People view intelligence differently. Some judge intelligence by looking at one's educational level. Others look at one's occupation. Learning and intelligence are concepts that everyone discusses, but most do not understand them fully.

Research has shown that up to 50 percent of children with learning difficulties end up with a diagnosable psychiatric disorder. It is therefore important for parents and teachers to understand the child's ability to learn, and intervene appropriately.

So, what is intelligence? What are learning difficulties? What impact do they have on the child? Can they be treated? *Living with Intelligence and Learning Issues* provides comprehensive information about the concept of intelligence, the factors that affect learning, and the learning difficulties that children may face.

Living with Intelligence and Learning Issues is part of a series of handbooks on mental health in children written by mental health professionals from the Child Guidance Clinic. Other titles in the series are:

- Attention Deficit Hyperactivity Disorder (ADHD)
- Anger
- Autism
- Discipline Issues
- Divorce and Family Issues
- Grief
- Self-harm Behaviours
- Sexuality Issues
- Stress

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Dedicated to
all the children of the Child Guidance Clinic
and their parents

CONTENTS

PREFACE

This book is about the fundamentals of learning and the difficulties it may present to some children. We also examine in detail one of the foundations of learning, intelligence. Learning and intelligence are concepts that everyone discusses, but most do not understand them fully. People have traditionally associated IQ fully with intelligence and the potential to do well in school and in life generally.

In Singapore, the pursuit of academic excellence has become a well-developed art among children, parents and teachers. The cost is that children with special needs face tremendous pressures to achieve academic results that are often beyond their capabilities. Very often, a psycho-educational assessment, including IQ tests, is done to determine whether the child has a learning difficulty. When children obtain low IQ scores, the reactions of their parents are mixed. Some blame their child for not putting in any effort; others blame themselves for their child's poor results. At the Child Guidance Clinic, one of the top referral reasons is that the child is slow in learning and has not been doing well in school.

Research has shown that up to 50 percent of children with learning difficulties are eventually diagnosed with psychiatric disorders. To prevent these problems from developing, parents and teachers must be aware of a child's ability to learn, and intervene appropriately when his abilities are compromised. Most parents are relieved when the implications of the IQ results and the concepts of learning and intelligence are fully explained to them. Many will moderate their expectations and begin to look for alternative ways to realise their child's potential.

We hope that this book can help to demystify what learning and intelligence are all about and provide a useful reference for parents who are concerned about the personal development of their children. This book offers helpful approaches developed and implemented at the Child Guidance Clinic.

We are grateful to Ms Li Zhong Ying, Dr Cai Yiming and Mrs Jeffrey Koh-Ang Ley Keow for their helpful suggestions in the development of the first edition of this book.

Ong Li Min
Ong Lue Ping
Daniel Fung
August 2015

INTRODUCTION

Children are unique individuals. Every child is different and develops at his own pace, with different developmental patterns. For example, some children walk without going through a crawling stage, while others progress in a stepwise manner.

However, adults expect the same progress from every child. In our fast-paced society, we expect every child to reach the same goals and targets.

When these are not met, adults become worried and label the child as 'slow', 'lazy', 'stubborn', 'stupid' and even 'disabled'.

Labelling is unhelpful as it only leads to stress and low self-esteem in children. Labels also create a false picture of the child, who is an individual in his own right and whose brain is wired in its own special way. In every child is a unique neural network that gives him a different way of viewing and conceptualising the world. Thus, not every child can meet the criteria for normal learning.

This book shares what we have learnt from our combined experiences of working with children, and helping them to cope with their unique characteristics, in an easy and systematic manner so that readers can understand and recognise that every child has his own set of strengths and weaknesses.

The book is divided into three sections:

- Parts 1-4 covers the concept of intelligence.
- Parts 5-8 explains the various factors that affect learning; learning proceeds only when these factors are intact and an absence of any of them can be a cause of learning difficulties.
- Parts 9-14 focus on learning difficulties and specific learning disorders, as well as the broad principles that are adopted to manage them.

CURRENT CONCEPTS OF INTELLIGENCE

PART 1

Intelligence refers to a person's verbal skills, and his ability to learn and remember information, recognise concepts and their relations to each other, engage in practical problem-solving and apply information to his behaviour in adaptive ways.

The general concept of intelligence and the recognition of individual differences in ability appeared as early as 2200 BC when Chinese administrators tested civil servants periodically to ensure that their abilities qualified them for their jobs. However, in Western culture, the term 'intelligence', derived from the Latin 'intellectus' (meaning 'perception' or 'comprehension'), dates from the 19th century. Since then, with the emergence of new statistical methods, and genetic and neurological research methodologies, the concept of intelligence has evolved from g-centric (a single general intelligence) dominated theories to more complex theories of multiple intelligences. More recently, attempts have been made to integrate psychometric, physiological and social aspects of intellectual functioning into a more comprehensive theory.

1.1 HOW HAS THE CONCEPT OF INTELLIGENCE CHANGED THROUGHOUT THE YEARS?

First tests of intelligence — Sir Francis Galton (1822–1911)

British scientist Francis Galton developed one of the first tests of intelligence. Inspired by his cousin Charles Darwin's law of natural selection, he believed that intelligence is biologically determined, and thus it must be manifest in all activities, even simple sensorimotor tasks. He established the Anthropometric ('human-measuring') Laboratory at the International Health Exhibition in London in 1884 and tested over 9,000 people on their abilities to perform sensory, motor and reaction-time tasks. He found family differences in these abilities and concluded that intellectual abilities were heritable.

However, he had no clear scientific theory of what intelligence was or how it worked. He simply had a hunch that intelligence was an all-pervasive 'natural ability' that was particularly prominent in the Victorian upper class.

Two-factor theory of intelligence — Charles Spearman (1863–1945)

In 1904, British psychologist Charles Spearman attempted to turn Galton's hunch into a respectable theory of intelligence. He used statistical correlation* to examine the relationships among the various tests of particular intellectual abilities.

*Correlation is a procedure that allows researchers to understand how two variables are related to each other.

Spearman found moderate positive correlations among the various tests of intellectual abilities. For example, he found that a person who scored high on a vocabulary test also tended to score high on other tests such as arithmetic and spatial reasoning. With these results, Spearman concluded that a general 'g factor', which reflects general reasoning ability, accounted for the moderate correlations among the different tests of ability. However, as the scores of the various tests are not perfectly related to each other, he suggested that a factor of intelligence that is specific to a particular test, called 's factor', may also exist.

He also stressed that 'g factor' will predict a person's performance on a task better than 's factor' and that an estimate of 'g' will provide the most important information about a person's intellectual ability. He then developed his two-factor theory of intelligence in 1927, which states that a person's performance on any intellectual task is determined by both 'g factor' and 's factor', with 'g' being the dominant factor in predicting intellectual performance.

Multiple-factors theory of intelligence — Louis Thurstone (1887–1955)

American psychometrician Louis Thurstone postulated his theory of Primary Mental Abilities in 1938. He performed factor analysis* on a set of 56 tests on 218 college students and extracted seven factors. He then asserted that intelligence comprises seven distinct primary mental abilities (verbal comprehension, verbal fluency, number, spatial visualisation, memory, reasoning and perceptual speed) rather than just one as suggested earlier by Spearman.

Multiple intelligences theory — Howard Gardner (1943–)

Thurstone's notion of intelligence as a constellation of numerous different abilities was validated in the 1980s with advancements in neuropsychological research methods. For instance, neuropsychological observations of the brain have shown that localised brain damage can impair specific types of abilities. This is clearly seen in most instances where damage to specific areas of the left hemisphere of the brain impairs mainly verbal abilities while damage to the right hemisphere impairs spatial ability.

Using such advancements, Howard Gardner, an American psychologist, came up with the Multiple Intelligences (MI) theory in 1983. According to this theory, there are seven different types of intelligence, which is discussed in Part 2 of this book.

*Factor analysis is a procedure that allows researchers to identify common factors among groups of tests.

1.2 WHAT IS THE CURRENT CONCEPTUALISATION OF INTELLIGENCE?

The idea of an individual having different distinct types of intelligence rather than a single form of intelligence gained popularity towards the end of the 20th century. However, results from recent genetic and neurological research studies seem to dispute this claim. For example, genetic dissections of intelligence test performance found not only genetic influences unique to specific aspects of intelligence but also a genetic component to general ability.

It seems the theories of Spearman, Thurstone and Gardner are all supported in a way. The current view of intelligence by most psychologists is that even though intelligence may involve a general ability to handle the different cognitive tasks as suggested by Spearman, it can also be expressed in many different ways, such that persons can be high on some aspects of intelligence but low on others.

With the emergence of more advanced statistical analysis, genetic studies and neurological research methodologies, more complex multiple intelligence theories and the 'discovery' of more types of intelligence can be expected in the future. The most recent theory was proposed by Kaufman in 2009 — the Dual Process theory, which posits that two interactive systems of controlled and autonomous cognition underlie human intelligence. Controlled cognition is intentional and is related to metacognition and executive functioning while autonomous cognition allows individuals to acquire information automatically and is generally related to implicit learning and latent inhibition, which may also be influenced by the level of the individual's engagement. Individuals are thus able to flexibly toggle between the two based on contextual needs.

THE DIFFERENT TYPES OF INTELLIGENCE

PART 2

In 1989, two Italian psychologists Gabriel Mugny and Felice Carugati conducted a study to analyse what the general population understood about the concept of intelligence. They found that people disagree a lot about what intelligence is. The same results were found in many other studies done in Britain and the United States. In fact, intelligence has been described as a 'polysemous' concept — many meanings serving many purposes. This conflict over what truly constitutes intelligence is also reflected in the field of psychology. For example, a survey done in the United States by Yale psychologist Robert Sternberg and his colleagues found that less than 10 percent of the psychologists they surveyed agreed on only a third of the attributes!

Hence, it is not surprising to find different theories about the nature and types of intelligence. This section mentions a few of these theories. An important point to note is that in recent times, the concept of intelligence has broadened to include many different aspects of a person's abilities.

2.1 FLUID INTELLIGENCE VERSUS CRYSTALLISED INTELLIGENCE

In 1963, Raymond Cattell, an American psychologist proposed that intelligence can be categorised into two types:

- Fluid intelligence — this refers to our inherited abilities to think and reason.
- Crystallised intelligence — this refers to our acquired general knowledge and information from the environment.

In a sense, fluid intelligence supplies the inherited ability whereas experience with language and exposure to books, school and other learning opportunities develop crystallised intelligence. Therefore, if two persons have the same experiences, the one with the greater fluid intelligence will develop a greater crystallised intelligence.

2.2 TRIARCHIC THEORY OF INTELLIGENCE

In 1985, Robert Sternberg of Yale University proposed three basic types of intelligence:

- Componential intelligence.
- Experiential intelligence.
- Contextual intelligence.

Componential intelligence

This involves the ability to think critically and analytically. Persons high on this aspect of intelligence usually perform well academically.

Experiential intelligence

Experiential intelligence, on the other hand, refers to the ability to deal effectively with novel situations and formulate new ideas. Persons high on this dimension are adept at extracting crucial information in a given situation and combining seemingly unrelated facts. Scientific geniuses and inventors such as Albert Einstein and Isaac Newton display this kind of intelligence.

Contextual intelligence

Lastly, persons who are high on contextual intelligence are intelligent in a practical sense and are adept at solving everyday life problems. They are more commonly termed as being 'street-smart'.

2.3 MULTIPLE INTELLIGENCES (MI) THEORY

In 1983, American psychologist Howard Gardner proposed his theory of multiple intelligences. Based on neuropsychological analysis of human abilities, Gardner concluded that intelligence falls into seven or more categories:

- Linguistic intelligence — the mastery of spoken and written language to express oneself or remember things. This form of intelligence typically contributes to strong academic performance as well as high scores on most IQ tests and tests of achievement.
- Musical intelligence — the capacity to recognise and compose musical pitches, tones and rhythms and to use them for performance or composition.
- Logical-mathematical intelligence — the ability to detect patterns, think logically, reason deductively and carry out mathematical operations.
- Spatial intelligence — the ability to recognise and manipulate spatial properties. Architects and sculptors are typically high in this form of intelligence.
- Bodily-kinaesthetic intelligence — the ability to use parts of the body or the whole body to solve problems or create products. Such abilities are often required of athletes and dancers.

- Intrapersonal intelligence — the ability to understand oneself and use that information to regulate one's own life.
- Interpersonal intelligence — the ability to recognise the intentions, feelings and motivations of other people. Counsellors and politicians are usually high on this aspect of intelligence.
- Naturalist intelligence — the ability to recognise and distinguish the variety of flora and fauna species in the environment and weather patterns.

2.4 POST-MI THEORY

In the last decade, many psychologists and organisational management professionals have expounded on Gardner's MI theory and proposed other types of intelligence. Some examples are emotional intelligence, social intelligence and the ability to handle oneself in times of adversity. These are consistent with Asian traditional concepts of intelligence which also stress on social competence and practical ability beside cognitive competence.

Emotional intelligence (EQ)

In 1995, Daniel Goleman, a psychologist and current co-chairman of The Consortium for Research on Emotional Intelligence in Organizations at Rutgers University in the United States, called the feeling side of intelligence 'emotional intelligence' or EQ. According to Goleman, EQ includes:

- an awareness of and the ability to manage one's feelings,
- the ability to notice individual differences and feelings in other people,
- the ability to empathise and respond appropriately to those feelings.

Goleman suggests that children who are better able to manage their emotions are able to pay attention as well as take in, remember and understand information better.

Social intelligence (SQ)

Overlapping emotional intelligence is social intelligence. This form of intelligence was proposed by Albert Sloan, a management consultant. He coined the term 'social quotient' or SQ and defined it as a measure of a person's social competence and ability to get along with others. SQ reflects a person's ability

to use social skills for personal success. According to Sloan, SQ, like any other social skills, can be learnt and improved upon.

Adversity Quotient (AQ)

In 1997, business consultant Paul Stoltz introduced another type of practical intelligence he calls 'adversity quotient' or AQ. This is actually a measure of how an individual perceives and deals with challenges. According to Stoltz, persons high on AQ are more able to handle uncertainty and complexity in the face of adversity.

Moral intelligence (MQ)

In 1997, Robert Coles, a Harvard Professor and noted child psychiatrist, stressed that building moral intelligence is as important as developing a child's cognitive and emotional intelligence. According to Coles, moral intelligence or MQ is reflected in how we behave. It is moral behaviour tested by life and lived out in the course of our everyday experience. Coles believes that parents can promote MQ in their children by setting good examples of their own moral behaviour for their children to model after.

This belief was also supported by Michele Borba, an educational consultant. Stressing that parents are their children's most powerful moral instructors, she suggested that parents should teach their children seven essential virtues to enhance the child's MQ. These virtues are:

- empathy,
- conscience,
- self-control,
- respect,
- kindness,
- tolerance,
- fairness.

ABOUT THE AUTHORS

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Ms Ong Li Min completed her Master of Psychology degree in Clinical Psychology at the University of Sydney in 2000 and subsequently joined the Institute of Mental Health in 2001.

Ms Ong currently conducts psychological assessment and therapy with child and adolescent clients at the Child Guidance Clinic. Her current interest areas are in child mood and anxiety disorders.

Dr Ong Lue Ping

Dr Ong Lue Ping is a clinical psychologist at the Child Guidance Clinic. He credits his choice of career to his wonderful parents who have been supportive of his ambition to pursue the scientific study of human behaviour and thinking since he was young.

He graduated with an honours degree in Social Science (Psychology) at the National University of Singapore in 2002, winning the Special Book Prize for Psychology for topping his honours class. In the same year, he fulfilled his dream to work at the Child Guidance Clinic where he conducts psychological assessment and therapy. He subsequently obtained his Doctorate in Psychology (Clinical) in 2013.

As a working father of three, he has not only developed a greater appreciation of the trials and tribulations of parenting but also the experience of unconditional love.

Dr Daniel Fung

Dr Daniel Fung is married to Joyce and is a full-time father of five wonderful children. His clinical practice is as a child psychiatrist at the Institute of Mental Health's Child Guidance Clinic. He is currently the Chairman Medical Board of Singapore's Institute of Mental Health

Dr Fung graduated from the National University of Singapore's Faculty of Medicine in 1990 and obtained a Masters of Medicine in Psychiatry in 1996 and was awarded the Singapore Psychiatric Association Book prize for being the best candidate.

He is an Adjunct Associate Professor at the Yong Loo Lin Medical School, Duke-NUS Graduate Medical School, National University of Singapore and Lee Kong Chian School of Medicine, Nanyang Technological University. He is also the programme director of REACH (Response, Early interventions and Assessment in Community mental Health), a community based mental health programme.

Dr Fung is currently the Vice President of the International Association for Child and Adolescent Psychiatry and Allied Professions and Past President of the Asian Society of Child and Adolescent Psychiatry and Allied Professions. In addition, he is the President of the Singapore Association for Mental Health, an NGO that supports mentally ill persons and their families in the community. Dr Fung is also a member of the school board of Paya Lebar Methodist Girl's School.

He has been involved in over 10 national level funded research grants. He has co-authored over 70 peer reviewed research papers, 25 books and 9 book chapters.