THE IN BASKET TEST AS

PRACTICAL PSYCHOLOGY

A thesis presented in partial fulfilment
of the requirements for the degree of
Doctor of Philosophy
in Psychology at Massey University

MICHAEL CHARLES SMITH

1982
Acknowledgements

I would like to thank Professor G. A. Shouksmith for his critical comments and support as my supervisor during the period this work was conducted.
ABSTRACT

The aim of this thesis is to demonstrate the value of the in basket test as practical psychology. Practical psychology is defined as applied psychology that is used by practitioners. In the case of personnel selection the practitioners are those who select people for work; this includes a large number and a wide variety of people.

For the in basket test to be regarded as practical psychology it was hypothesised that a single variable method of overall assessment of performance on the in basket test should be as good as a multivariate method; the in basket test should be reliable; the single variable approach should be a valid method of assessing performance on the test; and the validity of the in basket test should be demonstrated in an industrial setting. Four studies were conducted to test these hypotheses; a reliability study, a factor analytic study, an assessment of the validity of the in basket test using discriminant analysis, and a study of the test in a meat freezing works.

It was concluded that the single variable method of overall assessment of performance on the in basket test was as good as the multivariate method. It was argued that there were inherent difficulties in establishing the reliability of the in basket test, but inter scorer reliability was demonstrated. It was shown that the single variable of overall assessment on the in basket test was valid. The study conducted in a meat freezing works showed that the in basket could be used validly in an industrial setting.

As a result of the research and a review of other personnel selection
methods and their relationship to practical psychology, it was concluded that work sample tests need to be promoted more by psychologists as useful selection methods in industry.
Table of Contents

INTRODUCTION..........................................................1
  1.1 An Overview.....................................................1

PSYCHOLOGY, APPLIED PSYCHOLOGY AND PRACTICAL PSYCHOLOGY.......5
  2.1 Defining Psychology.............................................5
  2.2 Examples of Applied Psychology as opposed to Practical Psychology...9
  2.3 Examples of Practical Psychology..............................10
  2.4 Programmed Instruction and Practical Psychology..............16

INTERVIEWS, REFERENCES, AND APPLICATION FORMS.......................19
  3.1 Selecting People for Work.....................................19
  3.2 Reviews of the Validity and Reliability of the Interview.........20
  3.3 Criticisms of Kelly and Fiske's Work..........................25
  3.4 Reactivity and the Interview..................................26
  3.5 Current Trends in Research on the Interview....................28
  3.6 Clinical versus Statistical Decision Making...................29
  3.7 The Ignorance of Interviewers.................................33
  3.8 Some Reasons for the Popularity of the Interview................35
  3.9 References and Testimonials...................................38
  3.10 The difference between References and Testimonials...........39
  3.11 The Validity and Reliability of References and Testimonials....40
  3.12 The Different Uses of Application Forms........................45
3.13 The Actuarial Weighting of the Application Form..............46

TESTS AND ASSESSMENT CENTRES........................................55

4.1 Forms of Test used in Industry........................................55
4.2 Intelligence Tests....................................................57
4.3 Personality Tests....................................................59
4.4 Projective Tests and Selection......................................63
4.5 Mechanical Reasoning Tests........................................65
4.6 Apparatus Tests.....................................................66
4.7 Assessment Centres...................................................67
4.8 Validity and Reliability of Assessment Centres..................68

WORK SAMPLE TESTS..................................................71

5.1 Work Sample Tests and Selection....................................71
5.2 Clerical Tests..........................................................75
5.3 Work Sample Tests and Intellectual Skills.........................76
5.4 In Basket Tests..........................................................77
5.5 Work Sample and Other Test Design................................78
5.6 The Derivation of the Work Sample..................................80
5.7 An Optimal Approach for the Practitioner.........................82
5.8 Gaps in our Knowledge of Work samples...........................86

THE UNIQUE NATURE OF PERSONNEL DECISIONS.....................90

6.1 Validity and Classic Psychometric Theory.........................90
6.2 Validity and Personnel Decisions....................................91
6.3 Methods of Optimising Cut Off Scores...............................94
THE RELIABILITY OF THE IN BASKET TEST ........................................... 140
  9.1 Introduction to Reliability Measurement .................................. 140
  9.2 Test retest Reliability ....................................................... 141
  9.3 Alternate Form Reliability .................................................. 143
  9.4 The Meaningfulness of Split-half Reliability Coefficients .......... 143
  9.5 Inter Scorer Reliability ..................................................... 145
  9.6 Discussion ........................................................................ 149

FACTOR ANALYSIS AND THE IN BASKET TEST ........................................ 150
  10.1 The Aims of the Factor Analyses ........................................ 150
  10.2 Previous Factor Analyses of In Basket Test Scoring Categories ... 150
  10.3 Factor Analysis of the Plasto In Basket Test ......................... 159
  10.4 The Methodology of the Factor Analytic Study ....................... 161
  10.5 The Factors extracted using Principal Axes with Varimax Rotation 171
  10.6 Results of the Preliminary Factor Analysis ............................ 172
  10.7 Plotting Characteristic Roots or Eigenvalues ....................... 177
  10.8 An Alternative Analysis of the In Basket Scores ................... 178
  10.9 Principal Axis and Image Factor Analysis .............................. 181
  10.10 The Results of the Image Analysis ...................................... 183
  10.11 A Comparison of the Analysis with Earlier Studies ............... 187
  10.12 An Explanation for the Factor Analysis Results ................... 191
  10.13 Summary ........................................................................ 194

PREDICTING PERFORMANCE USING THE IN BASKET TEST ....................... 195
  11.1 Introduction to the Validity Studies ..................................... 195
  11.2 The Basis of Discriminant Analysis ..................................... 196
11.3 The Stepwise Selection Process and the Stepwise Criteria........198
11.4 The Discriminant Functions Calculated on the Variable Success....199
11.5 The Discriminant Analysis using the Variable 'Ontime'..........202
11.6 The Classification Analysis......................................204
11.7 Summary of Proposed Discriminant Analyses......................205
11.8 Analysis 1 - Multivariate Analysis of the 1977 Extramural Sample.205
11.9 Analysis 2 - Multivariate Analysis of the 1978 Extramural Sample.208
11.10 Analysis 3 - Multivariate Analysis of the 1978 Internal Sample..210
11.11 Analyses 4, 5 and 6: Univariate Discriminant Analyses........212
11.12 Analysis 7 - Single Variable Analysis of the Total Sample.....215
11.13 Analysis 8 - Multivariate Analysis on 'Ontime'...............217
11.14 Discussion of Analyses related to Hypotheses 1 and 2.........218
11.15 Summary of the Results of the Discriminant Analyses..........220

THE FREEZING WORKS STUDY...........................................223
12.1 Introduction to the Study........................................223
12.2 The In Basket Design Process....................................224
12.3 The Instructions for the Design of the Practitioner's In Basket..224
12.4 The Industry in which the Practical Study took Place............227
12.5 The Dollrier Freezing Works In Basket............................227
12.6 The Validity of the Dollrier In Basket Test......................228
12.7 The Analysis of the Dollrier In Baskets..........................229
12.8 Summary........................................................................231

SUMMARY AND CONCLUSIONS............................................232
13.1 Summary of Research Findings......................................232
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.2 Conclusions and Future Progress</td>
<td>234</td>
</tr>
<tr>
<td><strong>BIBLIOGRAPHY</strong></td>
<td>240</td>
</tr>
<tr>
<td><strong>APPENDIX 1</strong> PLASTO FACT SHEET</td>
<td>262</td>
</tr>
<tr>
<td><strong>APPENDIX 2</strong> PLASTO JOB DESCRIPTION</td>
<td>264</td>
</tr>
<tr>
<td><strong>APPENDIX 3</strong> PLASTO ORGANISATIONAL CHART</td>
<td>265</td>
</tr>
<tr>
<td><strong>APPENDIX 4</strong> PLASTO 'ITEMS'</td>
<td>266</td>
</tr>
<tr>
<td><strong>APPENDIX 5</strong> SCORING SHEETS FOR STYLE CATEGORIES</td>
<td>296</td>
</tr>
<tr>
<td><strong>APPENDIX 6</strong> EXTRACT FROM CARLTON AND BRAULT'S SCORING MANUAL</td>
<td>300</td>
</tr>
<tr>
<td><strong>APPENDIX 7</strong> CONTENT SCORING CATEGORIES</td>
<td>313</td>
</tr>
<tr>
<td><strong>APPENDIX 8</strong> OVERALL ASSESSMENT RATING SCALE</td>
<td>325</td>
</tr>
<tr>
<td><strong>APPENDIX 9</strong> RELIABILITY STUDY MEANS AND STANDARD DEVIATIONS</td>
<td>326</td>
</tr>
<tr>
<td><strong>APPENDIX 10</strong> DESCRIPTIVE DATA AND CORRELATIONS OF VARIABLES IN MAIN</td>
<td>329</td>
</tr>
<tr>
<td>ANALYSIS</td>
<td></td>
</tr>
<tr>
<td><strong>APPENDIX 11</strong> COMMUNALITY AND EIGENVALUES FOR SPLIT SAMPLE FACTOR</td>
<td>342</td>
</tr>
<tr>
<td>ANALYSES</td>
<td></td>
</tr>
<tr>
<td><strong>APPENDIX 12</strong> IMAGE FACTOR ANALYSIS MATRICES</td>
<td>344</td>
</tr>
<tr>
<td><strong>APPENDIX 13</strong> THE DOLLRIER IN BASKET TEST</td>
<td>356</td>
</tr>
</tbody>
</table>
List of Tables

3.1 Reliability coefficients obtained for the interview (from Ulrich and Trumbo 1965) ...........................................22
3.2 Correlations between interview predictions and actual performance (Kelly and Fiske 1951) ................................24
3.3 Median validity coefficients between predictors and criteria (after Kelly and Fiske 1951) .................................24
3.4 Summary table of reviews using "Box Scores" of clinical versus statistical combination of data ..............................32
3.5 A checklist of questions to decide on the merits of including particular items in application forms (Ahern 1949) ..........48
3.6 Results of a cross validity study using an application form to predict labour turnover ......................................50
4.1 Validity coefficients for five different sorts of work and some psychological tests (adapted from Ghiselli 1973) ..........58
5.1 Correlations between In Basket category scores and Performance Ratings for Unit Managers in the validation sample ..........87
7.1 Names and sample sizes of the groups used in the research ......111
7.2 A cross-tabulation of the age and sex of the total sample ..........111
7.3 A cross-tabulation of the age and sex of the 1977 Extramural student sample .....................................................113
7.4 A cross-tabulation of the age and sex of the 1978 Internal student sample .....................................................113
7.5 A cross-tabulation of the age and sex of the 1978 Extramural student sample .....................................................114
8.1 The scoring categories used to assess the style scores on the in basket test .....................................................135
9.1 The scoring categories used to assess the style and content scores on the in basket test and their reliabilities......147

10.1 A summary of major criticisms of the way factor analysis is practised (after Gorsuch 1974).................................152

10.2 A comparison of loadings on two factors on an In Basket test (after Frederiksen 1962).................................156

10.3 Scoring categories with reliability coefficients .7 and over accepted as variables for further analysis......................162

10.4 Means standard deviations and number of cases in sample A.......164

10.5 Means standard deviations and number of cases in sample B.......165

10.6 Full varimax rotated factor matrix for group A......................168

10.7 Full varimax rotated factor matrix for group B......................169

10.8 Full varimax rotated factor matrix for the whole sample...........170

10.9 Comparison of principal axes factor analyses......................173

10.10 Communality and eigenvalues of variables in the whole sample factor analysis........................................176

10.11 Communality estimates for the principal axis analysis...........180

10.12 Full varimax rotated factor matrix for the whole sample........184 & 185

10.13 Loadings above .3 on four main factors from the principal axis and image factor analysis.................................186

10.14 A comparison of loadings with previous factor analyses of the in basket test........................................189

11.1 Summary of Discriminant Analyses planned to test hypotheses one and two.....................................................206

11.2 Results of the multivariate discriminant analysis on the 1977 Extramural student sample........................................207

11.3 Results of the multivariate discriminant analysis on the 1978 Extramural student sample........................................209
11.4 Results of the multivariate analysis on the 1978 Internal student sample..........................................................211
11.5 Results of the univariate discriminant analysis on the 1977 student sample..........................................................214
11.6 Results of the univariate discriminant analysis on the 1978 student sample..........................................................214
11.7 Results of the univariate discriminant analysis on the 1978 Internal student sample......................................................216
11.8 Results of the univariate discriminant analysis on the whole student sample..........................................................216
11.9 Results of the discriminant analysis using the criterion 'On time'.................................................................219
12.1 Overall assessments and group criterion affiliations obtained through a modified form of synthetic validity.............229
List of Figures

2.1 A psychological continuum.................................................................9
2.2 The apparatus used by Jenkins (1947) to select knobs for shape
coding of controls..................................................................................12
2.3 Four cooker control panels tested in a study by Chapanis and
Lindenbaum (1959)..................................................................................13
3.1 Basic design for comparison of clinical and statistical
prediction Wiggins (1973).......................................................................30
5.1 Proportions of validity coefficients with job proficiency
criteria for eight types of predictors (from Asher and Sciarrino
1974)..........................................................................................................73
6.1 A hypothetical relationship between two variables, a predictor
and a criterion, showing the effects of the movement of the cut
off score on the predictor.......................................................................93
6.2 The relationship between validity, the selection ratio,
variability in job proficiency, and percent improvement in
proficiency (after Ghiselli and Brown 1955)..........................................96
6.3 Potential relationships between the ultimate and actual
criterion....................................................................................................98
6.4 Potential relationships between the ultimate and actual
criterion....................................................................................................98
6.5 Potential relationships between the ultimate and actual
criterion....................................................................................................98
8.1 Relationships among job analysis, job evaluation, job
description, criterion development and performance appraisal
(Landy and Trumbo 1980)..................................................................127
10.1 An algorithm for decision making when using factor analysis..160
10.2 Plot of the characteristic roots obtained for the principal axis analysis of the Plasto in basket test..................179