Third edition, U.S. Government Printing Office, Washington DC, 1965.

2. Department of Employment, Classification of Occupations and Directory of Occupational Titles, 3 volumes, Vol.1, H.M.S.O., 1972, p. 53.

for obtaining the norms before the detailed classification was available. Reference was therefore made to other British sources of occupational titles particularly the classification of occupations for census purposes (Registrar General, 1966).[1] Most of the titles selected were taken from this classification.

In selection of occupations for provisional norms for the test certain criteria were considered:

i) Test Level

It was important that occupations should be sampled which were entered by students at both Level 1 and Level 2 in educational attainment (definitions in Chapter IV, p. 196).

ii) Population and Sex

If they are to be of value in the guidance process, it will be useful to produce at least some norms in occupations with high populations. For Level 1 occupations the appropriate census populations relate to the 15 - 20 age group. For Level 2 occupations they are taken as the whole age group, since training requirements may mean that entrants may be 21 or over. Table 6.1 shows the populations of a number of occupations from which those named in CAPITAL LETTERS were selected. It was also important to consider both sexes in the selection based on this criterion.

---

1. Registrar-General: General Register Office, Classification of Occupations, 1966, H.M.S.O.

Table 6.1.

SELECTION OF OCCUPATIONS

List in order of Total Population

Occupations considered	Occupational Title selected	Population (thousands) aged 15-20		Population (thousands) Total population		Level of Interest	
Census Title		Male	Female	Male	Female	Test	A.P.U.Code
Clerk, Cashier, Machine Operator	CLERK	102.92	271.86	980.87	1,130.17	1	K
Typist, Shorthand writer, secretary	TYPIST	-	158,02	13.94	650.02	1	K
Fitter, machine erector	FITTER	80.18	-	652.18	3.22	1	L
Shop assistant: non food	SHOP ASSISTANT: non-food	32.71	118.11	133.88	438.31	1	G
Warehouseman, storekeeper	-	27.62	9.25	392.25	77.88	1	L
Teacher	TEACHER	-	-	183.24	261.66	2	F
Agricultural worker		56.82	11.18	296.44	50.57	1	M
Maid, valet & related service worker	-	-	25.25	20.39	300.64	1	F
Nurse	NURSE	-	-	28.55	262.74	2	F
Packer, labeller & related worker	PACKER	7.68	33.16	86.00	197.05	1	L
Shop assistant: food	-	17.57	41.83	62.69	216.35	1	G
Armed Forces (U.K.)	-	50.06	4.70	266.90	10.52	1	L,M.E.
Painter and decorator	-	19.84	-	255.99	7.38	1	L,J
Carpenter and joiner	JOINER	32.69	-	260.24	1.06	1	L
Sewer, embroiderer	TEXTILE MACHINE OP.	-	59.36	6.77	241.87	1	L
Labourer: building & contracting	LABOURER: BUILDING & CONT.	28.14	-	243.41	0.75	1	L
Electrician	ELECTRICIAN	40.65	-	228.48	5.61	1	L
Draughtsman	DRAUGHTSMAN	16.63	-	150.17	16.71	2	K
Plumber,lead burner & pipe fitter	-	18.47	-	149.12	0.70	1	L
Hairdresser, manicurist, beautician	HAIRDRESSER	6.52	50.14	39.99	99.55	1	L
Butcher and Meat cutter	-	20.71	-	115.65	4.60	1	L
Telephone operator	TELEPHONE OPERATOR G.P.O.	-	18.97	17.79	84.02	1	L
Accountant,Company Secretary,Registrar	BANKING	6.41	-	83.45	13.32	2	K
Police	POLICE	4.57	-	86.94	2.43	1	F
Laboratory assistant,technician	-	11.60	9.01	57.73	28.36	2	E
Surveyor, architect	ARCHITECT	-	-	67.97	-	2	J
Clergy,minister,members of religious orders	CLERGY	-	-	50.83	13.60	2	F
Medical practitioners	-	-	-	44.23	8.34	2	E,F
Chemist,physical & biological scientist	INDUSTRIAL CHEMIST	-	-	45.18	3.32	2	E
Mechanical engineer		-	-	46.16	0.11	2	E,L
Electrical engineer	ELECTRICAL ENGINEER	-	-	39.98	0.14	2	E
Social,welfare & related worker	SOCIAL CASE WORKER	-	-	19.99	18.11	2	F
Author,journalist & related worker	JOURNALIST	-	-	29.86	7.60	2	H
Painter,sculptor & related creative artist	CREATIVE ARTIST	2.22	4.35	22.60	12.65	2	J
Civil,structural & municipal engineer	CIVIL ENGINEER	-	-	29.34	0.02	2	E
Judge,barrister,advocate, solicitor	SOLICITOR	-	-	28.24	1.03	2	G
Lorry driver's mate, van guard	DRIVER'S MATE: VAN OR LORRY	16.39	-	28.41	2.43	1	L
Pharmacist, dispenser	-	-	-	19.13	8.65	2	E
	DISPLAY ASSISTANT		Not			1	J
	LIBRARIAN		available			2	H

Source of population statistics: Registrar General Census 1961

The census population figures (1961) (see Table 6.1) of these occupational groups show the distribution by sex set out in Table 6.2

TABLE 6.2

OCCUPATIONAL POPULATIONS CLASSIFIED BY SEX

	Level 1	Level 2
Predominantly Male	7	9
Predominantly Female	7	2
Balance between Sexes	0	2
No statistics	1	1
	15	14

At Level 1 the selected occupations show an equal balance between the populations in terms of sex. At Level 2 very few occupations are populated predominantly by females. Outstanding exceptions are Teaching and Nursing each with female populations of about 250,000.

iii) Specificity of Occupational Title

It was anticipated that the specificity of the detail of the occupational title would be one of the important factors in the use of the test. If the description was too vague e.g. selling, it could lead to difficulties of interpretation. Norms may then suggest that most alternative sentences in any item of the test could be appropriate descriptions. On the other hand very few students are likely to opt for an occupation which is too specifically titled e.g. shop assistant (antiques and objets d'art). To investigate the appropriateness of the relative detail in the occupational titles examples of varying degrees of specificity of title were included. These had to be determined subjectively since the details of CODOT Classification were not available at the time.

iv) Interest Category

If the test is to be adopted in schemes of guidance it seemed likely that it might be used as a complement to established measures of interest used in careers education. The following tests group interests into fields or categories:

a) Kuder Personal Preference Schedule (Kuder, 1960)[1]

b) Lee-Thorpe Interest Inventory (Lee and Thorpe, 1956)[2]

---

1. G.F.Kuder, Kuder Preference Record - Vocational Administrators Manual, Chicago, Ill. Science Research Associates Inc., 1960.

2. E.A.Lee and L.P.Thorpe, Occupational Interest Inventory - Manual, Monterey, California Test Bureau, 1956.

c) Rothwell Miller Interest Blank (Miller, 1968)[1]

d) Connelly Occupational Interests Questionnaire (Connelly, 1968)[2]

e) A.P.U. Occupational Interest Guide (Closs, Bates, Killcross, McMahon, 1969).[3]

Table 6.3 sets out the categories of interest described by the items of these five tests. It can be seen that the titles of the categories may correspond to a considerable extent, but in structure and items the tests differ considerably.

The Kuder and Lee-Thorpe Inventories are devised and normed in America where there is likely to be different interpretation and different occupational description compared with Britain.

The Rothwell-Miller Interest Blank is devised so that the client ranks in order of his personal preference groups of 12 occupational titles. The rationale of this test (Miller, 1968)[4] is based on the existence and influence

---

1. K.M.Miller, Rothwell-Miller Interest Blank (Manual), Slough N.F.E.R., 1968.

2. T.G.Connolly, Interests and Occupations, Cambridge, CRAC, 1968.

3. S.J.Closs, W.T.G.Bates, M.C.Killcross, D.McMahon, Manual of the Occupational Interests Guide, University of London Press, 1969.

4. Op.cit., p. 1.

Table 6.3

OCCUPATIONAL INTEREST CATEGORIES DESCRIBED IN TESTS

KUDER	LEE-THORPE	ROTHWELL-MILLER	CONNELLY	A.P.U. (experimental version)
Outdoor	Natural	Outdoor		Outdoor (M)
Mechanical	Mechanical	Mechanical	Mechanical/Manipulative	Mechanical/ Manipulative (L)
	Practical			
Computational	Business	Computational	Clerical/ Computational	Clerical/ Computational (K)
Clerical		Clerical		
Persuasive		Persuasive	Persuasive	Persuasive (G)
Scientific	The Sciences	Scientific	Scientific	Scientific (E)
Artistic		Aesthetic	Artistic	Artistic (J)
Literary	The Arts	Literary	Literary	Literary (H)
Musical		Musical		
Social Service	Personal-Social	Social Service	Social	Social Service (F)
		Medical		

of occupational stereotypes. Miller regards the accuracy of the stereotype as of secondary importance to its existence. Thus when people are expressing a preference or a dislike for a certain occupation, they are often expressing their attitude to the stereotyped idea of it. The interpretation of the Blank in terms of realistic choice of occupation is the joint responsibility of the counsellor and the client.

The Connelly Occupational Interests Questionnaire is devised from paired comparison items describing non-vocational activities exemplifying each of its seven occupational categories. It also uses paired occupational titles. The A.P.U. Guide originated as a modification of the Connelly Questionnaire (Closs, 1967).[1] It was completely re-drafted. The interest categories were revised as a result of factor analysis. New items were introduced and analysed by item/total category score correlation and then by factor analysis (Closs, Bates, Killcross, McMahon, 1969).[2] The purpose of the Guide, like the present test, is for use in individual counselling, particularly by discussion of high and low scores in the interest categories. The development of the Guide has been sponsored by the Central Youth Employment Executive and is generally available to the

---

1. S.J.Closs, The Construction of the A.P.U. Occupational Interests Guide, Unpublished M.A. thesis, University of Edinburgh, 1967.

2. Op.cit., pp. 41-46.

Youth Employment Service. For these reasons of validation and use within the British educational system, it was decided to take account of the eight interest categories listed in this Guide, when selecting occupations for experimentation in the present test. (See Footnote). Apart from the very limited evidence reported by Closs, Bates, Killcross and McMahon (1969),[1] very little work has been carried out on the predominant interests or interest profiles of occupational groups in Britain. They obtained these profiles from groups of Scientists, Youth Leaders, Insurance Salesmen and Shop Assistants, Journalists, Artists, Clerks and Accountants, Engineers, and Horticulture students and Farmers. In terms of the present work these occupational groups lack precise definition but the results give an indication of the predominant interests shown by these groups in terms of the test categories.

Strong has based his Vocational Blank on the

Footnote: Subsequent revision of the Guide has introduced an additional category - Musical - and the Clerical and the Computational interests have been separated (Closs, 1971)[2], thus producing ten interest categories in all. This revised edition of the Guide is due to be published shortly (June, 1973).

1. Ibid., p. 54.

2. S.J.Closs, A.P.U. Occupational Interests Guide - Final Version, Private communication - visit, 16/7/71. 1971.

relationship between interest and occupation. He has determined interest scores for his instrument in 80 occupations in 6 occupational groups - 50 for the Men's Blank and 30 for the Women's Blank (Strong, 1959).[1] In the American situation Strong has shown scores on his Interest Blank for 80 different occupational groups which distinguish the likes and dislikes of members of these occupational groups from men and women in general. Interest categories are, however, not defined as such by Strong.

Kuder (1960)[2] prepared a Job Chart which listed occupational titles in relation to the ten interest categories of his Preference Record. This chart was based partly on evidence from workers in the occupations, but for some titles it was purely subjective. It has also been divided into the skill level as defined in the Dictionary of Occupational Titles. This is the only major American Interest Guide which provides any evidence on the relationship between interest and occupations.

None of these Guides have yet developed interest profiles on British populations of participants. Indeed Closs et al. (1969)[3] suggest that only comparison of the profile as a whole is justified and there are major statistical problems in such comparisons.

---

1. E.K.Strong, Jnr., Manual for Strong Vocational Interest Blanks for Men and Women, Palo Alto, California, Consulting Psychologists Press Inc., 1959.

2. Op.Cit., pp. 8-18.

3. Op.cit., p. 59.

Since the A.P.U. Guide is used by many L.E.A. Youth Employment Services, it was selected as the most appropriate reference for occupational interest. For reasons given above, it was possible to give only subjective judgments on the predominant interests shown by participants in the selected occupations.

A total of 40 occupations was carefully considered in terms of these criteria. Table 6.1 (p. 250) shows the 29 of these which were selected. From this Table it can be seen that the census classification groups together some professions which, for the purpose of careers guidance, may be regarded as distinctly different e.g. Accountancy, and Banking. Where these groups were selected on the basis of population and interest category a particular profession was specified.

No occupation with artistic interest appeared in the census Table. Reference to Kuder (1960)[1] suggested that it might be appropriate to include "Window Dresser". "Librarian" was also included as a prepresentative of literary interest at Level 2.

The distribution of the 29 occupations between the eight A.P.U. interest categories is shown in Table 6.4.

---

1. Op.cit., p.11.

Table 6.4

SUBJECTIVE DIVISION OF SELECTED OCCUPATIONS INTO A.P.U. INTEREST CATEGORIES

Interest Category		No. of Occupations	
		Level 1	Level 2
E	Scientific	0	3
F	Social	1	4
G	Persuasive	1	1
H	Literary	0	2
J	Artistic	1	2
K	Clerical/Computational	2	2
L	Mechanical/Manipulative	9	0
M	Outdoor	1	0
		15	14

It is emphasised that in the absence of evidence the determination of interest category was essentially subjective. Lack of representatives in some categories at one of the levels indicates that scientific and literary interests (in occupational terms) may not be developed by students intending to leave school with less than 5 'O' Level passes. Examination of the Careers Guide (Central Youth Employment Executive, 1971)[1] suggests that scientific and literary careers are normally entered with a higher level of educational attainment (i.e. Level 2 of the test). Conversely school-leavers achieving 5 or more 'O' Level passes are not very likely to enter mechanical/manipulative and outdoor occupations which have a lower entry standard. Thus the 29 selected occupations (Table 6.1, p. 250) are seen to be representative of the eight interest categories

1. Central Youth Employment Executive, Careers Guide (1971-72), H.M.S.O., 1971.

of the A.P.U. Guide where these are appropriate at the level of entry.

Consideration of these five criteria produced the following 29 occupations for experimental investigation in terms of the test material:

TABLE 6.5.

OCCUPATIONS SELECTED FOR EXPERIMENTAL NORMING

Level 1	Title	A.P.U. Interest Category	Comment
1)	Agricultural Worker	M	Outstandingly the highest population (both male & female) in interest category.
2)	Clerk	K	Highest population of all census occupations, with high % of females under 20. Very broad definition of occupational title.
3)	Driver's Mate: Van or Lorry	L	Highest proportion of male population under 20 i.e. a "dead-end" job. Probably lowest academic entry level.
4)	Electrician	L	High population of males. With Electrical Engineer may allow for comparison of Levels.
5)	Fitter	L	High population of males. Broad definition of title
6)	Hairdresser	L	High population of females, particularly under 20. Precise definition of title.

Level 1	Title	A.P.U. Interest Category	Comment
7)	Joiner	L	High population of male
8)	Labourer: Building & Contracting	L	High population of male Broad definition of title.
9)	Packer	L	High population of females. Broad definition of title.
10)	Police	F	Low population, particularly of females. Occupation & work clearly defined. Wide range of academic entry level.
11)	Shop Assistant: non-food	G	High population, particularly of females, with high % under 20. A compromise in specificity of title definition.
12)	Telephone Operator: G.P.O.	L	High population of females, with high proportion under 20. Very precise definition of title.
13)	Textile Machine Operator	L	High proportion of females. Broad, possibly too imprecise, title definition.
14)	Typist	K	Very high proportion of females with high proportion under 20. Definition of title may overlap with Clerk.
15)	Window Dresser (Display Assistant)	J	No population statistics - probably very low & predominantly female. American title (Kuder). Now generally known as Display Assistant.

Level 2

Total populations in these professional occupations are concentrated very largely over the age of 20 since training and education occupies most of the career up to this stage.

16)	Architect	J	Predominantly male population. Title defined by professional practice.
17)	Creative Artist	J	Relatively high proportion of females. No professional definition of title.
18)	Banking	K	Included in census returns of Accountants but specifically defined by professional practice.
19)	Industrial Chemist	E	Included in census returns of "Chemist", Physicist & Biological Scientist". Specifically but broadly defined by professional practice.
20)	Clergy	F	Relatively high population, particularly of males. Clearly defined membership but variously interpreted in role.
21)	Civil Engineer	E	Clearly defined by professional practice.
22)	Draughtsman	K	Relatively high population particularly among males.
23)	Electrical Engineer	E	High population of males. Clearly defined professional practice. Possible to compare levels with Electrician.
24)	Journalist	H	Included in census returns of "Author", Journalist & related worker". Clearly defined by professional practice.

25)	Librarian	H	No population statistics. Clearly defined by professional practice.
26)	Nurse	F	Very high proportion of female. Entry may take place at lower educational level. Clearly defined by professional practice.
27)	Social Case Worker	F	Approximately equal population of men & women. Entry normally considered after other occupational experience or higher education.
28)	Solicitor	G	Included in census returns of "Judge, Barrister, Advocate & Solicitor". High population and proportion of males. Clearly defined by professional practice.
29)	Teaching	F	Very high population of both males & females. Wide range of professional practice.

PRODUCTION OF NORMS BY CAREERS OFFICERS

The Careers Officer is the experienced (and now usually trained) professional in the knowledge of occupational information relevant to the school-leaver. He is in a position to be able to compare the characteristics of a wide range of occupations. His knowledge and experience of certain occupations may also be particularly detailed.

Careers Officers are employed either by the Local Education Authority or by the Department of Employment, depending on the choice made by the Local Authority to exercise its powers under the Employment and Training Act 1948. In 1970, 144 Local Education Authorities in England and Wales operated the Service leaving 53 Authorities under the responsibility of the Department of Employment. 1638 Careers Officers were employed by the Local Education Authorities and 268 by the Department of Employment (Roberts, 1971).[1] Other professional vocational advisers of school-leavers operate in private organisations or Institutes. No statistics of such organisations are available, but one of the largest bodies employed only seven such advisers in 1968.

It was decided initially to approach Careers Officers in Local Education Authorities as a convenient, yet valid, way of obtaining Advisers' judgments. Should these not have provided an adequate sample, then an approach would

---

1. K. Roberts, From School to Work, Newton Abbot, David & Charles, 1971, p. 21.

have been made to officers of the Department of Employment. The Principal Careers Officers of the 30 largest Local Education Authorities in the United Kingdom in terms of number of secondary school pupils (Education Committee Year Book, 1969)[1] were approached by letter and asked if they would co-operate by allowing the investigator to send to members of their advisory staff a request to rate three named occupations in terms of the items of Part 1 of the test of occupational information. 21 of these officers immediately agreed to co-operate and a further five offered later. The aim was to obtain about 30 responses in each of the 29 occupations. This would involve about 300 Careers Officers rating three occupations each. The figure of 30 responses was determined as a balance between the practicality of achieving co-operation and a number sufficiently large to produce results of useful validity. To achieve this extent of co-operation from Careers Officers, 20 of a further 23 Principal Officers agreed to an approach being made to their staff. A total of 390 Officers were asked to rate three occupations each; of these replies were received from 311. No differentiation was made between Officers either in status, experience or training, although discussion with some Principal Officers indicated they had asked their more experienced staff to rate the occupations.

---

1. Education Committee Year Book, Councils and Education Press, 1969.

All replies were returned anonymously and any attempt to classify by Authority as denoted by post-mark should be regarded as approximate. Table 6.6 shows the distribution of these 311 Careers Officers.

TABLE 6.6

CAREERS OFFICERS CLASSIFIED BY REGION

London & Home Counties	25
South	27
West & South Wales	14
West Midlands	30
North Midlands	27
East Midlands	42
North West & North Wales	52
North East	37
Scotland	34
Northern Ireland	18
Unclassified	5
	311

The occupations were distributed at random to all the authorities, with two exceptions. Agricultural worker was not sent to any County Borough. Textile Machine Operator was sent only to those Authorities known to include areas of the textile industry. (Reference will be made in Chapter (VIII, p. 376) to the diversity of titling within this industry). Because of the ambiguity of this title one large Authority returned all the response sheets for this occupation. Approach to two other Authorities in the textile areas achieved no result and thus the response to this occupation totalled only 17.

In this way the responses of the Careers Officers were collected. The presentation of these norms will be discussed in a later section of this Chapter (p. 278).

PRODUCTION OF NORMS BY PARTICIPANTS

The students' responses are to be compared with the reality of the occupation as described by those actually working in it. Thus the 29 occupations were described in terms of the test items by groups of participants. These groups not only completed the occupational description (Part 1 of the test) but also expressed their judgments of the Important and three Most Important aspects of the occupation in which they were engaged. The following criteria were considered in the selection of these groups of participants.

i) Size of Groups and Availability of Participants

A group minimum number of 30 was again regarded as appropriate to produce a useful norm. In 29 different occupations these were likely to show some of the problems inherent in the design of the test. This minimum was achieved in 26 of the 29 occupations.

A group of 27 in the occupation "Industrial Chemist" was regarded as adequate for this purpose but for "Driver's Mate" and "Packer" the numbers 3 and 15 are too small. These occupations reveal difficulties in obtaining norms. In attempting to contact Van Boys and others included in the classification of "Driver's Mate", advice was obtained from the Grubb Institute of Behavioural Studies, the Industrial Society, five Senior Careers Officers (including the Deputy Careers Officer of the I.L.E.A.) and Mr. Edward Guinness (of Arthur Guinness and Son, Brewers). All these individuals were most helpful in suggesting the names of personnel officers of firms who employed large numbers of van boys and driver's mates. Thirteen of these firms were

invited to co-operate in the project by allowing a group of their van boys to complete the test material. Replies were received from four of these firms, only one agreeing to give the material to six of their van boys. Within ten days of the material being sent, three of these van boys had left this employment. The remaining three provided the only evidence in this occupation. The effort involved in trying to contact van boys was continuously spread over two years. This experience shows some of the difficulties of establishing norms in some occupations. This occupation was originally selected (see p. 260) because it exemplified a "dead-end" job. Census statistics (Table 6.1 p. 250) show the occupation to have the largest proportion of its members (over 60%) in the 15 - 20 age group, although correspondents suggest that the total may have declined considerably since the 1961 census.

Attempts to contact "Packers" were not quite so unsuccessful. Of the six firms contacted two agreed to help and fifteen employees completed the test material. This occupation illustrated the difficulty of obtaining co-operation from process workers who are bound to the rhythm of the production line. Also the majority of the workers in this occupation are older married women - very few are school-leavers.

ii) Location of Participants

The participants in the 29 occupations were contacted through educational institutions (Colleges of Further Education, Technical Colleges and Polytechnics), employers

or professional bodies. An attempt was made to disperse these through the United Kingdom, partly so that the regional variation in the description of occupations (particularly Level 1 occupations) might perhaps be analysed. (As yet the writer is not aware of a statistical technique which will enable comparison to be made of the occupational profiles produced by participants in different parts of the country)*. Location of the participants is shown in Table 6.7.

iii) Age and Experience of Participants

The participants had spent at least six months and less than 5 years in the occupation. The lower limit was specified so that they would be likely to have experience of many of the aspects of the work. The upper limit ensured that their description was not too far removed by promotion, disillusion or other factors from the view of the school-leaver on entry. As the material was often given to groups totally unknown to the writer, these limits were not always precisely adhered to. Also to eliminate doubt about training being included or excluded from experience, it was specifically stated that training was to count as experience. Table 6.7 shows the age, experience and location of the various participant groups. This Table shows that seven of the occupations do not precisely fulfil the criterion of age, if it is assumed that the participant should be within five years of the appropriate school-leaving age. Of these, three occupations normally take entrants after experience in other occupations: Police, Clergy, Social Case Work.

---

* Footnote: See further discussion of this problem in Chapter VIII, p. 385).

TABLE 6.7

NUMBER, LOCATION, AGE, OCCUPATIONAL EXPERIENCE AND EDUCATIONAL QUALIFICATIONS OF PARTICIPANTS PRODUCING NORMS.

LEVEL 1 OCCUPATIONS	NUMBER Male	Female	Total	LOCATION	AGE (YEARS) Mean	S.D.	OCCUPATIONAL EXPERIENCE (YRS.) Mean	S.D.
Agricultural Worker	54	1	55	Lindsey College of Agriculture	20.1	1.8	3.7	1.7
	17	4	21	Cumberland & Westmorland Col.of Ag.	18.6	1.2	2.1	0.7
	71	5	76	& Forestry	19.7	1.8	3.3	1.7
Clerk	3	23	26	North West Securities Ltd. Chester	25.3	6.4	4.3	3.3.
	10	18	28	Kirby Coll.of Fur.Ed. Teesside.	19.1	5.3	1.6	1.6
	13	41	54		22.1*	6.8	2.9	3.8
Driver's Mate: Van or Lorry	No valid norms produced							
Electrician	24	0	24	Denbighshire & Wrexham Tech.Coll.	21.0	4.6	5.1	2.3
	7	0	7	National Coal Board,Askington.N'land.	18.4	0.5	3.4	0.0
	31	0	31		20.5	2.5	4.8	2.1
Fitter	15	0	15	National Coal Board, Askington.N'land.	18.8	0.6	3.5	0.1
	89	0	89	North Western Gas Board,Lancs./Ches.	18.1	1.0	2.5	0.9
	104	0	104		18.3	1.0	2.6	0.9
Hairdresser	7	24	31	West Ches. Central Coll.of Fur. Ed.	17.9	0.9	1.7	0.9
Joiner	26	0	26	Army Apprenticeship Coll. Chepstow.	17.1	0.8	2.1	0.7
	8	0	8	Bradford Technical College.	16.9	0.6	1.9	0.4
	1	0	1	Denbighshire & Wrexham Tech.Coll.	18.0	0.0	1.0	0.0
	35	0	35		17.1	0.7	2.1	0.7
Labourer: Building and Contracting	19	0	19	Army Apprenticeship Coll. Chepstow.	17.0	0.4	1.7	0.6
	18	0	18	Denbighshire & Wrexham Tech.Coll.	26.6	9.0	3.7	3.5
	37	0	37		21.9	8.1	2.7	2.7
Packer	0	8	8	Rowntrees Ltd. York.	20.6	2.8	4.6	2.3
	0	7	7	T.Wall & Sons. Hyde, Cheshire.	19.6	2.6	2.9	1.5
	0	15	15		20.1	2.8	3.8	2.1
Police	23	8	31	Lancashire Constabulary	22.6*	2.5	2.0	0.0
Shop Assistant: Non Food	2	13	15	Boots Ltd., Oxford area.	19.7	3.3	3.7	5.0
	3	7	10	Birkenhead & Dist. Co-op.Soc.Ltd.	15.2	0.6	0.2	0.2
	0	8	8	West Cumberland Coll.ofSc. & Tech.	15.5	0.2	0.7	0.1
	5	28	33		17.2	3.2	1.9	3.8
Telephone Operators G.P.O.	1	19	20	Middlesborough Telephone Exchange	19.8	1.4	2.3	1.4
	1	9	10	Wrexham Telephone Exchange	26.4	6.9	7.8	6.9
	2	28	30		22.0*	5.2	4.1	4.9
Textile Machine Operator	24	0	24	Bradford Technical College	17.5	1.1	1.3	0.8
	21	0	21	Bolton Institute of Technology	19.4	2.9	3.6	2.7
	45	0	45		18.4	2.4	2.3	2.2
Typist	0	25	25	Kirby College of Education, Teesside.	17.3	0.7	1.7	1.6
	0	8	8	North West Securities, Chester.	19.7	1.7	3.0	1.8
	0	33	33		17.9	1.5	2.0	1.7
Window Dresser (Display Assistant)	0	22	22	Coll. of the Distributive Trades, Ldn.	18.8	1.4	1.7	0.4
	6	9	15	Bolton College of Art and Design	16.9	0.9	2.5	1.2
	6	31	37		18.1	1.6	2.1	0.9

* More than 5 years over school leaving age of 15 or 16.

LEVEL 2 OCCUPATIONS	NUMBER Male	Female	Total	LOCATION	AGE Mean	YRS. S.D.	OCCUPATIONAL EXPERIENCE (YRS Mean	S.D.
Architect	19	1	20	Waltham Forest Sch. of Art.& Tech.Coll.	24.9	3.5	6.8	2.7
	20	0	20	Northern Polytechnic. London	24.5	3.5	6.2	4.0
	39	1	40		24.7*	3.5	6.5	3.4
Creative Artist	24	13	37	Cardiff College of Art	19.6	1.3	1.6	0.9
	8	7	15	Leicester Polytechnic	20.2	2.1	2.5	1.6
	32	20	52		19.8	1.6	1.9	1.2
Banking	23	1	24	Barclays Bank Ltd.	25.2	1.6	7.4	2.2
	18	2	20	National Westminster Bank Ltd.	26.2	1.6	7.8	2.7
	41	3	44		25.7*	1.7	7.6	2.5
Industrial Chemist	18	9	27	Boots Ltd., Nottingham.	22.4	2.8	2.8	1.9
Clergy	18	1	19	Congregational Church in England and Wales	34.3	11.0	7.6	2.8
	11	0	11	Church of England	34.9	10.1	6.8	2.0
	29	1	30		34.6*	10.7	7.3	2.5
Civil Engineer	48	0	48	Teesside Polytechnic	22.3	3.6	4.1	2.8
Draughtsman	11	0	11	Army Apprenticeship College, Chepstow.	17.4	0.5	2.0	0.1
	0	34	34	Garretts Green Tech. Coll. Birmingham.	17.8	1.0	1.5	0.7
	11	34	45		17.7	0.7	1.6	0.6
Electrical Engineer	39	0	39	Denbighshire & Wrexham Technical College.	23.6	3.3	6.4	3.1
Journalist	11	7	18	Harris College, Preston.	20.3	1.4	2.4	0.4
	12	5	17	Richmond College of Further Educ. Sheffield.	20.4	1.5	2.1	0.5
	23	12	35		20.3	1.4	2.3	0.5
Librarian	3	32	35	Manchester Polytechnic.	23.2	6.4	3.0	2.7
Nursing	1	94	95	Manchester Royal Infirmary	20.8	1.9	2.8	1.3
Social Case Work	10	22	32	North Western Polytechnic, London.	30.1*	7.8	3.5	2.9
Solicitor	47	5	52	Law Society & Associate Members Group	23.3	1.5	2.8	1.4
Teaching	20	15	35	Chester College	26.3	5.5	4.9	1.4
	4	5	9	Durham University, Dept. of Education.	24.9	0.7	3.8	0.7
	24	20	44		26.1	4.9	4.7	1.4

*More than 5 years after school leaving at 18 or University at 21.

One occupation, Banking, suggests that the group who normed the test were more experienced than the criteria set out. This group were participating in courses at the Bank Staff Colleges and represent a higher level of participant experience than may be appropriate to the school-leaver.

iv) Educational Attainment of Participants

The justification for structuring the test at two levels is provided by the D.E.S. Statistics of Education (1968)[1] (see Chapter IV, Table 4.2., p. 194). This table shows the relationship between age of school-leaving and educational attainment.

Analysis of the educational attainments on the entry of the participants to the occupation provides information which tends to justify the inclusion of most of the 29 occupations at the appropriate Level (Table 6.8). Since many of these participants were taking part in further or higher education at the time they completed the test material, it is possible that they display a higher level of educational attainment than may be representative of the occupation as a whole. The Table shows that, apart from two outstanding exceptions, Display Assistant and Draughtsman, the occupations have been normed at the appropriate Level. Consideration of these two exceptions illustrates two different problems in the production of norms.

At Level 1, Display Assistants have a markedly higher educational level than the representatives of other occupations at this Level. This occupational group is, however, constituted as follows:

---

1. Department of Education & Science, Statistics of Education 1966, Part 2 G.C.E.,C.S.E. & School Leavers, H.M.S.O.,1968

TABLE 6.8

EDUCATIONAL ATTAINMENTS OF PARTICIPANTS

	OCCUPATION	NUMBER	<5 'O' Levels (or equivalent) No.	%	>4 'O' Level No.	%
Level 1.	Agricultural Worker	76	55	72	21	27
	Clerk	54	38	70	16	30
	Driver's Mate: Van or Lorry	3	3	100	0	0
	Electrician	31	28	90	3	10
	Fitter	104	99	95	5	5
	Hairdresser	31	27	87	4	13
	Joiner	35	35	100	0	0
	Labourer: Building & Contracting	51	51	100	0	0
	Packer	15	15	100	0	0
	Police	31	29	94	2	6
	Shop Assistant: Non-food	33	30	91	3	9
	Telephone Operator: G.P.O.	30	28	93	2	7
	Textile Machine Op.	45	44	98	1	2
	Typist	33	33	100	0	0
	Display Assistant *	37	16	43	21	57
Level 2.	Architect	40	4	10	36	90
	Creative Artist	52	4	8	48	92
	Banking	44	10	23	34	77
	Industrial Chemist	27	2	7	25	93
	Clergy	30	3	10	27	90
	Civil Engineer	48	9	19	39	81
	Draughtsman*	45	38	84	7	16
	Electrical Engineer	39	10	26	29	74
	Journalist	35	3	9	32	91
	Librarian	35	0	0	35	100
	Nursing	95	25	26	70	74
	Social Case Work	32	4	12	28	88
	Solicitor	52	0	0	52	100
	Teaching	44	2	5	42	95

* Occupations not normed at the appropriate Level.

	No.	<5 'O' Levels No.	%	>4 'O' Levels No.	%
College of the Distributive Trades, London	22	2	9	20	91
Bolton College of Art and Design	15	14	93	1	7
	37	16	43	21	57

This suggests that the educational level of entry of those Display Assistants trained at the College of the Distributive Trades may be distinctly higher than the majority who may be trained elsewhere. (This statement is made on the basis of private conversation with a Departmental Head in this College). This evidence shows the problems of sampling appropriate participants to produce a valid norm.

At Level 2, 84% of the Draughtsmen appear to have educational qualifications equivalent to Level 1. These qualifications appear to vary according to the interpretation placed on the occupation. Only six L.E.A. Colleges of Further Education offer courses specifically in Draughtsmanship (Directory of Further Education, 1970)[1] and the one which agreed to co-operate in this exercise trained only Tracers. Other students at this College studied Draughtsmanship as part of other courses in Engineering. It appears that the educational qualifications for Draughtsmanship are normally less than those of Level 2 of this test.

v) Occupational Titling

Although the titling of the occupation was discussed with the employer or lecturer responsible for the group of participants, the actual title of the occupation as set out by the participants themselves was not as uniform as

1. Directory of Further Education, Nornmarket Press, 1970.

the list of 29 presented to the Careers Officers.

Classification of these occupational titles has been carried out according to the CODOT system and Table 6.9 shows the distribution of titles according to the unit grouping for each of the selected 29 occupations. It will be shown later (Chapter VIII, p. 370) that the Unit (3-digit) Group Level is the most useful for this purpose and therefore the titling used by the participants has been classified at this Level. Reasons for exceptions to this level of classification are described elsewhere (p. 372).

Table 6.9 shows that all the participants in 21 of the 29 occupations give a title to their work which is within the CODOT Unit Group Classification. Minor exceptions to this level of classification are shown by a small percentage of Clerks and Typists (two groups where there is overlap in titling), Shop Assistants and Textile Machine Operators. In these cases a valid norm could easily be produced by disregarding the responses of those whose titles were not classified within the CODOT Unit Group. This expedient would also apply to the Labourer: Building and Contracting. The three remaining Level 2 occupations illustrate more difficult problems in the compilation of participant norms.

1) Industrial Chemist - 19 of this group of 27 titled themselves as Laboratory Technicians - only 5 as

Industrial Chemists. Approaches to three divisions of the largest chemical manufacturers in the country failed to achieve response from any more Industrial Chemists. This norm cannot be said to be representative of this occupation.

2) Electrical Engineers - All members of this group were taking a Higher National Diploma course in Electrical Engineering. Whilst they were likely to become Electrical Engineers, the majority of them were still at the Technician grade and could not be classified within the CODOT Group for Electrical Engineers.

3) The group of Draughtsmen/women is divided into two distinct sub-groups: Army Draughtsmen and women Tracers. Difficulty of locating participants in this occupation has already been mentioned (p. 273). Even in the largest College apparently offering Draughtsmanship courses, no Draughtsmen per se were trained there.

The experience of producing these norms has emphasised factors which need to be considered if the norms are to be of use in the guidance process. Norms produced must show the appropriate features of the group of participants from which they have been obtained. These features are:

i) Size of group, with sub-division into sex;

ii) Location of group, national or local;

iii) Age of group (mean and standard deviation);

iv) Occupational experience (mean and standard deviation);

v) Educational qualifications;

vi) Occupational titling - CODOT Group code.

From the foregoing discussion of the compilation of these norms, it is possible to draw up a set of criteria on which they may be further developed. These factors may reveal some inadequacies in the norms already produced.

The norms produced both by the Careers Officers and the participants are set out in Appendix 7. p.489. The presentation of these norms is discussed in the next section of this Chapter.

PRESENTATION OF NORMS

The purpose of norming the test in terms of occupational descriptions is to enable the responses selected by the student to be scored in a way which will give him a measure of the reality of the occupation he is describing.

For the use of the student and the guidance teacher norms are produced both by the Careers Officers and by the Participants. The uses in counselling of these two different viewpoints of occupations are more fully discussed later in Chapter VII (p. 323).

Norms for Part 1 of the test provide the student with a measure of the reality of his occupational information in terms of the occupational characteristics described by the test.

Norms for Part 2 of the test show the relative importance participants place on various aspects of the occupation in which they are involved. Careers Officers are not in a position to make these value judgments on occupations other than their own.

i) Part 1 Norms

The norms for this Part of the test should provide the student with a readily interpretable measure of his occupational information. Clearly this will take a numerical form. The expression used for this purpose is the Index of Reality (IR). This is computed for a student by scoring each of the sentences he has selected

in Part 1 of the test in terms of the judgments produced by the Careers Officers or the Participants. The Index of Reality (IR) is defined as:

> The sum of the scores thus obtained by the student for the 43 items and is computed either from the Careers Officers' or from the Participants' norms or both.

There are various alternative ways of expressing the sentence scores from the judgments of Careers Officers and Participants. In order to select the most appropriate form it is necessary to consider criteria which the norms must fulfil. These criteria for selection of the appropriate measure are:

1) Simple, yet valid interpretation of each sentence in each item.
2) Ease of comparison between items in the same occupational description, so that a student can see at a glance the items where his knowledge is realistic and where it is unrealistic.
3) Ease of comparison between the same item (e.g. Item 36 - Clerical Work) in different occupational descriptions (e.g. Clerk and Hairdresser) (see Table 6.10); this is useful where a student is comparing his knowledge of two occupations.
4) Convenience of computing a total measure for the 43 items as the score of a student describing one particular occupation i.e. a student's Index of Reality (IR) for an occupation.

There are four possible ways of expressing the scores of the judgments of the Careers Officers and the Participants for each sentence and item of a particular occupation. In varying degrees these attempt to fulfil the four criteria. Examples of these four types of expression are shown in Table 6.10.

1) Raw Score

This is the total number of responses for each sentence provided either by the Careers Officers or the Participants in the norming of a particular occupation. (The total for the five sentences in an item will not correspond to the group total (N) if some Careers Officers or Participants have left the item blank - Table 6.10 examples 2 and 4). This type of score makes comparison between occupations difficult, since scores are not standardised in any way.e.g. In example 2 (Table 6.10) the student scores 16 (out of an effective group total of 51) and in Example 4 scores 15 (out of a possible 30). In Example 4 he has scored relatively higher than in Example 2; yet in Example 2 17 is the highest possible score in these terms. This form of expression does not show for a student a clear comparison between occupations neither does it show the score of a particular sentence relative to scores for other sentences in the same item.

TABLE 6.10

EXAMPLES OF EXPRESSIONS OF NORMS FOR PART 1 OF THE TEST

		EXAMPLE 1					EXAMPLE 2					EXAMPLE 3					EXAMPLE 4				
	Type of Norm:	PARTICIPANT										PARTICIPANT									
	Occupation:	Clerk										Hairdresser									
	N	21					54					31									
	Item No.	21					36					21					36				
	Sentence No.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Expression of Norm.	Total Score																				
i) Raw Score	N	0	0	2	51	1	17	16	0	16	2	0	0	31	0	0	12	0	0	3	15
							(3 Blank)										(1 Blank)				
ii) Percentage	100	0	0	4	94	2	31	30	0	30	4	0	0	100	0	0	39	0	0	10	48
iii) Tenth	10	0	0	0	10	0	3	3	0	3	0	0	0	10	0	0	4	0	0	1	5
iv) Prpportional Distribution	Max. Score 10	0	0	0	10	0	10	9	0	9	1	0	0	10	0	0	8	0	0	2	10

O shows the selection of sentences in the two items and the two occupations by the same student.

However, the comparison of scores of 31 and 15 in Examples 3 and 4 shows the relative weighting of the choices of these sentences within the same occupation by the same group of Hairdresser participants.

Thus comparison of a student's score within an occupation may have some validity.

A student's total score (Index of Reality) expressed as the total of the Raw Scores of his selected sentence in each of the 43 items would give little indication of the reality of his occupational information since it could not easily be compared to a maximum possible score. This possible maximum total would be different for each occupation.

This type of expression in terms of Raw Scores fulfils criteria 1 and 2 but not 3 or 4.

2) Percentage

The total number of responses for each sentence is expressed as a percentage of the group total (N). (See Table 6.10). e.g. In Example 3 a group of 31 Hairdressers would produce a norm score of 100 on Item 21 Sentences. Every member of the group selected this sentence as the most appropriate description of the occupation in terms of this item. The percentage is normally expressed to two significant figures, yet it has been calculated from the judgments of a group of less than 100 Participants, this degree of accuracy is not justified.

The student choosing the highest scoring sentences in different items may show substantially different scores (Examples 3 and 4). The Index of Reality (IR) computed from the total scores for the 43 items will have a different maximum total for each occupation. (On the Clerk and Hairdresser norms these would be 2606 and 2956 respectively). Thus a student's Index of Reality would lack comparability.

This type of expression does not adequately fulfil any of the four criteria.

3) Tenth

The total number of judgments for each sentence by the Careers Officers or Participants is expressed as a Tenth of the total group (N) (Table 6.10).

This may be justifiably valid since all group totals are greater than ten (Driver's Mates have not been included).

In other respects this expression has the same disadvantages as the Percentage.

It fulfuls criterion 1, but not criteria 2, 3 or 4.

4) Proportional Distribution

The raw score of the highest sentence in an item is scaled to 10 and the others are expressed as tenths of this highest score (see Table 6.10). Thus 10 is the maximum possible score for each item. The maximum possible score for a student over the 43 items for any occupation is 430.

The Index of Reality (IR) expressed in terms of proportional distribution could be:

a) a total out of 430 i.e. $IR = \sum_{n=1}^{n=43} (ir_n)$

or b) a percentage i.e. $IR = \frac{\sum_{n=1}^{n=43} (ir_n)}{430} \times 100$

or c) a decimal i.e. $IR = \frac{\sum_{n=1}^{n=43} (ir_n)}{430}$

where ir_1, ir_2,.....ir_{43} are the student's scores for each of the sentences with reference to a norm.

The first of these three alternatives does not really give the student a clear and obvious measure of the reality of his occupational information. He is not used to comparing a score with a maximum of 430. The second shows the score in a form most familiar to the student, whilst the third expression is probably more usual to the guidance teacher and others familiar with the statistics related to testing. The percentage form is adopted and those preferring the decimal only need to divide the percentage by 100. Therefore the student's Indices of Reality in relation to the norms provided by the Careers Officers (A) and by the Participants (P) are defined as:

$$IR_A = \frac{\sum_{n=1}^{n=43} (ir_{An})}{430} \times 100$$

$$IR_P = \frac{\sum_{n=1}^{n=43} (ir_{Pn})}{430} \times 100$$

Two examples of the calculation of the Index of Reality for the same student in terms of the Participant norms for two different occupations are shown in Tables 6.11 a & b. This type of expression of the norm is simple in presentation - no sentence score is greater than 10 and the Index of Reality is shown as a percentage. It is valid in that the norms have been produced from judgments of groups of more than 10 (i.e. at least 30) Careers Officers and Participants. An example of the scores of a student has been added to the norms shown in Table 6.11 a & b. Here she can see at a glance the sentences where she has scored 10 i.e. her information is highly realistic and those where her score is relatively low (3 or less), that is, rather unrealistic. She thus should realise that her knowledge of the occupation of Hairdresser in terms of items 6,9,20,22,25,26,27,31,32,33,35,40, is relatively unrealistic. More broadly, she should be aware that her knowledge of the Physical Requirements (items 11 - 17) of the occupation are accurate, but that it is inaccurate in terms of Social Requirements (items 31 - 34). The same student also completed the test for the occupation of Clerk. Her scores are shown in Table 6.11 b.

These examples provide justification for expressing a norm in terms of the proportional distribution of the sentence scores for each item.

TABLE 6.10a EXAMPLE OF PRESENTATION OF NORMS, SHOWING A STUDENT'S SCORE IN TWO OCCUPATIONS

OCCUPATION: HAIRDRESSER

LEVEL: PART 1 | PART 2

Sentence No.	Participant Norms (Prop.Dist.) 1	2	3	4	5	Student's IR	Rank of Imp.Items	Student's choice of Imp. Items	Rank of M. Imp.Items	Student's Rank of M. Imp. Items
1	10	0	0	0	1	10		✓		
2	0	0	0	0	10	10				
3	0	0	0	10	0	10	6½ (6=)	✓	8½ (8=)	3
4	10	0	0	0	0	10	1½ (1=)	✓	2	
5	0	10	9	0	4	10		✓	12 (10=)	
6	2	10	5	1	1	2		✓		
7	10	1	2	0	5	10		✓		
8	0	2	10	2	0	10				
9	0	3	0	10	2	2			12 (10=)	
10	0	0	1	1	10	10				
11	0	10	0	0	2	10	4½ (4=)	✓	12 (10=)	2
12	5	10	1	0	0	10		✓		
13	0	0	1	10	2	10		✓		
14	0	0	10	5	3	10	4½ (4=)	✓	3	1
15	0	1	10	0	0	10		✓		
16	0	5	2	10	0	10		✓		
17	0	0	10	0	3	10	8			
18	0	0	0	0	10	10		✓		
19	1	0	4	10	6	6				
20	1	1	10	0	0	1		✓		
21	0	0	10	0	0	10		✓		
22	0	0	2	10	0	2	6½ (6=)	✓	4	
23	5	10	6	0	0	5				
24	10	2	0	3	2	10		✓		
25	3	2	1	1	10	1	3	✓	7	
26	0	10	1	0	0	0		✓		
27	0	10	1	0	2	1			12(10=)	
28	2	8	10	1	0	8				
29	10	5	2	1	2	5		✓		
30	0	1	5	10	0	10		✓		
31	1	0	4	2	10	4		✓		
32	0	0	0	3	10	0	9½ (9=)	✓	12(10=)	
33	1	1	10	0	9	1		✓		
34	5	2	0	0	10	5		✓		
35	10	0	0	0	4	4				
36	8	0	0	2	10	10				
37	6	0	10	3	4	6				
38	0	0	10	0	0	10		✓		
39	0	0	1	0	10	10				
40	0	1	2	10	4	4	9½ (9=)	✓	8½(8=)	
41	10	5	2	0	0	10			1	
42	0	0	1	10	9	10		✓	6	
43	0	0	2	10	2	10	1½ (1=)	✓	5	

= 303

Index of Reality = 71%

= .71

TABLE 6.10b

OCCUPATION CLERK

LEVEL PART 1 PART 2

Sentence No.	Participant Norms (Prop. Dist.) 1	2	3	4	5	Student's IR	Rank of Important Items	Student's choice of Important Items	Rank of Most Important Items	Student's Rank of Most Important Items
1	(10)	0	0	0	0	10	5	✓	$4\frac{1}{2}$ (4=)	1
2	0	0	0	0	(10)	10				
3	0	0	(10)	2	0	10	9	✓		
4	(10)	3	0	0	0	10	3 (2=)	✓	6	
5	1	7	(8)	0	10	8		✓		
6	(4)	10	1	0	0	4				
7	(0)	10	1	0	3	0				
8	0	1	(10)	1	1	10				
9	0	(3)	1	10	1	3				
10	0	0	1	0	(10)	10				
11	1	3	0	0	(10)	10				
12	7	10	(4)	0	0	4		✓		
13	3	10	(6)	1	0	6				
14	10	7	(9)	2	0	9				
15	3	3	(10)	1	0	10		✓		2
16	7	0	3	(10)	1	10		✓		
17	2	6	(10)	1	8	10		✓		
18	0	0	0	0	(10)	10	8			
19	1	0	2	(2)	10	2		✓		
20	0	(10)	2	0	1	10				
21	0	0	(0)	10	0	0				
22	0	0	0	(0)	10	0	3 (2=)	✓		
23	0	(7)	10	8	3	7		✓	2	
24	1	(10)	1	2	7	10				
25	(1)	1	2	2	10	1				
26	(0)	4	6	10	4	0		✓	$4\frac{1}{2}$ (4=)	
27	1	2	(10)	1	3	10		✓		
28	1	4	(10)	4	1	10			9	
29	10	(4)	2	3	0	4				
30	1	9	(10)	2	0	10		✓		
31	1	2	(10)	8	5	10				
32	(1)	3	10	4	9	1	$10\frac{1}{2}$ (10=)		$7\frac{1}{2}$ (7=)	
33	0	7	(10)	1	1	10	3 (2=)	✓	10	
34	10	0	0	0	(1)	1				
35	3	6	6	(10)	1	10		✓		
36	10	(9)	0	9	1	9	$6\frac{1}{2}$ (6=)	✓	$7\frac{1}{2}$ (7=)	
37	0	(2)	4	10	5	2		✓		
38	0	(2)	10	2	2	2	$10\frac{1}{2}$ (10=)			
39	0	0	0	0	(10)	10				
40	1	2	(1)	7	10	1	$6\frac{1}{2}$ (6=)	✓	3	3
41	9	(2)	9	10	5	2				
42	4	10	(1)	4	4	1				
43	0	0	1	(10)	0	10	1	✓	1	

$$\text{Index of Reality } IR_p = \frac{277}{64} = 64\%$$

This type of expression fulfils all the four stated criteria and is adopted as the most appropriate form for presentation of the Part 1 norms.

ii) Part 2 Norms

Part 2 of the test requires the student to decide which aspects of the occupation (as described by the items of the test) are important to him. From those selected he is asked to indicate the three he regards as the most important.

Norms in this part of the test were only obtained from the Participants since it was felt to be inappropriate for the Careers Officers to ascribe their personal values of importance to occupations other than their own.

The measure of importance is produced by the Participants' free choice of any number of items which they believe to be important to them in their particular occupation. Some interpret this by selecting very few, others select almost every one of the 43 items. (Those who selected less than three or all 43 items were regarded as invalid for the purpose of establishing the norms).

Various forms of expression for the Part 2 norms were considered. The criteria for selection of these expressions are:

1) The norm for each item must be simple and valid;
2) The student must be able to compare easily his selection of the Important and Most Important items with those of the Participants.

Comparison of Important items between occupations is not so relevant since a student will probably list different Important and Most Important items in completing the test for different occupations (e.g. see Tables 6.11 a & b). Different occupations will satisfy different needs (Chapter II, p. 65).

The choice of type of expression for the norms produced from the Participants' judgments rests between scores expressed as Raw Scores, as Percentages or in Rank Order. These alternatives are now considered: (Examples of these expressions are shown in Table 6.12).

1) Raw Score

This expression takes no account of the total number of Participants producing the norms and is subject to the same limitations described when considering this type for the Part 1 norms.

2) Percentage

This type of expression takes into account the differences in group totals producing the norms, but would not be valid if these totals were less than 100. (Tenths would be valid in this respect). Selection of expression for Part 1 norms was influenced by the need to produce a total score for each student (Index of Reality). A student could not be given a comparable total score for Part 2 of the test. A total which took account only of those items which he selected would

TABLE 6.12

EXAMPLES OF EXPRESSIONS OF NORMS FOR PART 2 OF THE TEST

Type of Norm: PARTICIPANT
Occupation : CLERK
N 54

Expression of Norm.	Max. Score	IMPORTANT ITEMS										MOST IMPORTANT ITEMS									
Item No.		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
i) Raw Score	N	41	2	38	46	27	23	19	17	32	5	16	0	9	15	0	0	0	0	8	0
ii) Percentage	100	76	4	70	85	50	43	35	31	59	9	10	0	5	9	0	0	0	0	5	0
iii) Rank (First Ten)	1	5		9	3(2=)							$4\frac{1}{2}$(4=)			6						
Student's Selection		✓		✓	✓	✓						1									

NOTES: Only items 1-10 of the 43 items are shown as examples in this Table.

Score for Most Important Items is computed from ranks provided by Participants

1st = 3 pts; 2nd = 2 pts. 3rd = 1 pt.

clearly vary with the number he selected. An average score per item based on those selected, say, only five items all of which scored highly on the measure of Importance would have a score very much higher than a second student who chose, say, thirty items many of which would be certain to score relatively less. The decision to choose five or thirty items as important is left entirely to the student. This consideration with the other limitations of the Percentage expression discussed earlier (p. 282) leads to the suggestion that Rank Order may be a more appropriate form for presentation of the Part 2 norms.

3) Rank Order

In order to interpret a student's selection of Important and Most Important items by comparison with those of Participants, Rank Order affords an appropriate technique. Those items selected can be compared with the Ranking provided by the Participants. The higher the Ranking of the items selected by the student, the more appropriate are his occupational values in relation to those expressed by the Participants. Rank of the Most Important items is similarly an appropriate expression.

This expression satisfies the criteria set out for selection.

The norms for the Important items are set out with the first ten in rank order. Comparison of a student's choice and the Participant's ten highest ranks shows at a glance whether the student regards them of similar importance. Table 6.11a shows that this student's Important items include nine of the first ten rated by the Hairdressers - only the 8th (Item 17) is not chosen. This particular student shows a relatively high degree of correspondence with Participant norms.

Expression of the norms of the Most Important items could be made in terms of the total possible score. Selection by each Participant is translated into a points score:

1st = 3 pts. 2nd = 2 pts. 3rd = 1 pt.

Thus if a group of 50 Participants all chose a particular item as first, the maximum score would be 150 points. The score for each item in this norm would then be expressed as a fraction of 150 or as a percentage. These points scores could also be shown as ranks. It is suggested that points scores are more useful since a large proportion of the items in each occupation are rarely selected as Most Important. On average, of the 28 occupations normed, only 6 of the 43 items scored over 5% and only 3 scored over 10%. Evidence from the items scoring over 5% may help the guidance teacher to indicate to the student the items which Participants regard as Most Important. Since the student is ranking these items, it is less confusing

if the ranks are also shown (see Table 6.11a). In view of the relatively small number of these items chosen as Most Important in any one occupation, only the first ten in overall rank order are shown in the norms.

Summary of Presentation of Norms

Tables 6.11 a & b show examples of the presentation of norms based on the experimental work already carried out.

Part 1 norms show the proportional distribution (compared to the maximum score of 10) for each of the five sentences in the 43 items. Superimposed on the norm is an example of a student's selection of sentences with norm scores (ir_p) listed for each item. The total for the 43 items gives the Index of Reality (IR_p) which is conveniently converted to a percentage or a decimal.

Part 2 norms show the ranks of the two highest scoring items judged by the Participants to be Important and Most Important with the points score for the Most Important. An example of the student's selection of items is given but discussions of the interpretation is deferred to Chapter VII (p. 317).

TRIAL OF THE TEST MATERIAL IN SCHOOLS

The purpose of the project is to attempt to produce a test of occupational information suitable for students who are at the stage of considering the choice of occupations. The material was therefore used in schools and colleges in the United Kingdom. Table 6.13 shows the location and type of these establishments and the number of students completing the two levels of the test. This table shows that the test was tried in a wide range of types of maintained secondary schools. An attempt was made to distribute these in different geographical areas, but no predetermined sampling was carried out. Co-operation was readily and generously afforded through friends, professional contacts and a number of Careers Officers.

The trial of the material in schools had two main aims:

i) To try out the method of administration and the design of the booklets.

ii) To discover the distribution of occupations as titled by the student.

i) Administration of Test and Design of Booklets

Enclosed with the material sent to each school was a copy of the notes on administration of the test (Appendix 8, p. 547). The answer booklets are designed for individuals to complete alone or with the minimum of guidance (Chapter IV, p. 218). This should reduce the need for long explanations and introduction by the teacher or supervisor. When used normally in the guidance process the test would have been introduced as an integral part

TABLE 6.13

LOCATION AND TYPE OF SCHOOLS WITH NUMBERS OF STUDENTS COMPLETING EACH LEVEL OF TEST

LOCAL EDUCATION AUTHORITY	No.	SECONDARY SCHOOL TYPE	No. of Students Level 1 M	Level 1 F	Level 2 M	Level 2 F
ENGLAND						
Bolton	1	Mixed High				
Cheshire	1	Girls' Grammar	39	22		
	1	Mixed Comprehensive			0	32
	7	Special	12	6		
Chester	1	Girls' Bilateral	42	32		
	2	Mixed Secondary	0	20		
Hampshire	1	Boys' Secondary	25	29		
	1	Mixed Secondary			4	0
Lancashire	1	Boys' Grammar	3	3	0	2
Lindsey	1	Mixed Comprehensive			13	0
Northumberland	1	Mixed Grammar	43	41		
Oldham	1	Mixed Comprehensive			18	33
Redbridge	1	Mixed Grammar	32	28	13	14
South Shields	1	Boys' Grammar/Tech.			43	24
Surrey	1	Boys' Grammar			11	0
Worcestershire	1	Boys' Secondary			53	0
	1	Girls' Secondary	23	0		
	1	Mixed Secondary	20	0		
	1	Mixed College of F.E.	10	9		
Yorkshire (North Riding)	1	Mixed Secondary			11	22
			37	29	13	22
WALES						
Denbighshire	1	Mixed Comprehensive				
Glamorgan	1	Mixed Comprehensive	16	13	31	28
			43	45	33	18
SCOTLAND						
Fife	2	Mixed Secondary (Non-Select				
	3	Mixed Junior High (Comp.)	44	49		
	3	Mixed Senior High (Grammar)	57	51	22	51
					96	86
Total 16	37		446	377	361	332
			823		693	
Grand Total			1416			

of careers education. In this experimental use of the material it was usually an isolated occasion not fully part of the teaching and guidance programme. Teachers and Careers Officers were encouraged to comment freely and candidly on their experiences.

Administration of Level 1 Test Booklets

Difficulties in understanding the procedure occurred only amongst the least able of the Level 1 students. One headteacher commented on his pupils' difficulty in understanding the verbal instructions, involving him in a long explanation which he believed lost some of the motivation of the pupils. Another experienced Careers Master in a selective school commented that Level 1 was too difficult for the less able but he only used Level 2. Teachers usually gave full oral instructions for the completion of Part 1, but found difficulty in choosing a time suitable to all members of a class at which to explain Part 2, since there was a considerable variation in the speed of completion of Part 1. For the less able it was too confusing to explain both Parts at the same time. Oral guidance on both Parts was generally felt to be essential for students in the lower half of the ability scale.

The design of the answer booklet with horizontal rows of sentence numbers e.g.

Item No.	Sentence				
17	1	2	3	4	5

was found to be too confusing since the sentences themselves

were listed vertically in the item booklets. In spite of the recognition of this difficulty in the notes for the administrators several students took some time to understand this. One interpreted the answer booklet numbers vertically and three "very backward" students gave up in utter confusion. Students in special schools and the lowest ability group in one of the comprehensive schools expressed their choices on the item booklets. Teachers and the Careers Officer supervising these groups found this to be effective and no difficulties were encountered except for the completion of Part 2.

This experience suggests that re-design of the booklets with responses alongside items might alleviate this difficulty. When the booklets were originally planned this was considered but rejected on account of excessive cost.

Administration of Level 2 Test Booklets

No difficulties of administration were reported by those who administered Level 2 of the test. A printing error in the instructions (3rd line - last paragraph) did not apparently cause questions or misinterpretation. (See Appendix 4, p. 446).

Analysis of Responses - Part 1 of the Test

Analysis of the responses of the 1416 students showed that only one student completed this Part of the test in an uninterpretable way, by ringing the Item numbers instead of the Sentence numbers. Three others completed less than half the items. There was no evidence to indicate whether

this was due to lack of understanding, motivation or time.

All the remaining responses showed that students had understood the test instructions and they produced responses to Part 1 which could be interpreted usefully.

Analysis of Responses - Part 2 of the Test

There was little comment from the teachers and Careers Officers on the completion of Part 2. A printing problem in the Level 2 response booklets made it difficult to select Item 1 as "Important" or "Most Important" since these words were printed so that they also filled the appropriate "box". (See Appendix 4, p. 464). Reprinting and re-designing the response booklet would remove this fault.

Of the 1412 interpretable responses, 669 students named occupations which were classified on the CODOT system within the 29 occupations for which norms had been obtained. These constituted 388 at Level 1 (48% of the total at Level 1) and 281 at Level 2 (41% of the total at Level 2). These 669 responses were further analysed in relation to their interpretation of the instructions for Part 2 of the test.

This analysis revealed that a number of students did not complete Part 2 of the test precisely according to instructions. (See Table 6.14).

TABLE 6.14

STUDENTS NOT COMPLETING PART 2 PRECISELY ACCORDING TO INSTRUCTIONS

	No. of students	
	Level 1	Level 2
Total completing Part 2	388	281
Part 2 completed with:		
Multi-ranked "Most Important"	2	2
Multi-unranked "Most Important"	5	2
3 unranked "Most Important"	6	3
only 2 unranked "Most Important"	3	3
only 1 unranked "Most Important"	3	1
no "Most Important"	14	4
no Part 2	0*	3**
3 "Most Important" on each sheet	2	1
	35	19
% of total not precisely completed	9	7
% of total not interpretable in any way	4	2

* not including 16 students from special schools and 7 students from a comprehensive school who answered Part 1 in item booklets

** not including 9 students who did not complete Part 2 because insufficient time was available.

If the special circumstances in the special school and the comprehensive school are taken into account the percentage of students who did not complete Part 2 precisely as instructed can be seen to be small. Of these some interpretation may be put on all the categories except

no "Most Important"

and no Part 2.

Part 2 was intentionally displayed at one opening of the response booklet so that students could see all 43 items simultaneously and so be able to make the necessary selection and comparison more effectively. 3 students nevertheless selected 3 "Most Important" items on each sheet. Clearly the vast majority understood this operation,

but perhaps in re-designing the booklet, this difficulty may be removed. The evidence of the trial on the completion of Part 2 suggests that, with oral and written explanation, the great majority of the students complete it effectively and thus produce useful judgments which will help in their careers education.

Timing of the test is not an important issue, except for the practical purposes of planning its use within the restrictions which may be imposed by a school-timetable. Table 6.15 gives the times recorded for each Level.

TABLE 6.15

TIME IN MINUTES FOR COMPLETION OF THE TEST MATERIAL

	Shortest	Longest	Approx.Mean
Level 1	20	60	36
Level 2	15	45*	30

* an exceptional student took 2½ hours.

A number of factors enter into the length of time: oral explanation by the administrator; motivation of students; occupational knowledge; concern for precision of detail; speed of reading; comprehension of words and phrases. This approximate measure by five of the teachers who administered the test suggest that one hour for Level 1 and ¾ hour for Level 2 is normally ample time.

From the experience of the administration of the test material in schools the following factors emerge:

1) Although instructions were printed in full on the booklets so that the test may be completed with little supervision, a number of less able students found

difficulties in interpretation. Explanation by the teacher usually proved adequate. Discussion of the test and its completion would normally be a natural part of the careers education programme and this time could be valuably used as a learning experience for the students. For the less able students in special schools and remedial classes, the answer booklet must be re-designed so that the responses appear alongside the sentences.

2) Part 2 had varied interpretation for up to 9% of the Level 1 students. Many of these responses would have some use in guidance. Further explanation by the teacher would eliminate most of the uninterpretable answers to this Part.

3) The test appears to take less than one hour, even for those who read slowly and those who pay very careful attention to detail. This is a reasonable assignment to fit into most school programmes. Motivation of the students is likely to be lost if the test took a longer time.

ii) Distribution of Occupational Titles

Analysis of the occupational titles named in the school trials shows that 294 different titles were listed. These were grouped according to the CODOT Unit or Minor Group classification. Table 6.16 shows that 35 of these titles are specified by 10 or more students. These occupations account for 1088 of the 1416 (77%) students. 22 of these 35 titles were chosen in the sample group of 29 occupations. Thus the experimental use of the material

TABLE 6.16

OCCUPATIONAL TITLES CHOSEN BY STUDENTS IN SCHOOL TRIALS
(only Titles chosen by 10 or more Students are listed)

CODOT Classification	Main Title	Male	Female	Total
022	* Solicitor	14	3	17
032	Accountant	18	0	18
034	* Banking	4	7	11
09	* Teaching	55	109	164
102	* Social Work	4	11	15
113	* Nursing	0	52	52
151	* Journalist	7	8	15
159	Linguist	3	7	10
161	* Artist	10	8	18
211	Biologist	17	4	21
212	* Chemist	13	0	13
213	Physicist	14	0	14
223	Mechanical Engineer	12	0	12
224	* Electrical Engineer	25	0	25
241	Airline Officers	10	0	10
251	* Architect	11	2	13
253	* Draughtsman	18	1	19
254	Laboratory Technician	6	12	18
31	* Clerk	11	93	104
322	* Typist	0	47	47
341	* Telephonist	0	11	11
361	* Shop Assistant	19	68	87
401	Army	19	0	19
411	* Police	10	4	14
431	Cook	11	2	13
441	Nursery Nursing	0	33	33
471	* Hairdressing	2	26	28
501	* Agricultural Worker	20	1	21
652	* Textile Machinist	1	25	26
67	* Joiner	39	0	39
74	Mechanic	66	2	68
76	* Electrician	65	0	65
775	Welder	11	0	11
81	Painter	20	0	20
86	* Construction Worker	15	0	15
				1088

35 Titles. *Titles included in 29 selected occupations.

suggests that norms in a further 13 occupations would make evaluation possible for about three-quarters of any sizeable group of students who might use it at either Level.

A number of "titles" appeared which could not be classified by the CODOT system. Indeed some at the Minor Unit or Sub-group level were not occupational titles at all. These are shown in Table 6.17.

TABLE 6.17

"TITLES" NOT CLASSIFIABLE BY CODOT SYSTEM

	Number of students	
	Male	Female
Administration	1	0
Environmental Research	1	0
Factory (Worker)	4	24
Further Education	1	0
Machine Operator	1	3
Research	3	0
Research Scientist	3	0
Scientist	5	3
Technician	2	0
"Something with Figures"	1	0
Blank or uninterpretable	11	12
	33	42

These 75 amount in total to 5% of the 1416 students' responses. The test would not be appropriate in its present form for the guidance of these students. More specific guidance to administrators may reduce this number. Alternatively a different method of interpretation may be used for blank responses (see Chapter VII, p. 329).

3) Selection of Appropriate Level of Test

The division of the test into two Levels of educational attainment has been justified by statistics of the qualifications of school-leavers (Table 4.2, p. 194), and by the attainments of the Participants who produced norms

(Table 6.8, p. 272) For these norms to be of use it is important that the student completes the test at the Level appropriate to the occupation he is describing. This Level will normally correspond with his potential educational attainment.

The trial in schools showed that some students were completing the test at a Level inappropriate to the occupation. Table 6.18 shows occupations listed by Level of entry requirement (Central Youth Employment Executive Careers Guide, 1971-72)[1] which were also described by some students completing the test at the other Level.

TABLE 6.18

OCCUPATIONS CLASSIFIED BY ENTRY LEVEL, BUT ALSO NAMED BY SOME STUDENTS COMPLETING THE TEST AT THE OTHER LEVEL

	Level 1			Level 2		
Entry Level 1	Male	Female	Total	Male	Female	Total
Clerk	7	66	73	4	28	32
Cook	0	2	2	1	0	1
Electrician	35	0	35	2	0	2
Forces	24	0	24	2	0	2
Hairdresser	0	25	25	0	1	1
Nursery Nursing	0	30	30	0	1	1
Police	6	3	9	4	1	5
Entry Level 2						
Architect	2	1	3	9	1	10
Banking	0	2	2	4	5	9
Civil Service	1	0	1	3	4	7
Draughtsman	9	0	9	9	1	10
Electrical Engineer	10	0	10	15	0	15
Biologist	0	1	1	17	4	21
Doctor	0	1	1	3	5	8
Journalist	2	0	2	5	8	13
Laboratory Technician	3	2	5	3	9	12
Mechanical Engineer	4	0	4	5	0	5
Minister	1	0	1	2	0	2
Nurse	0	36	36	0	16	16
Social Work	0	4	4	4	7	11
Teacher	13	8	21	42	101	143

1. Op.cit.

If it is assumed that total groups of less than five represent individual problems of inappropriate Level of such relative infrequency that they may be solved by help from the guidance teacher, this Table still reveals that some occupations are named by a considerable number of students at a Level of the test which may be inappropriate. 32 students named Clerk as an occupation at Level 2 and 36 named Nurse at Level 1. Reference to the C.Y.E.E. Careers Guide (1971-72)[1] suggests that entry to courses in Business Studies may lead to higher level clerical and secretarial work; for State Enrolment in Nursing; lower academic qualifications (not specified) may be acceptable. For these reasons it seems appropriate that norms in these occupations should be produced at both Levels. The number naming Teacher at Level 1 is considerable, but not a high proportion of the total. These students are likely to be underqualified for admission for professional training and there is no need to produce Level 1 norms for Teaching. The 10 naming Electrical Engineer at Level 1 may be potential Electricians and this norm could be used here. Draughtsmen appear in almost equal numbers at both Levels. Perhaps this could be normed at Level 1, as the predominance of participants at this Level might suggest (p. 272). The Police encourage entry on a wide range of academic qualifications up to University degree. Two norms may be appropriate here.

---

1. Ibid.

Thus norms should be available on the Level(s) appropriate to entry to the occupation. Students should complete the test material at a Level appropriate to their potential educational attainment. There is clearly need for guidance if the student names an occupation with an entry level higher than his educational potential.

The problems of administration and booklet design, of Level and of occupational titling are discussed further in Chapter VIII (p. 394).

DETERMINATION OF RELIABILITY

A measure of Reliability of the test was determined by administering Level 2 on two separate occasions to the same group of 22 girls in the sixth form of a Cheshire grammar school. A fortnight elapsed between the two administrations.

The test - re-test reliability was computed from the number of identical responses produced. In Part 1 this was +0.83 and in Part 2 it was +0.85. These students were taking part in a careers education course during this time. This is a measure of the interpretability of the test by the students. The relatively high positive correlations between the two results on both parts of the test shows that the students understood the meaning of the items and were consistent in their responses. An extension in knowledge and guidance may reduce these measures and over longer intervals of time these and other factors of maturity would account for differences in the two scores.

On the basis of these trials it appears to be appropriate to discuss the uses of the test in careers education (Chapter VII, p. 308) and the problems arising from its construction and use (Chapter VIII, p. 337).

CHAPTER VII

USES OF THE TEST IN CAREERS EDUCATION

The uses of tests in education are clearly related to the objectives they are designed to fulfil. The objectives of this present test have been set out in Chapter IV (p. 165) in terms of student behaviour:

1) To become aware of the many aspects of the occupational environment.
2) To be informed, if he wishes, of the accuracy of his occupational information in relation to the descriptions of those with knowledge of, and actually engaged in, the occupations.
3) To express value judgments about the aspects of the work which the student himself regards as important.

The first objective is concerned with students learning about occupations generally rather than specific occupations. The second and third objectives are concerned with personal guidance and decision-making within careers education. This Chapter discusses these two important uses of the test and describes two other potential uses to which the test is applicable.

USES OF THE TEST IN LEARNING

The first objective is related to student learning. By working through the items of Part 1 of the test a group of students may become aware, or be reminded, of the range of characteristics in occupations. The operation of choosing between the five sentences in each item requires consideration of the different alternatives in relation to the occupation. Perhaps this is a form of "trial and error" learning where each possibility is tried against the student's perception of the reality of the occupation. At a more advanced level it is a form of multiple discrimination between the alternatives (Gagné, 1965).[1] The selection of a response to each item thus builds up concepts of the physical, social and cognitive aspects of the occupation. Thus completion of this part of the test involves a learning process on the part of the student.

The content of the test is structured so that the student becomes aware of the range of aspects of occupational characteristics which may be important in the eventual choice of occupation. The item booklet could be used in various ways in classroom exercises. The following are presented as suggestions, but practicing teachers would have their own ideas appropriate to their own situation:

---

1. R.M.Gagné, The Conditions of Learning, New York, Holt, Reinhart & Winston, 1965, p. 113.

1) As an introduction to discussion about occupations.
2) As the basis for analysis of learning exercises in a group or particular occupations - a visit, a film, talk, discussion, works experience or combinations of these techniques.

To fulfil this first objective norms are not essential. The instrument is used not to measure the accuracy of students' occupational information, but to increase his awareness of the range of aspects it may be necessary to think about when carefully considering particular occupations.

Related to this use may be its possible application to curriculum evaluation. This is discussed in a later section of this Chapter (p. 331). The other two objectives are primarily concerned with the uses of the test in individual guidance.

USES OF THE TEST IN GUIDANCE

Hopson (1968)[1] suggests that the major use of tests in guidance is concerned with decisions, plans and their implementation. School students, inexperienced in the occupational world are confronted by a series of alternative choices and are affected by conflicting personal values (e.g. security v. monetary rewards; living at home v. using mathematical ability). They need help with the various stages of the decision-making process:

1) in deciding upon goals;
2) in considering alternative choices;
3) in weighing their own characteristics against their best chances of reaching their goals.

Identification of these goals is aided by this test of occupational information. Completion of Part 1 gives the student the opportunity to consider the range of occupational characteristics from which, in Part 2, he attempts to consider their relative importance. Through seeing a list of important characteristics he will be helped to formulate his occupational goals.

Alternative choices may be considered by working this test in relation to a number of different occupations. The use of norms will give the student a measure of the accuracy of this information and show how his values

---

1. B. Hopson, "The Uses of Psychological Tests in Educational and Vocational Counselling", University of Leeds: Vocational Guidance Research Unit, 1968, p. 12.

compare with those of participants working in the occupation. Goldman (1961)[1] claims that the degree of realism is important to the student. He also needs to know what information about the occupation is pertinent to his vocational decision. If his information is unrealistic particularly in the characteristics which he, and others, regard as important, there is need for guidance.

The third process of weighing personal characteristics against the best chances of achieving goals is the compromise process described by Super (1953).[2] Those who have developed self-awareness through the developmental stages assisted by information, tests and guidance are the better equipped to make an informed choice. In Britain at the present time the shortage of careers teachers, inadequate resources of time and facilities and the high case load of Careers Officers (Chapter I, p. 6), Chapter II, p. 92)) means that most of the careers guidance which is carried out is problem oriented (Super, 1957;[3] Hopson, 1968).[4] Under these circumstances guidance can

---

1. L. Goldman, Using Tests in Counselling, New York, Appleton, Century, Crofts, 1961, p. 27.

2. D.E.Super,"A Theory of Vocational Development," American Psychologist 8: 185-190, 1953, p. 190.

3. D.E.Super, "The Preliminary appraisal in vocational counselling," Personnel and Guidance Journal, 36: 154-161, p. 154.

4. B. Hopson,"The Uses of Psychological Tests in Educational and Vocational Counselling", University of Leeds: Vocational Guidance Research Unit, 1968, p. 13.

normally only be given when there is a relatively imminent choice to be made.

Matthewson (1962)[1] points out that the positive, continuing, developmental approach is likely to be of greater help to most people. Tests have an important part to play in developing self-awareness so that appropriate judgments may be made when the need arises.

The test of occupational information may be used in problem-oriented or developmental guidance. Within the present tests appropriate in careers education and guidance, this test helps to develop self-awareness of occupational characteristics and the student's personal values in relation to them.

Thus in a developmental guidance scheme a battery of tests is likely to contribute information which will help the student to become aware of his potential, his interests and values and the realism of his occupational information.

Hayes and Hopson (1971)[2] suggest that a minimum general testing programme related to careers guidance in a secondary school should consist of:

1) measures of achievement in specific subjects;
2) a general ability test;
3) a measure of personal and social adjustment;
4) a measure of interests.

---

1. R.H.Matthewson, Guidance Policy and Practice, 3rd Edition, New York, Harper, 1962, pp. 151-155.

2. J.Hayes and B. Hopson, Careers Guidance, Heinemann, 1971, p.89.

The occupational information test may be compared to an achievement test in that it measures knowledge in the occupational field, which is complementary to that which is tested in the conventional subject areas.
Part 2 of the test is complementary to the test of personality. It reveals to the student his own needs which an occupation may help to fulfil. The values shown by the aspects of the occupation which the student regards as important may be discussed in relation to his personality profile. Thus this test may be seen as part of a testing programme in careers guidance.

The importance of decision-making in careers education and the appropriateness of Gelatt's model has been discussed in Chapter II (p. 85). This model implies a mature and rational approach to decision-making and the formation of a terminal decision requires the mental processing of a vast amount of information about occupations. Haystead (1971)[1] has suggested that there are degrees of awareness of alternatives available. Those who operate in a "closed awareness" context may barely recognize that there are decisions to be made.

> "Children's knowledge of the employment structure of Sheffield was very limited and as a result several found themselves in jobs which they had not thought of at all until the opportunity occurred."
> (Carter, 1962)[2]

---

1. J.M.Haystead,"Social Structure, Awareness Contents and Processes of Choice", Sociological Review, 19: 79-94, pp. 85 and 92.

2. M.P.Carter, Home, School and Work, Pergamon, 1962, p. 150.

Those who show an "open awareness" need two "banks" of knowledge, that of themselves (self-concept) and of occupations (occupational concept). The process of bringing types of information together is the strategy of decision making (Gelatt, 1962).[1] The occupational self-concept develops as the individual weighs the two in the balance and attempts to see himself in the occupational situation. This may superficially appear as talent-matching (the dangers of which were set out in Chapter II, p. 52), but this decision-making process is worked through by the individual, not an adviser or teacher.

Further research on the decision-making process needs to be carried out to attempt to establish how those involved actually reach their decisions. Guidance is a process which should enable them to do it more comprehensively and effectively, but the resources of guidance teachers are restricted particularly in the time they are able to spend on individual counselling. Thus the test may be of use in enabling the individual to see for himself the reality of his occupational information.

If the validity of the test was to be tested in the decision-making process, it is suggested this might be based on Gelatt's model (Fig.2, p. 86).

The test has a vital part to play in this process. The student develops his occupational information through careers education. He becomes increasingly aware of his own values and begins to see the possible career alternatives

---

1. H. Gelatt, "Decision making: a conceptual frame of reference for counselling", Journal of Counselling Psychology, 9: 240-245, 1962.

in terms of the way of life he sees for himself. The test gives him the opportunity of evaluating the reality of his information in the occupation(s) he is considering and also relating the aspects he regards as important to this information. An individual or group of students might complete the material for a particular occupation and then discuss the Index of Reality and its relation to their Important items. The technique of counselling used by the teacher in this discussion will affect the students' attitudes and use of the test. The outcome of this counselling would be to reach an "Investigatory" or "Terminal" decision. An "Investigatory" decision would imply that the student went on to consider further the implications of his responses to both parts of the test. His knowledge might be unrealistic (low Index of Reality), perhaps in aspects of the occupation which he believed to be important. He might have realistic knowledge, but values which are not regarded as important by participants in the occupation. He would then seek further information and guidance and may re-work the test in the same or an alternative occupational title. A "Terminal" decision would mean that the student had chosen an occupation where his Index of Reality was high and his values were congruent with the participants. He would then act upon this decision by investigating the ways of entering the occupation or the implications in terms of further or higher education.

The responsibility for the use of the test lies primarily with the guidance teacher, who should have the professional expertise to determine when and how the test may be used effectively. He will have planned the careers education course and therefore be aware of the stages at which students may appropriately use the material. He should know his students and the extent to which they appear to need help or guidance in making decisions at the appropriate time. The technique of counselling and its degree of directiveness will be determined by the needs of the students and the resources of time and information which are available to the counsellor.

So the test of occupational information may become an instrument for use by students with the guidance of teachers in careers education.

ADMINISTRATION OF THE TEST OF OCCUPATIONAL INFORMATION

If the use of the test is justified in careers education, questions of administration arise. These are discussed under the headings of:

Types of Testing Situation

Selection of Norms

Appropriate Stages in Guidance

TYPES OF TESTING SITUATION

Hopson (1968)[1] lists four basic situations in which testing may take place:

1) Saturation Testing (Super, 1950)[2] or Uniform Battery (Goldman, 1961)[3], of tests selected to cover everything that is likely to be important for personal guidance. This method assumes that the whole range of abilities and interests may be of some importance and that the best way is to test for them all at once. This often entails unnecessary testing and waste of time and money, but it may be practically convenient. Yet is has many disadvantages: inappropriate tests are given to many students; there is no student participation either in choice or interpretation; inevitably there is an assembly-line atmosphere lacking personal warmth and significance.

---

1. Op.cit., pp. 35-36.

2. D.E.Super, "Testing and using test results in counselling", Occupations: 29, 95-97, 1950.

3. Op.cit., p. 58.

2) Individual Testing (Goldman, 1961)[1]

Testing is carried out in groups or classes, but each individual takes just the test or tests most appropriate to himself. Both this and Saturation Testing separate the testing from the guidance and there is a danger of lack of student motivation.

3) Preliminary Screening Battery (Cronbach and Gleser, 1965)[2] (Goldman, 1961)[3]

A short test is given to all students. This may provide sufficient information for guidance. For the remainder there is a processof narrowing down where students take further tests until sufficient information has been gathered for the appropriate decision to be made. For many careers teachers, interviews and personal records serve as screening devices to narrow down the choice of tests.

4) Precision Testing (Super, 1950).[4]

Tests are part of the guidance process to encourage student participation and further develop rapport. As problems and questions are discussed it becomes clear that other data are needed; so the student will complete other appropriate tests. Although this method is most time-consuming it encourages student participation and maturation. Galbraith (Chapter I, p. 7) suggests this is more appropriate than Saturation Testing but more

---

1. Loc.cit.

2. L.J.Cronbach and G.C.Gleser, Psychological Tests and Personal Decisions, 2nd Edition, Urbana: University of Illinois Press, 1965, pp. 90-91.

3. Op.cit., pp. 58-59.

4. Op.cit.

demanding of resources.

It appears that the test of occupational information may well form part of a battery used in Saturation or Individual Testing. The disadvantages of Saturation Testing can be reduced by careful selection of tests and by their administration to a group of students at approximately the same stage of vocational development. If it is used along with tests of verbal, numerical and other abilities, an occupational interest guide and perhaps a personality measure, there will be little overlap in the information obtained and little of the students' time and effort will be wasted.

These two types of testing are normally carried out in groups (or classes). The teacher may feel that it is appropriate to discuss the results in groups. As a result of experiments on the interpretations of test results by second and fourth year students in a secondary modern school, Hopson (1970)[1] warns against dangers of test interpretation in a group. Tests of interest may be appropriately discussed by students in a group setting. However tests of ability and achievement tend to rank and compare students who may become much more emotionally involved when discussing the results. This test of occupational information could only be compared in this sense with achievement tests in the computation of the Index of Reality. Here comparison is made, not with the results of other students (who may in

---

1. B. Hopson, "An Experiment in Using Psychological Tests in Group Guidance", Careers Quarterly 22: 17-24, 1970.

any case have described other occupations), but with the judgments of Participants and Careers Officers. The students' expression of occupational values in Part 2 of the test is subjective in the same way as the interest expression in the A.P.U. Guide or other interest test. Group discussion of occupational values may encourage self-development of the students. Thus the criticisms put forward by Hopson may not apply to this test.

The other two testing situations would normally be carried out separately by individuals rather than in groups.

In the Preliminary Screening technique this test may be used after analysis of abilities and interests had focussed on a small number or one occupation. By allowing opportunity for discussion of possible occupations before completion of the occupational information test, this may have advantages of time, economy and effective learning over the two previous methods.

Since the test has instructions which are clearly set out and have been shown to be interpretable by all Level 2 students and by the majority of those taking Level 1 (Chapter VI, p. 297), it is quite practicable for the material to be completed by individuals without supervision. This means that the teacher using Precision Testing may give the test to a student who may complete it at home or elsewhere, whilst the teacher is free to spend time in teaching and counselling rather than in test administration.

Thus the test of occupational information may be shown to be appropriate to all four types of testing.

SELECTION OF NORMS

The responses of the students may be scored against the norms produced by the Participants in the occupations or by the Careers Officers.

Clearly these norms offer occupational descriptions from two different viewpoints. The Careers Officers have the professional experience and probably the training to compare the characteristics of the range of occupations. Therefore in selecting the most appropriate sentence to describe a particular occupation, the Careers Officer will do so in the light of his broad rather than detailed occupational knowledge. Differences between the two sets of norms will arise from the different viewpoints and experience and values of the two different groups. Examples illustrate these differences:

Level 1 Occupation: Police

Item 14 General Health	Norm Scores: Careers Officers	Norm Scores: Participants
This job		
1. can be done by people with certain physical handicaps	0	0
2. can be done by people with certain health defects	0	0
3. requires people who are fit	1	10
4. is suitable only for people who are fit	2	2
5. demands very high standards of fitness	10	4

Importance ratings by Police Imp.=2nd. Most Imp. = 2nd.

The differences between Sentences 3 and 5 in this example illustrate the Careers Officers' overall comparison with other occupations in terms of fitness and the Police comparing their fitness within the occupational group.

Level 2. Occupation: Banking

Item 32 Initiative	Norm Scores: Careers Officers	Norm Scores: Participants
In this occupation I should		
1. be expected to follow instructions closely	10	2
2. be able to use my own ideas only occasionally	7	5
3. have the opportunity to work out some of my own ideas	2	5
4. be expected to plan my own work and use initiative	3	9
5. have freedom to decide and to act within broad limits	0	10

Importance Ratings by Bankers Imp. = 2nd. Most Imp. = 2nd.

The higher rating of initiative by the bank employees may be due to the sample being taken from Bank Staff Colleges where the participants had been selected for training as Assistant Managers. The Careers Officers' wider view of the occupation suggests the majority of participants may not be expected to exercise initiative to the extent indicated in Sentences 4 and 5.

Participants' experience may be strongly influenced by some abnormal or atypical local circumstance of the occupation. This could be an important feature to those working in a particular area or firm, but it would not be recorded on the judgments of participants whose norms were based on experience elsewhere or by a national sample of Careers Officers of whom a very small minority, if any, may be aware of this peculiarity. This is likely to be less true of the professions (Level 2 occupations) than of the Level 1 occupations.

Only the participant norms can include any judgments on Part 2 of the test. Clearly Careers Officers could only offer valid judgments of what are to them the important aspects of their own work.

Thus two distinctly different sets of norms may be used by the student in interpretation of the test. It is tentatively suggested on a basis of the differences that the Careers Officers norms may be more appropriately used at the point of discriminating between different occupations,

probably in the earlier stages of guidance. Participant norms may be more suitable at a later stage when the student can compare his description of the occupation with the detailed experience and occupational values of the participants. It is important that the student realises the differences in the sources of the norms and that he is helped by the teacher or counsellor to select the more appropriate norm and to interpret the results in the light of the source.

If the test is to be generally useful to students, norms are required in more occupations. This issue is discussed in Chapter IX, (p. 405).

APPROPRIATE STAGES IN GUIDANCE FOR USE OF THE TEST

It has been argued that the prime responsibility for test selection and use rests with the guidance teacher. Administration of the appropriate test should only take place when he is certain that it will provide evidence which will help a student (or group of students) to develop towards career decision-making.

This test of occupational information provides evidence which may help the student to select the occupation best suited to his needs. By comparing his knowledge with that of Careers Officers and later with Participants, he should have a greater understanding on which to base a decision.

Decisions involving occupational knowledge are made

at various stages and differ from school to school and between abilities of students.

A student is unlikely to have to make decisions for which detailed occupational information is crucial before the age of 13. On entering the third year of secondary education (assuming entry at 11 years) a student may be presented with subject choices which have occupational implications. These decisions are more likely to be made on the basis of ability and interest than occupational requirements. Other subject choices may be required at the fourth year stage.

For those who consider leaving school at the statutory leaving age of 16, the third year is the time for beginning a more detailed course to develop occupational awareness. At various stages during the third and fourth years the use of the test may be appropriate, particularly as a learning instrument to present the various aspects of occupations. In the fifth year Level 1 of the test may be used with each potential leaver who may complete it for a number of occupations and measure the realism of his occupational knowledge against the participant norms. Useful frameworks for guidance programmes in a comprehensive school are set out in Howden and Dawson (1973).[1] For students sitting C.S.E. and G.C.E. examinations the test may be taken as part of the guidance in the fifth year.

---

1. R. Howden and H. Dawson, Practical Guidance in Schools, Careers Consultants, 1973, pp. 70-89.

This may help to determine the most appropriate occupation for the student to enter if he seeks employment at this stage. For those entering the sixth form the choice of occupation may, for some, determine the choice of subjects studied for G.C.E. Advanced Level. Level 2 of the test may help them to form some picture of possible careers after school and higher education. Since the professional training for many careers qualifies only for entry to a very narrow range of occupations, it is particularly important that before entry a candidate should be aware of the characteristics of the occupation he is entering. At the Sixth Form stage Level 2 is more likely to be used in Precision Testing.

This outline is only a suggestion based on the practice and experience of those who have already used the test in schools. The responsibility for its use within the guidance programme rests with the guidance teacher or Careers Officer.

OTHER USES OF THE TEST OF OCCUPATIONAL INFORMATION

USE IN COMPUTER ASSISTED GUIDANCE

Scoring the answer booklets with appropriate norms for each sentence and item selected by the student is a simple but laborious and time-consuming process. Answer sheets can be designed to be read by document readers and scored by computer (see Chapter VIII, p. 395). (Closs et al. 1969).[1] This facility therefore needs to be considered in the designing of the item and response booklets.

Computers are beginning to be used in this country for the storage, retrieval and selection of appropriate information for use in careers guidance (Dyer, 1970;[2] Wilson, 1971).[3] The norms of this test could appropriately be fed into the bank of such a system. A student completing the test for a particular occupation could then have a print-out of the norm which emphasises (perhaps by an asterisk) the sentence which he selected in each item. He would then see his responses in relation to the norm as a whole, rather than only for his selected sentences.

The test might also be appropriate for a student

---

1. S.J.Closs, W.T.G.Bates, M.C. Killcross, D.McMahon, Manual of the Occupational Interest s Guide, University of London Press Ltd., 1969.

2. B.M.Dyer, "Computerised Guidance", Careers Quarterly 22: No. 4 (Autumn 1970), pp. 33-35.

3. J. Wilson, "Leicestershire Scheme of Computerised Guidance", Careers Quarterly 33: No. 3 (Summer 1971), pp. 23-24.

completing it by describing his "ideal" occupational characteristics rather than for a named occupation. (One Careers Officer interpreted the test in this way in the trials). These responses could then be fed into the computer and compared with the bank of norms to select those occupations most closely corresponding to the student's "ideal" description.

Wishart (1971)[1] has suggested ways in which the computer may be used in careers guidance. He specifies the application of the simple Bayesian algorithm to the interpretation of a modified version of the Connelly Occupational Preferences Inventory. As the student works through the sequence of personal history, paired occupational interests (only four interest categories were used in this work) and paired occupational preferences, the computer prints out the probability of the response in terms of the interest patterns determined by a group of people in a given occupation. A brief description of the mathematical basis of this application is set out in Appendix 9 (p. 550).

The use of the test with computer facility depends upon the availability and cost of computer time. As yet the Leicestershire scheme (Wilson, 1971)[2] is the only system in this country designed for school students

---

1. D. Wishart, Computers in Personnel Management, Private communication, 1971.

2. Op.cit.

although preliminary experiments are also being made by I.B.M. in two Cheshire schools (November, 1973). Two other systems are in operation for job-changers and university students (Watts, 1973).[1] The experience of Wilson and his staff and the trials carried out by Wishart (1972)[2] using the Connelly Inventory suggests that material produced for careers education will in future be more widely and effectively used when supported by computer facility. Experiments have yet to reveal the appropriateness of this test of occupational information in computer-assisted guidance, but Wishart's theoretical discussion appears to suggest that it could well be suited to this purpose.

USE OF THE TEST IN CURRICULUM EVALUATION

In the present climate of curriculum change in the schools, there is a growing awareness that objectives should be stated for the school, for the pupils and more specifically for particular courses. These objectives must be stated in terms which are sufficiently precise for evaluation (Wiseman and Pidgeon, 1970).[3] Objectives

---

1. A.G.Watts, "The Use of Computers in Guidance", Education and Training: 15, p. 218, 1973.

2. Op.cit.

3. S. Wiseman and D. Pidgeon, "Curriculum Evaluation", Slough: N.F.E.R., 1970.

may be classified as cognitive (Bloom, 1956)[1] or affective (Krathwohl, Bloom and Masia, 1956).[2] Within the cognitive field knowledge is regarded as basic to the higher order skills of comprehension, analysis, synthesis and evaluation. If the objectives of careers education are set out in these terms it is likely that occupational characteristics will be included as part of the basic knowledge. Evaluation of cognitive objectives, particularly knowledge, may be more appropriately carried out by carefully constructed and validated objective instruments (Wiseman and Pidgeon, 1970).[3]

Essentially each test should be constructed to evaluate precise objectives for a specified group of students. It may therefore be inappropriate to suggest that the present test has any use in curriculum evaluation. Nevertheless it may be offered with the basis of its structure and its norms for the evaluation of any careers curriculum or course which aims to develop the knowledge of occupational characteristics. For example, the items may be useful for evaluating the information gained on an occupational visit, (Hopson, 1967).[4]

---

1. B.S.Bloom (ed.), Taxonomy of Educational Objectives Handbook I: Cognitive Domain, Longmans, 1956.

2. D.R.Krathwohl,B.S.Bloom and B.B.Masia, Taxonomy of Educational Objectives, Handbook II: Affective Domain, Longmans, 1956.

3. Op.cit., pp. 47-55.

4. B. Hopson,"Occupational Visits - Education, Recruitment or a Lark?", Youth Employment 19: 1967, p.27.

A small scale trial investigation of this test material has been used as the pre- and post-test of a course of careers education in a non-selective secondary school. A group of fourth year students completed the test in the early stages of the course (1 October 1969). On one afternoon per week throughout two terms they attended talks, went on visits and took part in group and individual discussions. The purpose of the course was to develop students' self-awareness and information leading to career choice. 38 boys and 22 girls embarked on this course and took the pre-test. It was hoped to administer the post-test at the end of the Spring Term in March 1970, but for a number of reasons this was not possible. Some of these students left school at Easter, others transferred to C.S.E. classes and decided to remain at school for a fifth year. When the post-test was arranged on 3 June 1970, 17 boys and 12 girls completed the material. Of these, 2 boys and 2 girls had not taken the pre-test, thus analysis could only be made of 15 boys and 10 girls. The same occupations were described on both occasions by 7 boys and 5 girls. Thus approximately half this group had changed the considered occupation during the eight months of the course. It was possible to score Part 1 of both scripts for 6 boys and 4 girls. The others selected occupations for which norms were not available. Indices of Reality were determined for the remaining 6 boys and 4 girls who

had selected the same occupation on both occasions and for which norms were available. Table 7.1 shows the increase in each Index of Reality between the two test administrations. Little of value concerning the course evaluation can be drawn from an exercise with only 10 pupils in which other factors were not measured, but the technique could obviously be applied to larger numbers and the results analysed not only in terms of the Index of Reality, but by the different items or sections of the test. In this way a careers course might be refined to emphasise certain aspects of occupations, with the intention that students' Indices of Reality at the end of the programme approach nearer to 100%.

Norms for both Careers Officers and Participants were used in this exercise. It can be seen that the difference between them is relatively small, but a much larger investigation is necessary to reveal whether or not there is a significant difference between them.

TABLE 7.1

INDEXES OF REALITY OF 10 PUPILS SHOWING SCORES AT THE BEGINNING AND THE END (PRE- and POST -TEST) OF A COURSE OF CAREERS EDUCATION

Norms used	Participants			Careers Officers			Difference between two types of norms	
Pupil No.	$(IR)_{P1}$	$(IR)_{P2}$	$(IR)_{P2}-(IR)_{P1}$	$(IR)_{A1}$	$(IR)_{A2}$	$(IR)_{A2}-(IR)_{A1}$	$(IR)_{P2}-(IR)_{A2}$	% of $(IR)_{P2}$
1	63	74	+11	60	60	0	+14	21
2	74	81	+ 7	67	77	+10	+ 4	5
3	60	69	+ 9	57	70	+13	- 1	1
4	62	74	+12	69	75	+ 6	- 1	1
5	62	68	+ 6	63	70	+ 7	- 2	3
6	65	69	+ 4	45	53	+ 8	+16	23
7	67	74	+ 7	68	76	+ 8	- 2	3
8	71	76	+ 5	68	76	+ 8	0	0
9	64	76	+12	73	77	+ 4	- 1	1
10	59	61	+ 2	62	69	+ 7	- 8	12

SUMMARY OF THE USES OF THE TEST

The test has been structured to fulfil three objectives. Discussion in this Chapter has shown that it can be used as a learning device and as a basis for class discussion about the characteristics of occupations. Primarily it is likely to be used in individual guidance, Norms may or may not be used to help students to establish the Index of Reality of his occupational information, particularly in relation to those aspects of the work which he regards as important.

In looking to future developments in computer assisted guidance, its structure is such that it is readily adaptable with norms which could easily be fed into a computer information bank.

Whilst not established for a set of specific curricular objectives, the item content of the test may be useful in evaluation of courses in careers education.

Its use depends upon the inclination of the teacher. Encouragement and education may be necessary to overcome the apparent reluctance of some teachers to use tests (Chapter I, p. 30). This has not been the personal experience of the investigator in the contacts made in the experimental trials in this project.

CHAPTER VIII

PROBLEMS ARISING IN THE STRUCTURE AND USE OF THE TEST

The earlier chapters have revealed a number of problems related to the construction and use of this test of occupational information. This chapter is concerned with discussion of the issues raised. Comment is made on the decisions taken in relation to the structure of the test in the light of the experience of its use (described in Chapter VII) and other research evidence (e.g. Hayes, 1970).[1] Suggestions for possible modification and further development will be set out in Chapter IX.

The problems may be conveniently divided under four headings:

Validity of the test

Structure of the test

Norms for the test

Presentation and Administration of the test

---

1. J. Hayes, "Occupational Choice and the perception of occupational roles, University of Leeds, Department of Management Studies, Unpublished Ph.D., 1970.

VALIDITY OF THE TEST

Validity of test structure has been defined in Chapter IV (p. 167) and the four types of validity - content, concurrent, predictive and construct - are there discussed in relation to the rationale of this particular test of occupational information. Experience in constructing, norming and using the test in schools has produced evidence on these different aspects of validity.

i) Construct Validity

This measure of the validity is an analysis of the meaning of the test scores in terms of psychological concepts (Cronbach, 1966).[1] The appropriate psychological concepts have been described in Chapters I and II,(p. 22 +74) as the occupational concept, the self-concept and the occupational self-concept. Occupational information has been shown to be a contributory element to these concepts. Having chosen the objective type of test structure, occupational characteristics have been described in Chapter III (pp. 108 ff). The question is raised as to whether the items which have been constructed from an analysis of these characteristics adequately describe occupational information appropriate to the guidance of school students. Evidence on this is offered in terms of a discussion of item content and is considered later under content validity.

---

1. L.J.Cronbach, Essentials of Psychological Testing, New York, Harper & Row (2nd Edition), 1966, p. 120.

In this discussion detailed reference will be made to the correspondence of the test items with the description of occupational concept defined by Hayes and Hopson (1968)[1] (Chapter II, p. 72) and extended by Hayes (1970)[2] in his study of the perception of occupational roles.

ii) Predictive Validity

No work has yet been carried out on the extent to which the test predicts future vocational adjustment - a criterion against which any test concerned with careers education might justifiably be judged.

Job satisfaction might be regarded as one indication of predictive validity. A measure of job satisfaction might be correlated with Indices of Reality obtained in this test.

Comments on the construction of the test by Careers Officers and others suggested that items on Job Satisfaction might have been incorporated. Job Satisfaction is part of a wider concept of vocational adjustment, which is defined by Crites (1969)[3] in relation to the process of vocational choice:

---

1. J. Hayes and B. Hopson, "Occupational information and the process of vocational development", Technical Education Abstracts 9: 6-9, 1968, p. 7.

2. Op. cit.

3. J.O.Crites, Vocational Psychology, New York, McGraw-Hill, 1969, p. 325.

> "In making vocational choice an individual is, in effect, making a prediction of his vocational adjustment. When he expresses an intention of entering a particular occupation he is estimating that, of the occupations known to him (and open to him), this is the one which he thinks will bring him the greatest happiness, wealth, recognition or whatever he is seeking..... Vocational adjustment, however defined, refers to the state or condition of the individual in relation to the world of work after he has entered an occupation."

Thus adjustment, success and satisfaction are determined by the individual on the basis of his experience in work. A number of factors influence this adjustment. Most significant are the individual himself, the process by which he has made the occupational choice and the way in which he has adapted to the changed environment. The work may be different from that which he anticipated - it may have changed since his occupational concept was developed. His extra-occupational life - marriage, courtship, family - may have changed in a way which affects his work. This aspect is discussed further in relation to vocational maturity (p. 390).

Whilst adjustment is perhaps the most important outcome of vocational choice it would need a separate instrument to test it. Recently two instruments have been developed in America. Westbrook (1971)[1] has developed a Cognitive Vocational Maturity Test stressing occupational

---

1. B.W.Westbrook, The Cognitive Vocational Maturity Test, Raleigh: North Carolina: North Carolina State University, 1971.

information and decision-making and Sheppard (1971)[1] has produced an Adult Vocational Maturity Inventory. These instruments are still in the earlier stages of validation in America, but they may form the basis for the development of a corresponding instrument in this country. Until such time as a test of Vocational Adjustment is devised the predictive validity of this present test cannot be effectively determined.

iii) Concurrent Validity

When the test was originally constructed there was no comparable measure of occupational information from which concurrent validity might be assessed. Recently Kirton (1973)[2] has carried out an investigation which is likely to form the basis of a Job Knowledge Index. After discussion with senior experienced members of 17 different professions he selected about 10 key questions about each of these occupations. Ideally these were constituted as:

1 question on entry requirements
2 questions on training
1 question on salary
1 question on promotion
1 distinguishing question
4 questions on life-style

---

1. D.I.Sheppard, "The Measurement of Vocational Maturity in Adults", Journal of Vocational Behaviour 1: 399-406, 1971.

2. M.J.Kirton, "Career Knowledge of Sixth Form Boys", The Hatfield Polytechnic, Report to Leverhulme Trust, 1973, p. 23.

Each occupation had a different set of questions. The 17 occupations were selected on the basis of interest categories, but were restricted to those normally entered by sixth-form boys. It can be seen that the rationale used by Kirton is quite different from the inclusive non-selective basis on which items are included in this present test of occupational information. Although the objectives of the two tests are similar, any measure of concurrent validity through correlation with Kirton's Job Knowledge Index would be open to question on the grounds of different rationale.

iv) Content Validity

It was suggested in Chapter IV (p. 170) that content validity is the most important aspect of validity for this test of occupational information. This measure is discussed as Item Content (Part 1 of the test) and Occupational Values (Part 2 of the test).

1) Item Content

The only detailed description of occupational characteristics appropriate to guidance and careers edudation has been produced in a study carried out by Hayes (1970)[1] and published after the items of this test had been devised. Hayes emphasises the importance of the psycho-social aspects. A comparison of his description of these aspects with the corresponding items of the test

---

1. J. Hayes, "Occupational Choice and the perception of occupational roles," University of Leeds, Department of Management Studies, Unpublished Ph.D. thesis, 1970.

may be made. The test has eight items (nos. 27 - 34) specifically designed to describe the social environment and social requirements. These reflect the limited extent to which the social factors have been described in systems of occupational characteristics.

Hayes (1970)[1] defines the psycho-social aspects in detail under three headings: (Items in the test to which these aspects relate are indicated where relevant)

1) Social Work Situation

a) peer relationships

b) authority relationships and relationships between employers, supervisors and managers through hierarchical structure (Item 28)

c) role relationships - (Item 31)

Hayes exemplifies these by a number of questions and responses resulting from his interviews of Yorkshire Electricity Board apprentices:

Will I be meeting people? (Item 27)

Shall I work alone or with others? (Item 27)

Shall I work with people of my own age?

Shall I be helping people? (Item 27)

Will I get on with my boss?

2) Organisational, Occupational and Product Image

Information concerned with the image of the organisation, the occupation and the product (Item 30)

---

1. Ibid., pp. 73-78 and 84-102.

e.g. pride in working for the firm

the reputation of the firm

would you like to be a craftsman?

electricity is modern (pertinent in Y.E.B.)

3) Global Life-Style Implications

a) Income	-	amount, method of payment, relation to length of education (Items 21 - 26)
b) Status	-	status in society is derived from work and occupational titles are becoming increasingly important as symbols of status (Item 30)
c) Education	-	influences the broad category of occupations towards which the individual is directed (Blau et al., 1956)[1] (Items 41, 42)
d) Routine	-	affects social life and home relationships e.g. lorry driver (Hallowell, 1968),[2] trawlermen (Fraser, 1969),[3] bus-crews (Fraser, 1968),[4] (Items 19, 34)
e) Health	-	relation between health and occupation c.f. life insurance risk (Item 14)
f) Values and attitudes	-	pressures of occupation to achieve conformity (Item 32)
g) Social behaviour	-	where organisational pressures are not exerted, much overt social behaviour tends towards conformity

---

1. P.M.Blau, J.W.Gustad, R. Jesser, H.S.Parnes and R.C.Wilcock, "Occupational Choice: a Conceptual Framework", Industrial and Labor Relations Review 9: 531-543, 1956, pp. 533-537.

2. P.G. Hallowell, The Lorry Driver, Routledge & Kegan Paul, 1968, pp. 138-169.

3. R. Fraser (Ed.), Work 2, Penguin, 1969, p. 82.

4. R. Fraser (Ed.), Work: Twenty Personal Accounts, Penguin, 1968, p. 216.

i) dress (Item 11)
ii) house and area of residence
iii) leisure activities e.g. bank manager encouraged to play golf; policeman prevented by irregular working from playing football for a team

h) Family life -

i) occupations are normally oriented to individuals and not their families, although the "twilight shift" may be a recognition of family responsibilities of younger women
ii) wife's relationship to their husband's work e.g. clergyman's wife (Rankin, 1960),[1] coalminer's wife (Dennis, Henriques and Slaughter, 1956)[2]
iii) family's attitude to head of household's job
iv) work and non-work - complementary role of leisure activities

A re-examination of this list suggests that many of the psycho-social aspects listed by Hayes are included in the test. It is interesting that some of these aspects appear in the test in the non-social categories of occupational characteristics

i.e. Physical Requirements	- Dress (Item 11), Health (Item 14)
Economic Aspects	- Unusual hours of work (Item 19) Income (Items 21 to 26)
Qualifications and Training	- Education (Items 41 & 42)

The remainder fall within the items under the Social Environment and Social Requirements categories. Obviously

---

1. R.P.Rankin, "The ministerial calling and the minister's wife", Pastoral Psychology: 11: 16-22, 1960.

2. N. Dennis, F. Henriques and C. Slaughter, Coal is our Life, Eyre & Spottiswoode, 1956, pp. 180-186.

the global life-style of an occupation embraces all aspects of work and its related activities.

If the results of Hayes' investigation and description of the psycho-social aspects had been available in November 1968 when the test items were constructed the following aspects might have been included:

Peer Relationships

Leisure Activities

Family Life and Relationships

Thus the test may be seen to include most of the psycho-social aspects described by Hayes along with other aspects which he defines under the headings of Work Setting and Content and Nature of the Work.

Similar comparison could be made in terms of the item content of the test with different definitions of occupational characteristics e.g. CODOT and DOT (Chapter III, p.151 + 156). These and other systems had not been constructed primarily for use in vocational guidance or careers education. Items have been selected to be inclusive rather than exclusive since little empirical evidence exists to justify the item content or the range of items. However Hayes has provided some evidence to justify the inclusion of many of the items which was developed before his analysis was published. On the whole, therefore, it is concluded that the content of the test is appropriate.

2) Occupational Values

The third objective of the test is to provide an opportunity for the student to express value judgments about aspects of the work which he regards as important.

Occupational values as expressed in this test are defined in relation to occupational characteristics and do not take account of other extra-occupational influences, such as family responsibilities, leisure interests, purchase of housing, etc.

Schwarzweller (1960)[1] investigated Ginzburg's conclusion that in career planning "Values usually become a significant point of reference at about the age of 15 or 16" (Ginzburg et al.,1951).[2] He showed that values influence the status level of occupational choice. Professional and managerial level occupations are regarded as of high status - others of low status. High status occupations were chosen by pupils whose values tended to be high in relation to working with people and service to society. Low status occupations were associated with values of material comfort, security and hard work. Individualism, friendship and achievement did not show significant correlation with occupational status. There was little relationship between type (situs - as distinct from status) of occupation and the values expressed by boys. Girls who chose educational and medical occupations tended to be attracted by service to society rather than material comfort.

---

1. H.K. Schwarzweller,"Values and Occupational Choice", Social Forces 39: 126-135, 1960, p. 126.

2. E. Ginzberg, S.W.Ginsburg,S.Axelrad, J.L.Herma, Occupational Choice: An Approach to General Theory, New York, Columbia University Press, 1951, p. 74.

Schwarzweller showed that occupational values tended to form clusters which were related to social background of the pupils. He concludes that the socialisation process is a determining factor in the formation of occupational values.

The values chosen and described by Schwarzweller are listed, with definitions, in Table 8.1. Correspondence with items in the test of occupational information is indicated. The definitions are different and since the actual items used by Schwarzweller are not available it is impossible to see how close a relationship there may be between his items and those used in the test. The correspondence indicated is based on the definition of the values and the item content of the test of occupational information. This correspondence suggests that five of the 12 values come within the social items of the test and the remaining three from the economic, physical and cognitive aspects. Those which show no correspondence are concerned with family, security, peer-group conformity and service to society.

Kirton (1973)[1] listed in his questionnaire 13 job qualities which he suggested might attract an entrant towards an occupation. These are listed in Table 8.2.

---

1. Op.cit., p. 80.

TABLE 8.2

KIRTON'S JOB QUALITIES COMPARED WITH ITEMS OF THE TEST OF OCCUPATIONAL INFORMATION

Job Qualities	Corresponding Item in Test of Occ.Inf.	Item Title Level 2
Advising & helping others	27	Type of relationship with others at work
Creating things; ideas	32	Initiative
Directing work of others	28	Leadership of other at work
Earning respect of others	28	
Fully demanding of abilities	--	
Good promotion prospects	43	Future prospects
Good salary	23	Amount of starting pay
Good working conditions	4	Conditions of work surroundings
High social status	30	Prestige
Intrinsically interesting work	--	
Long term security	--	
Pleasant people to work with	31	Sociability
Scope to plan own work	32	Initiative

This Table shows the high degree of correspondence between the items of this test of occupational information and Kirton's job qualities. The difference in the two approaches is shown in the subjective nature of some of Kirton's job qualities particularly illustrated by "intrinsically interesting work" and "fully demanding of abilities". Again "security" appears as an important value which does not appear in the test.

The experimental use of the test has shown the relative importance of different aspects of work as described by the 43 items. The participants' choices of "Important"

and "Most Important" in the 13 Level 1 and 14 Level 2 occupations have been analysed. The rank order scores for each occupation have been totalled and the ten most important items rated by the participants have been identified. (Table 8.3). From the school-students' responses only those occupations chosen within the original list of 29 normed titles have been analysed and from these a minimum of 27 in the group was regarded as showing a pattern of values in an occupation. Thus for school-students only seven Level 1 occupations were analysed. These were Clerk, Electrician, Hairdresser, Joiner, Shop Assistant, Textile Machine Operator and Typist. Only one Level 2 occupation, Teaching, fulfilled these two criteria but 130 students choose this occupation and formed by far the largest of the school-pupils' occupational groups.

The ratings of the participants gives one type of measure of occupational life-styles. It shows the aspects of work regarded as important by those involved in a range of occupations. These aspects are now discussed in terms of the first ten items in overall importance to the participants.

"Future Prospects" (Item 43) appears to be the most important aspect overall. However as the sampling used relied on a large majority of those actually involved in further and higher education, this finding may be atypical of the population as a whole, particularly in the less skilled Level 1 occupations. Students also rated this item highly.

"Things or People Worked with" (Item 3) appears high in both Level 1 and Level 2 occupations. For students choosing teaching it is outstandingly high and evidence from Part 1 of the test suggests they are likely to work with people rather than things.

"Being Relied on (Reliability)" (Item 33) is generally important at both occupational levels and to participants and school-students.

"Deciding for Myself (or Initiative)" (Item 32) is another important social aspect. This shows more strongly in Level 2 occupations and school-students choosing Level 1 occupations rate this item as only average importance.

"Rates of Pay" (Item 22) is generally regarded as of high importance.

Three items appear so close in overall rank order that they cannot justifiably be rated separately:

"Working conditions" (Item 4) - more important in Level 1 occupations.

"Thinking or Reasoning" (Item 38) - more important in Level 2 than Level 1 and to participants rather than students.

"Accuracy" (Item 40) - generally important except perhaps to potential teachers.

Four other items appear in the first ten of one of the Levels:

"Repetition/Variety" (Item 9) is more important in Level 2 occupations, whereas "Appearance and Clothes" (Item 11), "Rates of Pay" (Item 14) and "Increases in

Pay" (Item 25) are more important to Level 1 participants (perhaps because smart appearance and good pay are assumed in Level 2 occupations?).

Two other items appear to be more important to school-students than participants:

at Level 1 : "Amount of Starting Pay" (Item 23)

and at Level 2 : "Examination Qualifications"(Item 41).

Comparisons made in this way are only intended to highlight certain aspects of occupations which may be generally important. Generalisations at this level tend to mask the importance of a particular item in a particular occupation e.g. "Place of Work - Outdoors" (Item 2) is outstandingly important to Agricultural Workers.

However the analysis of the participants' importance of occupational aspects shows that five of the major areas of occupational characteristics each have items which participants' regard as particularly important:

Major Area of Occupational Characteristics	Item	
Physical Environment	3	Things or People Worked with
	4	Working Conditions
	9	Repetition/ Variety
Physical Requirements		- - - - - - - - -
Economic Aspects	22	Rates of Pay
	25	Increases in Pay
Social Environment		- - - - - - - - -
Social Requirements	32	Deciding for Myself(Initiative)

	33 Being Relied on (Reliability)
Intellectual Requirements	38 Thinking or Reasoning
	40 Accuracy
Training and Future Prospects	43 Future Prospects

Further analysis of the items rated as Important and Most Important suggests that some items may be excluded from the test. Such items

(a) were not selected in the first ten Important items by participants in <u>any</u> of the 27 occupations;

(b) were not regarded by <u>any one</u> of these 1203 participants as being in the first three Most Important items in their judgment of occupational values.

On these criteria it might be considered that they are of such relatively little importance as not to form worth-while content of the test. The following items are thus regarded by the participants:

Level 1	Level 2
	2 Place of Work - Outdoors
	6 Dryness or Dampness of Work Place
7 Smell	7 Smell
8 Noise or Vibration	8 Noise or Vibration
	10 Hazards or Dangers of the Work

12 Strength 13 Sitting or Standing	12 Strength 13 Sitting or Standing
	18 Arrangement of Normal Hours of Work
19 Unusual Hours of Work	19 Unusual Hours of Work 20 Number of Hours worked in a Week 21 When Workers are Paid 23 Amount of Starting Pay
29 Membership of Unions	
31 How Much Work is done with Others	
	34 Separation from Home
35 Words and Writing 37 Numbers	
	36 Clerical Work

The same criteria were applied to the ratings by school-students of seven Level 1 occupations. Even from this smaller range of occupations only two items:

8 Noise and Vibration
28 Leadership of Others at Work

would show as not being important. Evidence from the only Level 2 occupation - Teaching - which has been analysed cannot validly be considered here. However, comparison of the evidence of the importance of items as set out in Level 1 of the test shows that school-students in only seven occupations tend to choose a wider range of items as important compared with the participants in 13 different occupations.

As an instrument for use in guidance there is an argument to maintain the full range of items giving school-students the opportunity to express their values in terms of the importance of occupational characteristics. Although this may be different from the values expressed by participants, they are part of the occupational self-concept of the student. The responsibility for discussing the difference between the two sets of values rests with the guidance teacher who may be directive if he feels the student is unaware of differences in aspects which the participants believe to have strong importance.

Reference to the basis of the structure of the test in Chapter IV (p. 197) shows that the content of the items is intended to be inclusive rather than selective. Appendix 3 (p. 438) shows the summary of the five main classification systems on which the selection of the content of the items was made. Perhaps subsequent research on occupational concepts will suggest other characteristics which might be included.

STRUCTURE OF THE TEST

Problems discussed in this section are concerned with the Objectives and Multiple Choice test structure, the Vocabulary used in terms of the understandability of the items by the students, occupational titling and the use and compilation of the norms.

i) Objective Type Test Structure

Arguments are presented to attempt to justify this type of structure.

1) If norms are to be produced the items must have precise description which can be interpreted by the students who are using the test and by groups who norm it.

Evidence from the pilot administration of the test (Chapter V) suggests that the objective type of structure is interpretable by students in the range of age and ability for whom it is intended. This range extended to all groups of students aged 14 and above. For non-readers and those still in need of remedial help, the items may be read to them by the teacher or counsellor who could record their selection of the appropriate sentence. This method was used effectively in special schools in which the test was tried. The vocabulary used in the items was tested in the pilot administration and amendments were made where it was possible to substitute familiar words whilst maintaining the appropriate occupational description.

The experience of the use of the test in 37 schools showed that very few students (only four out of 1416 - p. 297) were unable to complete the test in a way in which they could learn from the experience and achieve some measure of the Index of Reality.

A projective or clinical type instrument would have been very difficult to norm, not easy for inexperienced teachers and others to administer and would lack some value as a learning experience.

Nevertheless the objective type of structure places certain limitations on the instrument.

ii) Multiple Choice Item Structure

The choice of the objective structure with the multiple-choice alternative type of items, raises questions which illustrate both the advantages and disadvantages of this type of structure.

An advantage claimed in the choice of this structure (p. 180) is that of allowing scope for description of alternative definitions of situations, conditions, relationships or skills within each aspect. There is thus the opportunity to provide expressions which will more nearly approximate to the various descriptions of different occupations.

Experience has shown that it was not possible to introduce scalarity into every item since the description of many of them was not uni-dimensional

e.g. Item 39 Craft, Drawing, Painting and Music (Level 1)

In this job I should work with

1. wood, pottery, metal or stone.
2. paint.
3. accurate drawing.
4. rhythm and musical notes.
5. none of these things.

Of the 43 items, 6 are regarded as being scalar, 25 could be said to be semi-scalar and 12 are non-scalar. The non-scalar structure limits, to some extent, statistical interpretation of the profiles produced. Correlation of the profiles e.g. between sub-groups within a participant norm is not possible. This raises questions of the validity of norms discussed in a later section of this chapter (p. 381).

Peel (1971)[1] emphasises the way in which the multiple-choice structure acts as a teaching aid. He bases this assertion on the work of Anderson (1967)[2] who studied the levels of adolescent judgment by using open-ended type questions and multiple choice alternatives on a number of different passages, one of which is here set out as an example:

---

1. E.A.Peel, The Nature of Adolescent Judgment, Staples, 1971, p. 59.

2. D.R.Anderson,"An Investigation into the Effects of Instruction on the Development of Propositional Thinking in Children", Diploma in Child Psychology Research, School of Education, Birmingham University, 1967.

Lynn is a large town with a busy railway junction which attracts boys who are interested in train-spotting. Burton is a small place not far away and so many people who live there do their shopping in Lynn because there are more shops. British Railways have recently decided to close Burton station and run no more trains from there to Lynn.

Open ended question:

Should Burton station be closed? Why do you think so?

Multiple choice form:

Should Burton station be closed?

i It should be closed because the people would then have to do their shopping in their own town and this would be good for trade. (Circumstantial).

ii It should be closed because the trains have stopped running. (Restricted).

iii It depends on how many people use the trains and whether they have other ways of travelling. (Imaginative).

iv It should be closed because one day one of those boys spotting trains is likely to fall off the platform in front of a train and get killed. (Restricted).

v It should be closed because the people of Burton will not be able to do their shopping and the shops will not have much trade. (Restricted).

Peel (1971)[1]

Anderson categorised the answers into restricted, circumstantial and imaginative as indicated. He compared the number of imaginative responses in the two types of questions with and without a period of instruction before answering the problem.

	Not Instructed	Instructed
Multiple choice form	165	195
Open-ended question - Why?	70	164

1. Op.cit., p.34 and 58-59.

This evidence suggests the part that the multiple-choice structure may play in the learning process. However it should be emphasised that Anderson's experiment was concerned with levels of thinking rather than knowledge. Anderson (1967)[1] suggests that the apparent effect of the multiple choice structure is equivalent to a course of instruction but he warns that children answering multiple-choice type questions may operate at a level of thinking which seems to be higher than they reach when thrown on to their own resources. He also assumes that they are capable of holding in their minds the content of each of the alternatives in order to select the most appropriate. As yet no work seems to have been done to substantiate or disprove this assumption.

iii) Vocabulary and Understanding

Having established the multiple-choice structure as the most appropriate for this test instrument in its uses as a learning experience and in guidance, it is important to consider the expressions used in describing the items. The vocabulary has been checked against Burns' (1955)[2] vocabulary of secondary modern school children. By his criteria only four of the words appeared

---

1. Op.cit., pp. 89-90.

2. D.G.Burns, "Vocabulary of the Secondary Modern School Child", N.F.E.R. (Occ.Pub. No. 1), 1955.

to be difficult (p. 209). His work was based on dictionary definitions and the understanding of the words may not necessarily be the same in the context of the test items.

Difficulties arise in describing the occupational characteristics in words which are both adequately precise and at the same time understandable. An attempt was made in the pilot administration to check the interpretation of the words by a group of verbally less able students (Chapter V, p. 229). A wider and more intensive investigation may have revealed other words and expressions which were not understood or were misinterpreted by this type of student. Perhaps the method used by De Silva (1969)[1] (p. 176) in studying historical concepts might be adapted here to provide evidence in the understanding of occupational concepts. Such evidence might help to provide items which are more meaningful to students, particularly those of lower ability. To fulfil the purposes of this test they would also be structured from occupational characteristics. The content of the items would be determined primarily by the occupations rather than the student's knowledge.

A further measure of understandability of the words has been used recently by Hough (1972)[2] in her analysis of

---

1. W.A.De Silva, "Concept Formation in Adolescence with special reference to History", Unpublished Ph.D. thesis, School of Education, Birmingham University, 1969.

2. P. Hough, "The Readability of Careers Literature", Vocational Guidance Research Unit, University of Leeds, 1972.

certain careers literature published by the Central Youth Employment Executive. In this study the readability was analysed by a method devised from the noun frequency count established by Elley (1969)[1] in New Zealand. From Elley's work an adaptation for British children has been published as an Alphabetical Spelling List (Book II).[2] This list is based on the frequency of the use of words by British children. Those listed are scored at seven levels of frequency and an eighth level has been included by Hough based on Elley's work. A score of 1 indicated the highest level of frequency and 8 the lowest level of frequency amongst the recorded words. Any word not appearing in these lists is scored as 9.

The item booklet of Level 1 of the test of occupational information was analysed item by item using this technique. The mean word frequency level was computed for each item and the results are shown in Table 8.5. Application of this technique has shown the suitability of material for reading by groups of non-'O' Level students in British schools should come within the ranges shown in Table 8.4.

---

1. W.W.Elley, "The Assessment of Readability by Noun Frequency Counts", Reading Research Quarterly, Spring, 1969.

2. Alphabetical Spelling List (Book II), Exeter: Wheaton, Tenth Impression, 1970.

TABLE 8.4

NOUN FREQUENCY COUNT RELATED TO STAGES IN SECONDARY EDUCATION

Mean Noun Frequency Count	Non-'O' Level groups
3.69 - 4.77	3rd year
4.77 - 5.15	4th year
5.15 - 5.81	5th year

Source: Hough (1972).[1]

Inspection of the items listed in Table 8.5 shows that the majority of the items are suitable for 3rd year non-'O' Level students. Only two items (Nos. 10 and 42) come beyond the reading level of these 5th year students. This analysis also shows that the test compares very favourably with Hough's analysis of careers literature (Table 8.6).

TABLE 8.6.

READABILITY OF TEST OF OCCUPATIONAL INFORMATION (LEVEL 1) COMPARED WITH OFFICIAL CAREERS LITERATURE

	Test of Occ. Inf.	Choice of Career Booklets	"If I were a..." series
No. of Items/Booklets	43	16	20
Year Level Suitability			
3rd year	19	—	—
3rd year	15	—	—
4th year	3	—	2
5th year	4	5	15
5th year	2	11	3

Sources: Hough (1972)[2]

It would not be appropriate to use this technique on items of the Level 2 booklet, since the reading level of

1. Op.cit., Appendix 3.

2. Ibid., pp. 47 and 48.

TABLE 8.5

OCCUPATIONAL INFORMATION TEST (LEVEL 1) ITEMS ANALYSED BY NOUN FREQUENCY COUNT

Item No.	No. of Words scored 1-8	No. of Words scored 9	Total Word score for each item	Mean Word score for each item	READABILITY Year Level of non-'O' Level pupil
1	12	3	54	3.60	<3rd
2	8	5	61	4.69	3rd
3	15	1	48	3.00	<3rd
4	10	0	41	4.10	3rd
5	15	2	49	2.88	<3rd
6	15	6	99	4.71	3rd
7	13	6	104	5.48	5th
8	19	4	112	4.87	4th
9	17	6	128	5.57	5th
10	13	4	92	6.00	>5th
11	17	1	76	4.22	3rd
12	18	3	98	4.66	3rd
13	22	1	62	2.78	<3rd
14	25	7	148	4.62	3rd
15	19	3	70	3.18	<3rd
16	14	5	87	4.58	3rd
17	20	3	76	3.30	<3rd
18	21	6	107	3.96	3rd
19	15	1	35	2.19	<3rd
20	20	1	48	2.33	<3rd
21	16	0	28	1.75	<3rd
22	20	8	133	4.75	3rd
23	15	1	41	2.56	<3rd
24	19	3	120	5.71	5th
25	14	1	55	3.66	<3rd
26	11	4	49	3.27	<3rd
27	22	2	59	2.46	<3rd
28	18	5	94	4.09	3rd
29	24	5	131	4.52	3rd
30	20	2	75	3.41	<3rd
31	23	2	61	2.45	<3rd
32	15	2	62	3.65	<3rd
33	9	8	95	5.59	5th
34	17	2	54	3.18	<3rd
35	25	2	103	3.81	3rd
36	15	4	85	4.48	3rd
37	22	2	75	3.12	<3rd
38	17	2	52	2.74	<3rd
39	12	6	92	5.11	4th
40	14	2	63	3.94	3rd
41	16	5	101	4.81	4th
42	17	5	128	5.84	>5th
43	27	2	124	4.38	3rd

Summary of Items in terms of Readability in Year Levels of Non-'O' Level groups

Year Level	Number of Items
<3rd	19
3rd	15
4th	3
5th	4
>5th	2

Mean Score per Item = 3.95

these predominantly sixth form students had not previously been determined on this scale. Also in the pilot administration of the test, none of the Level 2 students raised difficulties in the understanding of the words (Chapter V. p. 232).

Thus this project has revealed a number of techniques for assessing the suitability of the vocabulary used in structuring the items in the test. Any subsequent amendment would draw upon this experience, but the words used here have been shown to have a substantial degree of interpretability.

iv) Occupational Titling

The original intention in the design of the test was that students should title an occupation and describe it in terms of the items of the test, choosing the one of the five alternative sentences which they felt was the most appropriate in each item. (Reference has also been made in Chapter VII, p. 329 to the alternative use without titles in computer assisted guidance).

The first requirement of the student is to specify the title of the occupation he is seriously considering. If the reality of the occupational information revealed by the test is to be determined by reference to norms, there must be an acceptable level of congruence between the titles stated by the students and the titles normed by the participants or the advisers.

The CODOT system (Department of Employment, 1972)[1]

---

1. Department of Employment, Classification of Occupations and Directory of Occupational Titles, 3 Vols.,H.M.S.O., 1972.

has provided the basis for classifying the titles. This system, described in Chapter III (p. 155) classifies occupations into three groups signifying the degree of specificity of definition and relationship between activities

e.g.	Major Group	XI	Farming, Fishery and Related Occupations
	Minor Group	50	Farming, Horticultural, Forestry and Related Occupations
	Unit Group	501	Farmworkers (Arable and Mixed Farming)
	Unit Sub-Groups	501.10	Agricultural Worker (general) (arable crops)
		501.20	Agricultural Worker (hand) (arable crops)
		501.30	Agricultural Worker (hop gardens)
		501.40	Agricultural Worker (mixed farming)
		501.98	Trainee
		501.99	Other farm workers (arable and mixed farming)

(Department of Employment, 1972)[1]

Evidence of the appropriateness of this system is provided by the titles stated by the participants and by the school-students. These were classified on the CODOT system along with the 29 selected occupations normed by the advisers.

---

1. Ibid., Vol.I, p.58.

TABLE 8.7

OCCUPATIONAL TITLES CLASSIFIED BY CODOT GROUPS

CODOT Group		Occupational Titles					
Name	Digits	Careers Officers		Participants		School Students	
		N	%	N	%	N	%
Major	1	0	0	0	0	3	1
Minor	2	4	14	9	10	30	11
Unit	3	23	79	59	64	214	77
Unit Sub-Groups	5	2	7	24	26	28	10
Unclassifiable		0	0	0	0	8	3
Totals		29	100	92	100	283	102

Table 8.7 shows the CODOT classifications which have been used by the three groups involved in the project.

1) Careers Officers They described the occupations using the titles presented to them e.g. Fitter, Telephone Operator G.P.O., Teaching.

2) Participants in these 29 occupations who were selected by their employers, lecturers or professional body. They provided a total of 92 titles related to the 29 occupations. The vast majority of these titles came within the CODOT classification for the 29 occupations (Table 6.9 p. 275).

3) School-students who were asked to name the occupation they were seriously considering. 1416 students named 283 different titles.

The CODOT classification shows that in each of the three groups the highest percentage 79%, 64%, 77% of the titles appeared at the Unit Group (3-digit) level of the classification. Participants, understandably, were more detailed in the titling than school-students. 26% of their titles were at the Unit Sub-Group (5-digit) level, whereas

only 10% of the school-students and 7% of the advisers used this degree of detail. The majority of the remaining titles were at the Minor Group (2-digit) level.

The degree of specificity of the titling has implications in the use of the test:

1) If the Index of Reality is to be determined, norms must be available for occupational titles stated by the students.

2) The test may be used by school-students who are exploring the possibilities and learning about the characteristics of a number of occupations. It is more valuable at this stage that the titles used should be relatively broad e.g. a girl may describe a Sewing or Embroidery Machinist (Unit level - 658) but would not at this stage in decision-making be too concerned about the kind of fabric she would be working with or the finer details of the machine which would be used. Thus it is not appropriate to describe this occupation at the Unit-Sub group level i.e. Fur Machinist (658.20) or Sewing Machinist (carpeting, matting, rugs) (658.75).

3) The specificity of the titling must be acceptable and meaningful to those who are providing the norms for the test. Evidence for this is provided by the Careers Officers who were encouraged to comment on the titling of the 29 occupations they normed. None of the comments recorded on the response sheets suggested that any of the 29 titles was too specific but of the 908 responses 32

suggested that the title provided was too broad and a further 57 specifically narrowed the title to one which the Careers Officer regarded as adequately precise for him to describe in terms of the test items. The distribution of these comments between the 29 occupations is shown in Table 8.8 (p. 373).

This Table shows that almost 10% of the 908 responses included comments that the titling was not sufficiently specific. The least specific occupations are Creative Artist, Clerk and Electrician. These three occupations illustrate problems of applying the CODOT classification to the titling used in this test.

The Creative Artist is interpreted in the classification as Artists and Sculptors (161). Careers Officers appear to specify the medium in which the artistry and creativity are exercised e.g. Sculptor (161.30), Etcher, Engraver (161.40), Interior Decoration Designer (161.50). It was at this level of detail that the 12 Careers Officers specifically narrowed this title. Of 11 school-students, however, 9 titled the occupation as Artist (161), the other two naming Advertising Technician (161.20) and Graphic Designer (161.20). The difficulty in classification here is that these two titles are included under the title of Artist (commercial). For the purposes of providing norms it is probably more useful for the school-students to establish them at the Unit Group level of Artist and Sculptor (161).

TABLE 8.8.

COMMENTS OF CAREERS OFFICERS ON SPECIFICITY OF OCCUPATIONAL TITLES

Codot Clssfn. Level.	Norm No.	Occptnl Title	No. of Careers Officers Too Broad	Specfily Narrowed	Total Normg. Occptn
501	A1	Agricultural Worker	0	0	32
31	A2	Clerk	7	2	33
935	A3	Driver's Mate: Van or Lorry	2	1	32
76	A4	Electrician	2	5	29
741	A5	Fitter	3	3	31
471	A6	Hairdresser	0	0	32
67	A7	Joiner	0	3	33
86	A8	Labourer: Building & Contracting	0	0	32
842	A9	Packer	3	1	31
411	A10	Police	0	3	31
361	A11	Shop Assistant: Non-food	0	2	31
341	A12	Telephone Operator G.P.O.	0	0	33
54	A13	Textile Machine Operator	0	2	17
322	A14	Typist	0	1	31
161.70	A15	Window Dresser	0	0	32
251	A16	Architect	0	2	32
161	A17	Creative Artist	4	12	32
034	A18	Banking	2	4	32
212	A19	Industrial Chemist	1	0	31
103	A20	Clergy	0	0	32
221	A21	Civil Engineer	1	4	32
253	A22	Draughtsman	1	4	34
224	A23	Electrical Engineer	2	2	30
151	A24	Journalist	0	1	33
063	A25	Librarian	0	1	30
113	A26	Nursing	0	1	34
102	A27	Social Case Worker	0	1	31
022	A28	Solicitor	1	1	34
09	A29	Teaching	3	1	31
			32	57	908

Clerk is interpreted at the Minor Group level (31) of the CODOT system. The Unit Groups within this classification cover the specific types of clerical work: Costing and Accounting (311), Cash Handling (312), Finance, Investment and Insurance (313), Production and Materials Control (314), Shipment and Travel Arranging (315), Record Keeping and Library (316).

Evidence of the school-students' titling shows the following titles within this area. Initial inspection might suggest that these might reasonably be included as Clerk (31):

Title	CODOT Classfn.	No. of Students
Secretary shorthand typist	321.10	19
Secretary typist	322.10	
(Junior)Clerk & Clerical Worker	31	16
Clerk/Typist	322.10	7
Filing Clerk	316.90	3
Shorthand Secretary	321.10	2
Mail Order Clerk	314.20	1
Comptometer Operator	331.50	2
Book-keeper/Hotel Receptionist	319.56	1
Clerical Officer (Civil Service)	069.20	1
Clerical Officer (Local Government)	069.30	1
		53

If a norm is drawn up on the title Clerk (31) 16 of the 53 would be precisely normed. The three Filing Clerks, one Mail Order Clerk and one Book-keeper/Hotel Receptionist might also be included within this group. The remaining 32 would not be normed under this title even taken at the broad interpretation of Clerk at the Minor Group level (31). It is significant that within this occupation none of the

53 titles were presented by the school-students at the Unit Group (3-digit) level. The problems of providing norms where the occupations described correspond to those named by the students are clearly illustrated here. Interpretation of the title and selection of the appropriate norm (if available) is an important problem in test administration. A reference base is necessary and the only valid one at present available is that provided by the CODOT.

Seven of the 29 Careers Officers regarded the title Electrician as too broad (Table 8.8). Evidence from the school-students suggested that this title was appropriate at the Minor Group level (76):

Title	CODOT Classification	No. of Students
Electrician	76	32
Electricial Engineer	224	7
Electrical Fitter	761.20	2
Electronic Engineer	224.57	2
Television Engineer	761.70	1
Auto-Electrician	761.60	1
		45

These titles indicate that 36 of the 45 would be appropriately classified as Electrician under the Minor Group classification 76. The titling of Electrical Engineer and Electronic Engineer suggests that these 9 school-students who used Level 1 of the test appropriately in relation to their potential qualifications of less that 5 'O' Levels were really describing electrician's work under the title of "Engineer". Alternatively they have really intended to aspire to the professional level indicated by

the title "Engineer". In this case they should have completed the test with the Level 2 items. This raised a problem of administration which will be discussed in a later section of this Chapter (p. 394).

An example of the various titling provided for a single occupation is shown by the Textile Machine Operator. 19 different titles were provided by 45 participants. Only two of these titles - Textile Designer and Wool Salesman - fell outside the CODOT Minor Group Classification 54. Difficulties were encountered in encouraging Careers Officers to norm this occupation. The Careers Officers in one large Local Education Authority within a textile industry within its area felt that the title was too broad to produce useful norms. In spite of requests to other Authorities in the textile areas, only 17 Careers Officers eventually normed this occupation.

The problems illustrated by these examples have implications for the norming of the test. In order to produce norms which give valid measures of the Index of Reality, certain criteria need to be fulfilled:

1) The norms which are to be used need to be compiled from titling which is clearly classified according to an acceptable system. The CODOT system has been used in this project, although it was not primarily designed for use in vocational guidance. Many of the titles, particularly at

the managerial and supervisory levels of the occupation are not applicable to school-students at the stage of entry or to the participants with little experience of the work. Nevertheless it has been shown (p. 370) that all titles specified by the participants and 97% of those used by school-students can be classified by this system.

The degree of specificity appropriate to this test appears to vary between occupations. In the majority of examples considered the Unit Group (3-digit) level appears to be the most appropriate. For some occupations particularly at Level 1, the Minor Group (2-digit) level may be more appropriate (e.g. Textile Machine Operator, Clerk, Electrician, Joiner).

The norms shown in Appendix 7 (p. 489) indicate the titles included. These were necessarily compiled before the complete edition of the CODOT classification was available in November 1972. Revision would be necessary particularly in the three occupations (indicated by in Table 6.9, p. 275) in which a substantial percentage of the participants' occupational titles fall outside the specified classification. (A discussion of the problems involved in producing norms is deferred to later in this chapter (p. 381)).

2) Students using the test in careers education and expecting an Index of Reality to be available will need guidance in the detail of the occupational titling.

This needs to be appropriate to the Level of the test

e.g. Electrician - Level 1; Electrical Engineer - Level 2. Lists of norms should be available to the administrator of the test who might be asked for guidance in the titling. These lists should show the CODOT Classification of the title named together with titles included within the norm

e.g. 86 Construction and Related Occupations
(Selected title in project: Labourer: Building and Contracting)

including
861 Bricklayer
Stoneman
862 Plasterer
863 Tile-setter
864 Roof slater and tiler
865 Glazier
866 Road & Track Making and Repairing Occupations
867 Concreter
869 Other Construction and Related Occupations

e.g. .04 Steeplejack
.08 Mastic Asphalt Spreader
.20 Sewerman
.90 Gravedigger

The student could then become aware of the scope of the norm and may view his Index of Reality accordingly.

This discussion raises the critical questions of the uses and compilation of the norms, now discussed in the next Section.

NORMS

i) Use of Norms

The test has been designed to fulfil three objectives (p. 165) in relation to the development of the self- and occupational concepts of the student:

1) that he should become aware of the many aspects of the occupational environment;

2) that he should be informed of the accuracy of his occupational information in relation to the descriptions of those with knowledge of, and actually engaged in, the occupation;

3) that he should be encouraged to express value judgments about aspects of the work which he regards as important.

To fulfil the first and third objectives a student does not necessarily need a measure of the reality of his occupational information. The reading of the item booklet and the selection of the appropriate alternative sentence in relation to a stated occupation can in itself be a learning experience. Discussion with individuals involved in careers education suggested that they would offer the material to students who wanted to widen their occupational awareness. They would use the items as a basis for discussion with the student about his ideas of the occupational environment. For non-directive counselling they would not quantify the Index of Reality unless the student specifically asked for this to be done. One

Careers Officer believed that the quantification of knowledge in this way was invalid. The student was likely to give the Index of Reality a more accurate interpretation than it merited.

Thus the test may be used in careers education as a stimulus to discussion through which students may build up their own occupational concepts, without reference to the quantitative description which norms may provide.

In order to fulfil the second objective, the student may ask to be informed of the accuracy of his occupational knowledge, in terms of the descriptions given by Advisers and Participants. The Index of Reality of the knowledge is determined by reference to the norms as described in Chapter VI (p. 233).

Alternatively if the material is going to be used in computer assisted guidance as indicated in Chapter VII (p. 329), norms will need to be available. These would be fed into the computer bank so that the student's responses could be compared with them and a list of the most appropriate occupational titles would be displayed.

These two applications of the test emphasise the importance of the norms, yet experience has shown a number of problems which need to be solved if the norms are to be valid in terms of the description of occupational characteristics. Unless the norms can be shown to have a recognised validity they should not be used in careers education.

ii) Compilation of a Norm

A number of factors have been shown to be involved in the compilation of a norm. Reference is made in Chapter VI (p. 277) to the features of a group of participants which are relevant to this compilation.

1) Size of Group

In this project 30 was taken as a minimum number of any group from which a useful norm could be developed. The larger the number in the group the greater is the confidence which can be placed in the results. 30 is only a subjective minimum for the group size. It is determined partly by the resources of time and finance available. If the test is shown to be of value in careers education, the size of the groups and the number of occupations could be considerably extended. In the participant norms produced experimentally two groups - Van Boy (N = 3) and Packer (N = 15) - were considerably below this minimum and Industrial Chemist (N = 27) was marginally below. The remaining 26 occupations were normed by participant groups of at least 30. Fitters (N = 105) and Nurses (N = 95) were the largest groups and the majority ranged from 30 to 50 (Table 6.7 p. 270). The factors involved in the experimental work were time, effort and finance in contacting and persuading appropriate groups to co-operate in the work. For the test to be used as part of a careers education programme

where the results are interpreted for the guidance of individuals, 50 is suggested as the minimum group size on which a norm should be published.

2) Location of Group

The experimental work was designed so that the norms provided by the Careers Officers were established on a national basis with almost random representation from various Local Authorities throughout the United Kingdom. Exceptions already described (p. 266) are Agricultural Workers and Textile Machine Operators, which were normed only in Authorities which were likely to have some employment in these occupations. Thus the regional variation in these norms cannot be determined and the users of the Careers Officers' ratings will need to be aware that the assumption is made that they are nationally and not locally determined norms.

In producing the participant norms the intention was to constitute groups which contained occupational representatives from different parts of the country. Table 6.7 (p. 270) shows that of 15 Level 1 occupations 12 were compiled from two or more regional sub-groups; 26 sub-groups in all. 13 sub-groups were obtained through firms or industrial organisations and 13 from Colleges of Further Education. Police and Hairdressers were composed of single groups. These 28 sub-groups were located regionally as shown in Table 8.9.

TABLE 8.9

REGIONAL LOCATION OF LEVEL 1 PARTICIPANT SUB-GROUPS

North East	8
North West	11
East Midlands	1
West Midlands	1
South East	1
Wales	6
	28

This regional distribution reflects the writer's personal contacts and the time and finance involved in travel from Durham and Chester.

Of the 14 Level 2 occupations 7 comprised two regional sub-groups. In the remaining 7 occupations single groups represented wider sampling e.g. Solicitors from a nation-wide sample provided by the Law Society. Bankers in Barclays and the National Westminster, Nurses from Manchester Royal Infirmary and the Industrial Chemists from Boots Ltd., Nottingham were the only groups provided by employers. The remaining five single groups were from Polytechnics, a University, a College of Education and Colleges of Further Education drawing participants in each occupational group who were working in different establishments. Table 8.10 shows the regional location of the employers and institutions of higher education, but for the reasons stated this only gives a broad indication of the location of places of work.

TABLE 8.10

REGIONAL LOCATION OF LEVEL 2 PARTICIPANT SUB-GROUPS

	Further & Higher Education	Employers	Professional Bodies
North East	3	0	
North West	3	1	
East Midlands	1	1	
West Midlands	1	0	
South East	3	2	
Wales	3	0	
	14	4	
National			3

Total Sub-Groups for 14 Level 2 Occupations = 21

This analysis of the compilation of experimental norms raises a fundamental issue on the "regionality" on which norms could be based.

It is obviously conceivable that norms could be established from representatives of occupations drawn from national samples. These could be compiled on the basis of the occupational returns provided by the Department of Employment. Representation could be proportionate to the number employed in a particular occupation region by region throughout the country. On the basis of the CODOT classification, those titling occupations within the Unit Sub-Group (3-digit) level could be grouped in the same norm e.g. Farmworkers (501) (p. 369). Such a norm would tend to submerge any regional difference which might exist.

Do regional differences exist at the level of occupational specificity appropriate to this test?

Reference to Table 6.7 (p. 270) suggests that five occupations for which norms have been obtained may provide evidence on this question. The five occupations are chosen on the basis of the comparability of sub-group size, age, occupational experience, educational attainment and different regional factors. These occupations are shown in Table 8.11 (p. 386). This Table shows the comparability between the sub-groups within these five occupations and suggests that any differences in the norms between the sub-groups may be due to regional differences in description of occupational characteristics.

The problem of the statistical comparison of profiles has been mentioned in Chapter VI (p. 269). It will here be discussed more fully.

This problem is one of comparing the responses for each particular item, produced by two different groups of respondents in a certain occupation. A particular example is considered:

The norm presented for agricultural worker (Appendix 7, p. 518) comprises

a sub-group of 21 agricultural workers in Cumberland and Westmorland

and a sub-group of 55 agricultural workers in Lindsey (Lincolnshire).

Item 17 shows the following profiles for each sub-group separately:

TABLE 8.11

COMPARABILITY OF REGIONAL SUB-GROUPS USED IN NORMS

CODOT	Occupation	Location of Sub-Groups	Number M.	Number F.	Number Tot.	Age Mean	Age S.D.	Occup.Exp. Mean	Occup.Exp. S.D.	Educational Attainment <5'O' Lev. %	Educational Attainment 5+'O' Lev. %
501	Agricultural Worker	Lindsey	54	1	55	20.1	1.8	3.7	1.7	73	27
		Cumberland & Westmorland	17	4	21	18.6	1.2	2.1	0.7	71	29
54	Textile Machine Operator	Bradford	24	0	24	17.5	1.1	1.3	0.8	100	0
		Bolton	21	0	21	19.4	2.9	3.6	2.7	95	5
251	Architect	N.E.London	19	1	20	24.9	3.5	6.8	2.7	20	80
		North London	20	0	20	24.5	3.5	6.2	4.0	0	100
034	Banking	National Groups	23	1	24	25.2	1.6	7.4	2.2	20	80
			18	2	20	26.2	1.6	7.8	2.7	25	75
151	Journalist	Preston	11	7	18	20.3	1.4	2.4	0.4	16	84
		Sheffield	12	5	17	20.4	1.5	2.1	0.5	6	94

	C. & W. sub-group					L. sub-group				
N =	21					55				
Sentence	1	2	3	4	5	1	2	3	4	5
Raw Score	5	8	8	0	0	10	23	9	6	7
Prop.Dist.	6	10	10	0	0	4	10	4	2	3

The statistical problem is to compare these two profiles either as Raw Scores or a Proportional Distribution. (Other forms of presentation have been shown to be less valid (Chapter VI, p. 280)). Four possibilities are considered:

a) Matching for shape (Cattell, 1949)[1]

Here a correlation coefficient is suggested:

$$r_s = \frac{\sum x' y'}{n \sigma_{x'} \sigma_{y'}}$$

where n = number of elements in the profile i.e. 5

x', y' = standardised scores for sentence (1....5) in each profile (x and y)

Since the possible score for each agricultural worker can only be either 0 or 1 for any sentence (i.e. the sentence is either chosen or not), standardisation is not possible. Also a comparison of the profiles should compare sentence with sentence, but r_s compares only item profiles. For these reasons this technique is not appropriate.

---

1. R. B. Cattell, "r_p and other Coefficients of Pattern Similarity", Psychometrika 14: 279-298, 1949, pp. 282-284.

b) Agreement between Patterns

Various statistics have been proposed for measuring the degree of absolute agreement between patterns. Chi-square (χ^2) may be suggested, but it is unsuitable here since it only measures departure from chance. Thus it is inappropriate here to apply to the proportional distribution profiles produced by two distinct groups.

As a more appropriate measure Cattell (1949)[1] suggested a similarity pattern index, r_p, which he later (Cattell, 1969)[2] used in measuring the similarity of occupational profiles. He showed that the 16 Personality Factors (Cattell 16 PFQ) of happily married couples showed a stronger mutual resemblance than those of maladjusted couples. However whilst this method may be used for comparing individual profiles on a number of different factors, it is not appropriate for comparing group profiles with other group profiles (Cattell, 1969).[3]

c) Comparison of Individual Performance

Cattell (1949)[4] suggests that the performance (P_{ij}) of an individual (i) in a number of different traits (j) may be compared with the performance of successful

---

1. Ibid., pp. 279-298.

2. R.B.Cattell, "The Profile Similarity Coefficient, r_p, in Vocational Guidance and Diagnostic Classification", British Journal of Educational Psychology, 39: 131-142, 1969.

3. Ibid., p. 137.

4. Op.cit., p. 285.

participants. Again, this statistic cannot be used for comparison of group profiles.

d) Unfolding Technique

A technique for comparing profiles is proposed by Coombs (1964).[1] This unfolding technique is based on comparisons of ranks of items within a profile. It is based on the assumption that a profile is scalar. In the present test only 6 of the 43 items are scalar (Chapter IV, p. 211) and so this technique cannot be applied to the test as a whole.

Thus the problem of comparison of profiles produced by responses to the test, presented here and in Chapter VI (p. 280) remains. When an appropriate statistical technique can be found, it will be possible to compare profiles produced by groups of participants in the same occupation and perhaps to identify factors which cause differences in these profiles. Until then the profiles can only be presented with a description of component sub-groups so that the student and guidance teacher may interpret the norms in relation to the background of these participants.

3) Age, Occupational Experience and Educational Qualifications of Group

Reasons for specifying the age, occupational

---

1. C.H.Coombs, A Theory of Data, New York, Wiley, 1964, pp. 80-139.

experience and educational qualifications of the norming group have been set out in Chapter VI (p. 269). These factors are readily measured and are apparently appropriate, since the purpose of the norms is to compare the reality of the occupation as perceived by the student with that perceived by the participants.

Other criteria might be applied to participants which may provide a greater confidence to those interpreting their Indices of Reality.

The work of Super and his associates in the Career Pattern Study in America has collected and analysed data on career development particularly of the 9th Grade and 12th Grade boys - normally aged 14 -15 and 17 - 18 years. Central to this work has been the concept of vocational maturity. It is defined as

> "the readiness to cope with the developmental life tasks of one's life stage, to make socially required career decisions and to cope appropriately with the tasks with which society confronts the developing youth and adult". [1]
> (Super and Jordaan, 1973)

The vocational maturity of the 9th and 12th Grade boys measured in terms of occupational information, planning and interest was found to be significantly related to occupational success and level attained by the age of 25. Although the measure of vocational maturity did not have predictive validity for the 9th or even the

---

1. D.E.Super and J.P.Jordaan, "Career Development Theory", British Journal of Guidance and Counselling 1: 3-16, Cambridge:CRAC, 1973, p.3.

12th Grade boys, measures of awareness of choice, of information and planning were predictive of later success. On the basis of this work a Cognitive Vocational Maturity Test has been developed (Westbrook, 1971).[1] This is also an objective test of occupational information but it includes also brief case studies which involve decision making. Early unpublished results suggest that it has a substantial degree of construct validity. Work on this project is only just being published and it will be interesting to compare it with this test of occupational information.

This recent American work suggests that age and educational qualifications may be related to occupational maturity, but that this concept is multi-dimensional. It is cognitive and attitudinal, and is related to socio-economic status and verbal intelligence. It may be that the recently developed instrument (Super and Forrest, 1972)[2] will provide a useful measure. Alternatively the Adult Vocational Maturity Inventory (Sheppard, 1971)[3] might be appropriate. If these prove to be useful in careers education and if the instruments are adaptable to the British population, then a measure of Vocational Maturity might be used as a criterion for selection of participants

---

1. Op.cit.

2. D.E.Super and D.J.Forrest, "The Career Development Inventory: Preliminary Manual", New York: Teachers College, Columbia University, 1972.

3. Op.cit.

to produce norms for this test of occupational information.

One purpose of the Occupational Information Test is to produce a measure of reality of the student's knowledge of occupational characteristics. Clearly the group providing the description of reality needs to be defined. It is arguable that such a group should be a cross-section of people involved in the occupation, irrespective of their age, experience, educational attainment or occupational success and satisfaction. This kind of group would produce a norm which would give a student an indication of the range of work and personal values of people with whom he may come into contact in that occupation. It would not necessarily be a precise description of occupational characteristics at the level at which he would enter or show the values held by those around his stage of vocational development.

Super and Jordaan (1973)[1] suggest that vocational development takes place in five main stages:

Growth stage	age:	birth - 14
Exploration stage		15 - 24
Establishment stage		25 - 44
Maintenance stage		44 - 64
Decline stage		65+

Those involved in choice are likely to be in the exploration stage and it seems appropriate to compare their knowledge and values with others who are at the same

---

1. Op.cit., p.3.

stage, but yet have some knowledge and experience of occupations.

The criteria suggested in Chapter VI (p. 277) appear to be appropriate for selection of participants to provide the norms for this test:

i.e. 1) Age: not more than five years after the normal age of entry to the occupation (16-21 for Level 1 Occupations; 21-26 for Level 2 Occupations).

2) Occupational Experience: not less than 6 months and not more than 5 years. (This may include part-time education and/or professional training).

3) Educational Attainment: appropriate to the occupational level -

Level 1 occupations:	less than 5 'O' Levels or equivalent
Level 2 occupations:	5 'O' Levels and probably Further and Higher education.

To these it may now be argued that Vocational Maturity may be added. This is justifiable on the grounds that a student seeking guidance and using the test results to help him may wish to view his occupational knowledge and values in relation to those who have made more deliberate decisions and have more carefully planned their career. Use of this criterion, however, depends upon

validation of an instrument and at the present time (1973) this is not available in this country. It is possible that very few in some occupational groups e.g. Van Boys would reach an "acceptable" level of Vocational Maturity. Perhaps lack of vocational maturity is one reason for entering an occupation where future prospects are limited. A test of Vocational Maturity developed in this country might grow out of the current experience with this test of Occupational Information.

PRESENTATION AND ADMINISTRATION

Experience in the use of the material in schools provides some evidence on the problems of presentation and administration.

The test has been designed for individual use and therefore the instructions for completion are set out on the front of the response booklet. Experience showed that oral explanation was usually necessary especially for school-students in the lower half of the verbal ability scale (p. 224). This is likely to be necessary in the administration of any verbal test material, particularly to the less able.

The experimental work in schools was carried out in classes rather than separately by individuals. It was an isolated exercise and not an integral part of careers education. Oral instructions necessary to explain the test, its purpose and its completion would be more naturally part of the teaching and guidance.

Initially the design of the booklets was dictated by financial considerations and economy. The items and the responses were written in separate booklets so that the item booklets could be re-used. Some students found difficulty in making the connection between the two. This was partly because the answer booklet was designed with the sentence numbers in rows and the sentences themselves were listed vertically in the item booklet.

Some less able students overcame this difficulty by making theirresponses on their item booklets. This proved to be quite effective for Part 1 of the test. For Part 2 it is essential that the titles of all the items are visible together. Hence the answer booklet shows them at a single opening of the pages (Copies are included in Appendix 4, p.464).

Re-design of the booklets is discussed in relation to this experience. In anticipation that the test may be used in schools as part of careers education, it must be produced economically.

Amongst the most recent test material in the careers field published in Britain is the Edinburgh A.P.U. Guide. This has separate item booklets and an answer sheet which is capable of being computer scored. These do not have instructions on completion of the Guide. The items are paired comparisons and completion involved only the single operation of choosing the preferred activity in each of the pairs. No other judgments equivalent to Part 2 of this test are required.

If the test of occupational information is to be used in computer assisted guidance then there is a need for the answer sheet to be separate from the items and their sentences. Economically also this is most desirable.

Ideally it would be desirable for Part 1 and Part 2 responses to be side-by-side, but in order for Part 2

judgments to be made effectively it is necessary for the student to see all the item titles at the same time. Perhaps they could complete Part 2 at the same time as Part 1 indicating item by item whether they regard it as important and entering the three most important items at the end.

Consideration of these factors and discussion with a professional printer have led to the following proposals. The item booklet as duplicated appears to be printable in an almost identical form, but the differences are mainly in the printing of the response booklet or sheet:

1) Directions as set out in the duplicated booklets appeared to be understood, but normally the material would not be given either to groups or individuals without verbal description and discussion. The test would normally contribute to the development of the occupational self-concept as part of a co-ordinated careers programme and its purpose should be made clear to the students. In individual guidance a student may choose to do the test because he realises it may help him in making career decisions. He will then wish to be familiar with the administrative procedure, an outline of which could be available on a separate sheet.

2) The titles of each item should be displayed so that the pupil can be reminded of items he is choosing as important and most important.

3) To avoid confusion with the item numbers, the sentences in each item should be lettered A, B, C, D, E.

4) The selection of the appropriate sentence is made by shading in pencil the block under the sentence letter. Soft lead pencil is used for magnetic detection in the computer reader.

5) The items are displayed in columns and the size of the print will be the major factor in determining the number of columns on an A4 sheet of paper.

6) All the items should be visible on a single sheet and the choice of the three most important items should be set out separately at the end of the sheet.

7) At the bottom of the sheet there will be a space for the student to indicate his selection of the three Most Important items.

8) Norms may be used in showing the realism of the occupational description. The scores for the selected sentences may be entered from the norms on the right hand side of the items. Perhaps a transparent template may be devised with holes so that the appropriate score may be entered on the sheet,

i.e. Item 22 Rates of Pay

	A	B	C	D	E
Norms on Template	0	1	3	10	0

Imp. [ ] 6½ Unimp. [ ]

Score

[ ]

[3]

[6½]

Different colour may be used to distinguish the score for the Index of Reality from the Rank of Import and Most Important items.

Thus the test may be published as an item booklet

and a single response sheet. A template may be too expensive to produce but the norm scores can quite easily be transferred to the appropriate columns. The economics of the production of the printed test material have not yet been fully explored.

A summary of the problems raised in this Chapter is incorporated in the discussion of future developments of the work which now follows in the final Chapter.

CHAPTER IX

SUGGESTIONS FOR FURTHER DEVELOPMENT OF THE TEST

SUMMARY OF CURRENT WORK ON THE TEST

The five years from 1968 - 1973 during which this project has been in progress, have seen considerable developments in careers education.

The Schools Council Enquiry 1 (1968)[1] highlighted the need and the inadequacies of the provision. Curricular changes were stimulated by the Newsom Report (Central Advisory Council for Education, 1963)[2], by the Raising of the School Leaving Age in 1972 -3, by the gradual reorganisation of secondary education (Benn and Simon, 1972).[3] The emphasis on the education of the individual, including not only the cognitive elements of instruction but the affective influences of guidance, has stimulated work in careers education and personal guidance.

Earlier educational practice and beliefs suggested that guidance was only for those with social problems or physical or mental handicaps and that careers education was for the intellectually less able. This was based on

---

1. Schools Council Enquiry 1: Young School Leavers, H.M.S.O., 1968, pp. 121-134.

2. Central Advisory Council for Education (England), "Half our Future", (Newsom Report), H.M.S.O., 1963, pp. 72-79.

3. C. Benn and B. Simon, Half Way There, Penguin, 1972, pp. 38-98.

the assumption that the socially integrated, physically normal and mentally capable were knowledgeable about careers or at least had access to information when they needed it. Also that they were capable of making their own decisions with the minimum of guidance from the school.

Emphasis is now being directed to the need for guidance for all - not only those involved in secondary education, (Department of Education and Science, 1973)[1] but for University students, and including those maturer students in the Open University. Positive programmes of personal, social, health, moral and career development are appropriate to all in secondary education and many aspects may be commenced in primary education and continued into further and higher education (Daws, 1973).[2] Whilst the practice in secondary education falls far short of this ideal, trends and influences which are working towards it are discernable. But of these aspects of personal development probably careers education has made most progress and impact during the last five years.

The interest shown in this project by those in schools who used the material and other Careers Teachers and Advisory Officers who discussed its construction and use,

---

1. Department of Education and Science, Education Survey 18: Careers Education in Secondary Schools, H.M.S.O., 1973, pp. 1-3 and 61-62.

2. P.P.Daws,"Mental Health and Education: Counselling as Prophylaxis", British Journal of Guidance and Counselling 1 No. 2: 2-10, p. 9.

suggests there is a need for some instrument of this type to complement the various measures of occupational interests which have recently appeared. This test recognises both the cognitive and affective elements of careers education in Part 1 and Part 2 of its structure. By basing the values expressed in Part 2 on the knowledge revealed in Part 1, the inter-relationship of the two elements is demonstrated to the students.

Testing may be viewed with suspicion by teachers. Those who are wary of any form other than the traditional essays which have characterised Ordinary and Advanced Level of the G.C.E. for so long are reluctant to believe that any significant value can be attached to objective multiple choice tests. At the other extreme are the non-directive counsellors who only provide tests when asked by their students (clients). Do secondary school students, particularly the less articulate 13 - 16 year olds have the self-insight and the knowledge of testing to ask for instruments of this type? Yet the changing methods of assessment initiated by the C.S.E. are having a growing impact on the G.C.E. Many more teachers now recognise and accept that objective type tests are valid and useful forms of assessment. Discussion will continue on the necessity for, and the functions of, counsellors. In 1966 there were officially none in British schools. Now, in 1973, there are about 300 - a relatively small number in 5,148 secondary schools.

Of the counsellors' duties careers guidance is often an important part (Bradshaw, 1973)[1], but careers education is a specialist field complementary to other forms of personal guidance provided by the counsellor. It is a positive experience in helping students to establish knowledge of occupations and of themselves and to develop skills which will enable them to make decisions at the appropriate time. Students will need to test the reality of their knowledge and reflect more precisely on their values in terms of occupational characteristics. To fulfil these purposes this test has been devised.

It appears from the evidence that this test has certain features which commend it:

1) It is inclusive in the occupational characteristics described. Evidence of the content validity showed that even in the psycho-social aspects emphasised by Hayes (1970)[2] very few of the features were not included. Results from a wider range of Level 2 occupations might show that some items, perhaps those describing the physical environment, may not rate high in importance. This study, unlike Kirton's (1973)[3], does not make this assumption, rather it provides detailed evidence on this question.

---

1. K.D.Bradshaw, Counselling in Schools, Headmasters Association and National Association of Educational Counsellors, 1973, p. 13.

2. J. Hayes, "Occupational Choice and the perception of occupational roles," University of Leeds, Department of Management Studies, Unpublished Ph.D., 1970.

3. M.J.Kirton, Career Knowledge of Sixth Form Boys, The Hatfield Polytechnic, Report to Leverhulme Trust, 1973.

2) It is interpretable to students for whom it is intended. The test of readability shows how well it compared with officially published careers literature (Chapter VIII, p. 367). Nevertheless reference to readability scales now available might improve the measure even more in certain items without detracting from the accuracy of describing occupational characteristics.

3) Norms, provided by Careers Officers and Participants, can be relatively conveniently collected. Limitations are largely those of time and finance. Experience in the project has shown that the CODOT system will provide a convenient reference base for titling. The norms can be defined in terms of occupational title, the number in sample, age, experience, educational qualifications and location.

4) The instrument is readily adaptable to computer-assisted guidance. If the American trend is followed computers will soon be used in this country to store information useful to those involved in careers guidance. The structure of this test is immediately adaptable to this use. Such facility would extend the use of this test to those who were not able or did not wish to title the occupation they were considering (Chapter VII, p. 329).

OUTLINE PROPOSALS FOR DEVELOPMENT

Experience during the five years of this work suggests certain amendments and developments to the test:

1) Item Content

There are suggestions that a few additional items may be introduced on Peer Relationships, Leisure Activities, Family Life and Relationships (Chapter VIII, p. 347) and Security (Chapter VIII, p. 349 + 351). If the test is developed further such items would be written. The analysis of readability gives valuable references in selection of words which are interpretable particularly by the Level 1 students.

2) Norms

Use by the school students has shown that if norms were produced in 33 occupations they are likely to cover about 75% of the titles named. If this was extended to 46 titles about 83% of the students would be able to use the norms.

The compilation of the norms has raised questions of their validity on a local, regional or national scale (Chapter VIII, p. 382). The lack of a statistical procedure to compare the norms of sub-groups and to establish whether significant differences are shown hinders the determination of their validity. On present experience it may be safer to establish local norms in certain Level 1 occupations. It is not thought that Level 2 occupations would show significant regional differences.

Technological and social changes continually affect

occupational characteristics. Some occupations change more rapidly than others. There will be a need to identify these changes in terms of the test items and revise norms at appropriate times. An additional item on future trends might be added to monitor this effect. Most norms should remain usefully consistent for a period of five years.

3) Name of the "Test"

Perhaps the name "Test" has unfortunate implications of selection, of success and failure. Nowhere are these implied in the use of this instrument. A more acceptable name might be "Guide". The two Levels might be known as

Job Information Guide

Occupational Information Guide

Since these titles are distinctive it may not be necessary to emphasise the differences between Level 1 and Level 2. In any manual or description of the test the distinctly different groups of students for whom these two Levels are appropriate would be made clear. Suitable selection would then be made by the guidance teacher or the student.

When this work was commenced it appeared to be a pioneer project in occupational information. In this country there has been little fundamental research in the

field of careers guidance and education. This project has shown the need for research in a number of different areas of this field. The decision was taken to focus this research on the production of an instrument which would be useful to the student and the guidance teacher. This work may have been even more valuable if it had had a stronger theoretical basis on which to build. The need for this type of research has not, to the knowledge of the investigator, been met. It has not even been recognised in the five years during which this project has been in progress. Three areas are suggested as fruitful fields:

1) Occupational Concept Formation

This concept has been discussed in Chapter IV (p. 176) in comparison with the methodology of Goldman (1964),[1] Bull (1969)[2] and De Silva (1969).[3] There is scope to investigate the way in which students form concepts of occupations. What are the components of the occupational concept? Perhaps money, position, physical location, prospects, life-style? Is there a developmental sequence with degrees of rationalisation in this concept formation? What factors influence such development?

---

1. R. Goldman, Religious Thinking from Childhood to Adolescence, Routledge and Kegan Paul, 1964.

2. N.J.Bull, Moral Judgments from Childhood to Adolescence, Routledge and Kegan Paul, 1969.

3. W.A.De Silva, "Concept Formation in Adolescence with special reference to History", Unpublished Ph.D. thesis, School of Education, Birmingham University, 1969.

2) Decision-Making Process

The development of occupational concept is related to the decision-making process, particularly the making of career decisions. An investigation of how young people judge issues of personal importance not only in terms of careers, but in other issues of personal experience e.g. choice of leisure activities, spending money, would be very useful in the analysis of this process. There would be implications here for the teaching of careers. It would influence the way in which information is made available to young people as a structured learning experience. It might affect the group structures of learning. Particularly in the present context it might reveal more clearly the stages in the guidance programme at which the Job or Occupational Information Guide might be most effectively used.

3) Vocational Maturity

Vocational Maturity is a concept which has recently been defined and described by Super and his co-workers in the Career Pattern Study (Super and Jordaan, 1973)[1] and by Gribbens and Lohnes (1968)[2]. This work has suggested that vocational decision-making, at least

---

1. D.E.Super and J.P.Jordaan, "Career Development Theory", British Journal of Guidance and Counselling 1: 3-16, 1973, pp. 4-16.

2. W.D.Gribbens and P.R. Lohnes, Emerging Careers, New York, Teachers College Press, 1968, pp. 20-21 and 102-104.

in America, is still a process of exploration for many even at 18 years of age (12th Grade). Evidence of the relationship between vocational maturity and success is conflicting. The determinants of maturity have yet to be fully investigated. This field is being explored in America, but very little work has been done in this country.

Questions of priority will always beset the educationalist. Does fundamental research always precede the more practical and immediate solution of pedagogical or counselling problems? Until there is much greater investment of money and minds in research, it is inevitable that attempts will be made to solve practical problems without adequate theoretical background. This project has attempted to produce a practical tool on the soundest theoretical basis at present available. The experience of the project has revealed problems and difficulties which future research and development will attempt to solve and overcome.

REFERENCES

REFERENCES

Adams, G.S., Measurement and Evaluation in Education, Psychology and Guidance, New York, Holt, Reinhart & Winston, 1964.

Advisory Centre for Education, The Role of the Careers Teacher, Cambridge: A.C.E., 1968.

Alphebetical Spelling List, (Book II), Tenth Impression, Exeter, 1970.

Anastasi, A., Psychological Testing, New York, Macmillan, 1968.

Anderson, D.R., "An Investigation into the Effects of Instruction on the Development of Propositional Thinking in Children," Diploma in Child Psychology, School of Education, Birmingham University.

Bamford, T.W., The Rise of the Public Schools, Nelson, 1967.

Barr, F.E., "A Scale for measuring mental ability in vocations", Unpublished M.A. thesis, Stamford University, 1918.

Basu, C.K., "A study of occupational information possessed by secondary modern school boys of school leaving age", Unpublished M.A. thesis, University of London, 1959.

Beard, R.M., An Outline of Piaget's Developmental Psychology, Routledge & Kegan Paul, 1969.

Beckman, R.O., "A new scale for changing occupational rank", Personnel Journal, 13: 25-33., 1934.

Benn C., & Simon, B., Half Way There, Penguin, 1972.

Blackburn, R.M., Union Character and Social Class: a study of white-collar Unionism, Batsford, 1967.

Blau, P.M., Gustad, J.W., Jessor, R., Parnes, H.S., & Wilcock, R.C., "Occupational Choice: a Conceptual Framework", Industrial and Labour Relations Review 9: 531-543, 1956.

Bloom, B.S. (Editor), Taxomony of Educational Objectives, Handbook I: Cognitive Domain, Longmans, 1956.

Blythe, R., Akenfield: Portrait of an English Village, Allen Lane, The Penquin Press, 1969.

Boothman, D.B., Topical, Longmans, 1967.

Boy, A.V., & Pine, G.J., Client-Centred Counselling in the Secondary School, Boston, Houghton Mifflin, 1963.

Bradshaw, K.D., Counselling in Schools, Headmasters Association and National Association of Educational Counsellors, 1973.

Brophy, A.L., "Self, Role and Satisfaction," Genetic Psychological Menograph, pp.263-308, 1959.

Brown, A.W., & Landsberger, H.A., "The Sense of Responsibility among Young Workers: Part I Definition and Measurement", Occupational Psychology 34: 1-14, 1960.

Bull, N.J., Moral Judgments from Childhood to Adolescence, Routledge & Kegan Paul, 1969.

Burns, D.G., "Vocabulary of the Secondary Modern School Child", London: N.F.E.R. (Occ.Pub. No. 1), 1955.

Buros, D.K., (Editor), The Seventh Mental Measurement Year Book, New Jersey, Gryphon Press, 1972.

Caplow, J., The Sociology of Work, Minneapolis, University of Minnesota Press, 1954.

Carter, M.P., Home, School and Work, Pergamon, 1962.

Cattell, R.B., "r_p and other Coefficients of Pattern Similarity," Psychometrika 14: 279-298, 1949,

Cattell, R.B., "The Profile Similarity Coefficient, r_p, in Vocational Guidance and Diagnostic Classification", British Journal of Educational Psychology, 39: 131-142, 1969.

Central Advisory Council for Education (England), "Half our Future", (Newson Report), H.M.S.O., 1963.

Central Youth Employment Executive, "The Work of the Youth Employment Service," 1968-1971, H.M.S.O., 1971.

Central Youth Employment Executive, Careers Guide (1971-72), H.M.S.O., 1971.

Cheshire County Council, "Job Evaluation", Private communication-J. Storey, 1968.

Chown, S.M., "The Formation of Occupational choice among grammar school pupils", Occupational Psychology, 32: 171-182, 1958.

Closs, S.J., "The Construction of the APU Occupational Interests Guide", Unpublished M.A. thesis, University of Edimburgh, 1967.

Closs, S.J., Bates, W.T.G., Killcross, M.C., McMahon, D., Manual of the Occupational Interests Guide, University of London Press Ltd., 1969.

Closs, S.J., A.P.U., Occupational Interests Guide - Final Version, Private Communication - visit 16/7/71.

Cohen, A., "Sociological Studies of Occupations as a "Way of Life", Personnel and Guidance Journal 43: 267-272, 1964.

Coleman, T., The Railway Navvies, Penguin, 1968.

Connolly, T.G., Interests and Occupations, Cambridge: C.R.A.C., 1968.

Coombs, C.H., A Theory of Data, New York, Wiley, 1964.

Coxon, A.P.M., and Jones, C.L., "Occupational Rankings: Cognitive Implications of Models for Representing Prestige Judgments. Project in Occupational Cognition: Working Paper No. 2, University of Edinburgh, Department of Sociology, 1973.

Crites, J.O., Vocational Psychology, New York, McGraw-Hill, 1969.

Cronbach, L.J., Essentials of Psychological Testing, New York, Harper & Row (2nd Edition), 1966.

Cronbach, L.J., and Gleser, G.C., Psychological Tests and Personnel Decisions, (2nd Edition) Urbana, University of Illinois Press, 1965.

Dale, J.R., The Clerk in Industry, Liverpool, University Press, 1962.

Danskin, D.G., "Occupational Sociology in Occupational Explorations", Personnel and Guidance Journal, 34: 134-136, 1955.

Davidson, H.H., Reissman F., and Meyers E., "Personality characteristics attributed to the worker", Journal of Social Psychology 57: 155-160, 1962.

Davis, R., The Grammar School, Penguin, 1967.

Daws, P.P., "What will the School Counsellor Do?" Educational Research 9: 83-92, 1967.

Daws, P.P., "A good start in life", Cambridge, Careers Research and Advisory Centre, 1968.

Daws, P.P., "Mental Health and Education: Counselling as Prophylaxis", British Journal of Guidance and Counselling 1 no. 2: 2-10, 1973.

Dennis, N., Henriques F., and Slaughter, C., Coal is our Life, Eyre & Spottiswoode, 1956.

Department of Education and Science, Report of the Committee on Maladjusted Children, H.M.S.O., 1955.

Department of Education and Science, Statistics of Education 1966 Part 2 G.C.E., C.S.E and School Leavers, H.M.S.O., 1968.

Department of Education and Science, Education Survey 18: Careers Education in Secondary Schools, H.M.S.O., 1973.

Department of Education and Science, Statistics of Education 1971 Part 2 G.C.E., C.S.E and School Leavers, H.M.S.O., 1973.

Department of Employment and Productivity - Manpower Research Unit., Classification of Occupational Characteristics, Private communication - A.W.Durham and P.A.L. Parker, 1967.

Department of Employment and Productivity, Occupational Classification - Preliminary Definition, Private communication - A.W.Durham, 1968.

Department of Employment., Classification of Occupations and Directory of Occupational Titles, 3 Volumes, H.M.S.O., 1972.

De Silva, W.A., "Concept Formation in Adolescence with special reference to History", Unpublished Ph.D. thesis, School of Education, Birmingham University, 1969.

Dipboye, W.J., and Anderson, W.F., "Occupational stereotypes and manifest needs", Journal of Counselling Psychology 8: 296-304, 1961.

Directory of Further Education, Cornmarket Press, 1970.

Doherty, J., "An Investigation into the vocational aspirations, expectations and incentive priorities of second and third year junior secondary and comprehensive school children Unpublished Ed.B. thesis, University of Aberdeen, 1965.

Dyer, B. M., "Computerised Guidance", Careers Quarterly, 22 No. 4 (Autumn) pp.33-35, 1970.

Education Committees Year Book, Councils and Education Press,1969

Edwards, A.M., "Population: Comparative Occupational Statistics for the United States 1870-1940" Washington, U.S. Printing Office, 1943.

Edwards, R., The Secondary Technical School, University of London Press, 1960.

Elley, W. W., "The Assessment of Readability of Noun Frequency Counts", Reading Research Quarterly (Spring) 1969.

Entwistle, H., Education, Work and Leisure, Routledge & Kegan Paul, 1970.

Field, R., "Schools Council Education and Guidance Project", Careers Quarterly No. 4, pp. 44-46, 1972.

Fine, S.A., and Heinz, C.A., "The Estimates of Worker Trait Requirements for 4,000 jobs", Personnel and Guidance Journal 36: 168-174, 1957.

Fine, S.A., and Heinz, C.A., "The Functional Occupational Classification Structive", Personnel and Guidance Journal 37: 180-192, 1958.

Ford, J., "Social Class and the Comprehensive School," Unpubbished Ph.D., University of Kent, Canterbury, 1967.

Fraser, R. (Editor), Work: Twenty Personal Accounts, Penguin, 1968.

Fraser, R. (Editor), Work 2, Penguin, 1969.

Freeman, R, in Fraser R (Editor), Work, Penguin, 1968.

Fryer, D., and Sparling, E.J., "Intelligence and occupational adjustment", Occupations 12: 55-63, 1934.

Gagné, R.M., The Conditions of Learning, New York, Holt, Reinhart and Winston, 1965.

Galbraith, H.M.C., "The Youth Employment Service: a Perspective Institute of Careers Officers, Icon Series, No. 1, 1971.

Gamage, C.S., The Esso Students Business Game, The Careers Teacher (Autumn 1971) pp. 9-10.

Gelatt, H., "Decision making: a conceptual frame of reference for counselling", Journal of Counselling Psychology 9: 240-245, 1962.

Gerberich, J.R., Specimen Objective Test Items, New York, Longmans Green, 1956.

Gillis, J., "Personality needs of future teachers", Educational and Psychological Measurement 24: 589-600, 1964.

Ginzberg, E., Grass on the Slag Heaps: the Story of the Welsh Miners, New York, Harper Bros., 1942.

Ginzberg, E., Ginsburg, S.W., Axelrad, S., Herma, J.L., Occupational Choice: An Approach to General Theory, New York, Columbia University Press, 1951.

Goldman, L., Using Tests in Counselling, New York, Appleton Century Crofts, 1961.

Goldman, R., Religious Thinking from Childhood to Adolescence, Routledge and Kegan Paul, 1964.

Goldthorpe, J.H., and Lockwood, D., The Changing National Social Structure quoted in Butterworth E and Weir, D: "The Sociology of Modern Britain", Collins (1970) 1963.

Gonyea, G., "Dimensions of Job Perceptions," Journal of Counselling Psychology 8: 305-313, 1961.

Gordon, W., "A comparative study of the occupational stereotypes of secondary school leavers and first year apprentices", Unpublished M.A. thesis, University of London, 1964.

Greenwood, E., Attributes of a Profession in Nozow/S., and Form, W.H. (Editors) Man, Work and Society: a Reader in the Sociology of Occupations, New York, Basic Books, 1962.

Gribbons, W.D., and Lohnes, P.R., Emerging Careers, New York, Teachers College Press, 1968.

Grunes, W.F., "Looking at Occupations", Journal of Abnormal and Social Psychology 54: 86-92, 1957.

Gustad, J.W., "Test Information and Learning in the Counselling Process", Educational and Psychological Measurement 11: 788-795, 1951.

Hahn, M.E., and MacLean, M.S., General Clinical Counseling in Educational Institutions, New York, McGraw-Hill, 1950.

Hall, R.K., and Lauwerys, J.A., (Editors), The Year Book of Education, Evans, 1955.

Hallowell, P.G., The Lorry Driver, Routledge & Kegan Paul, 1968.

Hartop, B.B., "Careers Work in Sixth Form Minority Time", Journal of the Careers Research and Advisory Centre, 1966, Vol2, p.18-23.

Hayes, J., "Occupational Choice and the perception of occupational roles", University of Leeds, Department of Management Studies, Unpublished Ph.D., 1970.

Hayes, J. and Hopson, B., "Occupational information and the process of vocational development", Technical Education Abstracts 9: 6-9, 1968.

Hayes, J. and Hopson, B., Careers Guidance, Heinemann, 1971.

Haystead, J.M., "Social Structure; Awareness Contexts and Processes of Choice", Sociological Review, 19: 79-94, 1971.

Haystead, J.M., "Certain Aspects of the Process of Job Choice and Entry into the Labour Market of a group of Scottish Junior Secondary School Pupils", Report to the Scottish Council for Research in Education, 1972.

Haycock, C., A Study of some aspects of the Internal Organisation and Management of the mixed All-through Comprehensive Schools with Eight Hundred or more Pupils: Port Talbot, Sceptre Publishing Co., 1970.

Heap, B. W., "Operating a Work Experience Scheme", Youth Employment Service Careers Bulletin, Summer 1966, p. 1-3½

Hilton, T.L., "Career-Decision Making", Journal of Counselling Psychology 9: 291-298, 1962.

Hood, H.B., "Occupational Preferences of Secondary Modern Schoolchildren", Educational Review (Birmingham), 4: 55-64, 1951.

Hoppock, R., Occupational Information - 3rd Edition, New York: McGraw-Hill, 1967.

Hopson, B., "Occupational Visits - Education, Recruitment or a Lark?" Youth Employment 19: 25-32, 1967.

Hopson, B., "The Uses of Psychological Tests in Educational and Vocational Counselling", University of Leeds, Vocational Guidance Research Unit, 1968.

Hopson, B., "An Experiment in Using Psychological Tests in Group Guidance", Careers Quarterly 22: 17-24, 1970.

Hopson, B. and Hough, P., "Personal and Career Development," Cambridge: Careers Research and Advisory Centre, 1973.

Hopson, B. Hopson, C., and Hayes, J., Speedcop Careers Game, Cambridge: Careers Research and Advisory Centre, 1973.

Hough, P., "The Readability of Careers Literature", Vocational Guidance Research Unit, University of Leeds.

Hough, P., "Readability", Careers Quarterly 25: 10-16, 1973.

Howden R. and Dowson, H., Practical Guidance in Schools, Careers Consultants, 1973.

Hughes, P.M., Guidance and Counselling in Schools, Oxford, Pergamon, 1971.

Hurlock, E., Child Development, New York, McGraw-Hill, 1964.

Institute of Careers Officers, Work Experience in British Secondary Schools, Bromsgrove Works, 1971.

International Labour Office, International Standard Classificati of Occupations, Report prepared for the Ninth International Conference of Labour Statistics, Geneva, 1957.

International Labour Organisation, I.L.O. Recommendation (No. 87) Concerning Vocational Guidance, 1949.

Isaacson, L.E., Career Information in Counselling and Teaching, Boston, Allyn & Bacon, 1966.

Jahoda, G., "Adolescent Attitudes to starting Work", Occupational Psychology 23: 184-188, 1949.

Jahoda, G., "Job Attitudes and job choice among secondary school leavers", Occupational Psychology 26: 125-140, 1952.

Jahoda, G. and Chalmers, A.D., "The Youth Employment Service - a consumer perspective", Occupational Psychology 37: 20-43, 1963.

Jahoda, G. and Chalmers, A.D., "School-leavers recall of the interview with the Youth Employment Officer Occupational Psychology 37: 112-129, 1963.

James, C., Young Lives at Stake, Collins, 1968.

James, F., "Comment on Hilton's Model of Decision Making", Journal of Counselling Psychology 10: 303-4, 1963.

Katz, M.R. and Norris, L., "The Measurement of Academic Interests: Part 1 Characteristics of Academic Interest Measures", Research Bulletin BB70, p. 57, 1970.

Kirton, M.J., "Career Knowledge of Sixth Form Boys: The Hatfield Polytechnic", Report to Leverhulme Trust, 1973.

Kohout, K.A. and Rothney, J.W.M., "A longtitudinal study of the consistency of vocational preferences", American Educational Research Journal 1: 10-21, 1964.

Krathwohl, D.R., Bloom, B.S., and Masia, B.B., Taxonomy of Educational Objectives, Handbook II: Affective Domain, Longmans, 1956.

Kuder, G.F., Kuder Preference Record - Vocational Administrators Manual, Chicago, Illinois, Science Research Associates Inc., 1960.

Lancashire, R.D., and Cohen, B.T., "Developments in Vocational Guidance", Occupational Psychology 44 (Jubilee Vol.), pp. 223-227, 1970.

Langeveld, M.J, (in Hall R.K. and Lauwerys, J.A. (Editors), The Year Book of Education 1955, Evans, 1955.

Lastrucci, C.L., "The professional dance band musician," Journal of Musicology 3: 168-172, 1941.

Law, B., "Decide for Yourself", Cambridge: Careers Research and Advisory Centre, 1973.

Lawsche, C.H.Jr., and Satter, G.A., "Studies in Job Evaluation I Factor Analyses of Point Ratings for Hourly Paid Jobs in Three Industrial Plants", Journal of Applied Psychology 28: 189-198, 1944.

Lee, E.A. and Thorpe, L.P., "Occupational Interest Inventory - Manual", Monteray, California Test Bureau, 1956.

Lindquist, E.F. (Editor) "Educational Measurement", Washington D.C., American Council on Education, 1950.

Lingwood, J., "The Vocational Information possessed by Secondary School Girls", Occupational Psychology 15: 185-198, 1941.

Lovell, K., The Growth of Mathematical and Scientific Concepts in Children, University of London Press, 1961.

Lyman, E.L., "Occupational differences in the value attached to work", American Journal of Sociology 61: 138-144, 1955.

Lytton, H. and Croft, M., Guidance and Counselling in British Schools, Arnold, 1969.

McCormick, E.J., Cunningham, J.W., and Gordon G.G., "Job dimensions based on factorial analyses of worker-oriented job variables", Personnel Psychology 20: 417-430, 1967.

McCormick, E.J., Cunningham, J.W., and Gordon, G.G., "Prediction of job requirements by a structured job analysis procedure," Personnel Psychology, 20: 431-440, 1967.

Mace, C.A., "The Analysis of Human Skills", Occupational Psychology 24: 125-140, 1950.

Macleary, D.M., Occupational Visits in Heppell R.P. (Editor): A Practical Handbook of Careers Education and Guidance, Careers Consultants Ltd., 1972.

Macleary, D.M. and Reid, J.R., Career Decisions, Cambridge: Careers Research and Advisory Centre, 1973.

Mathewson, R.H., Guidance Policy and Practice, 3rd Edition, New York, Harper, 1962.

Mellor, J.V.T., "Factors influencing the Development of Guidance in Secondary Education", Unpublished B.Ed. dissertation, University of Liverpool, 1973.

Merwin, H.C. and Di Vesta, F.J., "A study of need theory and career choice", Journal of Counselling Psychology 6: 302-308, 1959.

Miller, K.M., Rothwell-Miller Interest Blank (Manual) Slough N.F.E.R., 1968.

Ministry of Labour, Guide to Occupational Classification and Registration of Workers for Employment - E.D.526, H.M.S.O.,1960.

Ministry of Labour, Central Youth Employment Executive, "The Future of the Youth Employment Service", Albermarle Report, 1965.

Montgomery, R.J., Examinations: an account of their evolution as administrative devices in England, Longmans, 1965.

Moore, B.M., Private communication, Slough:N.F.E.R., 1972.

Morgan, R.G.T., "Occupational Description and Classification", Staines: Air Transport and Travel Industry Training Board, 1972.

Morris, C.W., Writings on the General Theory of Signs, Paris, Mouton, 1971.

Morrison, R.L., "Self-Concept Implementation in Occupational Choices", Journal of Counselling Psychology 9: 255-260, 1962.

Moser, H.P. Dubin, W., Shelsky, I.M., "A proposed modification of Roe's Occupational Classification", Journal of Counselling Psychology 3: 27-31, 1956.

Musgrave, P.W., "Towards a Theory of Occupational Choice", Sociological Review 15: 33-46, 1967.

Musgrave, P.W., Private communication, University of Aberdeen, 1968.

National Association of Careers Teachers, "Time and Facilities for Careers Work in Secondary Schools", (The McIntyre Report), Cornmarket Careers Centre, 1970.

National Foundation for Educational Research, "Procedures for Allocation of Pupils in Secondary Schools", Slough, 1963.

National Institute of Industrial Psychology, "Studying Work", N.I.I.P. Paper No. 2., 1951.

National Institute of Industrial Psychology, "The Seven Point Plan", N.I.I.P., Paper No. 1, N.I.I.P., 1952.

National Union of Teachers, Annual Guide to Careers for Young People, N.U.T., 1969.

Netherlands Ministry of Social Affairs and Public Health, Classification of occupations according to their mutual affinity, 2nd Edition, The Hague, State Labour Office, 1952.

Newsome, D., A History of Wellington College 1859-1959, Murray, 1959.

Osgood, C.E. Suci, G.J., and Tannerbaum, P.H., The Measurement of meaning, Urbana, Illinois: University of Illinois Press, 1957.

Osipow, S.H., "Occupations as a function of titles and descriptions", Journal of Counselling Psychology 9: 106-109, 1962.

Parkin, G.W., Edward Thring, Life, Diary and Letters, 1898, (quoted in Newsome D, Godliness and Good Learning, Murray, 1961).

Parsons, F., Choosing a Vocation, Gay & Hancock, 1909.

Paterson, D.G., "The Genesis of Modern Guidance", Educational Record 19: 36-46. Reprinted in Brayfield, A.H. (Editor), Readings in Modern Methods of Counseling (pp.13-20), New York, Appleton-Century-Crofts, 1950.

Paterson, D.G. Gerken, G. and Hahn, M.E., The Minnesota Occupational Rating Scales and Counseling Profile, Chicago, Science Research Associates, 1953.

Peel, E.A., The Pupil's Thinking, Oldbourne, 1960.

Peel, E.A., The Nature of Adolescent Judgment, Staples, 1971.

Pidgeon, D.A. and Yates, A., An Introduction to Educational Measurement, Routledge & Kegan Paul, 1969.

Rankin, R.P., "The ministerial calling and the minister's wife", Pastoral Psychology 11:16-22, 1960.

Reeb, M., "How People see Jobs: A Multi-dimensional Analysis", Occupational Psychology 33, 1-17, 1959.

Registrar-General: General Register Office, Classification of Occupations, 1966, H.M.S.O., 1966.

Robbins Report, Committee on Higher Education, H.M.S.O., 2154, 1963.

Roberts, K., "The Entry into Employment: An approach towards a general theory", Sociological Review 16: 165-184, 1968.

Roberts, K., From School to Work, Newton Abbot, David & Charles, 1971.

Roe, A., Psychology of Occupations, New York, Wiley, 1956.

Roff, H.E., and Watson, T.E., Job Analysis, Institute of Personnel Management, 1961.

Rogers, C.R., Counselling and Psychotheraphy, Boston, Houghton Mifflin, 1942.

Rotary Club Magazine, Work Experience in Manchester, 1969.

Rusalem, H. "New Thoughts on the Role of Occupational Information", Journal of Counselling Psychology, 1: 84-88, 1954.

Sadler, J., The Careers Library in Heppell, R.P.,(Editor) A Practical Handbook of Careers, Education and Guidance, Careers Consultants Ltd.,1972.

Samler, J., "Psycho-social aspects of work: a critique of occupational information", Personnel and Guidance Journal 39: 458-465, 1961.

Schools Council, Enquiry 1: Young School Leavers, H.M.S.O., 1968.

Schools Council, Working Paper 40: Careers Education in the 1970's., Evans/Methuen Educational, 1972.

Schools Council, Careers Education and Guidance Project, Foundation Course Trial Materials, Schools Council Publications, 1973.

Schwarzweller, H.K., "Values and Occupational Choice", Social Forces 39: 126-135, 1960.

Shartle, C.L., Occupational Information, 3rd Edition, Englewood Cliffs, New Jersey, Prentice Hall, 1959.

Shartle, C.L., "Occupational Analysis, Worker Characteristics and Occupational Classification Systems" in Borow, H: Man in a World at Work, Boston, Houghton Mifflin, 1964.

Sheppard, D.I., "The Measurement of Vocational Maturity in Adults", Journal of Vocational Behaviour 1, 399-406, 1971.

Short, E., "Positively Prejudiced", The Guardian, 4th October, 1972.

Smith, M., "An Empirical Scale of Prestige Status of Occupations", in Nosow, S. and Form, W.H., (Editors), Man, Work and Society: a Reader in the Sociology of Occupations, New York, Basic Books, 1962.

Starkey, H.F., "Factors influencing Occupational Choice among Secondary Modern School Leavers", Unpublished M.Ed. thesis, University of Manchester, 1969.

Stavishevsky, R.and Matlin, N., "A model for translation of self-concepts into vocational terms", in Hopson, B. and Hayes, J., The Theory and Practice of Vocational Guidance, Pergamon, 1968.

Stenhouse, L., "The Humanities Curriculum Project", in Hooper R. (Editor): The Curriculum: Context, Design and Development, Edinburgh, Oliver & Boyd for Open University, 1971.

Stephens, M., "Vocational preferences of secondary modern school girls in a London suburb", Unpublished M.A. thesis, London University, 1957.

Stewart, N., "A.G.C.T. Scores of Army Personnel Grouped by Occupations", Occupations 26: 1-37, 1947.

Stocks, J.C., "An Inquiry into the Choice of Teaching as a Career", Unpublished M.Ed. thesis, University of Birmingham, 1967.

Stones, E. and Morris, S., Teaching Practice: Problems and Perspectives, Methuen, 1972.

Strong, E.K. Jnr., Manual for Strong Vocational Interest Blanks for Men and Women, Palo Alto, California, Consulting Psychologists Press Inc., 1959.

Super, D.E., The Dynamics of Vocational Adjustment, New York, Harper & Row, 1942.

Super, D.E., "Testing and using test results in counselling", Occupations 29: 95-97, 1950.

Super, D.E., "A Theory of Vocational Development", American Psychologist 8: 185-190, 1953.

Super, D.E., "The Preliminary appraisal in vocational counselling", Personnel and Guidance Journal, 36: 154-161, 1957.

Super, D.E., The Psychology of Careers, New York, Harper & Row, 1957.

Super, D.E., "Vocational Maturity in the Secondary School" Psychology of Careers Course, Keele University, 1970.

Super, D.E. and Forrest, D.J., The Career Development Inventory: Preliminary Manual, New York, Teachers College, Columbia University, 1972.

Super, D.E. and Jordaan, J.P., "Career Development Theory", British Journal of Guidance and Counselling 1: 3-16, Cambridge, C.R.A.C., 1973.

Swanston, T., "Investigation into the cases for vocational preference and choice of rural and urban school leavers", Unpublished Ed.B. thesis, University of Aberdeen, 1954.

Taussig, F.W., Principles of Economics (1st Edition) Vol.II, New York, Macmillan, 1911.

Taylor, S.E., Frankenpohl, H. and White, C.E., A revised core vocabulary," Huntington, New York, Educational Development Laboratories, 1969.

Taylor, W., The Secondary Modern School, Faber & Faber, 1963.

Thorndike, E.L. and Large, I., The Teachers' Word-book of 30,000 words, Columbia, Teachers College, Columbia University, 1944.

Tyler, L.E., "Theoretical principles underlying the counseling process, Journal of Counselling Psychology 5: 3-10, 1958.

U.S. Department of Labour, Dictionary of Occupational Titles,
Vol.1 Definitions of Titles
Vol.2 Occupational Classification and Industry Index,
Third Edition, U.S.Government Printing Office Washington, D.E., 1965.

U.S. Department of Labor, Dictionary of Occupational Titles, 1st Edition 1939
2nd Edition 1949

U.S. Department of Labor, U.S.Employment Service, Estimates of Worker Trait Requirements of 4,000 Jobs, U.S. Government Printing Office, 1956.

Valentine, C.W. and Ritchie, F.M., "Reasons for choice of occupation among secondary school pupils (I)" Forum of Education, 5: 85-101, 1927.

Vaughan, T.D., Education and Vocational Guidance Today, Routledge & Kegan Paul, 1970.

Veness, T., School Leavers, Methuen, 1962.

Walker, K.F., "A Study of Occupational Stereotypes", Journal of Applied Psychology 42: 122-124, 1958.

Watts, A.G., "The Use of Computers in Guidance", Education and Training 15: p.218, 1973.

Westbrook, B.W., The Cognitive Vocational Maturity Test, Raleigh, North Carolina, North Carolina State University, 1971.

Williams, J.E., The Derbyshire Miners: A Study of Industrial and Social History, Allen & Unwin 1962.

Williamson, E.G., Counselling Adolescents, New York, McGraw-Hill, 1950.

Williamson, E.G., "Directive Versus Non-Directive Counselling" Educational Digest 16: p. 35, 1951.

Wilson, J., "Leicestershire Scheme of Computerised Guidance", Careers Quarterly 33 No. 3 (Summer 1971), pp. 23-24, 1971.

Wilson, M.D., "Vocational preferences of secondary modern schoolchildren", British Journal of Educational Psychology 23: 97-113 and 163-179, 1953.

Wiseman, S. and Pidgeon, D., Curriculum Evaluation, Slough: N.F.E.R., 1970.

Wishart, D., "Computers in Personnel Management", Private communication, 1971.

Wood, R., "Objectives in the Teaching of Mathematics" Educational Research 10: 83-98, 1968.

TABLE 43 ITEM CONTENT SHOWING SOURCES IN SYSTEMS OF CLASSIFICATION OF OCCUPATIONAL CLASSIFICATION.

Systems of Classification of Occupational Characteristics.					
Test Items Level 1	Test Items Level 2	Dictionary of Occupational Titles (DOT)[1]	Classification of Occupations + Directory of Occupational Titles (CODOT)[2]	National Institute of Industrial Psychology Job Studies (NIIP)[3]	Job Analysis Cheshire County Council (CCC)[4]	Job Dimensions based on Factorial Analysis (McCormick et al)[5]
PHYSICAL ENVIRONMENT						
Item 1 Place of work - Indoors This job is done mainly in 1. an office or shop. 2. a factory or workshop. 3. a hospital or at home. 4. travelling about. 5. none of these places.	This occupation is done mainly 1. in an office or shop. 2. in a factory or laboratory. 3. at home or in a hospital or school. 4. travelling about. 5. in none of these places.	Inside or outside	Mainly indoors	Indoors/outdoors Factory/office Confined space/travelling	Outdoor/indoor	
Item 2 Place of work - Outdoors This job is done mainly 1. in the open air 2. underground 3. overhead 4. on a building site 5. in none of these places	This occupation is done mainly 1. in the open air 2. underground 3. overhead 4. on a building site 5. in none of these places	inside or outside high places	mainly outdoors	underground overhead	unlocalised underground overhead platform, scaffold	outdoor work
Item 3 Things or People Worked With In this job I should work mostly with 1. tools or fixed machinery 2. things to sell 3. pen, typewriter or paper 4. people 5. none of these things	In this occupation I should spend most time with 1. tools, fixed machinery, instruments or laboratory equipment 2. things to sell 3. pen, typewriter or paper 4. people 5. none of these things				bench machine counter desk	
Item 4 Working Conditions Place where this job is done is 1. clean 2. dusty 3. greasy 4. dirty 5. dirty and greasy	Place where this occupation is done is 1. clean 2. dusty 3. greasy 4. dirty 5. a combination of two or three of these last three conditions	dust	dust		clean dust greasy dirty	
Item 5 Temperature of Work Place Place where this job is done is usually 1. very hot 2. hot 3. pleasantly warm 4. cold 5. either hot or cold, depending on the weather	Place where this occupation is done is usually 1. very hot 2. hot 3. pleasantly warm 4. cold	extremes of heat extremes of cold temperature changes	very hot very cold	temperature high/low even/varied		

Level 1	Level 2	DOT	CODOT	NIIP	CCC	McCormick et al
Item 6 Dryness or Dampness of Work Place						
Place where this job is done is	Place where this occupation is done is					
1. dry	1. dry	wet + humid	humidity		dry	
2. normal indoor conditions	2. normal indoor conditions					
3. sometimes dry + sometimes damp	3. sometimes dry + sometimes damp (Indoors)					
4. sometimes dry + sometimes damp	(Outdoors)				moist humid	
5. damp	5. damp					
Item 7 Smell						
Place where this job is done has	Place where this occupation is done has					
1. pleasant smells	1. pleasant smells				natural/ventilated/draughty	
2. no noticeable smells	2. no noticeable smells					
3. sweet and sickly smells	3. sweet and sickly smells					
4. smells of disinfectant as in hospitals						
5. unpleasant fumes, for example, petrol or acid		Poor ventilation, fumes, odors, toxic conditions		fumes/acids	noxious gases, fumes, odours	unpleasant environment
Item 8 Noise or Vibration						
Place where this job is done	Place where this occupation is done					
1. is very quiet	1. is very quiet					
2. is quiet with occasional sounds	2. is quiet with occasional sounds					
3. has normal sounds, for example, talking, quiet machinery, office equipment, traffic.		noise + vibration		noise/vibration		
4. is noisy	4. is noisy					
5. is very noisy with disturbing vibrations			very noisy work		hearing hazard	
Item 9 Repetition or Variety						
In this job I should	This occupation involves					
1. repeat a simple task all the time	1. constant repetition					
2. repeat a few different tasks all the time	2. frequent repetition					
3. repeat a complicated task	3. some repetition + some variety					
4. do a number of different kinds of task	4. considerable variety					
5. have continual change in the kind of task	5. continual variety					
Item 10 Dangers of the Work	**Hazards or Dangers of the Work**					
Most likely cause of injury in this job is from	Most likely cause of injury in this occupation is from					
1. machinery	1. machinery	Proximity to moving pa			Fire, electricity	
2. accident on the road, in the air, or at sea						
3. personal attack	3. personal attack		Dangerous work		Violence	
4. falling materials	4. falling materials				Muscular strain	
5. my own clumsiness or forgetfulness	5. my own fault	Exposure to explosives				

Level 1	Level 2	DOT PHYSICAL	CODOT REQUIREMENTS	NIIP	CCC	McCormick et al
Item 11 Appearance or Clothes						
In this job I should usually wear	In this occupation I should usually wear					
1. old clothes	1. old clothes					optional or work clothes
2. working clothes or overalls	2. working clothes or overalls					
3. protective clothing, for example, helmets, boots.						
4. uniform	4. uniform					specific uniform
5. smart clothes	5. smart clothes					formal clothing
Item 12 Strength						
In this job I should	This occupation involves					
1. do no lifting	1. no lifting	sedentary < 10lbs.	mainly sedentary, occasional standing	physical strength		General physical activities
2. lift light objects	2. lifting of light objects	light < 20lbs.	medium work – frequent standing, walking, pushing, sitting, some climbing + bending < 14lbs.			
3. lift and move heavy objects occasionally	3. lifting and moving of heavy objects occasionally	medium < 50lbs.				
4. lift + move heavy objects frequently	4. strenuous work of lifting heavy objects frequently	Very heavy > 100lbs.	Heavy work > 56 lbs		Unusual strength in hands, arms, legs, back	
5. lift and move very heavy objects	5. very strenuous work including climbing crouching or crawling with awkward or very heavy objects	Stooping, kneeling crouching, crawling	Very heavy with continual climbing, bending, crouching, crawling, pushing, lifting, carrying	Constant standing, sitting, stooping, kneeling, walking, climbing, reaching, lifting		
Item 13 Sitting or Standing						
In this job I should	This occupation involves					
1. sit all the time	1. sitting all the time	sedentary	mainly sedentary, occasional standing	sitting	% standing, % sitting	Physical + sedentary activities
2. sit more than stand	2. more sitting than standing					
3. sit and stand about equally	3. about equal sitting and standing					
4. stand more than sit	4. more standing than sitting			standing		
5. stand, stoop, lie, walk or climb most of the time	5. standing, walking, stooping or climbing most of the time	stooping, kneeling, crouching	continual climbing, bending, crouching, crawling	stooping, reaching, walking		Knee-bending activities
Item 14 General Health						
This job	This occupation					
1. can be done by people with certain physical handicaps			absence of skin allergies, respiratory weaknesses, digestive complaints	General health		
2. can be done by people with certain health defects, for example, poor breathing, skin disease, serious stomach upsets.						
3. requires people who are fit	3. requires people with reasonable health					
4. is suitable only for people who are fit	4. is suitable only for people of good health					
5. demands very high standards of fitness	5. demands very high standards of health					
Item 15 Work with Hands and Feet						
In this job I should do	This occupation involves					
1. no accurate work with hands	1. no accurate work with hands	manual dexterity; finger dexterity	Motor co-ordination unimportant			skilled manual activities
2. simple work with hands	2. simple work with hands	handling; feeding + off bearing	Uncomplicated + imprecise	eye/hand/limb/finger/foot movements	manipulating, repairing and constructing things. manipulating tools and components	muscular co-ordination dexterity of fingers, hands, legs
3. accurate work with hands	3. accurate work with hands	tending; manipulating	Complex + imprecise			
4. simple work with hands and feet		driving-operating-controlling	Precise + uncomplicated			
5. accurate work with hands and feet		precision working; setting up	Precise + complex			
Item 16 Eyesight						
This job	This occupation					
1. can be done by people with very poor eyesight, even with glasses		Seeing: acuity				
2. cannot be done by people who are colour blind		Colour vision	Normal colour vision	vision – colour		
3. involves no strain on the eyes	involves no strain on the eyes		Normal vision acuity	vision – normal	eyesight rating	
4. requires good normal eyesight	requires good normal eyesight					
5. demands high standards of eyesight						

Level 1	Level 2	DOT PHYSICAL	CODOT REQUIREMENTS	NIIP	CCC	McCormick et al
Item 11 Appearance or Clothes						
In this job I should usually wear	In this occupation I should usually wear					
1. old clothes	1. old clothes					optional or work clothes
2. working clothes or overalls	2. working clothes or overalls					
3. protective clothing, for example, helmets, boots.						
4. uniform	4. uniform					specific uniform
5. smart clothes	5. smart clothes					formal clothing
Item 12 Strength						
In this job I should	This occupation involves					
1. do no lifting	1. no lifting	sedentary < 10lbs.	mainly sedentary, occasional standing	physical strength		General physical activities
2. lift light objects	2. lifting of light objects	light < 20lbs.	medium work – frequent standing, walking, pushing, sitting, some climbing + bending < 14lbs.			
3. lift and move heavy objects occasionally	3. lifting and moving of heavy objects occasionally	medium < 50lbs.				
4. lift + move heavy objects frequently	4. strenuous work of lifting heavy objects frequently	Very heavy > 100lbs.	Heavy work > 56 lbs		Unusual strength in hands, arms, legs, back	
5. lift and move very heavy objects	5. very strenuous work including climbing crouching or crawling with awkward or very heavy objects	Stooping, kneeling crouching, crawling	Very heavy with continual climbing, bending, crouching, crawling, pushing, lifting, carrying	Constant standing, sitting, stooping, kneeling, walking, climbing, reaching, lifting		
Item 13 Sitting or Standing						
In this job I should	This occupation involves					
1. sit all the time	1. sitting all the time	sedentary	mainly sedentary, occasional standing	sitting	% standing, % sitting	Physical + sedentary activities
2. sit more than stand	2. more sitting than standing					
3. sit and stand about equally	3. about equal sitting and standing					
4. stand more than sit	4. more standing than sitting			standing		
5. stand, stoop, lie, walk or climb most of the time	5. standing, walking, stooping or climbing most of the time	stooping, kneeling, crouching	continual climbing, bending, crouching, crawling	stooping, reaching, walking		Knee-bending activities
Item 14 General Health						
This job	This occupation					
1. can be done by people with certain physical handicaps			absence of skin allergies, respiratory weaknesses, digestive complaints	General health		
2. can be done by people with certain health defects, for example, poor breathing, skin disease, serious stomach upsets.						
3. requires people who are fit	3. requires people with reasonable health					
4. is suitable only for people who are fit	4. is suitable only for people of good health					
5. demands very high standards of fitness	5. demands very high standards of health					
Item 15 Work with Hands and Feet						
In this job I should do	This occupation involves					
1. no accurate work with hands	1. no accurate work with hands	manual dexterity; finger dexterity	Motor co-ordination unimportant			skilled manual activities
2. simple work with hands	2. simple work with hands	handling; feeding + off bearing	Uncomplicated + imprecise	eye/hand/limb/finger/foot movements	manipulating, repairing and constructing things. manipulating tools and components	muscular co-ordination dexterity of fingers, hands, legs
3. accurate work with hands	3. accurate work with hands	tending; manipulating	Complex + imprecise			
4. simple work with hands and feet		driving-operating-controlling	Precise + uncomplicated			
5. accurate work with hands and feet		precision working; setting up	Precise + complex			
Item 16 Eyesight						
This job	This occupation					
1. can be done by people with very poor eyesight, even with glasses		Seeing: acuity				
2. cannot be done by people who are colour blind		Colour vision	Normal colour vision	vision – colour		
3. involves no strain on the eyes	involves no strain on the eyes		Normal vision acuity	vision – normal	eyesight rating	
4. requires good normal eyesight	requires good normal eyesight					
5. demands high standards of eyesight						

Level 1	Level 2	DOT	CODOT	NIIP	CCC	McCormick et al
Item 17 Talking	**Talking or Speech**					
In this job I should	This occupation involves					
1. do no talking at all as part of the work, except for friendly chatter	1. no talking at all as part of the work, except for friendly chatter	talking + hearing	normal hearing absence of speech defects	Hearing Voice	Keen hearing	
2. talk to people sometimes	2. talking to people sometimes					
3. talk to people often	3. talking to people often					
4. speak very clearly sometimes	4. particularly clear speech					
5. speak very clearly most of the time	5. speaking more than one language					
Item 18 Arrangement of Normal Hours of Work		ECONOMIC	ENVIRONMENT			
In this job I should work	In this occupation the hours worked					
1. when I want to	1. are decided by the worker					
2. shifts	2. are shifts					
3. split shifts (2 parts of a shift in one day)	3. are split shifts (2 parts of a shift in one day)					
4. regular daytime hours, unless the weather is bad	4. are regular daytime hours, perhaps with overtime					
5. regular daytime hours, perhaps with overtime	5. depend on others and are frequently irregular					
Item 19 Unusual Hours of Work						
In this job I should work	In this occupation a person has to work					
1. in the evenings	1. in the evenings					
2. at night or early morning	2. at night or early morning					
3. sometimes on Saturdays or Sundays						
4. at any of these times						
5. at none of these times						
Item 20 Numbers of Hours Worked in a Week						
In this job I should normally work	In this occupation I should normally work					
1. less than 30 hours per week	1. less than 30 hours per week					
2. between 30 and 40 hours per week	2. between 30 and 40 hours per week					
3. between 40 and 50 hours per week	3. between 40 and 50 hours per week					
4. between 50 and 60 hours per week	4. between 50 and 60 hours per week					
5. over 60 hours per week	5. over 60 hours per week					
Item 21 When Workers are Paid						
In this job I should be paid	In this occupation I should be paid					
1. when each part of it was done	1. when each part of the work is done					
2. each day	2. each day					
3. each week	3. each week					
4. each month	4. each month					
5. at other times	5. at other times					
Item 22 Rates of Pay						
In this job I should be paid	In this occupation I should be paid					
1. for each part of the work when it is done properly (this includes piece work)	1. when each part of the work is done		piece work		Pay: hourly v. salary	
2. only from profit or commission I make	2. by the hour or by the week, perhaps with overtime or bonus					
3. by the hour, perhaps with overtime or bonus	3. by the month, perhaps with overtime or bonus		basic and bonus			
4. by the week, perhaps with overtime or bonus	4. only or mainly from profit or commission					
5. by the month, perhaps with overtime or bonus	5. only or mainly by professional fees		salary			

Level 1	Level 2	DOT	CODOT	NIIP	CCC	McCormick et al
Item 23 Amount of Starting Pay						
In this job I should start by earning	In this occupation I should start by earning					
1. less than £3 per week	1. less than £5 per week					
2. between £3 and £8 per week	2. between £5 and £12 per week					
3. between £8 and £12 per week	3. between £12 and £20 per week					
4. between £12 and £20 per week	4. between £20 and £30 per week					
5. over £20 per week	5. over £30 per week					
Item 24 Extra Benefits						
In this job I should be allowed	In this occupation I should be allowed					
1. a reduced price on things I buy	1. a car allowance, travel or meal facilities					
2. canteen meals at cheap prices or luncheon vouchers	2. low interest loans and/or allowances on marriage					
3. free or cheap travel	3. life insurance policies and/or non-contributory pensions			Pension schemes, Sickness benefit		
4. other benefits	4. a combination of these or other benefits			Profit sharing		
5. no extra benefits	5. no additional benefits					
Item 25 Increases in Pay						
In this job I might get an increase in pay	In this occupation increases in pay are given					
1. for good work	1. on merit					
2. on promotion	2. on promotion					
3. on passing examinations	3. on passing examinations					
4. on birthdays or other special times	4. automatically at certain times eg. birthdays					
5. for more than one of these reasons	5. for more than one of these or other reasons					
Item 26. Maximum Wage	**Payment at 30 years old**					
In this job I should reach the maximum wage when I am	The payment in this occupation now to people aged 30 years who have not been promoted, compared to the starting pay on entry at 17 or 18 or after full-time education, increases by:					
1. 18 years old	1. less than twice as much					
2. 21 years old	2. about twice as much					
3. 25 years old	3. about three times as much					
4. 30 years old	4. four or five times as much					
5. 40 years old	5. more than five times as much					
SOCIAL ENVIRONMENT						
Item 27 How work is done with People	**Type of Relationship with People at Work**					
In this job I should	This occupation involves					
1. work alone for most of the time	1. very little contact with people	No significant relationship				
2. work separately, but in a place with others	2. speaking to people or passing on messages	Speaking; signalling				
3. work closely with a few others as a team	3. persuading people	Persuading				
4. sell to other people	4. supervising or instructing people	Supervising, instructing	Selling to people	Direct or indirect contact with people		
5. help, advise or be in charge of other people	5. negotiating with, or advising people	Monitoring, negotiating	Teaching Helping; advising	Method of making contact Amount of companionship		
Item 28 How much Leadership of Others	**Leadership of others at Work**					
In this job I should	This occupation involves					
1. work alone	1. working alone		Working alone for a long time	Degree of control of others		
2. be supervised by employers or foreman	2. being supervised by employers, foreman or senior staff	Serving, Interpretation of feelings + ideas from personal viewpoint, Responsibility for direction, control and planning	Serving	Amount of supervision		
3. work in a team of equals with little supervision	3. working in a team of equals with little supervision		Working in a team	Team or individual process		
4. be in charge of, and work with, a small team	4. being in charge of, and working with, a small team		Influencing others effectively + easily	Co-operative team-work	Responsibility for employee contacts	Hierarchical interaction: person to person
5. be in charge of a group of people without close supervision			Controlling	Size of group / responsibility		Supervisory activities
				Rewards: range variation		

Level 1	Level 2	DOT	CODOT	NIIP	CCC	McCormick et al
Item 29 Membership of Unions In this job	**Membership of Unions or Professional Bodies** In this occupation					
1. there is no union	1. there is no union or professional body					
2. I could join a union when I started work if I wanted to	2. I could join a union or professional body					
3. I should be encouraged to join a union when I started work	3. I should be required to join a union or professional body					
4. I should be encouraged to join a union, have some say in its policy for young workers and be entitled to some benefits.	4. final examination qualifications would automatically give me membership of a professional body			Employee representation Personal welfare facilities		
5. I should be required to join a union when I started work	5. final examination qualifications + a stated period of approved experience would give me membership of a professional body					
Item 30 How Other People see the Job Other people think this job is	**How others see the Occupation (Prestige)** Other people see this occupation as					
1. unattractive and not very useful	1. unattractive and not very useful work					
2. unattractive but useful	2. unattractive but useful work			Prestige		
3. attractive and useful	3. attractive and useful work					
4. very attractive and useful	4. very attractive and useful work					
5. very attractive but not very useful	5. very attractive but not very useful work					
Item 31 How much work is done with Others (Sociability) In this job I should	In this occupation					
1. work alone for long periods	1. I should not need to work closely with other people					
2. work with other people occasionally	2. getting on with people would only be an incidental part of the work					
3. have to be able to get on with other people	3. getting on with people would be a significant part of the work			Type of contact: responsibility. Getting on well with others		Responsible personal contact
4. meet and talk to other people frequently	4. getting on with people would be an essential part of the work					
5. be meeting and talking to other people all the time	5. working with and understanding people would be the most essential part of the work					
Item 32 Deciding for Myself in the Job In this job	**Deciding for Myself in the Occupation (Initiative)** In this occupation I should					
1. everything would be immediately checked	1. be expected to follow instructions closely	response to non-independent action				
2. I should be told exactly what to do	2. be able to use my own ideas only occasionally					
3. I should have some say in how I did my work	3. have the opportunity to work out some of my own ideas					Decision making and communication. Decisions affecting people
4. I should be able to try my own ideas sometimes	4. be expected to plan my own work and use initiative					
5. I should be expected to try out my own ideas	5. have freedom to decide and to act within broad limits			Resourceful. Depending on himself rather than others		
Item 33 Being Relied on In this job	**Reliability** In this occupation I should be responsible for					
1. I should have no responsibility	1. little things					
2. I should have little responsibility	2. some equipment or a little money			Responsibility	Responsibility for money, materials, tools, property. employee contacts, public contacts, work of others	Responsible personal contact Supervising activities
3. the supervisors would place a lot of trust in me	3. valuable materials or money					
4. I should be in charge of a small part of the firm	4. people rather than materials or money					
5. the firm would depend very heavily on my work	5. a vital part of a process or organisation					

Level 1	Level 2	DOT	CODOT	NIIP	CCC	McCormick et al
Item 34 Separation from Home						
In this job I should live	This occupation involves					
1. at home all the time	1. living at home all the time					
2. away from home for short periods	2. living away from home for short periods					
3. away from home for long periods	3. living away from home for long periods					
4. away from home permanently	4. living away from home permanently					
5. where the job is offered	5. being prepared to live wherever a post is offered					
		COGNITIVE REQUIREMENTS				
Item 35 Words and Writing	(Language)					
In this job I should have to	This occupation involves					
1. understand simple written instructions	1. checking or copying simple material		Understand simple verbal information Understand + note simple information Compose letters Interpret complex verbal information Complex information + ideas	Verbal expression, written or oral	Fluency of speech Preparation of reports	Informative discussions Communication of data Persuasive communications Public contact activities
2. write a few words or short sentences	2. understanding simple verbal instructions					
3. copy or type or pass on messages	3. composing straightforward letters or reports					
4. write reports, compose letters or express difficult ideas in words	4. reading and interpreting complicated verbal information					
5. do no reading or writing	5. compiling original written work expressing complicated verbal ideas					
Item 36 Clerical Work						
In this job I should have to	This occupation involves					
1. check and copy	1. no significant written work		Clerical perception: detail in verbal or tabular material, computation, checking			Clerical activities
2. sort and file papers	2. occasional administrative or organisational matters					
3. type letters or reports from dictation	3. filing, cataloguing or organising written material					
4. compose letters and make arrangements	4. reading, responding to and acting upon correspondence + communication with others					
5. do no written work	5. organisation, planning + writing reports					
Item 37 Numbers	(Mathematics)					
In this job I should	This occupation involves					
1. measure or work with money occasionally	1. no real use of numbers		Number recognition, simple counting Simple addition, subtraction multiplication, Simple arithmetic fractions, decimals, Arithmetic, geometry, trigonometry algebra Advanced mathematics, statistics	Dealing with figures	Mathematics used	
2. measure or work with money sometimes	2. simple mathematical work, subsidiary to the main purpose					
3. often do work with lengths, weights, volumes, time or money	3. frequent, but relatively straightforward work with numbers					
4. work with numbers all the time	4. mathematics of a high standard and varied operations					
5. use no numbers	5. original + complex work with mathematical functions					
Item 38 Thinking	Thinking or Reasoning					
The work in this job requires	This occupation involves					
1. very little thinking	1. applying commonsense to carrying out simple instructions	Data level: Copy	Apply commonsense to carry out simple instructions	General intelligence level	Intelligence	Mental v. physical activities Intellectual v. physical activities
2. more doing than thinking	2. considerable action together with deliberate thought	Compute, compile	Apply commonsense to carry out detailed but uncomplicated instructions			
3. doing + thinking about equally	3. careful thought but at least an equal amount of action	Analyse	Apply principles of rational systems to practical problems			
4. more thinking than doing	4. frequent solving of problems, mentally rather than practically	Co-ordinate	Apply logical + scientific thinking to abstract + concrete variables			
5. a lot of thinking	5. continual, sometimes original, thinking rather than doing	Synthesise	Apply logical + scientific thinking to intellectual non-verbal + practical problems			

Level 1	Level 2	DOT	CODOT	NIIP	CCC	McCormick et al
Item 39 Craft, Painting, Drawing and Music						
In this job I should do work with	This occupation involves					
1. wood, pottery, metal or stone	1. an understanding of space and shape in wood, metal, pottery, stone or other materials	Perceive pertinent detail in objects or pictorial material. Visual comparison and discrimination			Read blue-prints	
2. paint	2. an appreciation of colours + designs			Painting		
3. accurate drawing	3. accurate drawing ability		h	Drawing		
4. rhythm + musical notes	4. an appreciation of rhythm + musical notes			Playing an instrument		
5. none of these things	5. none of these abilities					
Item 40 Accuracy						
In this job accuracy is	In this occupation accuracy is					
1. never necessary	1. not necessary	Response to precision			Precision required	
2. sometimes necessary	2. necessary in some of the work					
3. often necessary	3. necessary in most of the work					
4. always necessary	4. necessary in all of the work					
5. always necessary to a very high degree	5. always necessary to a high degree					

TRAINING AND PROSPECTS

Item 41 Examination Qualifications						
To enter this job I should need	People entering this occupation are required to have					
1. to try no examinations	1. no fixed examination qualifications		Vocational Knowledge	Specialised training		
2. no C.S.E. grades or G.C.E. passes	2. at least 5 C.S.E. grade 1 or 5 G.C.E. 'O' level passes					
3. some C.S.E. grades	3. at least 1 G.C.E. 'A' level pass					
4. less than 5 C.S.E. grade 1 or G.C.E. 'O' level passes	4. at least 2, preferably 3 G.C.E. 'A' level passes					
5. at least 5 C.S.E. grade 1 or G.C.E. 'O' level passes	5. a College Certificate or University Degree/Diploma					
Item 42 Place of Training						
In this job I should receive	In this occupation					
1. no training	1. there is no essential training					
2. training whilst the job is being done	2. all training takes place whilst the work is being done					
3. training in a special place in the firm	3. partly in the firm, partly at College or by correspondence course					
4. training partly in the firm + partly at college	4. all training is done at College or University					
5. all the training at college	5. most of the training is done after a College or University course					
Item 43 Future Prospects						
If I enter this job I	In this occupation					
1. might be out of work later on	1. there is no chance of promotion					
2. have no chance of improving myself	2. there is little chance of promotion					
3. have a chance of improving myself, perhaps by going to another firm	3. the chances of promotion are good after suitable experience					
4. have a chance of improving myself, if I have more experience and/or further training	4. the chances of promotion are good after varied experience + suitable training					
5. have a chance of improving myself, if I move from my home area	5. the chances of early promotion are very good.					

FOOTNOTE: The abbreviated form of these items is shown here using a common stem as in the revised version. (See Appendix 5 p. 465)
This is necessary for convenience in display.
References are shown fully in Appendix 3 (p. 439)