1. **Theories of Intelligence**

Intelligence is defined in the Macquarie Concise Dictionary as the “capacity for understanding and for other forms of adaptive behaviour; aptitude in grasping truths, facts, meaning, etc” (1988:501). There have been discussions since the 1800’s concerning the structure of intelligence, with some researchers arguing for the concept of a unitary general intelligence, consisting of a number of subfactors, (eg. Spearman, 1904) while others have proposed that intelligence is not a single entity that can be measured but composed of a number of discrete abilities. (Gardner, 1983; Meeker and Meeker, 1993; Taylor, 1993)

A theory of intelligence that is also described as a definition of giftedness and is the only one listed as a separate topic in the DOE *Bright Futures Facilitators Manual* (1998) and therefore given more prominence than any other theory is that of Gardner’s Multiple Intelligences. (p. 38) This theory has been influential in Victorian (and Australian) schools, especially among practitioners of gifted education (Comerford, 2001, pers. comm; Gross, 2001; Morelock and Morrison, 1996; Vaille, 1995), with professional development twilight seminars organised by the DEET Gifted Education Section having a focus on Multiple Intelligences as recent as 26th February and 6th March 2002. (DEET, 2002)

The influence of the theory of Multiple Intelligences is in evidence at Smith St Primary school when teaching staff ask “what is he/she gifted in?” after being informed that a student achieved above the 95th percentile on a standardised intelligence test. However, when teaching the initial three students identified as gifted, the gifted coordinator did not use Multiple Intelligences as was instructed in the *Bright Futures* training. From her knowledge of gifted students she recognised that this was not appropriate so used the activities as added fun rather than in a structured program. (pers. comm)

Therefore the remaining discussion will focus on this theory as well as that of general intelligence $g$, as standardised intelligence tests are structures to measure $g$. (Raven, Raven, and Court, 1998a; Raven, Raven, and Court, 1998b; Kaufman and Lichtenberger, 2000)

1.1. **General Intelligence - Spearman**

From 1883, commencing with Francis Galton, experimenters in psychology have been conducting tests to determine the best method of determining what they called general intelligence. In his review of the work up to 1903 Spearman found that any positive correlations found by researchers between mental tests and independent measures (eg. school performance) were contradicted by other researchers. Spearman, in an examination of test methodology, concluded that, rather than there not being a thing called general intelligence, that the tests were inadequate to measure it. (Spearman, 1904) Using factor analysis on the early intelligence test intercorrelations, Spearman extracted the factor $g$ (general intelligence) (Borland, 1997:9)

Spearman theorised that $g$ was made up of two components: educative and reproductive ability.

Educative ability is the ability to forge new insights, the ability to discern meaning in confusion, the ability to perceive, and the ability to identify relationships. since perception is primarily a conceptual process, the essential feature of educative ability is the ability to generate new, largely non-verbal, concepts which make it possible to think clearly. (Raven; Raven, and Court, 1998a:SPM1)

Psychometric tests of intelligence for example the Stanford-Binet Intelligence Scale, Wechsler Scales and the Raven’s Progressive Matrices have been constructed with these definitions in mind.
and so are said to measure $g$ (Borland, 1997; Kline, 1993:172) Binet, who first developed the IQ test, however did not claim that it measured intelligence in totality. (Silverman, 1995) Silverman states that Binet “viewed intelligence as a rich, complex multifaceted gestalt - a myriad of dynamically interrelated abilities”. (1995:7)

The concept of general intelligence, comprising multiple contributing abilities is demonstrated when you look at an individual who excels in one area of endeavour who also has the potential to excel across the board. This is in contrast to multiple abilities which are independent of each other resulting in individuals who can excel in only one area. (Gross, MacLeod, Drummond and Merrick, 2001)

### 1.2. Multiple Intelligences - Gardner

Gardner did not agree with the concept of intelligence as measured by intelligence tests. His problem with them was that they measure only logical-linguistic capacities and that therefore society was brainwashed into a restricted view of intelligence, with no regard to cultural importance. (Gardner, 1993; Walters and Gardner, 1995) He does concede though that the score obtained from intelligence tests predicts the ability to achieve in school. (Gardner, 1993)

He states that “in a more traditional view, intelligence is defined operationally as the ability to answer items on tests of intelligence” (Walters and Gardner, 1995:55), whereas in the theory of Multiple Intelligences ‘an intelligence entails the ability to solve problems or fashion products that are of consequence in a particular cultural setting” (Walters and Gardner, 1995:55).

Gardner (1993) developed his theory of Multiple Intelligences by observing and working with adult patients suffering from brain damage. He observed that these patients could perform certain tasks and not others, depending on the area of the brain that had been damaged. From these observations he decided these different cognitive abilities operated as autonomous modules, with different areas of the brain responsible for different functions and functionally independently of each other.

Rather than calling these different abilities talents, he called them ‘intelligences’ to challenge the psychometricians and others who thought they knew the meaning of ‘intelligence’. (Gardner, 1993) While numerous practitioners and researchers disagree with his description of intelligences (for example: Delisle, 1996; Gross, 2001; Klein, 1997), supporters of his rejection of $g$ as defining intelligence disagree with his calling cognitive styles intelligences (Morgan, 1996). Morgan states that ‘cognitive style researchers ... do not identify their work as ‘intelligence theory’ because as in the case of MI (multiple intelligence) theory, it does not qualify as such” (1996:269)

Originally describing seven intelligences in 1993 (verbal-linguistic, logical-mathematical, visual-spatial, body-kinaesthetic, musical-rhythmic, inter-personal, intra-personal) by 1995 Gardner had added naturalistic intelligence (Klein, 1997), all of which operate independently and around which Gardner envisions specific educational programs to cater for these different ‘intelligences’ (1993).

Gardner’s theory has a very limited research base, no psychometric basis and inadequate empirical support for use in education. (Alsop, 2001; Gross, 2001; Klein, 1997) Provision in schools in Victoria often entails working with a grid with Gardner’s intelligences down one side and Bloom’s Taxonomy of thinking skills along the top. In the resulting boxes of the grid are activities derived from the corresponding ‘intelligence’ and thinking skill (for example: pers. comm. Comerford, 2000; DOE, 1996; Twilight Seminar for Gifted Education Term 1, 2002). In this way the teacher is able to choose the box that suits the child, who can then complete the specific activity. This then covers the specific ‘intelligence’ and level of thinking skill.
2. Theories of Giftedness

In a discussion conducted under the heading of “some definitions of giftedness” (DOE, 1996:4), the DOE states that: “early definitions essentially equated giftedness with intelligence (general intellectual ability)” (p.4)

This general factor of intelligence is described by the DOE in the *Bright Futures Resource Book* as “an inherent reasoning capacity - a superior ability to understand meanings, to make connections and to solve problems related to events in the world.” (1996:4) The discussion continues by stating: that “educators and psychologists now consider this definition of giftedness too restrictive in the way it reduces the diverse range of characteristics, skills; talents and abilities of a student to a single numerical *intelligence quotient* (IQ score) to be ranked against that of other students.” (DOE, 1996:4)

This conceptual leap equating general intelligence to giftedness, with no explanation, is hard to understand but does open the way for DEET to discard the concept of general intelligence and embrace definitions of giftedness as multiple characteristics that, depending on the theorist, either are necessary to interact to describe giftedness, or can be seen as one area of giftedness (United States Office of Education; Renzulli; Gardner and Tannenbaum, - all listed in by the DOE, 1996:4-6)

In 1996, the DOE decided on a broad definition of giftedness due to the range of definitions and the resulting difficulties arising when one is used in preference to another. (p. 8) This was reiterated in the DEET’s submission to the Senate inquiry in 2001:

> The Victorian Government recognises an inclusive definition of ‘giftedness’. This embraces and encourages excellence in all forms of intellectual, academic and creative endeavour and acknowledges that:
> - it is difficult to isolate a single definition of giftedness that encompasses the broad spectrum of human abilities and accounts for culture, class, gender and domain
> - generally, the types of definitions that have been proposed by researchers and education authorities move towards a broad concept of giftedness over a wide range of human endeavours
> - there are varying degrees of giftedness, not only in traditional academic areas but also in areas such as art, music, leadership and sport

(DEET, 2001:1-2)

DEET advised in its submission to the Senate Inquiry into the education of gifted and talented that its deliberate use of a broad definition of giftedness was ‘to ensure maximum *acceptance* and inclusion’, which the Senate Committee acknowledged was a political definition aimed at winning support for special provision for the gifted. (Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001b:26)

This lack of guidance in defining giftedness means that individual teachers in schools can make up their own mind about the meaning of gifted. This is even encouraged in the DOE *Facilitators Manual* (1998) which was written as part of the *Bright Futures Professional Development package*. It contains instructions on how to run the six, sixty to ninety minute sessions of professional development. This manual is intended to be used with the *Bright Futures Resource Book* (1996) and accompanying videos. During the first session, on identification of gifted students, the participants are instructed to discuss the “connections between the theory of Multiple Intelligences and particular students in class.” It goes on to say that:

> Many practitioners support the concept of Multiple Intelligences, but as many researchers and practitioners endorse a concept of general ability (known as ‘g’).
Discussion of the different ideas can help to clarify each participant’s position. (DOE, 1998:9)

Later in the same session the facilitators are instructed to advise the participants that “there are no ‘more right’ answers or models (of giftedness), but there are people who will identify with aspects of the different models” (DOE, 1998:9)

This lack of guidance is confirmed in the submission by DEET to the Senate inquiry:

The Victorian Gifted Education Professional Development Program encourages teachers and their school communities to workshop their beliefs and understandings around the education of gifted students and to reach a shared position from which to develop a whole school plan to provide for gifted students. (DEET, 2001:3)

The instruction by DEET that teachers make up their own minds as regards models and definitions of giftedness can lead to ad hoc provision which can vary from classroom to classroom and year to year. (pers. comm. DEET teachers’ gifted network coordinator)


2.1. Multiple Intelligences

The use of Multiple Intelligences theory for educational programming for gifted students does not provide for their needs and is generally discounted as a description of gifted individuals (Gross et al, 2001; Senate Employment, Workplace Relations, Small Business and Education References Committee, 2001b:21), with many experts in the field of gifted education stating that Multiple Intelligences theory has been embraced by teachers who wish to claim that every child is gifted and to deny the charge of elitism (Alsop, 2001; Delisle, 1996; Gross, 2001).

As a result of educators embracing this alternative way of viewing intelligence they have been distracted – some might say, relieved – from confronting the reality of the range of learning potential in their classrooms. It is easier to keep children busy designing a chook shed, writing a school song and forming the letter “A” with one’s body (all examples have been taken from a “multiple intelligences” curriculum guide) than it is to teach the bright-eyed fast learning child addition and subtraction of fractions, or an enriched vocabulary by which to express their understanding of their world. (Alsop, 2001:1)

Essentially, what is happening in the classroom is with the use of Multiple Intelligences talent development for all students rather that provision for the special needs of gifted students.

Interestingly, despite the continued encouragement by the DEET Gifted Education Section of the use of Gardner’s Multiple Intelligences as a form of provision for gifted students, and its emphasis in the Bright Futures training, the following statement from DEET’s submission to the Senate inquiry appears to indicate doubt as to its use.

Victorian teachers have found Howard Gardiner’s model of Multiple Intelligences useful in helping to vary approaches to teaching and learning. However, the widespread use of this model is not necessarily accompanied by an understanding of gifted education. Many teachers use the model in isolation believing that in so doing they are catering for gifted students. Simply applying this model does not ensure curriculum is appropriately challenging and may mask possible areas of underachievement or learning disability in a gifted student. (DEET, 2001:5)
Multiple Intelligences theory does not describe the whole gifted individual and does not explain to their family and themselves why they are who they are.

Talent developers and multiple intelligence fans, in their quest for a new and simpler conception of giftedness, have ignored two important elements in their equation: the developmental nature of giftedness, and the fact that giftedness is someone you are, not something you do. Essentially, talent development and multiple intelligences lack two features that are the vital aspects of every gifted person I’ve ever met: heart and depth. (Delisle, 1996:13)

2.2. Asynchronous Development

Giftedness is characterised in early childhood by advanced development. (Gross, 1993; Harrison, 1999; Porter, 1999) This is usually observed by the early attainment of developmental milestones such as early talking and walking. Often there is also a preference for play with older children. (Altman, 1983; Gross, 1993; GERRIC, 2002)

Numerous authors have reported on the unevenness in rates of gifted individuals physical and mental development. (for example: Gross, 1993; Morelock and Morrison, 1996; Terrassier, 1985)

One of the definitions of gifted children discussed in the Bright Futures training program was asynchronous development. The presenter for this discussion on video was Martha Morelock who first reported on the proceedings of a meeting of practitioners, theorists and parents where a comprehensive description of giftedness that describes the whole person was proposed. (Morelock, 1992; Silverman, 1992)

Giftedness is asynchronous development in which advanced cognitive abilities and heightened intensity combine to create inner experiences and awareness that are qualitatively different from the norm. This asynchrony increases with higher intellectual capacity. The uniqueness of the gifted renders them particularly vulnerable and requires modifications in parenting, teaching and counseling in order for them to develop optimally. (The Columbus Group, 1991 in Morelock, 1992:14)

Simply, a gifted child displays this internal asynchrony when one minute it is possible to have an adult level conversation and soon after a tantrum is thrown if all is not going as desired. Physically, this asynchrony can be seen in a child whose mind can conceive a beautiful picture but whose fine motor skills are only able to come with the roughest drawing.

2.3. Proportion of the population recognised as gifted

The proportion of the population that is deemed gifted has altered over the years, with Terman defining those in the top 1% and Gagne suggesting the top 15%. Gross has classified gifted individuals according to degrees of giftedness, ranging from 16.6% of the population to less than 0.0001% (Gross et al, 2001; The Gifted Education Research, Resource and Information Centre’s (GERRIC) submission to The Senate Employment, Workplace Relations, Small Business and Education and References Committee 2001, p.15)
<table>
<thead>
<tr>
<th>Levels of Giftedness</th>
<th>IQ Range</th>
<th>Percentage in the Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>mildly or basically gifted</td>
<td>115-129</td>
<td>16.6% to 2.3%</td>
</tr>
<tr>
<td>moderately gifted</td>
<td>130-144</td>
<td>2.3% to 0.1%</td>
</tr>
<tr>
<td>highly gifted</td>
<td>145-159</td>
<td>0.1% to 0.01%</td>
</tr>
<tr>
<td>exceptionally gifted</td>
<td>160-179</td>
<td>0.01% to 0.0001%</td>
</tr>
<tr>
<td>profoundly gifted</td>
<td>180+</td>
<td>&lt; 0.0001%</td>
</tr>
</tbody>
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Table 1. Incidence of giftedness in the population. (adapted from The Gifted Education Research, Resource and Information Centre’s (GERRIC) submission to The Senate Employment, Workplace Relations, Small Business and Education and References Committee 2001, p.15)