

A city skyline is silhouetted against a sunset sky. The sun is low on the horizon, creating a warm orange and yellow glow. A few red laser lines are visible in the sky. The buildings are dark, with some lights starting to appear.

FIFTH EDITION

**SAMPLE
CHAPTER**

**BUSINESS
PSYCHOLOGY and
ORGANIZATIONAL
BEHAVIOUR**

EUGENE McKENNA

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C O N T E N T S

Acknowledgements	vii	12. Leadership and Management Style	387
Preface	ix	13. Power, Politics, and Conflict	435
PART I PERSPECTIVES AND ENQUIRY	I	PART IV THE ORGANIZATION	000
1. Historical Influences and Research Methodology	3	14. Organizational Structure and Design	000
PART II THE INDIVIDUAL	29	15. Organizational Culture	000
2. Personality	31	16. Organizational Change and Development	000
3. Intelligence and Psychological Testing	65	17. Stress	000
4. Motivation and Job Design	91	PART V OCCUPATIONAL PSYCHOLOGY/HR PRACTICES	000
5. Perception	137	18. Selection and Appraisal	000
6. Communication	175	19. Rewards and Training	000
7. Learning and Memory	195	Glossary	000
8. Individual Decision Making and Creativity	233	References	000
9. Attitudes, Values, Job Satisfaction, and Commitment	267	Author index	000
PART III THE GROUP	315	Subject index	000
10. Groups	317		
11. Teambuilding	361		

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P R E F A C E

T A major objective was to produce an introductory text that would introduce the basic concepts and principles clearly with the emphasis on relevance and applications, but at the same time would not over-popularize the subject. Therefore, every effort was made to write the book in a style likely to engage the interest of the student, drawing on numerous real-life examples and research studies relevant to the world of business. The book takes the reader through individual, group, and organizational/human resource perspectives, while at the same time offering an appreciation of their historical development and methodological issues. The text requires no previous study of psychology or the behavioural sciences. Despite its suitability for use on degree, diploma, professional, and short courses, it can profitably be used by reflective practitioners.

Learning outcomes, chapter summaries, review questions, pointers to additional reading, a comprehensive bibliography, and a glossary are features of the text. Although each chapter is self-contained, the reader will find within individual chapters numerous cross-references. For lecturers who adopt the book, there are online teaching resources, including a companion website, chapter-by-chapter PowerPoint lectures, a multiple-choice test bank, and a set of sample discussions based on selected themes in each chapter.

Particular illustrations of practice and relevant research evidence are contained in numerous “panelled or boxed items” dispersed

throughout the book; some of these could be used as mini-cases or vignettes. When important terms are introduced in the text, they are highlighted to indicate their inclusion in the Glossary section at the end of the book.

In this new edition the presentation style and structuring has improved and the text has been revised and updated with expanded and new material, including the following: affective events theory, cognitive evaluation theory and control theory in motivation; attribution theory in perception; story telling and social media in communication; investor psychology in decision making; employee engagement and positive psychology in attitudes and job satisfaction; corporate memories in culture; life cycle of growing organizations in change and development; technostress and environmental influences in stress; narcissism and hypomania in leadership; emergent trends in selection; and recent debate in occupational psychology.

There has also been a substantial rationalization of the text with a significant rearrangement of material within and between chapters, including the removal of a lot of material on consumer behaviour, human factors in safety, and behavioural aspects of accounting, which were considered inessential, given the evolution of the book.

Finally, I hope I have realized my objective in writing this new edition, and hope the reader finds reading it a pleasant and rewarding experience.

Eugene McKenna



CONTENTS

- 65** **Learning outcomes**
- 66** **Introduction**
- 66** **Models of intelligence** ~ Factorial approach · Information-processing models
- 72** **Mediating influences: Heredity, age, gender**
- 74** **Psychological testing** ~ Intelligence tests · Achievement and aptitude tests ·
Personality tests · Issues in Psychometrics
- 87** **Chapter summary**
- 87** **Questions**
- 88** **Further reading**

CHAPTER

3


INTELLIGENCE AND PSYCHOLOGICAL TESTING

LEARNING OUTCOMES

After studying this chapter you should be able to:

- Understand the meaning of intelligence.
- Recognize the different approaches to the construction of models of intelligence.
- Appreciate the significance of emotional intelligence.
- Analyse the ways in which intelligence is measured.
- Identify the influences likely to affect intelligence.
- Draw a distinction between intelligence tests and ability tests.
- Understand the significance of personality tests and issues with respect to their use.

INTRODUCTION

 One might well ask whether there is a relationship between intelligence and personality (examined in the previous chapter). According to Phares and Chaplin (1998) intelligence in some ways epitomizes the trait approach to personality. Although there is no generally accepted view of intelligence, their definition seems appropriate: intelligence is an ability to adapt to a variety of situations both old and new; an ability to learn, or the capacity for education broadly conceived; and an ability to employ abstract concepts and to use a wide range of symbols and concepts. With respect to our ability to adapt to a variety of situations mentioned above, an implication is that we should take note of cultural influences. What is needed in one environment may be quite different from what is required in another environment (Eysenck, 2009).

A link has been established between high intelligence and individual work performance, particularly when the task involved is relatively complex (Gottfredson, 1997), and between high intelligence and good health and longevity, due to the person's capability for being better able to detect body symptoms and understand health issues (Gottfredson & Deary, 2004).

Therefore, it is not surprising to find an endorsement of the concept of intelligence and a growing tendency to put employees through intelligence and related tests. In the light of these trends it seems appropriate to explain the nature of intelligence, to identify factors that influence intelligence, to describe the measurement of intelligence using IQ and EQ tests, and to introduce complementary activities such as aptitude and achievement tests used in the employment setting. Also, in the spirit of psychometrics, personality tests are examined alongside the other tests. This chapter covers:

- models of intelligence;
- mediating influences (such as heredity, age, gender);

- psychological testing (intelligence tests, aptitude and achievement tests, and personality tests); and
- issues in psychometrics.

MODELS OF INTELLIGENCE

The importance of intelligence is reflected in the controversy over its measurement. In particular, in the USA there have been repeated attacks on the use of intelligence tests. In this section we will examine the more traditional models consisting of “g” and “s” factors, primary abilities, the structure of the intellect, and the more recent information-processing models (including emotional intelligence).

Factorial approach

Spearman (1904) proposed that people possess a general factor – called *g* – in different quantities, and a person could be described as generally intelligent or stupid. According to Spearman, the *g* factor contributes significantly to performance on intelligence tests. He also mentioned other factors – called *s* factors – and these are specifically related to particular abilities. For example, an arithmetical test would be aimed at a specific *s* factor. Overall, the tested intelligence of the individual would reflect the *g* plus the various *s* factors. It is interesting to note that when the *g* factor was compared with the *s* factor, *g* was a better predictor of job performance than *s* (Ree, Earles, & Teachout, 1994). A diagrammatical representation of Spearman's model of intelligence appears in Figure 3.1.

Subsequently, Thurstone took exception to the emphasis placed on general intelligence (Thurstone, 1938). He felt that intelligence could be segmented into a number of primary abilities. The seven primary abilities revealed by intelligence tests are listed in Table 3.1. Both Spearman and Thurstone used a statistical technique (factor analysis) to provide a better

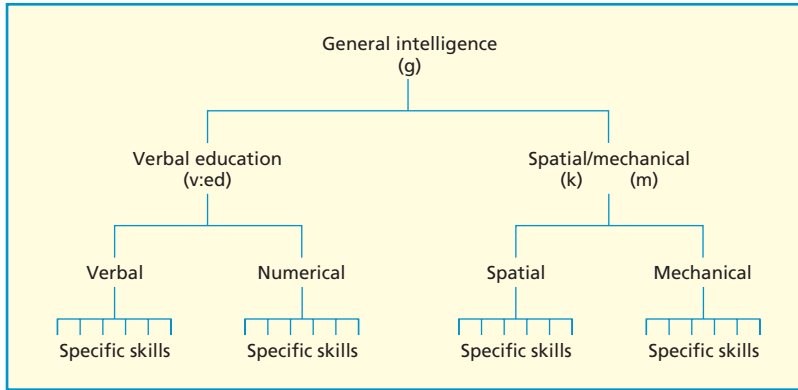


Figure 3.1 Spearman's hierarchical model of intelligence.

TABLE 3.1 Thurstone's primary mental abilities (Thurstone & Thurstone, 1963)

Ability	Description
Verbal comprehension	The ability to understand the meaning of words; vocabulary tests represent this factor.
Word fluency	The ability to think of words rapidly, as in solving anagrams or thinking of words that rhyme.
Number	The ability to work with numbers and perform computations.
Space	The ability to visualize space–form relationships, as in recognizing the same figure presented in different orientations.
Memory	The ability to recall verbal stimuli, such as word pairs or sentences.
Perceptual speed	The ability to grasp visual details quickly and to see similarities and differences between pictured objects.
Reasoning	The ability to find a general rule on the basis of presented instances, as in determining how a number series is constructed after being presented with only a portion of that series.

picture of the types of abilities that determine performance on intelligence tests, and Guilford (1967) proposed a model of intelligence, called the structure of the intellect model. It categorises intelligence on three dimensions:

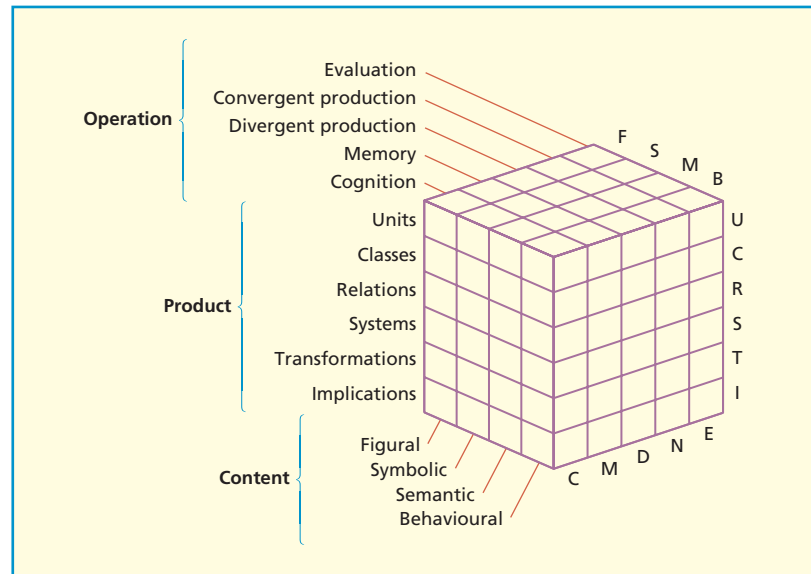
- operations (what the person does);
- contents (the information on which the operations are performed);
- products (the form in which information is processed).

This model of intelligence is shown in Figure 3.2. In the cube, each cell represents a separate ability – 120 in all ($5 \times 4 \times 6 = 120$). A drawback of the Guilford model is that it seems to be a taxonomy or classification rather than an explanation of intellectual activity (Phares & Chaplin, 1997).

Information-processing models

Until the 1960s, research on intelligence was dominated by the factorial approach used by

Figure 3.2 Guilford's (1967) model of the structure of the intellect. Reproduced by permission of The McGraw-Hill Companies.



researchers such as Thurstone and Guilford, mentioned earlier. Subsequently, a new approach emerged influenced by the development of cognitive psychology, with its emphasis on information-processing models. The basic proposition in this approach is the attempt to understand intelligence in terms of the cognitive processes that operate when individuals engage in intellectual activities, such as problem solving (Hunt, 1985). In specific terms, the information-processing approach poses a number of questions, such as:

- What mental processes come into play in the various ways intelligence is tested?
- How quickly and accurately are these mental processes operationalized?
- What types of mental representations of information do the mental processes draw on?

Here the emphasis is on attempts to identify the mental processes that underlie intelligent behaviour (Nolen-Hoeksema, 2009). The information-processing approach is reflected in Sternberg's (1985) work, where he proposed a triarchic theory of intelligence involving the individual functioning intellectually in three ways:

- *Componential*. This refers to analytical thinking – recognizing, defining, and representing problems – and is associated with success in taking tests. Analytical abilities are applied to relatively familiar problems that are largely academic.
- *Experiential*. This refers to creative thinking, and characterizes the person who can dissect experience into various elements and then combine them in an insightful way. Sternberg (2000) provides an illustration of the importance of the experiential approach, as follows:

Student A was brilliant academically, and did well on psychometric tests that emphasize memory and analytical skills. She commenced her studies in psychology as one of the top students, but ended the course as one of the bottom students. Why? Though A was brilliant academically, she displayed only minimal creative skills on a course that demanded such skills. (Creative abilities are used to tackle relatively novel problems.) In this case it was not that A was born creatively backward. Rather it seemed more likely that A had previously been over-reinforced or rewarded for her analytical skills to such an extent that

there was no incentive to develop or discover whatever creative skills may have been latent in her.

- *Contextual.* This emphasis specifies the real-world contextual functions of intelligence, and those possessing this attribute are likely to be “streetwise”, reflected in the behaviour of people who can “play the game” and manipulate the environment. One would expect this person to adapt to existing environments as well as to shape them into new and hopefully better ones. When adapting and shaping fails, they are capable of selecting different environments.

Sternberg’s research shows that analytical (componential), creative (experiential), and practical (contextual) abilities are largely independent: “When students’ abilities and achievements are assessed for not only memory and analytical skills but also for creative and practical abilities, the students formerly considered as not very bright can succeed in school at higher levels” (Sternberg, Grigorenko, Ferrar, & Clinken-Beard, 1999). In the final analysis what matters is not just knowledge, or the intellectual skills one applies to this knowledge, but how the knowledge is used.

Sternberg is of the view that the performance of the individual is governed by these three aspects of intelligence. He takes a broader view of intelligence than the more traditional approaches and his view encapsulates the following (Nolen-Hoeksema, 2009):

- (1) Ability to learn and profit from experience.
- (2) Ability to think or reason abstractly.
- (3) Ability to adapt to the vagaries of a changing and uncertain world.
- (4) Ability to motivate oneself to complete speedily the tasks one is expected to accomplish.

As to vocational relevance, a group of researchers took Sternberg’s **triarchic theory of intelligence** as a framework for use and then split the three intelligences discussed above into further subdivisions in the selection of

managers, as follows (Harvey, Novicevic, & Kiessling, 2002):

Analytical	Practical	Creative
• cognitive	• political	• innovative
• emotional	• socio-cultural	• intuitive
	• organizational	

Another broad view of intelligence is put forward by Gardner (1999). He maintains that there is no such thing as singular intelligence. Rather there are six distinct types of intelligence independent of each other, each operating as a separate system in the brain according to its own rules. The six intelligences are:

- (1) Linguistic
- (2) Logical–mathematical
- (3) Spatial
- (4) Musical
- (5) Bodily–kinaesthetic
- (6) Personal

The first three types are familiar and are normally measured by intelligence tests. The last three may appear unusual in the context of a discussion of intelligence, but Gardner feels that they should be treated similarly to the first three.

Musical intelligence, involving the ability to perceive pitch and rhythm, has been with us since the dawn of civilisation, and forms the basis for the development of musical competence. Bodily–kinaesthetic intelligence involves the control of one’s body motion, and the ability to manipulate and handle objects in a skilful way. For example, the dancer exercises precise control over movement of the body, and the skilled worker or neurosurgeon is able to manipulate objects in a dextrous way.

The last of the six intelligences – personal intelligence – can be divided into two parts: interpersonal and intrapersonal intelligence. The former is the ability to register and understand the needs and intentions of other people and to develop sensitivity to their moods and temperament in order to be able

to predict how they will behave in new situations. Intrapersonal intelligence, by contrast, is the ability to develop awareness of one's own feelings and emotions, to discriminate between them, and to use this information as a guide to personal actions. This is the foundation stone for emotional intelligence, discussed later.

It is recognized that some people will develop certain intelligences to a greater extent than others, but all normal people should develop each intelligence to some extent. The intelligences interact with each other, as well as building on one another, but they still operate as semi-autonomous systems. In Western society the first three types of intelligence (linguistic; logical–mathematical; spatial) are given prominence, and of course they are open to measurement by standard intelligence tests. But evidence indicates that the other intelligences (musical; bodily–kinaesthetic; personal) were highly valued at earlier periods of human history, and are valued currently in some non-Western societies (Nolen-Hoeksema, 2009). Even in Western cultures, children endowed with unusual non-traditional intelligences, such as bodily–kinaesthetic intelligence, can be groomed to become, for example, a first-rate footballer or a ballet dancer.

After an analysis of Gardner's multiple intelligences, it was concluded that "in spite of its popularity there is surprisingly little direct evidence to support it" (Eysenck, 2009), but then Eysenck goes on to acknowledge some interesting connections. For example, he says that Gardner (1993) related his concept of intelligence to individuals who displayed outstanding creativity, and established interesting links, as follows:

Logical/mathematical = Albert Einstein
Linguistic = T S Elliot
Intrapersonal = Sigmund Freud
Spatial = Pablo Picasso

Many highly creative people, such as the above, were brought up in families where

they experienced pressure to meet high standards of achievement; they displayed potential in childhood, and were single-minded in their ambition but neglected other aspects of their life, which created a negative impact on their families.

Emotional intelligence

Few constructs have captivated the attention of theorists, researchers, and practitioners with such intensity and suddenness as **emotional intelligence** (Petrides, Furnham, & Frederickson, 2004). In the past most intelligence tests were concerned with the individual's ability to think and reason effectively. But in the West in recent years there has been a fair amount of activity aimed at the assessment of the more social and interpersonal aspects of intelligence, which are often associated with non-Western cultures. A manifestation of this development is the creation of the concept of emotional intelligence (the ability to monitor one's own and others' emotions, to discriminate among these emotions, and to use the information acquired to guide one's thinking).

This concept (called EQ, or alternatively EI) was developed by Singer and Salovey (1994) and popularized by Goleman (1998). EQ derives its inspiration from the work of Gardner (1999) on multiple intelligence, which was discussed earlier, and has been eagerly embraced by some practitioners in business in recent times. Emotional intelligence is concerned with an individual's emotional and social skills and consists of the following four dimensions:

- (1) *Emotional attunement or self-awareness, and people skills.* The person is good at reading his or her own feelings, and has the capacity to empathize with others and take into account other people's feelings.
- (2) *Emotional management.* This is reflected in ensuring that the person's emotions (e.g., anger, sadness) do not overwhelm him or her, and that they are appropriate to the situation. It can be seen as an ability to cheer oneself up, or stop a temper

tantrum in mid-course by, for example, going out for a walk.

- (3) *Self-motivation*. This is connected with the extent to which individuals are good at delaying gratification. A conclusion from the research is that those capable of delaying gratification (i.e., waiting a while to take a reward rather than taking it immediately) were more socially competent and self-reliant than individuals who settled for immediate rewards. Those intent on obtaining immediate rewards had trouble subsequently postponing gratification, tended to be more argumentative, had low self-esteem, and coped badly with stress.
- (4) *Self-management skills*. This refers to handling situations without being subsumed or overwhelmed by them.

It is said that those with high EQ make personal connections with much ease and are good at defusing explosive situations. Goleman (1998) sees potential in applying EQ to organizational settings. He maintains that occupational competencies based on EQ play a greater part in first-rate performance than does intellect or technical skill. He suggests that emotional intelligence is crucial in the determination of the effectiveness of leaders; he argues that in challenging jobs associated with people with a high EQ, the possession of an extra dimension in the form of high EQ gives leaders a competitive edge. In the final analysis it seems sensible to acknowledge that superior performance is dependent upon both our emotional and our thinking sides.

Dearlove (1999) reported that companies have re-evaluated the leadership qualities they need and increasingly place emphasis on the emotional dimension. He quoted the views of the executive development manager at British Telecommunications, who stresses “the importance of understanding relationships. The company is seeking to develop interpersonal sensitivity and a mindset that is about collaboration and understanding what

others have to contribute and seeing partnerships as an opportunity to learn.” There is a reappraisal of the type of leadership qualities the company requires to meet its ambitions for global expansion through joint ventures and partnerships: “As boundaries get fuzzier and fuzzier, leadership becomes more and more vital. The emphasis is now on relationship management. The critical issue is interpersonal sensitivity. We are moving to a more holistic approach.” The issue of leadership qualities and skills is also considered in Chapter 12.

From research into derailed leaders – the rising stars who faded away (see Chapter 12) – at the Center for Creative Leadership in the USA, it was concluded that these executives failed most often because of an interpersonal flaw (e.g., poor working relations, authoritarian) rather than a lack of technical ability (Gibbs, 1995). The Center mounts seminars across the USA for managers who want to “get close” to their emotions, and these sessions are unlike the sensitivity training programmes of old (see Chapter 15).

Criticism

In recent years much criticism has been levelled at the emotional intelligence construct. Zeidner, Mathews, and Roberts (2004) conclude that business executives frequently view EQ as more like emotional competencies and as such is capable of being acquired and nurtured through the process of learning. Woodruffe (2000) does not seem to be overly impressed by EQ. He feels it is another name for competencies, and that the measures of emotional intelligence are not the best method available. This could be better achieved through assessment centre exercises (see Chapter 18) or by multi-rater feedback.

According to Petrides et al. (2004), the criticism levelled against the trait EQ is that it is indistinguishable from the major personality dimensions. This is a view shared by Eysenck (2009) when he states that “emotional intelligence as assessed by the Emotional Quotient Inventory mainly involves re-packaging well-established personality dimensions, and has

little significance to intelligence conventionally defined". In a similar vein Furnham (2008) views it as being much more of a social or personality variable than a cognitive variable connected with information processing. According to Conte (2005), the measures of EQ are diverse and researchers have not subjected them to as much rigorous study as they have with measures of personality and general intelligence. Finally, criticism by Locke (2005) is scathing. He says the concept of emotional intelligence is invalid because it is not a form of intelligence and because it is defined so broadly and inclusively that it has no intelligible meaning.

MEDIATING INFLUENCES: HEREDITY, AGE, GENDER

We realize that people differ in intellectual ability, and many would agree that some aspects of intelligence are inherited. However, opinions differ as to the relative contributions made by our genetic inheritance (heredity) and environment (i.e., what happens to the individual during the course of development).

The environmental conditions likely to determine how an individual's intellectual potential will develop include nutrition, health, quality of stimulation, emotional climate of the home, and appropriate rewards for accomplishments (Bayley, 1970). Inevitably, one feels forced to take a pragmatic position on this issue. For example, heredity and environment interact. Heredity sets the scene in terms of specifying the possible limits of achievements for any person in a given situation, but the environment determines how near to these limits of achievement any individual will move in any given situation (Plowin, 2001).

The debate over genetic factors in intelligence raises the possibility of inherited racial differences in intelligence – in particular the question of whether black people are innately less intelligent than white people. Black Americans as a group score 10–15 points

lower on standard intelligence tests than white Americans as a group. The controversy focuses not on the difference in IQ but on the interpretation of the difference. Some argue that the two groups differ in inherited ability (Jensen, 1977), whereas others maintain the black–white differences in average IQ can be put down to environmental differences between the two groups (Kamin, 1976).

But an opposing view to Kamin's originated from 50 experts. These experts "wrote to the *Wall Street Journal* reacting to a controversial book on intelligence, firmly stating that there are indeed racial differences in the scores. They maintained that intelligence is of great practical and social importance, and that genetics plays a bigger role than does environment in creating IQ differences among individuals" (Furnham, 2000). There is further comment on the nature versus nurture debate in Panel 3.1.

If intelligence was simply an innate quality, then IQ would not be expected to alter throughout the life of the person, apart from minor changes due to the measuring instrument used. However, there is strong evidence from a number of sources to suggest that IQ scores fluctuate over time (Anastasi, 1997; Howe, 1998). The environment can be powerful in shaping IQ. There has been a rapid increase in intelligence in many countries in the West in recent decades (Flynn, 1994, 2007). This is referred to as the "Flynn Effect". A possible explanation for this effect could be attributable to a number of causes.

In recent decades our brains are exercised and challenged in new ways and for many more hours. There is a trend towards ever greater complexity in the way we collectively think and use information and our thought patterns are different from those of our recent ancestors (Flintoff & Leake, 2009). For example, people have spent more time in education, there is greater exposure to information through the contemporary communication medium, the growth of middle class families, and the growth of jobs requiring more cognitive complexity. However, here has been a challenge

Panel 3.1 Nature versus nurture

In 1980 researchers in Dunedin, New Zealand gave 1000 3-year olds a series of psychological tests. Caspi, Harrington, Milne, Amell, Theodore, and Moffitt (2003) reassessed these individuals, now aged 26. By and large the children who behaved badly in the original tests were still experiencing problems as adults. For instance, the most irritable and emotionally unstable 3-year olds – classified as under-controlled – tended to be the least adjusted by the age of 26. They were tense, easily upset, antagonistic, and prone to antisocial behaviour. By contrast, the 3-year olds rated as “confident” or “well-adjusted” appeared to be doing well as young adults.

This dramatic discovery demonstrated how little the main personality traits had changed. From this one might conclude that crude genetic determinism (nature) may be highly influential. However, the emerging wisdom is that many bits of genetic material interact in complex ways with a diversified environment to influence intelligence and behaviour. Ridley (2003) maintains that nature and nurture always interact with each other, and that we need to think of our nature as emerging via nurture, rather than predetermined by a genetic blueprint. He cites evidence in support of genes as a dominant force – for example, identical twins separated at birth and brought up in different environments tend to show similar character traits – but equally children’s sensitivity to their environment (e.g., upbringing, school, extra-curricular pursuits) appears to vary depending on the precise genetic make-up.

In a keynote address to the recent BPS Division of Occupational Psychology 2011 Annual Conference, Prof Time Judge, University of Notre Dame, emphasized the dominant influence of genetic inheritance over environmental factors and concluded that we should accept people more for who they are and think a little less about changing them through interventions based on occupational psychology. Given the prominence of nature as an influential factor he feels that selection techniques should be developed to detect a better fit between the candidate and the organizational role.

(Judge, 2011; Prowse, 2003)

to the Flynn effect by Sundet, Barlaug, and Torjussen (2004). In a study of trends in intelligence among Norwegian conscripts over half a century, they concluded that there was no general increase in IQ since the mid-1990s.

A person’s performance on a test could also be influenced by temporary states: for example, the person is affected by illness, is demotivated for some reason, or is going through an emotional upheaval. In addition, intelligence tests tend to measure different things at different ages. For example, test items that require young children to stack blocks and identify parts of the body are quite different from items that are highly verbal, abstract, and mathematical, found in tests for older children and adults.

The impact of age on test performance is important (Botwinick, 1984). A decline in

performance over time can be attributable to a number of factors. There may be a general deterioration of health, or growing deficiencies of hearing and eyesight. Also, as people grow older they may become more cautious and fearful of making mistakes, and this may undermine their test performance. It is said that giving extra time to older people to do the test, or allowing them more time to familiarize themselves with the test procedures, will often lead to higher scores (Phares & Chaplin, 1997). In the final analysis, it would be wise to distinguish between those with a defective mental capacity because of an age-related infirmity and those who are not disadvantaged in that way.

The question of gender also ought to be raised. This was suggested by Furnham (2000) when he stated that:

despite most tests having been devised so as not to show “sex differences”, and the received wisdom for many decades being that differences are small, trivial, and not worthy of explanation or research, nevertheless studies relying on self-perception by lay subjects show consistent differences. Males think they are more intelligent than females, and that their male relatives are more intelligent than their female relatives. However, this believed superiority lies primarily in “spatial” and mathematical areas – only a part of fundamental intelligence. For some researchers this remains a shocking finding explained only by sociological processes; for others it represents a reasonable grasp of reality.

Finally, attempts have been made to devise culture-fair tests. These tests attempt to neutralize the effects of forces that distinguish one culture or subculture from another. In essence what is attempted is the removal of factors that reflect cultural background rather than innate ability. These could include language handicap (i.e., lack of total familiarity with the language of the test) or speed of reaction. In the latter case, not all cultures or subcultures subscribe to the view that faster means better. Although sound in theory, culture-fair testing has not worked very well (Phares & Chaplin, 1997). Tests are being reviewed closely, particularly in the USA, if it is felt that they are inappropriately used and act to the disadvantage of a particular racial or ethnic group.

PSYCHOLOGICAL TESTING

Psychological testing is often referred to as **psychometric testing**. The term psychometrics is now used to refer to a broad range of

different types of assessments and measurements of intelligence, achievement/aptitude, and personality.

Intelligence tests

Tests are available to measure general intellectual ability. These tests are called “intelligence tests”. The first tests resembling contemporary intelligence tests were devised by Binet in France, who had been asked by the French government to create a test that would detect children who were too slow intellectually to benefit from a regular school curriculum. Binet felt that intelligence should be measured by tasks that required reasoning and problem-solving abilities, rather than perceptual-motor skills. The test required the child to execute simple commands, to name familiar objects, to think of rhymes, to explain words, etc. It was both a verbal and a performance test.

Binet joined forces with Simon and published a scale, later revised, in 1905. Binet maintained that a slow or dull child was merely a normal child who was backward in mental growth. Therefore, the slow child would produce a result on the test normally associated with a child younger than him or her. A bright child would perform at a level associated with a child older than him or her. It followed that the bright child’s mental age (MA) was higher than his or her real or chronological age (CA); a slow child’s MA is below his or her CA.

The selection of items to be included in the test is of crucial importance. Normally one would expect to find both novel and familiar items. The choice of novel items is meant to ensure that the uneducated child is not at a disadvantage. In Figure 3.3, an example of a novel item is given where the child is asked to choose figures that are alike, on the assumption that the designs are unfamiliar to all children.

When familiar items are chosen for the test, there is the assumption that all those for whom the test is designed have had the requisite previous knowledge to cope with the

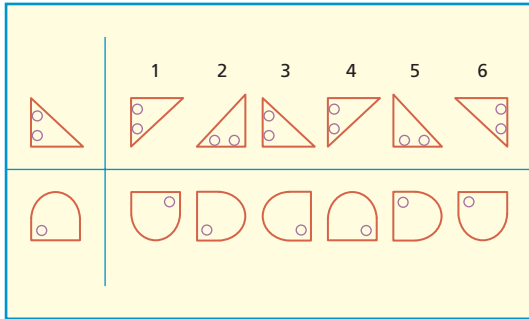


Figure 3.3 Novel items used in intelligence tests. The following instructions accompany the test: mark every card to the right that matches the sample card on the left; you can rotate the sample card but not flip it over. Cards 2, 3, and 6 are correct in the first line; 1, 3, and 5 are correct in the second line. (From Thurstone & Thurstone, 1942.)

items (Nolen-Hoeksema, 2009). The following request and statement provides an example of an allegedly familiar item:

*Circle F if the sentence is foolish;
circle S if it is sensible.*

S F

*Mrs Smith has had no children and
I understand the same was true of
her mother.*

It should be noted that recognition of the fallacy of this statement is valid as a test of intellectual ability for the child who can read and understand all the words in the sentence. The possession of general knowledge and familiarity with the language of the test are necessary to cope with many of the items on intelligence tests. It may be difficult to meet this requirement because of the variability in the educational background and experience of the child. Where the child is tested on novel items, a difficulty may also arise because the discrimination required in a perceptual sense to solve the problem may be found more readily in one culture rather than in another. Nevertheless, the items found in contemporary intelligence tests have endured the rigour of application in the practical world, but it should be noted that the validity of intelligence

tests in predicting school performance is applicable only to a particular culture.

Stanford-Binet Intelligence Scale

This was developed in the United States out of the earlier work of Binet, is well known and widely used, and has been revised on a number of occasions. The index of intelligence used is the intelligence quotient (IQ), and this is expressed as a ratio of mental age (MA) to chronological age (CA) as follows:

$$IQ = \frac{MA}{CA} \times 100$$

Using 100 as a multiplier means that when MA = CA, then the IQ will have a value of 100. If MA is less than CA, the IQ will be less than 100; if MA is greater than CA, the IQ will be more than 100.

An IQ between 90 and 110 is considered to be normal, but above 130 it is considered to be very superior. The person with an IQ below 70 is judged to be retarded. As with many differences between individuals, the distribution of IQs in the population approximates the bell-shaped normal distribution curve. That is, most cases would fall into the mid-value of the curve, with just a few cases at the left and right extreme positions on the curve.

The Stanford-Binet Intelligence Scale was designed to ensure that all items contributed equally to the total IQ score. This means that an individual might perform well on a test inviting the production of geometric forms, but badly on a test of vocabulary. Although the tester might note the strengths and weaknesses, they would cancel each other out in arriving at the IQ score. Under the 1986 revised scale, standard age scores are substituted for IQ scores, and it is now possible to obtain scores for different areas of the test. In accordance with the current view of intelligence as an accumulation of different abilities, a separate score can now be obtained for each of the broad areas of intellectual ability set out in Table 3.2 (Thorndike, Hagen, & Satlet, 1986).

TABLE 3.2 IQ test scoring segments

Category	Subcategory
Verbal reasoning	Vocabulary
	Comprehension
	Absurdities
	Verbal relations
Quantitative reasoning	Quantitative
	Number series
	Equation building
Abstract/visual reasoning	Pattern analysis
	Copying
	Matrices
	Paper-folding and cutting
Short-term memory	Bead memory
	Memory for sentences
	Memory for digits
	Memory for objects

Wechsler intelligence scales

One of the first intelligence tests to test separate abilities, which has been widely used, was developed by Wechsler in 1939 (cited in Wechsler, 1981). These scales were developed because it was felt that the Stanford-Binet test relied heavily on language ability and did not cater for the needs of adults (Wechsler, 1981).

The Wechsler Adult Intelligence Scale (WAIS) has two sections: a verbal scale and a performance scale. Each section generates separate scores, as well as an overall IQ score. A similar test with some modifications was also developed for children. The items in the WAIS refer to the meaning of words and comprehension, speed of learning or writing, and the manipulation or arrangement of blocks, pictures, or other materials.

It is claimed that both the Stanford-Binet and Wechsler scales satisfy the conditions for

a good test – that is, they show good reliability and validity. Also, both tests are fairly valid predictors of achievement, particularly at school (Nolen-Hoeksema, 2009).

Emotional intelligence questionnaire

Various ability-based measures of emotional intelligence have been developed. ASE – a division of NFER-Nelson – in Windsor, UK, produced an emotional intelligence questionnaire developed by Victor Dulewicz and Malcolm Higgs. In this questionnaire there are 69 items or statements, of which the items listed here are extracts (reproduced by permission of NFER-Nelson). The respondent would indicate the extent of his or her agreement with the statements.

- It is possible to control my own moods.
- In dealing with problems and decisions I take account of the needs of others.
- I find it difficult to maintain performance when faced with disappointment.
- I am effective in building team commitment to goals and objectives.

Another company, Hay McBer, which is part of Hay Management Consultants, has produced a similar instrument – a multi-rater 360-degree feedback instrument, called the Emotional Competence Inventory (ECI). Interested readers are referred to a brief article by Watkin (1999), which highlights what the ECI measures, explains how it was developed, and states how it can be applied to organizations.

There is also the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) (Mayer, Salovey, & Caruso, 2002). The MSCEIT rests on four main abilities that underlie emotional intelligence, as follows:

- perceiving emotions in oneself and others;
- using emotions to secure an advantage;
- understanding emotions and making sense out of them;
- managing emotions so as to evaluate them with respect to self and others.

After subjecting the MSCEIT to analysis, it was reported that employees with higher scores were rated as easier to deal with, more interpersonally sensitive, more tolerant of stress, more sociable, and with greater potential for leadership than those with lower scores (Lopes, Bracket, Nezlek, Shutz, Sellin, & Salovey, 2004).

Finally, when reflecting on the tests discussed here and the achievement and aptitude tests considered next in this chapter, one should bear in mind the general issues raised later about testing.

Achievement and aptitude tests

These are essentially tests of ability, but differ in certain respects from the intelligence tests discussed earlier. Vernon (1956) drew a distinction between intelligence and achievement as follows:

Intelligence refers to the more general qualities of thinking – i.e. comprehension, level of concept development, reasoning, and grasping relations – qualities which appear largely to be acquired in the course of normal development without specific tuition. By contrast, achievement refers more to knowledge and skills which are directly trained.

The use of ability tests to stream children in schools, to admit pupils and students to schools and colleges, and to select people for jobs can arouse passions and much debate. When they were first developed they were approved of as an objective and impartial method of identifying talent in the face of subjective elements in the form of various types of favouritism (e.g., based on class, wealth, politics, and so on). However, they have their critics who label them as narrow and restrictive. In essence this means that they do not measure those characteristics that are the most important in determining how well a person will perform in an educational setting

or at work (e.g., motivation, social skills, qualities of leadership) and they discriminate against minorities (Nolen-Hoeksema, 2009). It should be noted that the factors that make personality tests useful (discussed below) are equally applicable to ability tests.

A distinction is made between achievement tests and aptitude tests (Nolen-Hoeksema, 2009). An achievement test is designed to measure developed skills and tells us what the person can do currently. An aptitude test is designed to forecast what a person can attain with training. However, the distinction between the two types of test is not neat, because the intention is to assess the current standing of those tested, whether the purpose of the test is to assess what has been learned to date or to predict future performance.

Both types of test include similar kinds of questions. The real differentiating factor seems to be the purpose of the test. For example, on completion of a course in mechanics a test of knowledge of mechanical principles is given to the participants. This amounts to a test of achievement. But similar questions might be incorporated into a battery of tests for those applying for pilot training, because knowledge of mechanical principles has been found to be a good predictor of success in flying. In this case, the test would be considered a test of aptitude.

Although the significant factor differentiating achievement and aptitude tests has been identified here as the purpose rather than the content of the test, the existence of relevant prior knowledge and experience is nevertheless an important factor to note. An aptitude test assumes little in terms of relevant prior knowledge and experience, whereas an achievement test assumes the person tested has accumulated specific subject matter, the mastery of which is measured by the test.

In practice, the possession of relevant prior knowledge or experience, though not required by the aptitude test, could nevertheless influence the test results. This arises because tests using verbal, numerical, or symbolic material are not totally unfamiliar, and

obviously previous education and experience inevitably exerts an influence.

Aptitude tests at work

Examples of the types of aptitude test found in the occupational field are examined in this section (Toplis, Dulewicz, & Fletcher, 2004). These tests could be used in the personnel selection process, to be discussed later in Chapter 18.

Verbal ability

There are a number of tests that measure lower levels of word meaning and comprehension. Some of these tests necessitate an element of reasoning with words. Also, there are verbal tests involving more complex mental operations of reasoning and critical evaluation and these are available for assessing candidates of high ability, such as graduates and managers.

Numerical ability

There are lower level numerical tests requiring an understanding of, and skill at, arithmetical calculations. In these tests, candidates' existing accomplishments, as well as their aptitude, are being assessed. There are also numerical tests for candidates of high ability, such as graduates and potential managers, which are concerned with higher order numerical reasoning and with critical evaluation of quantitative information.

Spatial ability

There are tests for lower ability and higher ability candidates requiring mental proficiency in identifying, visualizing, comparing, or manipulating two- or three-dimensional shapes.

Diagrammatical ability

These tests focus on abstract symbols and diagrams ranging from superficial perceptual tasks to complex abstract logical processes. They do not include verbal or numerical items.

Manual dexterity

Eye-hand coordination features in tests that fall into this category, and the emphasis is on perception and manipulation involving the

fingers and hands. Some tasks require speed with little precision, whereas other tasks place the primary emphasis on precision where speed is considered to be of lesser importance. The abilities involved in manual dexterity tests are relevant to most manual jobs, and are not closely related to the other ability and intelligence tests discussed in this chapter.

Mechanical ability

These tests are distinct from the manual dexterity tests described in the previous subsection. There is an element of intelligence and reasoning ingrained in them, and they are designed to measure the capacity to succeed and learn in jobs that require mechanical ability.

Scholastic Aptitude Test

There are certain tests, such as the Scholastic Aptitude Test (SAT) in the USA, that measure both aptitude and achievement. The SAT is used to test applicants for admission to colleges and it consists of a verbal section that measures vocabulary skills and the ability to understand what is read, and a mathematical section that tests the ability to solve problems requiring arithmetical reasoning, algebra, and geometry. The emphasis is on the ability to apply skills acquired to date in order to solve problems. Questions based on knowledge of particular topics are not included. There is another test known as GMAT, which is used globally. This test measures basic verbal, mathematical, and analytical writing skills that the individual has developed over time in education and work. It is claimed that it helps selectors in business schools to assess the applicant's suitability for advanced study in business and management. Therefore, it could be used as one predictor of academic performance on an MBA or other postgraduate management course. Just like the SAT, questions on specific knowledge are not asked.

Personality tests

Most of the personality tests used are pencil-and-paper tests with multiple-choice elements.

In practice, they are not tests in the sense that correct and incorrect answers are possible to the various questions. They are really *questionnaires* in which the job applicant or employee seeking advancement in the organization is requested to state how he or she feels about certain issues, or how he or she would react in certain specified situations.

Personality questionnaires

The first personality questionnaire used as a placement or selection tool operated as a screening device on soldiers in the First World War. It was used to identify soldiers who it was felt were unable to face the challenge of combat, and it enabled the speedy testing of thousands of candidates. Handling so many people using interviews would be impracticable. The personality questionnaire was called the “Personal Data Sheet”.

A personality questionnaire can have “Yes” or “No” answers, although some questionnaires have an intermediate category such as “Don’t know” or “Cannot say”. A typical item in a personality questionnaire might read, “I feel comfortable with other people”, with the possible answers:

- Yes
- Don’t know
- No

Cattell’s 16 PF questionnaire

A number of researchers have used the 16 PF questionnaire with managers. The 16 PF instrument comprises 187 questions presented in a forced-choice format. For each question, three possible answers are provided – “Agree”, “Uncertain”, and “Disagree”. The instructions discourage the excessive use of the “Uncertain” response. In this type of process there is always a danger that respondents may distort their true position on various issues by unwittingly giving an inaccurate or a socially acceptable response. However, this danger may be minimized in a supportive climate where questionnaires are completed anonymously.

The Eysenck Personality Inventory (EPI)

This is a device used to measure the dimensions of personality, and lie scale items are included to screen out respondents making socially desirable responses.

The EPI has been used as a personality measure in a number of occupational settings. For example, Eysenck (1967) conducted a study of business groups and found that successful business people were stable introverts, but there was some variation across functions. Those working in finance, research and development, and internal consultancy were the most introverted, and those whose activities cut across more than one function were less introverted. In another study, this time in pilot training, Bartram (1995) concluded that applicants for pilot training are much more emotionally stable and more extraverted than the general population.

A large amount of data from EPI personality questionnaires was analysed and as a result there was an endorsement of Eysenck’s three dimensions – extraversion, neuroticism, and psychoticism. An additional two dimensions, described as sensation-seeking and obsessiveness, were identified (Kline, 1987). A person scoring high on sensation-seeking tends to get involved in activities likely to satisfy his or her need for sensation, such as rally driving or mountain climbing.

The person endowed with a significant level of obsessiveness displays obsessive behaviour exemplified by an almost unnatural adherence to rules and regulations, often accompanied by a strong preoccupation with tidiness, and sometimes stinginess. Another manifestation of obsessiveness is authoritarianism, and should a manager possess this trait there is a likelihood that he or she is capable of adopting an autocratic style of management.

Other questionnaire tests

An example of other tests used to measure personality is the Saville & Holdsworth Ltd (1984) Occupational Personality Questionnaire (OPQ) developed in the UK.

TABLE 3.3 Traits in the Saville & Holdsworth Ltd (1984) Occupational Personality Questionnaire

Trait	Characteristics
Relationships with people	
Persuasive	Enjoys selling, changes opinions of others, convincing with arguments, negotiates.
Controlling	Takes charge, directs, manages, organizes, supervises others.
Independent	Has strong views on things, difficult to manage, speaks up, argues, dislikes ties.
Outgoing	Fun-loving, humorous, sociable, vibrant, talkative, jovial.
Affiliative	Has many friends, enjoys being in groups, likes companionship, shares things with friends.
Socially confident	Puts people at ease, knows what to say, good with words.
Modest	Reserved about achievements, avoids talking about self, accepts others, avoids trappings of status.
Democratic	Encourages others to contribute, consults, listens, and refers to others.
Caring	Considerate to others, helps those in need, sympathetic, tolerant.
Thinking style	
Practical	Down-to-earth, likes repairing and mending things, better with the concrete.
Data rational	Good with data, operates on facts, enjoys assessing and measuring.
Artistic	Appreciates culture, shows artistic flair, sensitive to visual arts and music.
Behavioural	Analyses thoughts and behaviour, psychologically minded, likes to understand people.
Traditional	Preserves well-proven methods, prefers the orthodox, disciplined, conventional.
Change-oriented	Enjoys doing new things, seeks variety, prefers novelty to routine, accepts changes.
Conceptual	Theoretical, intellectually curious, enjoys the complex and abstract.
Innovative	Generates ideas, shows ingenuity, thinks up solutions.
Forward planning	Prepares well in advance, enjoys target setting, forecasts trends, plans projects.
Detail conscious	Methodical, keeps things neat and tidy, precise, accurate.
Conscientious	Sticks to deadlines, completes jobs, perseveres with routine, likes fixed schedules.
Feelings and emotions	
Relaxed	Calm, relaxed, cool under pressure, free from anxiety, can switch off.
Worrying	Worries when things go wrong, keyed up before important events, anxious to do well.
Tough-minded	Difficult to hurt or upset, can brush off insults, unaffected by unfair remarks.
Emotional control	Restrained in showing emotions, keeps feelings back, avoids outbursts.
Optimistic	Cheerful, happy, keeps spirits up despite setbacks.
Critical	Good at probing the facts, sees the disadvantages, challenges assumptions.
Active	Has energy, moves quickly, enjoys physical exercise, doesn't sit still.
Competitive	Plays to win, determined to beat others, poor loser.
Achieving	Ambitious, sets sights high, career-centred, results-oriented.
Decisive	Quick at conclusions, weighs things up rapidly, may be hasty, takes risks.

The OPQ was developed from a model of personality that was created initially from a review of existing questionnaires, theories of personality, work-related information, feedback from companies, and repertory grid data generated by employees in companies. It consists of some 11 questionnaires for use in selection, development, counselling, and teambuilding. The OPQ is based on 30 traits listed in Table 3.3.

Some reservations have been expressed about the OPQ, but equally there are supportive comments, as follows: “It has not yet been the subject of the peer review process nor the focus of independent research that is necessary for all scientific achievements” (Jackson & Rothstein, 1993).

Having analysed the concept 5.2 questionnaire – one of a series of questionnaires subsumed under the label of OPQ – it was concluded, from the analysis conducted by Barrett, Kline, Paltiel, and Eysenck (1996) and the research of others, that the OPQ concept 5.2 is overlong and contains a proportion of redundant and quantifiably complex items. There is little evidence to support the existence of 30 discrete measurement scales, and although it has strengths it could benefit elsewhere from further development.

However, supportive findings were reported by Robertson and Kinder (1993), who carried out a major meta-analysis looking at the criterion-related validity of OPQ personality measures. The results show that OPQ fares well in relation to other predictors of performance, such as assessment centres, cognitive ability tests, and work samples. These predictors or tests are examined in Chapter 18.

In addition to personality questionnaires, there are other ways of making assessments of personality. In daily life we are constantly making subjective assessments of the personality of others. In a formal sense we use the interview as a method to assess personality. Other ways of assessing personality are described elsewhere in this book: for example, projective tests and the repertory grid were

discussed in Chapter 2. There is also “graphology”, the study of how we loop our Ls and cross our Ts, and this is more popular in Europe than in the USA (see Panel 3.2).

Issues in psychometrics

The remainder of this chapter will be devoted to examining psychometric tests from a number of angles:

- features of tests
- advantages of tests;
- disadvantages of tests;
- standing of psychometric testing;
- ethical issues.

Features of tests

Psychological tests generally possess a number of features (Toplis et al., 2004). With the odd exception they tend to be objective, standardized measures with well-controlled and uniform procedures governing the way the test is conducted and scored. Therefore, the test items, instructions, and time allowed (where a time limit exists) should be the same for every candidate. Also, every candidate should be exposed to the same physical test conditions, such as adequate illumination, appropriate temperature, a distraction-free environment, and adequate space.

Scoring, whether operated manually or computerized, must be objective to ensure that the tester’s or scorer’s judgement does not lead to variations in the score. Therefore, the tester has a “key” that contains a value allocated to a given answer. The raw scores derived from values placed on the responses are only significant when they are compared with *norms* for the particular occupational group in question. The norms are the range of scores obtained from a large representative sample of people for whom the test was designed. The sample could, for example, consist of a group of sales representatives in the UK, and the norms relate to the normal or average performance of this group, with degrees of deviation above and below the

Panel 3.2 Graphology

Parallel to the scientific assessment of personality is the growth in non-scientific methods such as graphology (handwriting analysis). In the words of two exponents of handwriting analysis, “handwriting holds the key to one of life’s most fascinating and tantalising mysteries – the true personality of another human being” (Greene & Lewis, 1988). According to Lowe (2007) handwriting is a reflection of the inner personality; it shows a person’s ego strength, how good they feel about themselves, and their intellectual, communication, and working styles.

Adopting an allegedly “scientific” approach to graphology, called graphonomy, a profile of an employee was produced from an inspection of a person’s handwriting. The person profiled was a 27-year-old man occupying a managerial position in the buying department of a London department store. Married with one young daughter, he was promoted from the position of sales clerk having spent 10 years with the same firm, wielding considerable authority in his job and carrying significant responsibilities. He was said to be an attractive, outward-going person with many friends, and scored strongly on traits such as assertiveness, ambitiousness, and extraversion (Greene & Lewis, 1988).

From interpreting the signature of John McCain, a candidate in the US presidential election of 2008, Lowe – cited above – is reported in the *Gulf News* (19 May 2008) as saying that McCain’s variable writing style revealed a proud, idealistic, and impulsive man on a short fuse. The signature of another candidate, now President Obama, revealed similar traits. Hilary Clinton’s legible, balanced signature showed a woman of great intelligence, and its simplicity portrayed a “what you see is what you get personality”.

The results of a study of personnel selection techniques used for managers in the mid-1980s showed that 2.6% of the top 1000 UK companies always used graphology in the assessment of managers (Robertson & Makin, 1986). However, drawing inferences about the personal qualities of the person from an analysis of his or her handwriting is challenged as an unreliable form of assessment (Klimoski & Rafael, 1983). (There is further discussion of graphology, including criticism, in the context of selection methods in Chapter 18.)

average. To ensure standardization and objectivity, a normative score is read from a norms table. Also, this ensures that the subjective interpretation of the data by the tester is removed from the process.

A percentile score is taken from the conversion tables, and this represents the proportion of the reference group (the occupational group with which the individual tested is compared) that has a lower score than the person tested. For example, if a sales representative scored at the 75th percentile on a particular dimension of a test using UK norms, then his or her score would be better than 75% of UK sales representatives. Only 25% of UK sales representatives would have a better score.

The manual supporting the test should contain scientific data to show the “quality”

of the test and what it is supposed to do. In this context two factors are crucial – reliability and validity. A test is reliable if it gives the same profile on a repeated basis in the same conditions. In other words, the measure must be consistent. A test is valid if it measures what it is supposed to be measuring. A more detailed explanation of these concepts appears in Chapters 9 and 18 in connection with attitude measurement and selection methods.

It should be noted that training those responsible for the administration and interpretation of tests is very important, as is restricted access – for example, preventing candidates getting hold of tests before selection, and therefore reducing the chances of tests being misused. Proponents of personality

tests are keen to emphasize their usefulness. It is claimed that, when compared with other selection devices such as interviews and references, personality tests have a number of attractive features.

In a cross-cultural context some types of tests may have greater significance than others. For example, tests of cognitive abilities should be important for many jobs throughout the world, and evidence indicates that they are less prone to cultural effects (Salgado, Anderson, Moscoso, Bertua, de Fruyt, & Rolland (2003). It is claimed that some non-verbal tests of cognitive ability, rather than verbal tests of cognitive ability, do not discriminate against respondents from different cultural and linguistic backgrounds (Higgins, Peterson, Lee, & Pihl, 2007).

However, it is suggested that personality tests may be more susceptible to cultural influences. Feltham, Lewis, Anderson, and Hughes (1998) maintain that personality tests make few allowances for cultural differences between countries. By way of example, they refer to a question on a standard test focusing on a need to achieve. Swedes may not respond in the expected way to such a question because they would like to bury any desire to achieve beneath a socially conscious exterior. A project that Feltham et al. were engaged in was to try to get rid of cultural incompatibility in an existing test offered by a consultancy company.

In the next two subsections there are useful comments relating to both the advantages and disadvantages of tests of personality and ability (Furnham, 2008; Toplis et al., 2004).

Advantages of tests

- Tests provide quantitative data on temperament and ability that make it possible to compare individuals on the same criteria, which is appealing when compared with “interviews” and “references”. In interviews it is possible to find different questions being asked of different interviewees, and in references often the language used is

not the most illuminating in conveying the nature of personal characteristics.

- Tests are scientific instruments based on theoretical foundations, and they are reliable, valid, and allow us to distinguish between subjects in terms of good, bad, and indifferent.
- Tests are comprehensive, embracing the basic features of personality and ability that form the foundation of varied behavioural patterns.
- Tests are fair because they prevent corruption, favouritism, and bias being perpetuated because of a candidate’s membership of an influential network or club.
- Users of tests not conversant with personality theory are provided with useful behavioural concepts for distinguishing between individuals.
- The outcome of testing provides powerful insights to challenge one’s beliefs and behaviour.
- Data generated by tests can be filed and re-examined at a future date to establish how effective this information was in predicting success in the job.

Disadvantages of tests

Having recognized a number of the strengths of personality and ability tests, we are now going to look at some of the weaknesses. The answers provided by respondents to questions on the personality questionnaire could be distorted for a number of reasons, and tests could likewise have some weaknesses, such as the following:

- Subjects may not have sufficient self-awareness to give a response that reflects their true feelings.
- Subjects may not be feeling well and may perform in an unexpected way.
- The questions may be misread for a multitude of reasons (e.g., lack of an adequate educational background).
- Subjects deliberately sabotage the process by giving random, meaningless responses.
- Tests are invalid – they do not measure that which they say they are measuring and the

scores produced do not predict behaviour over time.

- Tests fail to measure certain critical factors, such as the existence of “trustworthiness” and the likelihood of “absenteeism” in organizations.
- Tests are unfair and biased towards particular racial and gender groups. For example, in connection with gender, it is said that males tend to secure more favourable profiles, which act to their advantage when it comes to obtaining jobs.
- Sometimes the necessary skill to interpret the results of the test and produce accurate profiles is absent due to deficiencies on the part of those charged with this responsibility. This could arise as a result of lack of skill, insight, and experience.
- There is a lack of good “norms” to which the raw scores can be related. Therefore, there is a tendency to use norms more appropriate to a different culture (see the explanation of norms in the next subsection).
- As tests become more established, subjects could acquire them in advance and derive benefit from addressing the questions. In such cases the results may reflect prior preparation rather than the true ability of the candidate.
- Freedom of information legislation might create a situation where those tested could have access to the results and challenge the scores and the interpretation placed on them.
- Subjects may deliberately set out to create a false impression. Unlike tests of intelligence and aptitude (discussed above), which are almost impossible to fake because the candidate comes up with either the right or the wrong answer, tests of personality are open to faking.

Issue of faking

The last point needs elaboration. If a person applying for a job takes a personality test, the motivation to secure the job may lead that person to generate responses that he or she thinks will make them an attractive candidate

in the eyes of the employing organization. It was found that personality profiles obtained from job applicants tended to be considerably inflated when compared to those obtained from non-job applicant samples (Birkeland, Manson, Kisamore, Brannick, & Smith, 2006). It seems that where a personality test is taken for the purposes of vocational guidance, people are motivated to give relatively truthful answers to the questions because it is in their interest to discover all they can about themselves in order to make sound vocational choices. However, one cannot rule out faking to create a good impression even in these circumstances (McCormick & Tiffin, 1974).

The tester can use forced-choice techniques specifically designed to minimize faking. With a forced-choice item the respondent must choose between answers that appear equally acceptable (or unacceptable) but differ in validity for a specific criterion. The following is an example of a test item from a personality test (the Gordon Personal Profile) using the forced-choice technique. The respondent is asked to examine a set of descriptions of personal characteristics and select one description that is most like, and one description that is least like, him or her. The descriptions are: (1) a good mixer socially; (2) lacking in self-confidence; (3) thorough in any work undertaken; (4) tends to be somewhat emotional.

It should be noted, however, that the forced-choice technique reduces but does not eliminate faking, especially by the applicant for a specific job (Anastasi, 1997). Other measures to neutralize faking are disguising the test so that it appears to be something quite different from what it really is, and introducing “lie scales”. The latter is a set of questions designed to detect distortion by the person being tested. One approach is to introduce a number of statements depicting ultra-perfect qualities that, bar a few, the normal person could not conceivably possess. If the respondent scores too highly on these items, then the tester can challenge the credibility of all the other responses and disregard the test score.

Another approach is to repeat individual test items, sometimes slightly disguised, and then see whether the respondent gives the same answers to both sets of questions.

Serious consideration has been given to the issue of faking by subjects completing personality questionnaires or tests used in personnel selection. In one study the results, which were in line with previous findings, indicated that the questionnaires used were all highly susceptible to faking. Through recognizing certain caveats, the researcher found that subjects were able to fake in a selective way by projecting desirable profiles compatible with their perception of the occupation in question (Furnham, 1990).

Hirsh and Peterson (2008) have recently come forward with an alternative strategy involving the use of personality questionnaires that are more resistant to biased self-reporting in the first place. It is claimed to be a fake-proof measure of the Big Five personality traits. This questionnaire contains a number of comparisons between two or more desirable personality descriptions (e.g. are you a hard worker or a creative thinker?). This type of forced-choice between two or more desirable options limits the respondents opportunities to enhance his or her esteem, as a respondent cannot inflate scores in one area without simultaneously deflating scores in another area.

Standing of psychometric testing

Nearly four decades ago Ghiselli (1973) concluded that personality tests have some modest value when used to assist with the personnel selection process. More recently Murphy and Dziewecznski (2005) maintained that the validity of measures of broad personality traits is still low, that personality tests used in organizations are still poorly chosen, that links between personality and jobs are poorly understood, and that personality measures are unlikely to achieve the degree of acceptance associated with cognitive tests. However, Hirsh (2009) is complimentary about the standing of one particular model of

personality, when he maintains that relating personality to job performance has benefited greatly from the use of the Big five measure.

In the UK Blinkhorn and Johnson (1990) casts doubts on the use of personality tests for recruitment and promotion purposes. They looked at the three most widely used and respected tests (including the 16 PF and the OPQ) and concluded that there is little evidence of enduring relationships between personality test scores and measures of successful performance at work.

Jackson and Rothstein (1993), in an analysis of the use of personality tests for personnel selection, take issue with Blinkhorn and Johnson on their conclusions. They maintain that “the criticisms do not accurately or fairly characterize *all* personality measurement in personnel selection research”. Despite their reservations, however, Blinkhorn and Johnson do acknowledge that personality testing may be invaluable for counselling purposes, or in other situations where self-perception is as important as the truth.

Later Blinkhorn (1997) expressed profound reservations about the usefulness of psychometric tests when he stated that “test theory has contributed little to our understanding of ability, aptitude and temperament or improved reliable measurement of personal characteristics over the past fifty years”. A similar view was expressed by Barrett (1998) – that all the measurement made within occupational psychology is of ambiguous status, and that occupational selection and psychometric testing are unlikely to progress much further in terms of greater understanding and prediction unless they adopt an approach to investigative psychology that is in accord with the principles and axioms of scientific measurement. Duncan (1999), a practitioner, challenges Barrett’s view about the ambiguous scientific status of measurement in psychometric testing, and puts forward views defending the scientific basis of psychometrics.

There has also been criticism from a prominent US academic who has conducted research into intelligence, referred to earlier.

Sternberg, writing in the *American Psychologist*, states that tests have not kept abreast of developments in psychology; in fact, they are rooted in knowledge that has been around for a long time. Conventional ability tests measure only a narrow range, and results differ with race and sex, which could leave employers open to ethical and legal problems. Sternberg (quoted in Rogers, 1998) refers to the psychometric industry as

an oligopoly of a small number of companies, that have their respective turfs set out for them, and should be subjected to more economic competition and more pressure to change. Clients should insist on tests that better reflect what we know today, not 100 years ago.

There are further thoughts on psychometrics in Panel 3.3.

Ethical issues

It is worth reflecting on some important ethical considerations in the use of tests for selection purposes (Porteous, 1997):

- Tests should never be used without justification. One should ensure that the test has relevance to the job, and that the individual's score on the test can be compared with at least some aspects of performance on the job.
- Tests should be administered by users with qualifications approved by The British Psychological Society (BPS).
- Tests should not be stored in places with easy general access; instead they should be securely filed.
- The test results of individuals who fail to secure the job on offer should be destroyed or retained without identifying the candidate's name.
- Applicants should receive sympathetic feedback on their test performance, particularly when they were not selected for the job. People are probably more sensitive to not securing the job because they "failed the test" (particularly an intelligence test) than would be the case with an unsuccessful outcome at a selection interview.
- Use should be made of valid and up-to-date tests because the changing requirements of jobs call for a different set of abilities,

Panel 3.3 Debate in psychometric testing

One of the major objectives of classical psychometric assessment (personality/cognitive ability tests) used in selection has been to predict performance. Reservations have been expressed about the efficacy of this approach (Hirsh, 2009; Lewis et al., 2009). Hirsh calls for an acknowledgement of what he describes as situational moderators, in effect the behavioural context in which performance takes place. For example, the existence of clearly structured roles, close supervision, and formalized communication systems may help to reduce what would otherwise be differences in performance between more or less "conscientious" employees, thereby reducing the importance of this personality trait. By contrast, situations involving sudden unexpected crises or requiring immediate emergency action may enhance differences in performance between more and less "emotionally stable" individuals, thereby increasing the extent to which this personality trait predicts performance.

According to Lewis et al., the psychometric measures used over a very long period of time are not robust enough to accommodate the evidence gained from our perceptions. If managers and others are sceptical, it is because of the low levels of demonstrated validity. We need to bring back content validity! Because of deficiencies in the classical approach, there is a need for a paradigm shift both in what we measure (IQ, personality) and how we complete the measurement.

or because there are changes in the quality of candidates offering themselves for selection.

- Conditions should be created in which all candidates have a reasonable expectation of performing at their best by providing suitable conditions for the administration of the

test and by giving a clear statement of what is in store for candidates. Also, give candidates the opportunity to gain practice by tackling sample test questions prior to the actual test. However, one should avoid a situation where coaching for tests is commonplace.

CHAPTER SUMMARY

- After defining intelligence, models of intelligence were introduced.
- The early models, using a factorial approach, dominated the scene until the 1960s. Subsequently, the information-processing model, influenced by developments in cognitive psychology, became influential.
- The tendency now is to take a broader view of intelligence than is found in the more traditional approaches, and one manifestation of this trend is the acknowledgement of the importance of emotional intelligence.
- Also, the part played by heredity and environment in influencing intelligence was recognized as a subject of heated debate, and the effects of age and gender were briefly examined.
- The issue of the measurement of intelligence, using intelligence tests, was noted as being controversial.
- Closely related to intelligence tests are aptitude and achievement tests, which are really tests of ability. A distinction was made between aptitude and achievement tests, and examples of aptitude tests in the occupational field were given.
- Other tests such as personality tests in wide use were analysed, in particular the EPI and OPQ, and other ways of assessing personality, including graphology, were acknowledged. In future tests based on the “Big Five” factor theory, discussed in Chapter 2, are likely to be prominent.
- Issues connected with the use of psychometrics were explored.

QUESTIONS

- (1) Discuss the difference between personality and intelligence.
- (2) Outline the “models of intelligence” and identify a particular model that appeals to you, giving reasons for your choice.
- (3) Assess the significance of emotional intelligence in the contemporary world of work.
- (4) Describe the ways in which intelligence is measured, and comment on the controversy over its measurement.
- (5) Discuss the relative importance of genetic inheritance and a person’s environment as factors influencing intelligence.
- (6) Distinguish between achievement tests and aptitude tests, and comment on their usefulness in a business organization.
- (7) Identify a major personality test and assess its usefulness in an employment setting.

FURTHER READING

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