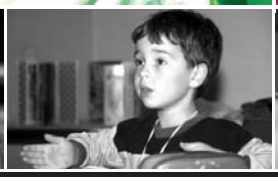
GIFTED AND TALENTED EDUCATION

PROFESSIONAL DEVELOPMENT PACKAGE FOR TEACHERS

Module 4

Early Childhood



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Welcome!

You are about to start a Professional Development Course which will help you identify the gifted and talented students in your class or your school, and differentiate the curriculum to respond to their individual learning needs. You'll also be able to decide which of your students may benefit from various forms of ability or interest grouping and which may possibly be candidates for one or more of the many forms of academic acceleration.

About the Package

The course consists of six Modules

Each Module consists of three levels: Core, Extension and Specialisation. The Core levels of the six Modules are the heart of this course. The Core Modules contain essential information and practical advice and strategies to assist you to identify and respond to your gifted and talented students.

We strongly suggest that you complete the Core level of each Module.

Pre-tests

We are aware that teachers and school administrators will enter this course with a wide range of existing knowledge of gifted and talented education. To accommodate this range of knowledge and experience, we have started each Core Module, from Module 2 onwards, with a pre-test. We encourage you to take these pre-tests and, if you 'test out' on any Module at Core level, simply move on to the next Module. For example, if you 'test out' of Core Module 2 you will pass over that Module and move on to Core Module 3.

Extension and Specialisation Levels

Extension and Specialisation levels for each Module. Material covered in the Extension and Specialisation levels builds on the knowledge you will have gained from the Core level in each Module. Key issues are examined in greater depth and participants explore a wider range of issues in the cognitive and social-emotional development of gifted students. New identification, curriculum differentiation and program development techniques are introduced.

The Extension and Specialisation levels require teachers, counsellors and administrators to undertake further reading and practical activities to reflect on classroom practice, school practice and policy. They encourage participants to focus on their specific role in the school and prepare a brief action plan to demonstrate application or mastery of outcomes.

Schools may decide that completion of the course at Specialisation level would be a useful prerequisite for becoming the school's Gifted Education Coordinator.

What will you learn in this course?

The course consists of six Modules:

Module One: Understanding Giftedness

Understanding the nature of giftedness and talent; what the terms mean; levels and types of giftedness. Cognitive and affective characteristics of gifted and talented students; ways in which these students may differ from their classmates - even if at first we don't observe this.

Module Two: The Identification of Gifted Students

A range of practical identification procedures, with particular attention to procedures which are effective in identifying gifted students from culturally diverse and disadvantaged groups. We'll be emphasising the use of a combination of approaches rather than a single measure such as IQ testing or teacher nomination used in isolation.

Module Three: Social and Emotional Development of Gifted Students

Understanding the social and emotional characteristics and needs of gifted students. Ways in which gifted students may differ somewhat from their classmates in their social and emotional development. Supporting gifted students and their parents. Teaching strategies and class structures which foster the development of positive social attitudes and supportive peer relationships in gifted students.

Module Four: Understanding Underachievement in Gifted Students

Understanding the causes of underachievement in gifted students. Identifying gifted underachievers and planning interventions designed to prevent and reverse cycles of underachievement.

Module Five: Curriculum Differentiation for Gifted Students

Teaching strategies and methods of curriculum differentiation which enhance the learning of gifted students in the regular classroom. Appropriate use of different enrichment models that international research has found to be effective with gifted and talented students. Practical applications of pre-testing, curriculum compacting and individualised programming.

Module Six: Developing Programs and Provisions for Gifted Students

Practical strategies for the establishment and monitoring of ability, achievement or interest grouping, and the many forms of accelerated progression. Particular attention will be paid to the effects of various strategies on students' academic and social development.

Using the package

Much of the material is suitable across teaching and learning contexts. This content is not specifically marked. However, content that may be applicable to your particular context is identified as follows:

Role	Classroom Teacher 	Executive Staff 	Principal 
Location	Urban 	Rural 	
Mode	Self Study 	Small Group 	Whole Staff 

Follow these symbols through the content to customise your learning path.

Each Module comes in two parts, each concluding with a practical exercise. We suggest that you complete the first and second parts a few days apart - unless this is not workable in your particular learning context. This will give you a chance to digest the information in Part 1 and work through the Reflective/Practical component.

Core Module 4:
Understanding Underachievement

Contents

Module 4

Understanding Underachievement in Gifted Students

Welcome to our Module on understanding why academically gifted children may underachieve in schools.

Gifted students are amongst our greatest academic underachievers but are often unrecognised as being either academically gifted or underachievers.

Students gifted in other domains, such as sport or music, often do not experience the same problems that can lead to underachievement in the academically gifted. Consequently, this Module will specifically examine academic underachievement amongst gifted students, with the aim of helping you develop a meaningful understanding of this challenging issue.

Pre-Test

1. What do you understand by the term ‘invisible’ underachiever?
2. What are some of the main causes of academic underachievement in gifted students?
3. Why are gifted academic underachievers sometimes hard to identify?
4. Gagné’s Differentiated Model of Giftedness and Talent provides an excellent mechanism for understanding underachievement. Why?

1. 'Invisible' underachievers are very difficult to identify, although you may have a suspicion that they are much more capable than their class performance indicates. They underperform on measures meant to identify their potential. These students occur in all sections of society but are more common in culturally diverse and low socio-economic status (SES) groups.
2. There are numerous reasons. Some of these are specific learning difficulties, low self-efficacy toward academic learning, dysfunctional perfectionism and the forced-choice dilemma. There are many more.
3. There are a number of issues implicated here. Underperformance in the classroom is a major factor. However, these students often have their gifts and talents masked, both intentionally or by uncontrolled factors such as specific learning difficulties or boredom resulting from inappropriate work.
4. Underachievement is clearly conceptualised in the Gagné model. By using the term 'gifts' to mean potential and 'talent' to mean performance, Gagné provides a simple understanding of underachievement. Gifts that do not develop into talents represent underachievement. The inclusion in the Gagné model of 'catalysts', that enable gifts to develop into talents, provides a mechanism to explain how underachievement occurs. Too few positive catalysts, or too many negative factors, will inhibit the conversion of gifts to talents.

Outcomes

At the completion of this Module you will:

- understand that appropriate definitions of underachievement are necessary if we are to recognise gifted academic underachievers in our classrooms.
- be aware of some of the causes of underachievement in gifted students.
- understand that academic underachievement is common in gifted students and often hard to identify, especially in those from some cultural minorities and low socio-economic status groups.
- understand that the characteristics and behaviours of academically gifted underachievers may provide clues to aid their identification.

Who are the academically gifted underachievers?

Defining underachievement - A rationale

There are important reasons why you must have a clear understanding of just who the gifted underachievers are in your classrooms:

- The definition of underachievement chosen will determine who is recognised as an underachiever, and consequently, who receives appropriate provision.
- Once gifted underachievers are recognised, teachers' expectations of these students are often shifted upwards. Research strongly links improved academic performance of underachieving students with higher teacher expectations.

It is, therefore, crucial that academically underachieving gifted students are recognised. Appropriate definitions are fundamental to this process.

Commonly used definitions

- In general terms, underachievement is widely recognised as a discrepancy between potential and performance (Reis & McCoach, 2000).
- One of the most useful and commonly cited definitions of underachievement is that of Whitmore:

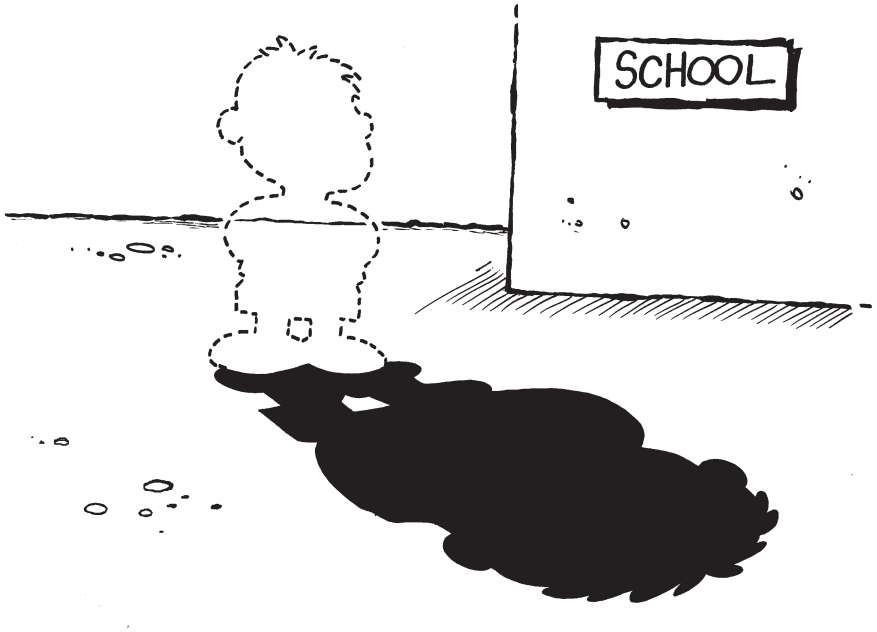
  'Underachievement has been simply defined as school performance judged to be significantly below the level expected, based on some reliable evidence of potential for higher achievement' (Whitmore, 1987, p. 1).

Underachievement is widely recognised as a substantial discrepancy between potential and performance.

‘Invisible’ underachievers

However, there are problems with the definitions of underachievement presented above.

- How do we effectively determine **potential** for higher achievement?
- What of the child who underperforms on an IQ test or other usually reliable measures? For some students, the very factors that lead to their performing below potential in the classroom can also lead to their performing below potential on standardised identification measures, such as IQ tests.
- Hence the dilemma: below potential academic performance both in the classroom and on usually reliable measures will not result in the child being identified as a gifted academic underachiever if these commonly used definitions are followed. We need a definition to account for such students and thus recognise this form of difficult-to-detect underachievement.



These students are ‘invisible’ underachievers (Chaffey, Bailey & Vine, 2003). That is, they underperform both in the classroom and on commonly used evidence of potential for higher achievement.

‘Invisible’ gifted underachievers exist in all sections of society but are more likely to be found in culturally diverse and low SES populations. We will investigate the issues contributing to both forms of underachievement later in this Module.

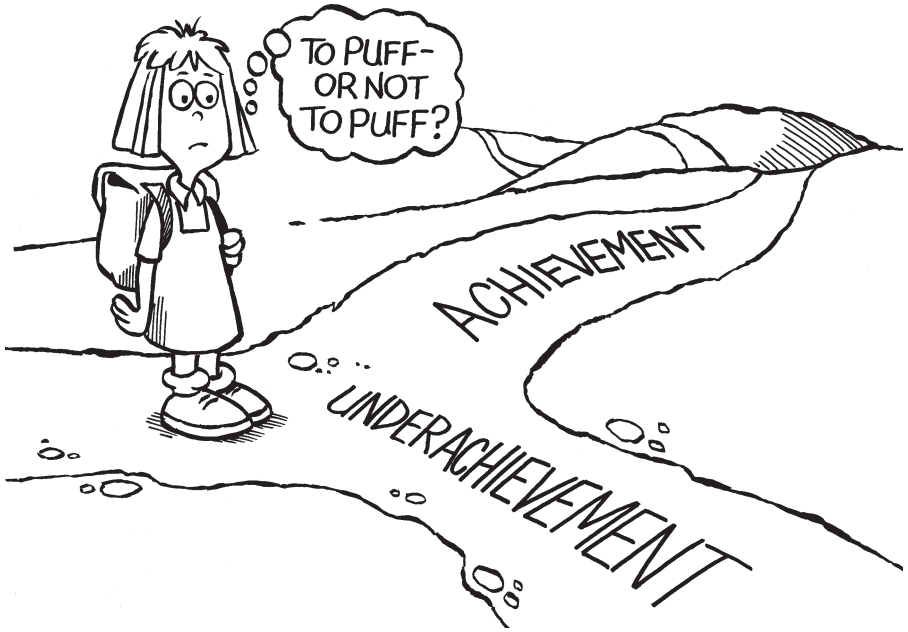
Invisible underachievers have been described as ‘shadows in the mist’. That is, faint outlines of their high academic potential become apparent from time to time but it is extremely difficult to identify them conclusively.

Gagné's model and underachievement

In Module 1 you learned about Gagné's model of giftedness and talent. One of the major advantages of the Gagné model is that it clearly conceptualises underachievement. This understanding is possible due to the differentiation of the terms 'gifted' and 'talented'.

CASESTUDY

For example, Kate is academically gifted (high academic potential), having been assessed in the 98th percentile band using a standardised (IQ) test. This outcome surprises her teacher. However, her academic talent (performance) places her mid-class in most subjects, including maths and English. Kate is a gifted academic underachiever.



The Gagné model provides an eloquent mechanism to explain how underachievement arises: if the catalysts necessary to convert potential to performance are absent, negative or weak it is highly likely that gifts will not fully develop into equivalent levels of performance, ie talents.

Important factors thought to contribute to academic underachievement

Academic underachievement has many causes. It may be the result of a single factor or a combination of factors. In this section we discuss some of the major contributors to academic underachievement.

Gagné's gifts and talents - another view

Using the Gagné definitions of giftedness and talent it is possible to demonstrate that academic underachievement may result from two basic processes:

- Underachievement may occur when gifts are not effectively developed into talents.
- Talents may emerge that adequately reflect a child's level of giftedness; however, these talents may not be expressed consistently in the classroom setting.

For example, Hamish, a Year 5 student, has demonstrated his academic talents in a number of ways, including exceptional outcomes in national competitions in maths and science. However, in the classroom setting he is fearful of standing out and being called a 'nerd', or worse. Hamish rarely achieves highly in this setting and is placed about mid-class in terms of academic performance by his teacher.

Important factors that inhibit the development of gifts or the expression of talents

Important factors that can contribute to the academic underachievement of gifted students are outlined in this section. While these issues are presented in isolation it is important to note that there are often strong connections between them. A fuller understanding of these factors will be developed in the Extension and Specialisation levels of Module 4.

In order to give a practical focus to the issue of developing gifts and expressing talents, a table of some do's and don't's is presented at the end of this section.

Low academic self-efficacy

Self-efficacy is defined by Bandura (1986, p. 391) as 'people's judgements of their capabilities to organise and execute courses of action required to attain designated types of performance.' Put simply, it is your **self-belief** that you can plan and successfully complete a given task.

Possessing a low self-efficacy toward academic learning has the potential not only to inhibit the transition of academic giftedness to talent but also to mask giftedness and talent.

An individuals' level of self-efficacy toward a given task will determine:

- whether coping behaviour will be initiated - ie how likely they are to attempt something,
- how much effort will be expended - ie how high their motivation for that task will be,
- how long task engagement will be sustained in the face of obstacles and difficulties - ie, how resilient they are (Bandura, 1977).

At worst a student with low academic self-efficacy will choose not to try, or to put in minimal effort, for fear of failing - or, in the case of gifted students, for fear of not being able to live up to others' high expectations of them. Such students give up quickly when difficulties arise and are likely not to be identified as gifted.

Major contributors to self-efficacy are thought to be **mastery** - being able to complete a task successfully yourself - and **vicarious experience** - seeing someone similar to yourself able to complete a task successfully (Bandura, 1977). The vicarious experience provided by mentors, like-ability peers and other role models can provide the impetus for an otherwise reluctant student to attempt a task: a necessary first step if mastery is to be attained.

In their pre-school years some students experience few positive vicarious experiences toward academic learning and are rarely exposed to tasks that may encourage early mastery. As self-efficacy is strongly influenced by vicarious experience and mastery it is highly likely that these students will begin their first day of school with a below average self-efficacy toward academic learning.

CASESTUDY

For example, Brian's father works as a retail assistant in a local store and his mother is fully occupied caring for five children. Both his mum and dad left school at the earliest possible opportunity, suffered negative school experiences and have little enthusiasm for, or trust in, the school system. No one in Brian's immediate family has successfully completed tertiary education and he has rarely experienced the company of adults who have done so. His parents seldom read and books are rare in the household. Brian has never experienced home activities that are directed toward learning to count or read. Brian is going to begin his school career next week.

Even though students from all sections of our society can experience low self-efficacy toward academic learning, it is more likely to be present in those from culturally diverse and low socio-economic status backgrounds.

The forced-choice dilemma

The forced-choice dilemma (Gross, 1989), in which a student feels he has to choose between group acceptance and achievement, can be a major contributing factor to the academic underachievement of many gifted students. It is particularly powerful for students from social or cultural groups that have historically experienced poor educational outcomes.

Double-labelled students

Gifted students who also have a specific learning disability, a physical impairment, autism, Asperger's Syndrome, Attention Deficit Disorder, Attention Deficit Hyperactivity Disorder, otitis media, or anything else which impairs their performance and masks their high potential, may experience extreme difficulty in developing their giftedness into talent. For an excellent coverage of this see Yewchuk and Lupart (1993) or Davis and Rimm (2004). A useful website on this topic is http://ericec.org/

Perfectionism

Gifted students exhibit perfectionism at higher rates than in the general population. Research in the USA suggests that as many as 50% of the general population may show perfectionist tendencies. However, the proportion in gifted students may be as high as 70% (Ablard & Parker, 1997) or even 90% (Davis & Rimm, 2004).

Perfectionism may have positive or negative outcomes. For most, this is a positive characteristic which may produce high motivation and excellent outcomes. Such students are termed **healthy perfectionists**. For some gifted students, though, their perfectionism is dysfunctional (found to be about 26% of the gifted students in the Ablard and Parker study) and can be a major contributor to underachievement. In its worst form, **dysfunctional perfectionism** can lead to paralysis of effort, because of the student's fear of failure.

Indicators that a student may be affected by dysfunctional perfectionism include:

- being fearful of making mistakes,
- being very anxious about schoolwork,
- being overly precise,
- constantly seeking approval or reassurance,
- being excessively self-critical,
- handing work in late (or not at all),
- expressing feelings of being inadequate with respect to academic ability, and
- in the worst cases, becoming 'frozen' and unable/unwilling to attempt academic tasks.

'Perfectionism becomes a clinical concern only when it prohibits gifted students from appreciating their competency or the adequacy of their work' (Baker, 1996, p. 365).

Boredom

Gifted students who are presented with academic work below their knowledge and skill levels, or at too slow a pace, will quickly become bored. All students need to work in their 'flow' zone (as discussed at the end of Module 3) if they are to maximise learning outcomes. Students who are unrecognised as being academically gifted are especially vulnerable, as behaviours arising from boredom may be interpreted as behavioural problems, rather than those of a bored gifted child.

Dominant visual-spatial learners

Visual-spatial learners are said to think holistically, often divergently, and in 'pictures'. However, they can struggle with the task of putting images into words, which is vital for classroom achievement (Freed, 1996). In classrooms, where the auditory-sequential learning style is largely used, gifted visual-spatial learners may quickly become frustrated and disengaged, resulting in low academic self-efficacy, underachievement and oppositional behaviours.

Metacognition and cognitive inefficiency

Metacognition, usually described as awareness of, and thinking about, your thinking processes, has two aspects: metacognitive knowledge (what one knows about cognition) and metacognitive control (what one does to regulate cognition).

Metacognitive knowledge includes:

- declarative knowledge: knowledge about one's skills, intellectual resources, and abilities as a learner
- procedural knowledge: knowledge about how to implement learning procedures (eg strategies)
- conditional knowledge: knowledge about when and why to use learning procedures.

Metacognitive control includes:

- planning: planning, goal setting, and allocating resources prior to learning
- monitoring: assessment of one's learning or strategy use
- evaluation: analysis of performance and strategy effectiveness after a learning episode (Schraw & Graham, 1997).

Metacognitive control may be as simple as knowing it is important to take your time (rather than being overly impulsive) when undertaking a task, while metacognitive knowledge includes awareness of the elements of creative and critical thinking, or problem solving strategies. There is evidence that such skills are teachable and that their acquisition leads to an enhanced sense of self-efficacy in students.

When students disengage from classroom learning for long periods their metacognitive skills may develop poorly and their cognitive efficiency (ie their ability to make full use of their intellectual potential) may be impaired. These students may present as less able than their actual level of giftedness, and are likely to underachieve because of their own and their teachers' lower expectations.

Masking academic giftedness and talent

Factors that inhibit the development of gifts or the expression of talents can also mask gifts and talents. That is, these factors can effectively prevent teachers from realising that students experiencing them are gifted and talented.

For example, specific learning disabilities, dominant visual-spatial learning style and low self-efficacy may heavily mask potential giftedness. On the other hand dysfunctional perfectionism, boredom and the forced-choice dilemma may cause gifted children with well-developed academic talents to appear far less able than they really are.

One very understandable, but undesirable, outcome of the unrecognised masking of gifts and talents is that teachers may develop unrealistically low expectations of a student's academic potential and abilities.

The gifted Aboriginal child and underachievement

Academically gifted Aboriginal students are underrepresented in virtually all types of gifted education provision. However, academically gifted Aboriginal students exist in our schools in the same proportions as students from other community groups (Chaffey, Bailey & Vine, 2003). Unfortunately these students are not always recognised as gifted, as their academic gifts and talents are often heavily masked.

Gifted Aboriginal students may underachieve for the same reasons as any student in our schools. However, Aboriginal students are likely to experience two underachievement factors more strongly than do most other students: the forced-choice dilemma and low academic self-efficacy.

Many Aboriginal students experience a powerful forced-choice dilemma regarding academic learning. This is largely a consequence of the not-so-distant past when Aboriginal people often experienced less than optimal education conditions, leading to a lack of trust in, and oppositional attitudes toward, education.

Gifted Aboriginal students often present differently from the stereotypical gifted child. Consider the case of Adam, an academically gifted Indigenous boy, aged 9:

Adam is a handsome boy who is gifted and talented both artistically and athletically. In class his teacher thinks he is 'about average' but capable of better. Adam often helps his less able mates in class, but is easily distracted by these same mates. He rarely stands out as better than his mates in school work. Adam also rarely hands in homework to his teacher, but often does it at home. Adam scored in the bottom bands in the NSW Year 3 Basic Skills Tests in literacy and numeracy, a result his teacher could not understand. She commented that 'he is much better than that'. Weaknesses in Adam's fundamental literacy and numeracy skills are evident. When Adam was assessed using the Coolabah Dynamic Assessment method he scored at the 21st percentile band in the Pretest but, following the intervention phase, his score jumped dramatically at posttest to the 91st percentile band. Adam is a gifted 'invisible' underachiever (Chaffey, 2002).

Low self-efficacy toward academic learning has been associated with Indigenous peoples worldwide and is thought to be the result of long-term educational disadvantage (Ogbu, 1994). This issue will be discussed further in the Extension level of Module 4, while the Coolabah Dynamic Assessment method will be explored in the Specialisation level of Module 4.

At the end of this Module you will find a copy of the Chaffey et al article, should you wish to read it in full.

'Achieving' underachievers

One of the major difficulties in identifying academically gifted children is that they may be achieving in class at levels that appear quite satisfactory. However, strong average or even above average classroom performances can still represent significant underachievement for academically gifted children.

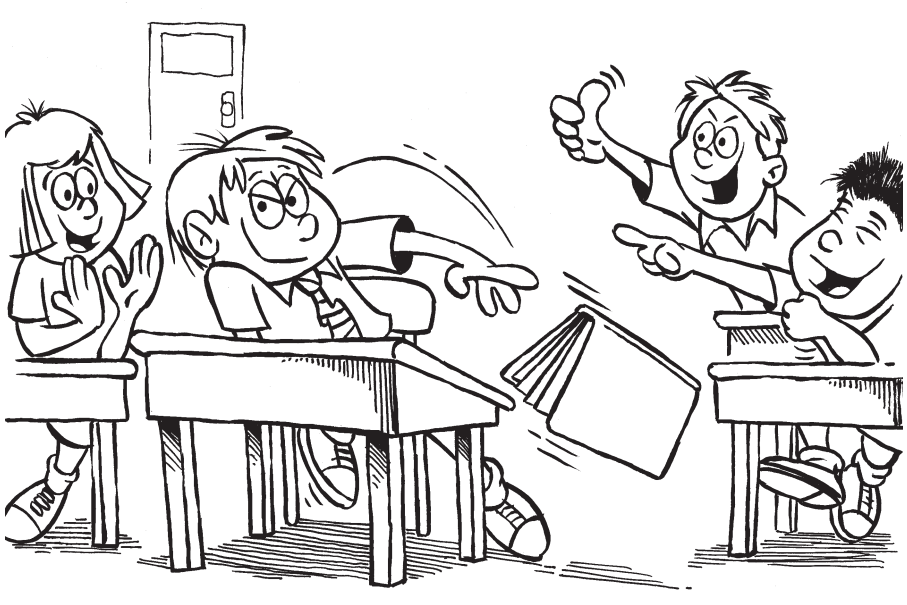
For example, Julia is consistently performing in the top 10 in her class of 30, although usually near the lower end of this group. Julia is a very quiet child who was previously assessed in the 98th percentile band on a standardised IQ test. Although solid, her classroom performance represents a major underachievement when compared to her previously assessed intellectual potential.

In another example, research-based this time, case studies of eight Indigenous children (ages 8-11) identified as having high academic potential revealed just this situation. Seven of the eight students were performing academically at about an average level in their class. Only one, Kate, was performing in class at the level suggested by her intellectual potential. Kate's teacher recognised her academic giftedness (96th percentile band) and was working hard to see that potential fulfilled. Although the other teachers all acknowledged that their student could probably do better, all were surprised by their student's assessed potential when shown the results of testing (Chaffey, 2002).

Can you suggest why seven of these eight students were performing academically at about the middle of the class?

Teacher expectation can be a victim of masking factors

Many of the factors that contribute to academic underachievement may also act to mask giftedness or talent. It is a simple task to understand why teachers may not recognise gifts or talents that are heavily masked.



Consider the case of Ruby

Ruby is a Year 3 girl who simply refuses to engage in most forms of maths. When maths tasks are presented Ruby quickly 'tunes out'. No amount of persuasion or threat changes this behaviour. When pushed she becomes aggressive. Mr Jones, her teacher, has given up trying to involve Ruby in maths lessons.

How would you interpret this behaviour? Here is some more information: Ruby has a very low self-efficacy toward maths. Her level of potential in maths is heavily masked due to her non-engagement, a strong indicator of low self-efficacy. Might she be academically gifted in maths? Ruby could be a similarly disengaged Year 1 or Year 8 student.

Research (eg Brophy, 1983) strongly supports the view that high teacher expectations can positively influence the academic achievement of students in our schools. This is especially so for underachieving students. Conversely, it is self-evident that if a teacher holds low expectations for students and has 'given up' with respect to their academic achievement, then the negative impact may be substantial.

Reflective/Practical Component

Think of any students you have taught who you now feel may have been 'invisible' underachievers. What were their behavioural and personality characteristics?

Identifying gifted underachievers

Identifying gifted underachievers is a crucial and challenging task. The use of appropriate definitions (discussed in Part 1 of this Module) is a necessary first step. However, appropriate identification methods are also essential if we are to effectively find gifted underachievers, including invisible underachievers.

As was discussed at the beginning of this Module, academic underachievement may be revealed if a student scores highly on a standardised test or some other usually reliable identification method(s). We have discussed the most commonly used identification methods in Module 2: **Identification**.

'Invisible' underachievers are very difficult to identify using the commonly recommended methods. Dynamic testing adds a new dimension to the task of identifying of gifted culturally diverse and low SES students. Dynamic testing is designed to 'get behind' the masks that prevent many gifted students from demonstrating their high academic potential and talents. Details of an Australian dynamic testing method, Coolabah Dynamic Assessment, will be presented in the Specialisation level of this Module.

It is worth noting that teacher-centred, subjective methods may be less effective for identifying gifted underachievers and this is especially so for students from culturally diverse or low SES backgrounds (Chaffey, Bailey & Vine, 2003). The masking of academic giftedness and of the expression of talents makes it most difficult for teachers to recognise gifted underachievers.

The terms 'invisible underachiever' and 'shadows in the mist' are well chosen as they highlight the nature of the challenge that classroom teachers face.

Profiles of gifted and talented students

A useful way to understand better the behaviours, feelings and needs of the gifted has been presented by Betts and Neihart (1988), in the form of six different profiles of gifted and talented students. These are particularly useful for understanding gifted underachievers.

The profiles are presented in the form of a matrix and provide information on most aspects of the gifted child's life, including suggestions for identification. (Note that dynamic testing does not appear in their paper as an identification option as this method has only recently been developed, researched and applied.) A brief description of the six profiles follows:

Type 1: Successful

Type 1 students are bright, motivated achievers. However, their motivation may be directed mainly towards teacher acceptance rather than towards the full development of their high abilities.

- Well behaved, conformist, achieves in schoolwork; seeks approval from teachers and other adults
- Neat, tidy in bookwork; may be perfectionist
- Seeks order and structure; likes clear instructions
- Does not take risks; may 'achieve' - but at levels significantly below their true ability - at university or in adult life.

Type 2: Challenging

Teachers often fail to recognise challengers as gifted. These students feel frustrated because the school system does not recognise their high abilities. They may be bored, angry and resentful and they may 'take it out' on their teachers and other students. Unfortunately this further decreases the likelihood of their being identified as gifted by teachers who associate giftedness with Type 1 behaviours!

- Can be obstinate, tactless and sarcastic
- Questions and challenges authority
- Can be rude, arrogant; unpopular with peers but sometimes buys acceptance as class clown
- Does not 'suffer fools gladly'.

Type 3: Underground

These students have responded to the 'forced-choice dilemma' - the choice between excelling academically and being accepted by the peer group - by choosing peer acceptance. Unfortunately they may then become afraid that they will lose this acceptance if they drop their camouflage.

- Conceals ability for peer acceptance
- Strong belonging needs
- May be insecure and anxious
- May feel guilty for denying their gifts.

Type 4: Dropouts

'Dropouts' have not necessarily dropped out of school. They may be physically present in the classroom but intellectually and emotionally quite divorced from what is going on in it. They are angry with adults and with themselves because the system has not met their needs and they feel rejected. They may express this resentment through withdrawing into themselves and refusing to participate **or** by acting out and responding defensively.

- Can be depressed and withdrawn **or** angry and defensive
- Interests may lie outside curriculum and are not valued by teachers or classmates
- Extremely low self-esteem; low performance.

Type 5: Double labelled (now often called 'twice exceptional')

These are gifted students who also have a physical or emotional disability or a learning disability - for example, a gifted student who is also hearing impaired or visually impaired, a gifted student with Asperger's Syndrome or a gifted student who has a specific learning disability. These students are doubly disadvantaged as frequently the school focuses only on the disability and ignores the gift.

- Gifted students who are physically or emotionally disabled or with specific learning disabilities
- May display disruptive behaviours through frustration
- May be confused about their ability to perform
- **Very** frustrated when teachers ignore their gifts and focus only on their disabilities.

Type 6: Autonomous learners

These gifted students have learned how to work effectively in the school system. They are academically successful, they have strong, positive self-concepts and they are able to work cooperatively with teachers to design their personal learning goals. They are liked and admired by staff and students and often serve in some leadership capacity within the school.

- They use the system to succeed. They are confident enough to express their needs but they do so in ways that teachers and peers will accept
- They are independent and self-directed
- They don't wait for others to do things for them
- They are respected and liked by teachers and peers.

Ironically, autonomous learners are rewarded by the system for being what the system wants! However, all gifted students should be assisted to become autonomous learners. Betts and Neihart's article includes school and home support strategies which we can use with students from each of the first five groups to assist them to develop these skills.

The Betts and Neihart article, 'Profiles of the gifted and talented', appears at the end of this Module. The profile matrices for each type are on pages 449-450 of the article.

We don't suggest that you read the whole article at this stage (although you may want to later - it contains a lot of useful and practical information).

However, briefly review the profile matrices now and reread the brief descriptors of the six types which we have given above.

- Although invisible underachievers are not mentioned in the Betts and Neihart profiles, can you suggest where they may fit? Discuss this with colleagues, if completing this Module in a small or large group.
- Use Betts and Neihart's matrix to identify possible Types 1 - 5 underachievers in your classroom or school. Discuss these with colleagues, if completing this Module in a small or large group.

Working with the gifted underachiever: Some do's and don't's

In this Module several major causes of, and factors associated with, underachievement have been discussed, to establish an understanding of the basis of underachievement. In the table below some fundamental do's and don't's with respect to each issue are summarised briefly, along with some recommendations for further reading should you wish to extend your knowledge of particular issues.

Underachievement Factor	Some Do's	Some Don't's
Low self-efficacy A useful source of information on this topic is Bandura (1977).	• Engage the student in mastery activities. Begin at a much lower level of difficulty than the student's potential may appear to warrant. • Provide academic role models the student can relate to. • Maintain high expectations even when the student appears disengaged. Your high expectations are crucial. • Realise that these students will give up quickly and need your support to reach mastery. • Provide performance feedback and praise following mastery.	• Don't give up when the student refuses to engage in mastery activities. Provide all the necessary scaffolding for mastery. • Don't start these students at difficulty levels that appear to suit their level of giftedness. • Don't give unearned praise.

Forced-choice dilemma A useful source of information on this topic is Gross (1989).	• Meaningfully include the student's family in the educational process. See, for example, Sylvia Rimm's TRIFOCAL Model for dealing with underachievement (Davis & Rimm, 2004). • Encourage a culture of acceptance of academic achievement as a positive thing. • Provide role models who achieve academically as well as in physical or creative domains, such as sport or art. • Provide gifted students with mentors and counselling to help them understand their giftedness. • Understand that many at-risk students will come from communities where a forced-choice dilemma concerning education is common.	• Don't make the student stand out when a forced-choice dilemma is obvious. • Don't highlight achievement in non-academic areas at the expense of academic excellence. • Don't try to solve the problem by separating individuals from their community or peers.
Undiagnosed specific learning disability **Diagnosed specific learning disability**	• Be aware that specific learning disabilities can be powerful masks of giftedness and talent. • Have students assessed for specific learning disabilities if you suspect they are gifted or 'clever' but are substantially underachieving for no obvious reason. • Liaise closely with their families about students' condition and how to optimise their learning outcomes. • Seek specialist advice on the best way to facilitate the particular student's learning. • Show the student that you hold high expectations for his schooling. • Help the student's classmates to understand the problem.	• Don't take students' abilities at face value. • Don't take students' abilities at face value.

Dysfunctional perfectionism A useful source of information on this topic is Silverman (1999).	• Realise that perfectionism can have very positive outcomes and is only a problem when it leads to a student failing to appreciate her own competency or adequacy. • Allow the student to experience failure in a way that is non-threatening, eg in some non-academic activity. • Encourage the student to experiment and treat unsuccessful outcomes as simply a learning experience. • Encourage the student to engage in tasks that can only be done in small steps, eg learning to play a musical instrument. • Use bibliotherapy (see below) to assist the student to grow in a socio-emotional sense and to become aware that other gifted people exist and have similar challenges. Bibliotherapy involves using book characters (fiction or non-fiction) to enable students to compare themselves vicariously (and therefore in a less confronting way) with others who may have had similar feelings, problems and experiences. Teachers can invite students to reflect on and discuss characters' actions and their consequences, as a means of gaining insights into their own behaviour. A useful source of information on bibliotherapy is Colangelo (2003).	• Don't expect too much from the student simply because she is academically gifted.

Boredom	• Be aware that some students may claim to be bored as a mask to hide stresses such as a fear of failure. • Be aware that a lack of engagement or poor behaviour may reflect genuine boredom. • In 'invisible' underachievers expressions of boredom can easily be misinterpreted as poor behaviour, because of their unrecognised academic potential. Do investigate further. • Provide tasks whose difficulty level matches the student's ability level. • Use open-ended tasks to allow the student to extend herself. • Allow the student to pick his own areas of interest.	• Don't expect a gifted student to be enthusiastic about lessons that contain tasks he mastered long ago.
Dominant visual-spatial (VS) learners A useful source of information on this topic is Silverman's website.	• Realise that visual-spatial learners learn holistically rather than step by step. • Realise that most current educational practices utilise a step by step approach, thus disadvantaging the VS learner and increasing the likelihood of underachievement. • Establish close liaison with the student's parents. • Help the student realise she is quite normal but has a different learning style. • Group VS learners together where possible. • Use hands-on and visual approaches. • Use computers. • Provide tasks that require creativity.	• Don't use rote memorisation and drill. • Don't expect timed tests to produce valid outcomes. • Don't stress the student's weaknesses, such as poor handwriting.

Gifted academic underachievers - consider this scenario

A scenario is presented for your consideration. It describes a possible case of underachievement and requires your suggested action plan. (If you have time when you have completed the scenario best suited to your situation you may be interested to skim read, or even consider in detail, the equivalent case study scenario in primary.)

After you have considered your response - and discussed it with others, if appropriate - read the feedback provided (below) for your scenario.

Angelé *is five years old and is six months into her first year of school. She is very shy; she engages in classroom activity occasionally but is withdrawn at other times. Even when she does participate actively she seems to give up quickly. However, sometimes Angelé provides answers and insights which suggest that she is very bright. Her parents have never visited, or even contacted, the school.*

What is your action plan?

Angelé *is five years old and is six months into her first year of school. She is very shy; she engages in classroom activity occasionally but is withdrawn at other times. Even when she does participate actively she seems to give up quickly. However, sometimes Angelé provides answers and insights which suggest that she is very bright. Her parents have never visited, or even contacted, the school.*

Individually write down your thoughts about Angelé's behaviours and how you might best act. Then, as a group, create an action plan to assist Angelé to achieve her academic potential.

Feedback

Angelé comes from a family which has recently migrated to Australia. Her parents received little formal education and they are just beginning to use English regularly in the home. Angelé shows classic signs of having low academic self-efficacy. Working on her self-efficacy is, therefore, a good starting point.

However, she also shows 'flashes' of brilliance, suggesting that she may have high academic potential. She may even be academically gifted.

Diagnostic identification measures are warranted, to ascertain the extent of her learning potential. Strategies to help Angelé enhance her academic self-efficacy are essential. Mastery activities and involving her family in her school life would be essential.

You have probably had opportunities to trace students' progress through your school. Can you identify individual students who have consistently shown Betts and Neihart's Type 1 - Type 5 characteristics over the years, or who seem to have changed categories?

There are many factors that mask gifts and talents.

• List as many as you can.

• Now think back over the students you have taught during your career. Identify individuals who may have been affected by factors masking their gifts and talents.

Resources

References and Further Reading

Ablard, K. E. & Parker, W. D. (1997). Parents' achievement goals and perfectionism in their academically talented children. *Journal of Youth and Adolescence*, 26 (6), 655-665.

Baker, J. A. (1996). Everyday stressors of academically gifted adolescents. *Journal of Secondary Gifted Education*, 7, 356-368.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review*, 84(2), 191-215.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*, Englewood Cliffs, NJ: Prentice Hall.

Betts, G. T., & Neihart, M. (1988). Profile of the gifted and talented. *Gifted Child Quarterly*, 32 (2), 447-452.

Brophy, J. E. (1983). Research on the self-fulfilling prophecy and teacher expectations, *Journal of Educational Psychology*, 75(5), 631-661.

Chaffey, G. W. (2002). Identifying Australian Aboriginal children with high academic potential using dynamic testing. Unpublished Ph.D. dissertation, University of New England, Armidale, NSW.

Chaffey, G. W., Bailey, S. B., & Vine, K. W. (2003). Identifying high academic potential in Australian Aboriginal children using dynamic testing. *Australasian Journal of Gifted Education*, 12 (1), 42-55.

Colangelo, N. (2003). Counseling gifted students. In N. Colangelo & G. A. Davis (Eds.), *Handbook of gifted education* (pp. 373-387). Boston: Pearson Education.

Davis, G. A., & Rimm, S. B. (2004). *Education of the gifted and talented* (5th edition). Needham Heights: Allyn and Bacon.

Freed, J. (1996). Teaching right: Techniques for visual-spatial gifted children. *Understanding Our Gifted*, 8 (3), 3, 16-19, 21.

Gross, M. U. M. (1989). The pursuit of excellence or the search for intimacy? The forced-choice dilemma of gifted youth. *Roeper Review*, 11 (4), 189-194.

Ogbu, J. U. (1994). Understanding cultural diversity and learning. *The Journal for the Education of the Gifted*, 17 (4), 355-383.

Reis, S. M., & McCoach, D. B. (2000). The underachievement of gifted students: What do we know and where do we go? *Gifted Child Quarterly*, 44 (3), 152-170.

Schraw, G., & Graham, T. (1997). Helping gifted students develop metacognitive awareness, *Roeper Review*, 20, 4-8.

Silverman, L. K. (1999). Perfectionism, *Gifted Education International*, 13 (3), 216-225.

Whitmore, J. R. (1987). Conceptualizing the issues of underserved populations of gifted students, *Journal of the Education of the Gifted*, 10 (3), 141-153.

Yewchuk, C., & Lupart, J. L. (1993). Gifted handicapped: A desultory duality. In K. A. Heller, F. J. Monks, & A. H. Passow (Eds.), *International handbook of research and development of giftedness and talent* (pp. 815-832). Oxford: Pergamon Press.

Websites

Silverman, L. K., Effective techniques for teaching highly gifted visual-spatial learners
At: http://www.gifteddevelopment.com

Council for Exceptional Children, Information Centre on Disabilities and Gifted Education.
At: http://www.ericec.org/ or http://www.ericec.org/fact/dualexep.html

George T. Betts and Maureen Neihart (1988). Profiles of the gifted and talented. *Gifted Child Quarterly, 32(2)*, 248-253.

Profiles of the Gifted and Talented

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Abstract

After several years of observations, interviews, and reviews of literature, the authors have developed six profiles of gifted and talented children and youth. These profiles help educators and parents to look closely at the feelings, behaviors, and needs of the gifted and talented. Also, tips on identification of each profile are included as well as information on facilitating the gifted and talented in the school and home.

Gifted children are usually discussed as an undifferentiated group. When they are differentiated, it tends to be on the basis of differences in intellectual abilities, talents, or interests rather than from a total or "gestalt" point of view in terms of behavior, feelings, and needs. For example, creatively gifted, intellectually gifted, learning disabled gifted, and artistically gifted are among the different categories that have been reported. The purpose of this article is to describe a theoretical model to profile the gifted and talented that differentiates gifted individuals on the basis of behavior, feelings, and needs. The matrix describes and compares the needs, feelings and behaviors of six different profiles of gifted children. This model serves to increase awareness among educators and parents of differences among gifted children and provides guidelines for identifying gifted children. It can also be used to develop appropriate educational goals for the gifted. These types are offered as a generalization to facilitate the task of identifying and guiding gifted children in all aspects of development. They are not intended to describe any one child completely.

Personality is the result of life experiences and genetic makeup. All gifted children are not affected by their special abilities in the same way. Gifted children interact with and are influenced by their families, their education, their relationships, and their personal development. Experience with gifted children in a variety of settings has served to increase awareness that the gifted cannot be seen as one group (Strang, 1962).

Little has been done, however, to distinguish among groups of gifted children. Roeper (1982) proposed five types of gifted children based strictly on the approaches gifted children use to cope with their emotions. She identified the perfectionist, the child/adult, the winner of the competition, the self-critic, and the well-integrated child. She focused on the development of coping styles and the ways in which gifted children experience and express feelings.

Few studies focus on a holistic perspective of the gifted child. Most address one aspect of development or an area of achievement or interest. (Colangelo & Parker, 1981; Delisle, J.R., 1982; Gregory & Stevens-Long, 1986; Kaiser, Berndt, & Stanley, 1987; Schwolinski & Reynolds, 1985). The development of the whole child must be addressed, taking into account the interaction of emotional, social, cognitive, and physical factors. It is essential to remember that "A child is a total entity; a combination of many characteristics. Emotions cannot be treated separately from intellectual awareness or physical development; all intertwine and influence each other" (Roeper, 1982, p. 21). Giftedness should not be defined by separate categories; every aspect of personality and development influences and interacts with every other aspect. Giftedness should be examined as a construct that impacts on personality.

PROFILES OF THE GIFTED AND TALENTED

The following presentation of six different profiles of gifted and talented students can provide information for educators and parents about the behavior, feelings, and needs of gifted and talented children and youth. It is important to remember that this is a theoretical concept that can provide insights for facilitating the growth of the gifted and talented, not a diagnostic classification model (see Figure 1).

Putting The Research To Use

It is essential that educators and parents understand the cognitive, emotional, and social needs of the gifted and talented. "Profiles of the gifted and talented" provides a framework for a better understanding of these students by looking closely at their feelings, behavior, and needs. Additional information is provided concerning adult and peer perceptions, identification, and home and school interactions. Parents and educators use the profiles to gain a deeper awareness of the gifted and talented. They are also able to use the information for inservice and courses concerning the nature and needs of the gifted and talented. Furthermore, educators can present the information directly to students in order to help them develop more insight into their own needs and behavior. "Profiles of the gifted and talented" is a starting point for those who want to develop a greater awareness and insight into these students. The application of the approach will provide deeper and greater understanding of our gifted and talented.

Additionally, children and youth should not be defined by any one of the following categories. The behavior, feelings, and needs of gifted and talented children change frequently when they are young, but as years pass there will be fewer abrupt changes and they may settle into one or two profile areas. This approach provides a new understanding of the gifted and talented and new opportunities for developing techniques and strategies for facilitating the cognitive, emotional and social growth of these children.

TYPE I
THE SUCCESSFUL

Perhaps as many as 90% of identified gifted students in school programs are Type I's. Children who demonstrate the behavior, feelings, and needs classified as Type I's have learned the system. They have listened closely to their parents and teachers. After discovering what "sells" at home and at school, they begin to display appropriate behavior. They learn well and are able to score high on achievement tests and tests of intelligence. As a result, they are usually identified for placement in programs for the gifted. Rarely do they exhibit behavior problems because they are eager for approval from teachers, parents and other adults.

These are the children many believe will "make it on their own." However, Type I's often become bored with school and learn to use the system in order to get by with as little effort as possible. Rather than pursue their own interests and goals in school, they tend to go through the motions of schooling, seeking structure and direction from instructors. They are dependent upon parents and teachers. They fail to learn needed skills and attitudes for autonomy, but they do achieve. Overall, these children may appear to have positive self-concepts because they have been affirmed for their achievements. They are liked by peers and are included in social groups. They are dependent on the system but are not aware that they have deficiencies because of the reinforcement they receive from adults who are pleased with them and their achievement. However, Goertzel and Goertzel (1962) concluded that the brightest children in the classroom may become competent but unimaginative adults who do not fully develop their gifts and talents. It seems that these children have lost both their creativity and autonomy.

Gifted young adults who may underachieve in college and later adulthood come from this group. They do not possess the necessary skills, concepts, and attitudes necessary for lifelong learning. They are well adjusted to society but are not well prepared for the ever-changing challenges of life.

TYPE II

Type II's are the divergently gifted. Many school systems fail to identify Type II gifted children for programs unless the programs have been in place at least five years and substantial in-servicing has been done with teachers. Type II's typically possess a high degree of creativity and may appear to be obstinate, tactless, or sarcastic. They often question authority and may challenge the teacher in front of the class. They do not conform to the system, and they have not learned to use it to their advantage. They receive little recognition and few rewards or honors. Their interactions at school and at home often involve conflict.

These children feel frustrated because the school system has not affirmed their talents and abilities. They are struggling with their self-esteem. They may or may not feel included in the social group. Some Type II's also challenge their peers, and therefore are often not included or welcomed in activities or group projects; on the other hand, some Type II's have a sense of humor and creativity that is very appealing to peers. Nevertheless their spontaneity may be disruptive in the classroom. In spite of their creativity, Type II's often possess negative self-concepts.

Type II's may be "at risk" as eventual dropouts for drug addiction or delinquent behavior if appropriate interventions are not made by junior high. Parents of gifted high school students who drop out of school (Type IV) frequently note that their children exhibited Type II behaviors in upper elementary school or junior high. Although this relationship has not been validated empirically, it carries significant implications that merit serious consideration.

TYPE III
THE UNDERGROUND

The Type III gifted child is known as "the underground gifted." Generally, these are middle school females although males may also want to hide their giftedness. If a gifted boy goes underground, it tends to happen later, in high school, and typically in response to the pressure to participate in athletics.

In general, Type III's are gifted girls whose belonging needs rise dramatically in middle school (Kerr, 1985). They begin to deny their talent in order to feel more included with a non-gifted peer group. Students who are highly motivated and intensely interested in academic or creative pursuits may undergo an apparently sudden radical transformation, losing all interest in previous passions. Type III's frequently feel insecure and anxious. Their changing needs are often in conflict with the expectations of teachers and parents. All too often, adults react to them in ways that only increase their resistance and denial. There is a tendency to push these children, to insist that they continue with their educational program no matter how they feel. Type III's often seem to benefit from being accepted as they are at the time.

Although Type III's should not be permitted to abandon all projects or advanced classes, alternatives should be explored for meeting their academic needs while they are undergoing this transition. Challenging resistant adolescents may alienate them from those who can help meet their needs and long-term goals.

Figure 1

PROFILES OF THE GIFTED & TALENTED

	FEELINGS AND ATTITUDES	BEHAVIORS	NEEDS	ADULTS & PEERS PERCEPTIONS OF TYPE	IDENTIFICATION	HOME SUPPORT	SCHOOL SUPPORT
TYPE I: Successful	• Boredom • Dependent • Positive self-concept • Anxious • Guilty about failure • Extrinsic motivation • Responsible for others • Diminish feelings of self and rights to their emotion • Self critical	• Perfectionist • High Achiever • Seeks teacher approval and structure • Non-risk taking • Does well academically • Accepts & conforms • Dependent	• To see deficiencies • To be challenged • To take risks • Assertiveness skills • Autonomy • Help with boredom • Appropriate curriculum	• Loved by teachers • Admired by peers • Loved & accepted by parents	• Grade point average • Achievement Test • IQ Tests • Teacher nominations	• Independence • Ownership • Freedom to make choices • Time for personal interests • Risk taking experiences	• Accelerated and enriched curriculum • Time for personal interests • Compacted learning experiences (pre-testing) • Opportunities to be with intellectual peers • Development of independent learning skills • In-depth studies • Mentorships • College & career counseling
TYPE II: Challenging	• Boredom • Frustration • Low self-esteem • Impatient • Defensive • Heightened sensitivity • Uncertain about social roles	• Corrects teacher • Questions rules, policies • Is honest, direct • Has mood swings • Demonstrates inconsistent work habits • Has poor self control • Is creative • Prefers highly active & questioning approach • Stands up for convictions • Is competitive	• To be connected with others • To learn tact, flexibility, self-awareness, self control, acceptance • Support for creativity • Contractual systems	• Find them irritating • Rebellious • Engaged in power struggle • See them as creative • Discipline problem • Peers see them as entertaining • Want to change them • Don't view as gifted	• Peer Recommendations • Parent nomination • Interviews • Performance • Recommendation from a significant, non-related adult • Creativity Testing • Teacher advocate	• Acceptance and understanding • Allow them to pursue interest • Advocate for them at school • Modeling appropriate behavior • Family projects	• Tolerance • Placement with appropriate teacher • Cognitive & social skill development • Direct and clear communication with child • Give permission for feelings • Studies in-depth • Mentorships • Build self-esteem • Behavioral contracting
TYPE III: Underground	• Unsure • Pressured • Confused • Guilty • Insecure • Diminished feelings of self and rights to their emotions	• Denies talent • Drops out of G/T and advanced classes • Resists challenges • Wants to belong socially • Changes friends	• Freedom to make choices • To be aware of conflicts • Awareness of feelings • Support for abilities • Involvement with gifted peers • Career/college info. • Self-acceptance	• Viewed as leaders or unrecognized • Seen as average and successful • Perceived to be compliant • Seen as quiet/shy • Adults see them as unwilling to risk • Viewed as resistive	• Gifted peer nomination • Home nomination • Community nomination • Achievement testing • IQ Tests • Performance • Teacher advocate	• Acceptance of underground • Provide college & career planning experiences • Time to be with same age peers • Provide gifted role models* • Model life-long learning • Give freedom to make choice	• Recognize & properly place • Give permission to take time out from G/T classes • Provide some sex role models • Continue to give college & career information

PROFILES OF THE GIFTED & TALENTED (continued)

	FEELINGS AND ATTITUDES	BEHAVIORS	NEEDS	ADULTS & PEERS PERCEPTIONS OF TYPE	IDENTIFICATION	HOME SUPPORT	SCHOOL SUPPORT
TYPE IV: Dropouts	• Resentment • Angry • Depressed • Explosive • Poor self-concept • Defensive • Burn-out	• Has intermittent attendance • Doesn't complete tasks • Pursues outside interests • "Spaced out" in class • Is self abusive • Isolates self • Is creative • Criticizes self & others • Does inconsistent work • Is disruptive, acts out • Seems average or below • Is defensive	• An individualized program • Intense Support • Alternatives (separate, new opportunities) • Counseling (individual, group, and family) • Remedial help with skills	• Adults are angry with them • Peers are judgmental • Seen as loners, dropouts, dopers, or air heads • Reject them and ridicule • Seen as dangerous and rebellious	• Review cumulative folder • Interview earlier teachers • Descrepancy between IQ and demonstrated achievement • Incongruities and inconsistencies in performance • Creativity testing • Gifted peer recommendation • Demonstrated performance in non-school areas	• Seek counseling for family	• Diagnostic testing • Group counseling for young students • Nontraditional study skills • In-depth studies • Mentorships • Alternative out of classroom learning experiences • G.E.D.
TYPE V: Double Labeled	• Powerless • Frustrated • Low self-esteem • Unaware • Angry	• Demonstrates inconsistent work • Seems average or below • May be disruptive or acts out	• Emphasis on strengths • Coping skills • G/T support group • Counseling • Skill development	• Seen as "weird" • Seen as "dumb" • Viewed as helpless • Avoided by peers • Seen as average or below in ability • Perceived to require a great deal of imposed structure • Seen only for the disability	• Scatter of 11 points or more on WISC or WAIS • Recommendation of significant others • Recommendation from informed special ed. teacher • Interview • Performance • Teacher Advocate	• Recognize gifted abilities • Challenge them • Provide risk-taking opportunities • Advocate for child at school • Do family projects • Seek counseling for family	• Placement in gifted program • Provide needed resources • Provide alternative learning experiences • Begin investigations and explorations • Give time to be with peers • Give individual counseling
TYPE VI: Autonomous	• Self confident • Self accepting • Enthusiastic • Accepted by others • Supported • Desire to know & learn • Accepts failure • Intrinsic motivation • Personal power • Accepts others	• Has appropriate social skills • Works independently • Develops own goals • Follows through • Works without approval • Follows strong areas of passion • Is creative • Stands up for convictions • Takes risks	• Advocacy • Feedback • Facilitation • Support for risks • Appropriate opportunities	• Accepted by peers and adults • Admired for abilities • Seen as capable and responsible by parents • Positive influences • Successful • Psychologically healthy	• Grade point average • Demonstrated performance • Products • Achievement Testing • Interviews • Teacher/Peer/Parent self nominations • IQ tests • Creativity Testing	• Advocate for child at school and in community • Provide opportunities related to passions • Allow friends of all ages • Remove time and space restrictions • Do family projects • Include child in parent's passion	• Allow development of long-term, integrated plan of study • Accelerated and enriched curriculum • Remove time and space restrictions • Compacted learning experiences with pretesting • In-depth studies • Mentorships • College & career counseling and opportunities • Dual enrollment or early admission • Waive traditional school policies and regulations

TYPE IV
THE DROPOUTS

Type IV gifted students are angry. They are angry with adults and with themselves because the system has not met their needs for many years and they feel rejected. They may express this anger by acting depressed and withdrawn or by acting out and responding defensively. Frequently, Type IV's have interests that lie outside the realm of the regular school curriculum and they fail to receive support and affirmation for their talent and interest in these unusual areas. School seems irrelevant and perhaps hostile to them. For the most part, Type IV's are high school students, although occasionally there may be an elementary student who attends school sporadically or only on certain days and has in essence "dropped out" emotionally and mentally if not physically.

Type IV students are frequently gifted children who were identified very late, perhaps not until high school. They are bitter and resentful as a result of feeling rejected and neglected. Their self-esteem is very low, and they require a close working relationship with an adult they can trust. Traditional programming is no longer appropriate for Type IV's. Family counseling is strongly recommended, and the Type IV youth should also be given individual counseling. Diagnostic testing is also necessary to identify possible areas for remediation.

TYPE V
THE DOUBLE-LABELED

Type V refers to gifted children who are physically or emotionally handicapped in some way, or who have learning disabilities. The vast majority of gifted programs do not identify these children, nor do they offer differentiated programming that addresses and integrates their special needs. Fortunately, research on the effective identification of these children has been promising, and suggestions do exist for ways to provide programming alternatives (Daniels, 1983; Fox, Brody, & Tobin, 1983; Gunderson, Maesch, & Rees, 1988; Maker, 1977; and Whitmore & Maker, 1985).

Type V students often do not exhibit behaviors that schools look for in the gifted. They may have sloppy handwriting or disruptive behaviors that make it difficult for them to complete work, and they often seem confused about their inability to perform school tasks. They show symptoms of stress; they may feel discouraged, frustrated, rejected, helpless, or isolated.

These children may deny that they are having difficulty by claiming that activities or assignments are "boring" or "stupid." They may use their humor to demean others in order to bolster their own lagging self-esteem. They urgently want to avoid failures and are unhappy about not living up to their own expectations. They may be very skilled at intellectualization as a means of coping with their feelings of inadequacy. They are often impatient and critical and react stubbornly to criticism.

Traditionally, these students are either ignored because they are perceived as average or referred for remedial assistance. School systems tend to focus on their weaknesses and fail to nurture their strengths or talents.

TYPE VI
THE AUTONOMOUS LEARNER

The Type VI gifted child is the autonomous learner. Few gifted children demonstrate this style at a very early age although parents may see evidence of the style at home. Like the Type I's, these students have learned to work effectively in the school system. However, unlike the Type I's who strive to do as little as possible, Type VI's have learned to use the system to create new opportunities for themselves. They do not work for the system; they make the system work for them. Type VI's have strong, positive self-concepts because their needs are being met; they are successful, and they receive positive attention and support for their accomplishments as well as for who they are. They are well-respected by adults and peers and frequently serve in some leadership capacity within their school or community.

Type VI students are independent and self-directed. They feel secure designing their own educational and personal goals. They accept themselves and are able to take risks. An important aspect of the Type VI is their strong sense of personal power. They realize they can create change in their own lives, and they do not wait for others to facilitate change for them. They are able to express their feelings, goals, and needs freely and appropriately.

Conclusions

This matrix will be useful in a number of ways. One use is as a tool for inservicing educators about gifted and talented children and youth in general and about the differentiated social and emotional needs of the specified types in particular. The model can also be used as a teaching tool in order to expand students' awareness and understanding of the meaning of giftedness and the impact it has on their learning and relationships.

The model may also serve as a theoretical base for empirical research in the areas of definition, identification, educational planning, counseling, and child development. By looking closely at the behavior and feelings of gifted and talented youth, better educational programming may be developed to meet their diversified needs.

References

Colangelo, N. and Parker, M. (1981). Value differences among gifted adolescents. *Counseling and Values, 26,* 35-41.

Daniels, P.R. (1983). *Teaching the gifted/learning disabled child.* Rockville, MD: Aspen Systems Corporation.

Delisle, J.R. (1982). Striking out: Suicide and the gifted adolescent. *Gifted/Creative/Talented, 13,* 16-19.

Fox, L.H., Brody, L., and Tobin, D. (1983). *Learning-disabled/gifted children.* Baltimore: University Park Press.

Goertzel, V. and Goertzel, M. (1962). *Cradles of eminence.* Boston: Little, Brown and Company.

Gregory, E.H. and Stevens-Long, J. (1986). Coping skills among highly gifted adolescents. *Journal for the Education of the Gifted, 9,* 147-155.

Gunderson, C.W., Maesch, C., and Rees, J.W. (1988). The gifted/learning disabled student. *Gifted Child Quarterly, 31,* 158-160.

Kaiser, C.F., Berndt, D.J. and Stanley, G. (1987). Moral judgment and depression in gifted adolescents. Paper presented at the 7th World Conference on Gifted and Talented Children, Salt Lake City, Utah.

Kerr, B. (1985). *Smart girls, gifted women.* Columbus, OH: Ohio Psychology.

Maker, J. (1977). *Providing programs for the gifted handicapped.* Reston, VA: Council for Exceptional Children.

Roeper, A. (1982). How the gifted cope with their emotions. *Roeper Review, 5,* 21-24.

Scholwinski, E. and Reynolds, C.R. (1985). Dimensions of anxiety among high IQ children. *Gifted Child Quarterly, 29,* 125-130.

Strang, R. (1965). The psychology of the gifted child. In W.B. Barbe, (Ed.). *Psychology and education of the gifted: Selected readings* (pp. 113-117). New York: Appleton-Century-Crofts.

Whitmore, J.R. and Maker, J. (1985). *Intellectual giftedness in disabled persons.* Rockville, MD: Aspen Systems Corporation.

Identifying High Academic Potential in Australian Aboriginal Children Using Dynamic Testing

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Abstract

The primary purpose of this study was to determine the effectiveness of dynamic testing as a method for identifying high academic potential in Australian Aboriginal children. The 79 participating Aboriginal children were drawn from Years 3–5 in rural schools in northern New South Wales. The dynamic testing method used in this study involved a test–intervention–retest format where the intervention was designed to address predicted causes of underachievement.

The dynamic testing method used in the present study proved to be an effective identification tool, revealing high academic potential in similar proportions to those in the instrument normative population.

The present study has implications for both gifted education and Aboriginal education generally. These implications arise from the findings of this study that many of the children were 'invisible' underachievers and that it is possible to identify this underachievement in the dynamic testing process.

Introduction

The disproportionately low representation of Aboriginal children in Australian programs for the gifted (Braggett, 1985; Harslett, 1996; Taylor, 1998) suggests that the identification of academic giftedness in Aboriginal children is an issue in need of further investigation. The problem of under-representation of minority groups in programs for the gifted is not confined to Australia. In the USA, prior to 1980,

minority groups were under-represented in programs for the gifted by 30% to 70% (Richert, 1985). Although in more recent times educational authorities in the USA appear more aware of the issues regarding appropriate identification strategies, minority students remain significantly under-represented in programs for the gifted (Frasier, 1997; Gallagher & Coleman, 1992). The issue of under-representation of minority groups in programs for the gifted is a challenging one. However, as Frasier (1997, p. 498) stated: 'There is no logical reason to expect that the number of minority students in gifted programs would not be proportional to their representation in the general population.'

The difficulties experienced in identifying academic giftedness in Australian Aboriginal children are not unique. Similar problems have been experienced with children from other cultural minorities and/or low socio-economic status (SES) groups (Borland & Wright, 1994; Braggett, 1985; Ford, 1996) and are the result of a number of interacting factors which include low expectations of academic performance linked to the deficit thinking paradigm and SES. The deficit thinking paradigm suggests that children from particular racial, social or cultural groups may be academically less able than members of the dominant culture, for reasons related to their group membership (Valencia & Solorzano, 1997). The deficit view has been used by some to explain why children from cultural minorities and/or low SES groups often score lower on IQ tests and perform at lower levels in the classroom. Furthermore, these deficit views have been a contributing factor in the establishment of expectations of lower–level test and school performance, resulting in self-fulfilling prophecies (Ford, 1996; Rosenthal & Jacobson, 1968), so that underachievement in the classroom and on tests seems inevitable and the outcome has often been a culture of 'blaming the victim' (Ryan, 1976). The deficit thinking paradigm has been strong with respect to Australian Aboriginal children (McConnochie, 1982).

The methods used to identify academic giftedness are prone to underestimate its presence in culturally different and/or low SES children. The most commonly used methods, IQ tests and teacher–centred processes (Davis & Rimm, 1998), are potentially flawed with respect to children from cultural minorities and/or low SES groups. Such children often score lower than the general population on IQ tests due to socio-emotional issues and inefficient metacognition rather than because their

cognitive potential is lower (Tzuriel & Feuerstein, 1992). The ability of teachers to identify gifted students from these groups has been questioned (Braggett, 1985; Pendarvis, 1990), the suggestion being that teachers are likely to identify 'teacher pleasers' as gifted, often overlooking gifted students who display oppositional behaviours or are different in other ways (Davis & Rimm, 1998; Pendarvis, 1990). It is apparent that identifying academically gifted children from cultural minorities and/or low SES groups has been difficult and that a substantial source of the problem is the inadequacy of the methods chosen.

Overcoming the problems in identifying academically gifted children from cultural minorities and/or low SES groups has been hindered by the way three central constructs — giftedness, talent and underachievement — have been defined. Most conceptions of giftedness and talent do not give sufficient emphasis to the gifted underachiever, one exception being Gagné's (1995) differentiated model of giftedness and talent. If gifted underachievers are not meaningfully accounted for in conceptions of giftedness and talent it is highly unlikely that underachievers will be effectively sought. This is especially so for gifted underachievers from minority groups where giftedness is often heavily masked (Ford, 1996). The most commonly used definitions of underachievement require, to establish academic potential, performance on some measure or indicator of potential (Reis & McCoach, 2000), but the most commonly used methods to assess this are IQ tests and teacher nomination, the very assessment forms where minority students have been shown to underperform (Braggett, 1985).

The presence of gifted children in minority groups is acknowledged in every Australian state policy, but advice on suitable identification methods is limited. Underachievement is often mentioned but not defined. That children may underperform both in the classroom and on commonly used measures of aptitude or potential has long been recognised (Butler–Por, 1993; Reis & McCoach, 2000; Whitmore, 1987). However, a review of the literature has revealed the absence of a consistent term for this type of underachievement, which can only lead to lack of recognition in the classroom, with low expectations, deficit views and continued underperformance some of the consequences. The establishment of a consistent definition is a simple and necessary step if gifted children from cultural minority and/or low SES groups are to be included in programs for the gifted in equivalent numbers to the wider community. For the purpose of the study reported here the term 'invisible' underachievers is used and is defined as individuals whose assessed potential is less than their actual potential and who also underperform in the classroom.

Dynamic testing may, partially at least, solve the problem of providing a suitable assessed aptitude for achievement for Indigenous children (Grigorenko & Sternberg, 1998). Dynamic testing may be considered a subset of dynamic assessment which has been defined as:

> approaches to the development of decision-specific information that most characteristically involve interaction between the examiner and examinee, focus on learner metacognitive processes and responsiveness to intervention, and follow a pretest-intervention-posttest administrative format. (Lidz, 1997, p. 281).

Dynamic testing is different from dynamic assessment in that it only seeks to determine the learning potential of an individual, rather than to establish long term cognitive change (Grigorenko & Sternberg, 1998). Dynamic testing follows the test–intervention–retest format of classic dynamic assessment but is characterised by a comparatively short intervention which is designed to establish learning potential by showing the extent to which the individual has the ability to benefit from the intervention experience. The intervention is designed to address issues that are perceived to contribute to the underperformance of an individual in the initial pretest, usually some measure of cognitive ability. A posttest given some time after the intervention determines the extent of improvement from the pretest and, thus, provides an indication of learning potential. Consequently, dynamic testing has the potential to identify giftedness in individuals who under-perform on one–off tests of cognitive ability.

The central purpose of this study was to determine the suitability and effectiveness of dynamic testing in identifying high academic potential in Australian Aboriginal children, its principal research question being: *Can dynamic testing effectively identify high academic potential in a sample of Australian Aboriginal children?*

Method

Subjects

The dynamic testing method was administered to 79 Aboriginal children in Years 3 to 5 (ages 8 to 11) from schools in a rural district of northern New South Wales. The schools varied from small schools to larger ones in regional centres. All Aboriginal children within these grades in the participating schools were invited to take part in the assessment. Local Aboriginal communities were informed about the project and asked to contribute ideas on how to optimise the overall assessment. As a result of

this consultation the group size for the intervention component was determined to be not more than four and not fewer than two, parents were given individual advice when requested and a respected Aboriginal adult was involved in each intervention. Acceptance of the research by the Aboriginal communities is reflected in the high participation rate of 90%.

Experimental Design

The experimental design (see Figure 1, below) involved two groups (Intervention and Control) matched on pretest Raven's Standard Progressive Matrices (RSPM) scores. The Intervention Group received a metacognitive intervention designed to probe each child's cognitive potential (Vygotsky, 1974). The RSPM–matched Control Group received a placebo intervention designed only to give the illusion of being the same as the metacognitive intervention. One week after the respective interventions the RSPM was re-administered to both groups, concluding the formal dynamic testing process. However, in order to investigate the persistence of the pretest to posttest gains, a far posttest was administered to both groups six weeks after the posttest.

Intervention and Control groups were used to determine the extent, if any, of practice effects resulting from the multiple application of the RSPM.

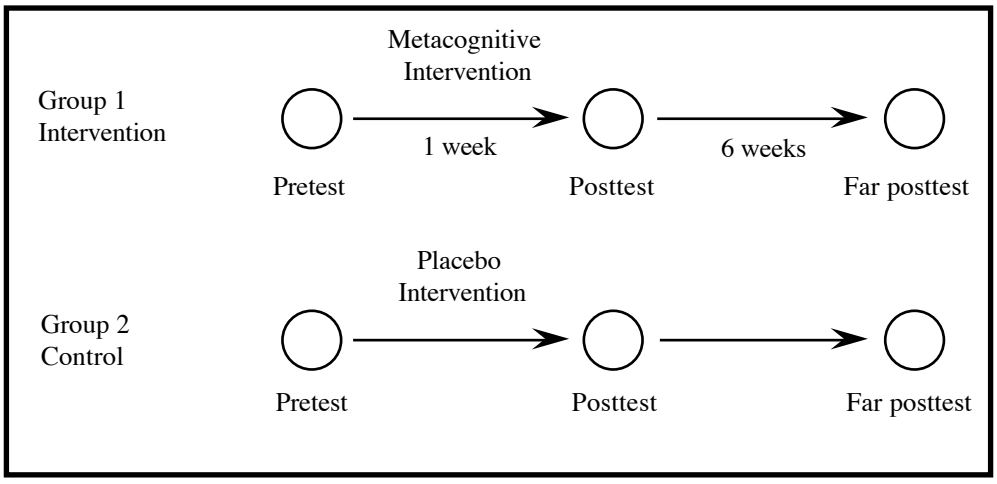

Figure 1. Experimental design used to investigate the principal research question.

The Placebo Intervention

A placebo intervention was used with the Control Group to ensure that these children thought they were participating in the research program in exactly the same way as the children in Intervention Group. Consequently, the placebo intervention was of the same duration, took place in the same room and had a trusted Aboriginal person present. The activities were delivered using an overhead projector, as in the metacognitive intervention. However, the placebo activities consisted of memory games and puzzle completion tasks, neither of which were considered to have any relationship to metacognitive training.

The Metacognitive Intervention

In order to achieve the maximum from both the test taking effort of the children and the metacognitive intervention embedded in the dynamic testing, it was necessary to address socio-emotional and cultural factors that were perceived as possible inhibitors of these outcomes. These factors were the forced-choice dilemma (Gross, 1989), self-efficacy (Bandura, 1977), expectation issues (Lovaglia, Thompkins, Lucas & Thye, 2000; Rosenthal & Jacobson, 1968; Steele & Aronson, 1995), and cultural differences. It is necessary, therefore, to consider the intervention in two parts, the socio-emotional component giving access to the metacognitive component. If a child has the highest academic potential yet her/his test performance is inhibited by fear, self-doubt or the pressures of low expectation or alienation to education, then a true estimation of the child's academic potential will be difficult to obtain.

Strategies Employed to Overcome the Socio-Emotional Inhibitors to Optimal Performance

The Forced–Choice Dilemma

Involuntary minority peoples, including Australian Aboriginal people, often experience a powerful forced-choice dilemma with respect to education. For academically able Indigenous students the dilemma is clear: should the students 'act white' and risk alienation from their cultural peers or retain peer acceptance and shun academic excellence (Colangelo, 2002; Ogbu, 1994)?

In order to minimise any possible forced-choice dilemma the following strategies were adopted:

- 'Ice-breaker' sessions were designed to make the students comfortable with the assessor and with the data collection process. The activities were all designed to meet the children in an environment that they enjoyed.

- The dynamic testing procedures were presented in such a way that the RSPM was perceived as being very different from usual classwork. The nature of the RSPM itself helped in this regard as it requires neither literacy nor numeracy skills to complete. The 'test' nature of the RSPM was de-emphasised and replaced with the idea that it involved puzzles and games. Within this framework, the idea of 'pass' or 'fail', or 'good' or 'bad' performance, disappeared and was replaced with the terms 'having fun', 'doing your best' and 'helping me work out the puzzles'.

- A respected Aboriginal adult was present at every data collection and ice-breaker session. This person was well known to and respected by the children. During data collection and intervention sessions the Aboriginal person generally assisted the tester and offered appropriate support to the children where required.

Self-Efficacy

A child's self-efficacy is of primary importance as it determines how much effort will be expended and how long that effort will be sustained in the face of difficulties. Self-efficacy has been identified as an important component in developing expertise (Sternberg, 2001) and the test performance of involuntary minority students (Lovaglia, Lucas, Houser, Thye & Markovsky, 1998). Bandura (1977) identified personal accomplishments as the most powerful of the factors that positively influence self-efficacy. It was assumed that many of the students in this study were academic underachievers and would be likely to have a low self-efficacy with respect to school tasks. If this were so then these students would be unlikely to engage fully in or persevere with the cognitive tasks presented. With this in mind, all components of the metacognitive intervention were designed to result in successful outcomes for all students. The expected outcome was improved self-efficacy. This was especially so in the first hour of the intervention as the intervention items were graded in difficulty, with the more difficult items presented in the second hour of the two–hour intervention.

Expectation

The literature reviewed with respect to expectation revealed three separate issues that could potentially act as blocks to optimal performance in the dynamic testing. Firstly, the effect of negative teacher expectations (Rosenthal & Jacobson, 1968) was addressed by putting forward low key, but constantly positive views about the students' performance. It was expected that the children would try to the best of their ability and would succeed. There was a fine line here that needed to be addressed by ensuring that trust was established early in the ice-breaking and data collection processes. Secondly, as a non-Indigenous person it is possible that the tester may have triggered a stereotype threat response (Steele & Aronson, 1995) from the children if too demanding of them before trust was established. Lastly, the 'shadow of the future' effect (Lovaglia et al., 2000) was addressed by developing the notion that the dynamic testing process was not a test at all and outcomes would be anonymous, thus reducing fears that might arise if a student did too well. This issue is strongly linked to the forced-choice dilemma.

Cultural Factors

The forced-choice dilemma and expectation issues are linked to Aboriginal culture through the concept of involuntary minority status (Ogbu, 1994). Specific cultural issues that were addressed were as follows:

- Not only did the assessment instrument used in the dynamic testing require no reading or writing skills but also there are no specific cultural knowledge requirements in the RSPM. These factors have resulted in the RSPM being described as a relatively culture-fair test of cognitive ability (Matthews, 1988).
- Although the optimal condition for scaffolding would be one-to-one, the metacognitive intervention (Intervention Group) was done in groups of four in order to minimise the effects of shyness.
- As previously mentioned, all data collection sessions were completed with a respected Aboriginal adult present and positively participating in the process.

Once the socio-emotional and cultural inhibitors to focused participation were addressed, the metacognitive intervention component of the dynamic testing could proceed.

The Metacognitive Intervention

The dynamic testing metacognitive intervention was based on Vygotsky's (1974) notion that an individual's Zone of Proximal Development (ZPD) can be explored by

an intervention that guides the individual's cognitive and metacognitive endeavours to give indications of what cognitive potential may exist (Lidz, 1987). Vygotsky (Reiber & Carton, 1987, p. 209) stated that 'What collaboration contributes to the child's performance is restricted to limits which are determined by the state of development and his (sic) intellectual potential.'

Guiding Principles and Strategies Employed in the Metacognitive Intervention

The metacognitive intervention used in the present study was developed in a number of ways. Firstly, the literature relating to dynamic testing was reviewed and appropriate strategies and methods adapted to meet the needs of the present research. Secondly, the proposed metacognitive intervention was tested and refined in two pilot studies.

Guiding principles were as follows:

1. None of the training items was from the RSPM but analogues only were used (Tzuriel & Feuerstein, 1992).

2. While a standard, and thus reproducible, presentation of intervention material occurred, all efforts were made to ensure that all students understood the demands required to complete successfully the tasks presented (Bandura, 1977; Budoff, 1987).

3. The child was asked to draw the final solutions as a means of moving the elements of the solution into the concrete. In double classified problems Budoff (1987, p. 177) noted that many students were able to derive one attribute at a time but had difficulty holding this first attribute in working memory while the second was derived. His solution was to have the students draw the first attribute before deriving the second attribute of the double classified problem.

4. After each problem was solved one of the children was asked to indicate orally how he or she had arrived at the solution (Carlson & Wiedl, 1979). No child was asked to explain a solution unless the correct answer had been given first. Each child was asked to contribute in turn, so that no individual dominated or missed out. The group size in the intervention was never more than four, so every child received at least four opportunities to give an explanation. Any child who showed reluctance in this regard was not pushed to explain her/his solution.

5. Excessive speed and impulsive behaviour were discouraged (Budoff, 1987). Curbing impulsivity was achieved primarily by using strategies 3 and 4, above.

6. During the interactive components of the intervention, positive performance-based feedback was constantly given (Bandura, 1977; Craven, Marsh & Debus, 1991).

7. At no time were the students pressured to perform at a given achievement level. The students were simply encouraged to do their best. When difficulties were encountered positive, encouraging help was immediately forthcoming.

8. A mutually respectful environment was established during the course of the ice-breaker sessions. The working environment necessary to produce optimum interaction between the students and the mediator was highly dependent on this mutual respect.

9. The event was kept as enjoyable as possible.

Self-Efficacy and the Metacognitive Intervention

The need to encourage the self-efficacy of the students with respect to the dynamic testing was seen as pivotal to the procedure's ultimate success. Constant success in reaching the correct solutions to the RSPM cognitive analogues was the central strategy for developing and encouraging the students' self-efficacy (Bandura, 1977). The gradual change from easier to harder cognitive tasks in the cognitive analogues and constant scaffolding ensured that all children reached the desired solutions.

Feedback was constantly given to the children to support metacognitive knowledge, metacognitve control and self-efficacy development. Schunk (1991) notes the positive effects of praise for effort (attributional feedback) in developing self-efficacy while Craven et al. (1991) note positive effects of performance and attributional feedback on self-concept. Brophy (1981) suggests twelve strategies for delivering praise. Of these, the following were consistently used during the metacognitive intervention:

- The accomplishment was specifically identified.

- Information was conveyed to the student regarding the particular student competence that led to success.

- It was ensured that the students understood that their achievements were the result of their effort and ability.
- Praise was delivered only when it was deserved and had a clear focus.

The Intervention Items (Cognitive Analogues of the RSPM)

The metacognitive intervention items were selected from the Learning Potential Assessment Device (LPAD) Set Variations I and II and Variations B.8–B.12 (Feuerstein, Rand, & Hoffman, 1979). All items are cognitive analogues of the RSPM. These items are presented in a similar form to the RSPM in order to establish familiarity with the format while the matrices contained similar cognitive processes to the RSPM but using dissimilar presentations. In all, 24 items were selected for use in the intervention, representing the major cognitive processes used in the RSPM.

Case Studies

Case studies were developed for eight children who were identified as having high academic potential following the dynamic testing. Semi structured interviews were conducted with the child, their teacher and parent(s).

The Instrument

The RSPM is designed to measure Spearman's *g* (de Lemos, 1989) and is considered to be one of its purest measures (Jensen, 1981; Matthews, 1988). In the present study the RSPM was used to measure the children's potential to learn. The RSPM is considered to be a relatively culture-fair instrument (Matthews, 1988) and to be motivating to students (Budoff, 1987).

Data Analysis

Raw Scores

The RSPM was given to all students, both Intervention and Control Groups, at the pretest, posttest and far posttest stages of the data collection process, producing a total of 237 sets of RSPM data. The raw score means, standard deviations and the RSPM Australian norms were used to compare the students in this study to the population as a whole in relation to general learning potential.

ANOVA

In order to determine the significance of any differences in RSPM performance of the Intervention and Control Groups a repeated measures form of ANOVA was used.

Results

The data presented as raw scores allow comparisons of gain scores (from pretest to posttest) and changes in the percentile band placement as indicated by the RSPM Australian norms. In order to help determine the merit of the dynamic testing method used in the present study to identify academic giftedness, individual scores of those who reach gifted status (>85th percentile band) are presented.

Raw Scores

Table 1

RSPM Pretest, Posttest and Far Posttest Mean Raw Scores and Standard Deviations for Intervention, Control and Total Groups

Dynamic Testing	Intervention Group		Control Group		Total Group	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Pretest	27.85	8.95	26.2	8.82	27.09	8.87
Posttest	36.24	8.21	29.05	10.24	32.78	9.87
Far Posttest	35.44	7.86	30.0	10.14	32.82	9.38

Table 2

RSPM Norm Percentile Bands of Intervention, Control and Total Group at Pretest, Posttest and Far Posttest

Dynamic Testing	Intervention Mean Percentile Band	Control Mean Percentile Band	Total Group Mean Percentile Band
	$\bar{X}$	$\bar{X}$	$\bar{X}$
Pretest	29.98	24.63	27.41
Posttest	54.49	32.71	44.01
Far Posttest	50.93	34.61	43.08

Gifted Group

Any student who scored at or above the 85th percentile band in any of the three administrations of the RSPM has been included in the 'Gifted Group'. As most categorisations of giftedness centre around percentile band rankings on standard

tests (Gagné, 1998), it is useful to present the raw scores and percentile bands for this group at pretest, posttest and far posttest. These results are presented in Table 3.

Table 3

RSPM Raw Scores and Percentile Bands for the Total Gifted Group at Pretest, Posttest and Far Posttest

Case	RSPM Pretest Raw Score	RSPM Norm Percentile Band	RSPM Posttest Raw Score	RSPM Norm Percentile Band	RSPM Far Posttest Raw Score	RSPM Norm Percentile Band
s02*	23	26	45	96	43	91
s13*	21	18	44	91	36	58
s14*	26	26	43	88	36	58
s26*	35	58	43	91	45	96
s27*	43	88	39	73	41	81
s29	35	37	47	93	46	90
s45*	35	58	39	75	42	88
s48*	36	42	43	80	44	85
s49	38	71	41	85	45	94
s52*	45	86	50	97	47	93
s57	48	85	42	54	46	77
s62*	36	42	42	75	46	91
s67*	41	81	45	93	43	88
s69	40	63	41	69	44	85
s72*	35	41	42	72	45	86
Mean	**35.80**	**54.80%ile**	**43.07**	**82.13%ile**	**43.27**	**84.07%ile**

* Intervention students

Comparing the Dynamic Testing Performance of Control and Intervention Groups

In order to determine the significance of any differences in the dynamic testing performance between the Control and Intervention Groups the RSPM data were examined using the repeated measures form of ANOVA, the summary is presented in Table4.

Table 4

ANOVA Summary

Source	Procedure	Sum of Squares	df	Mean Square	F Ratio	P Value
TIME	Sphericity Assumed	1664.49	2	832.24	54.31	0.001
	Greenhouse-Geisser	1664.49	1.71	972.16	54.31	0.001
	Huynh-Feldt	1664.49	1.77	940.38	54.31	0.001
	Lower-bound	1664.49	1	1664.49	54.31	0.001
TIME * GROUP	Sphericity Assumed	323.76	2	161.88	10.56	0.001
	Greenhouse-Geisser	323.76	1.71	189.10	10.56	0.001
	Huynh-Feldt	323.76	1.77	182.92	10.56	0.001
	Lower-bound	323.76	1	323.76	10.56	0.002
Error(TIME)	Sphericity Assumed	2359.91	154	15.32		
	Greenhouse-Geisser	2359.91	132	17.90		
	Huynh-Feldt	2359.91	136	17.32		
	Lower-bound	2359.91	77	30.65		

It is evident from Table 4 that the interaction effect of interest – Factor 1*Group – is significant (F=10.56, df=2, p<.001). The plot of RSPM means in both Intervention and Control Groups on pretest, posttest and far posttest is given in Figure 2, below.

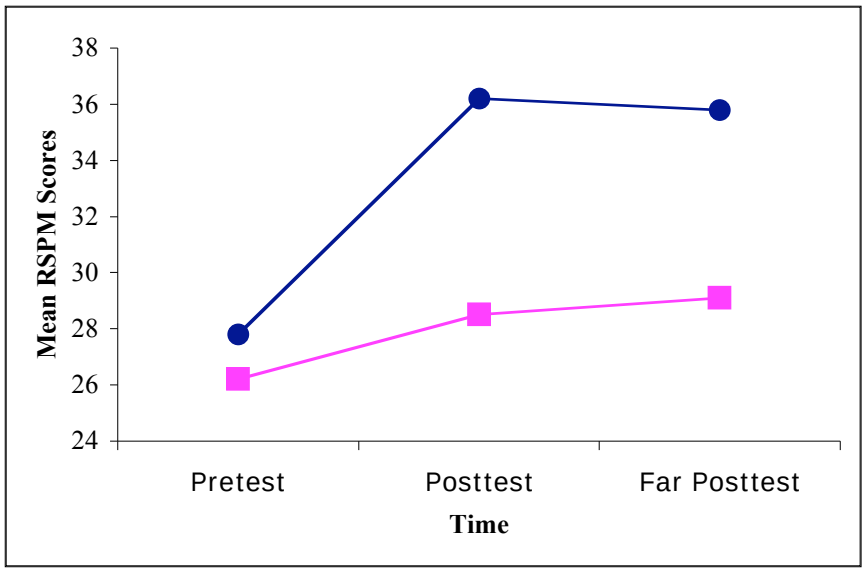

Figure 2. RSPM mean scores at pretest, posttest and far posttest for Control and Intervention Groups.

A subsequent, protected comparison of means revealed that:

- there was no significant (p=.05) difference between the groups at pretest (F=0.632; df=1; p=.429);
- there was a significant (p=.05) difference between the groups on posttest (F=11.95; df=1,77; p=.001);
- there was a significant (p=.05) difference between the groups on the far posttest (F=7.158; df=1,77; p=.009).

Discussion

The dynamic testing procedure resulted in significant improvements in performance in the cognitive variable as measured by the RSPM. A significance level of p<.05 for the differences between pretest and posttest scores was sought, whereas a significance level of p<.001 resulted from analysis using the repeated measures form of ANOVA.

This finding strongly supports the hypothesis that dynamic testing would successfully improve the Intervention Group's performance in the cognitive variable as measured by the RSPM.

The significant changes from pretest to posttest were associated with using two approaches aimed at addressing 'deficient learning habits, and motivational patterns that are responsible for the poor performance' (Tzuriel & Feuerstein, 1992, pp. 187–188). Firstly, an overarching socio-emotional strategy was employed with the Total Group (Control and Intervention) to help counter perceived inhibitors to test performance and motivation. The second, and major strategy, used with the Intervention Group was the metacognitive intervention aimed at addressing deficit learning habits. The metacognitive intervention was the independent variable in this study. The significant difference ($p<.001$) between the mean posttest scores of the Intervention and Control Groups strongly supports the notion that the score change was the result of the independent variable alone as both groups were immersed in the socio-emotional intervention.

The claim that the Intervention Group RSPM pretest to posttest score gain is largely the result of the metacognitive intervention supports the theoretical foundations of dynamic testing, that is, the interlocked concepts of the Zone of Proximal Development (Vygotsky, 1974) and Cognitive Modifiability (Tzuriel & Feuerstein, 1992). The significant increase in scores following intervention offered strong support for the conclusion that the participating children were performing below their potential at pretest. That is, they were underachieving and their Zone of Proximal Development contained a substantial number of immature cognitive functions. The cognitive modifiability of the Intervention Group is supported by the posttest and far posttest outcomes. The one–week period between intervention and posttest chosen for the present study may not have been long enough to sustain a claim that the cognitive changes, as indicated by actual RSPM performance, were more-or-less stable (Tzuriel & Feuerstein, 1992). However, the mean gains made at posttest (8.4 raw score points) were largely maintained at the far posttest (7.6 raw score points) six weeks later and this does indicate relative stability and integrity of the cognitive changes made. The six–week time frame ensured that the cognitive changes were not affected by experimental artefacts immediately after the intervention or by spontaneous temporal changes (Tzuriel & Feuerstein, 1992).

Dynamic Testing Outcomes Reveal Underachievement on the RSPM Pretest

In the present study the mean pretest score on the RSPM for the Total Group was 27.09 raw score points, which represented a mean 27.41 percentile band on the instrument norms. The well below average RSPM pretest score for the study group suggested substantial underachievement when compared with the norm population. That the low pretest score represented a substantial underachievement by the study children was supported by the significant improvements of the Intervention Group following intervention. These data supported the notion that one-off applications of relatively culture-fair tests such as the RSPM do not produce a true indication of the academic potential of children from culturally different and/or low SES populations. Underachievement on relatively culture-fair tests has been linked to sociocultural factors (Skuy, Kaniel & Tzuriel, 2001), 'cognitive impairments, deficient learning habits and motivational patterns' (Tzuriel & Feuerstein, 1992, p. 185) and socio-emotional factors such as expectation, status, and self-efficacy (Lovaglia et al., 1998). It can be concluded that any one-off RSPM assessment of Aboriginal children should be treated in such a way as to recognise high scores only, because low or even average scores are likely to represent a degree of underachievement.

Following the metacognitive intervention the mean RSPM raw scores for the Intervention Group increased from 27.85 to 36.24, a gain of 8.39 raw score points. In terms of the RSPM instrument norms the Intervention Group moved from the mean 29.98 percentile band at pretest to the 54.49 percentile band at posttest. The stability of the score increase from pretest to posttest was established when the far posttest group mean percentile band remained at 50.93 after a six–week period. The total Intervention Group score changes on the RSPM from pretest to posttest indicate that the pretest scores of the study children represent a substantial underachievement. This suggests that dynamic testing may be a better way of using the RSPM to determine academic potential than a one-off application for the participating children. However, the identification of giftedness is essentially an individual process.

Individual Dynamic Testing Outcomes

Interpreting Individual Dynamic Testing Outcomes

At the individual level a descriptive approach, using percentile bands and raw score changes, was necessary in order to make dynamic testing score changes easier to understand and consequently to facilitate their use in the field. In order to achieve this outcome the RSPM dynamic testing data were discussed in two ways. Firstly, the raw score changes were used in a purely descriptive way to demonstrate the general

magnitude of changes observed. Secondly, the percentile bands that the different test scores represented when compared with the norm population were used to enhance further the descriptive power of the dynamic testing outcomes. Further, since raw scores change with the age cohorts, percentile bands can give a view of test performance that is consistent across age groups. It is fully recognised that the posttest and far posttest percentile bands should not be interpreted in a strictly psychometric sense, as on these testing occasions intervention strategies were employed that were not used when the instrument norm samples were collected. This, however, did not apply to the pretest as these data were collected in strict accordance with the RSPM manual. Percentile bands at posttest and far posttest can provide an indication of potential that was brought to life by a comparison to the norm population. For example, student s13 recorded a pretest score of 21 raw score points and improved to 44 raw score points at posttest, clearly a large improvement. In terms of percentile bands this meant a shift from the 18th to the 91st bands, which highlights the dramatic nature of that change.

The use of the RSPM norms to make descriptive comparisons with the dynamic testing outcomes was limited by one major factor. If the norm population used for the RSPM was given the benefit of a similar metacognitive intervention used in the present study it is highly likely that some upward shift in test performance would result due to the undoubted presence of some underachievers in the norm population. However, in a review of research related to coaching and testing, Lidz (1987) noted that while test scores did improve they were relatively minor for populations with superior educational opportunities, a view supported by Anastasi (1988). This notion is supported by the relatively small gain scores on the RSPM dynamic testing reported by Tzuriel and Feuerstein (1992) when the study population consisted of a mix of disadvantaged and regular schools. Consequently, when making descriptive comparisons of the dynamic testing outcomes with the RSPM norms it should be considered that the dynamic testing outcomes may be slightly elevated relative to the RSPM norms. Despite this complication, descriptive comparisons of the dynamic testing outcomes of the students in the present study with the normative population gave a much better indication of the children's academic potential than the one-off first application of the RSPM.

Individual Dynamic Testing

The dynamic testing scores at both pretest and posttest can be used for the identification of giftedness. The pretest scores can be used in the same way as one-off standardised tests with a score benchmark applied to determine gifted status. In

the present study three of the 79 study children scored at or above the 85th percentile band at pretest and could be considered as gifted applying Gagné's (1995) broad conception of giftedness and talent. However, the three children identified as gifted by the pretest represented only 3.8% of the study children and this would inevitably lead to an under-representation of Aboriginal children in nominations of giftedness.

Individual posttest scores in the dynamic testing process may better reflect the academic potential of an individual student than the pretest scores. Students who have the potential to benefit from the socio-emotional strategies and metacognitive intervention are most likely to show the greatest gains at posttest. That is, if pretest scores are negatively affected by socio-emotional inhibitors, low self-efficacy and inefficient metacognition it is highly likely that successful intervention at each of these levels will lead to improved posttest scores. The greater the initial underachievement the greater the potential gain at posttest. If a child is not negatively affected by performance inhibiting factors little gain can be expected following intervention as the child is likely to score close to potential at pretest.

It is highly unlikely that in the present study all Intervention Group students performed to their potential at posttest despite the strategies employed, as this would mean that all students were successfully and fully reached during intervention. However, the posttest scores of a number of individuals are most relevant for support for the use of dynamic testing as a tool in the identification of high academic potential in Aboriginal children.

The RSPM results of the study children who scored at or above the 85th percentile band on any of the three test occasions are presented in Table 3**.** Fifteen of the 79 study children scored at or above the 85th percentile band on at least one testing occasion. Of the 15 children identified as gifted 11 were from the Intervention Group. The test occasion that identified the child is shown below, in Table 5.

Table 5

RSPM Test Occasion on which the Child was Identified as Gifted

	Intervention Group			Control Group		
Student	**Pretest**	**Posttest**	**Far Posttest**	**Pretest**	**Posttest**	**Far Posttest**
S02 *		X	X			
S13 *		X				
S14 *		X				

S26 *			X				
S27 *	X						
S29						X	X
S45 *				X			
S48 *				X			
S49						X	X
S52 *	X		X	X			
S57					X		
S62 *				X		X	
S67 *			X	X			
S69							X
S72 *				X			

* Intervention students

Two (4.9%) of the 41 Intervention Group children were identified as gifted by the pretest, with a further five identified at the posttest following the metacognitive intervention. These seven students (17.1% of the Intervention Group), identified as gifted as a result of the dynamic testing test-intervention-retest protocol, showed a mean raw score gain of 10.71, substantially higher than the total Intervention Group mean raw score gain of 8.39. This represents a mean shift from the 54.71 percentile band to the 89.96 percentile band. These data suggest that the intervention children identified as gifted following intervention were underachieving to a greater extent than the already underachieving total Intervention Group. Furthermore, the 17.1% of the Intervention Group who reached the gifted 85th percentile band benchmark following the dynamic testing was very close to the 15% expected from the norm population.

Four children from the Intervention Group scored in the gifted range only in the far posttest. These students gained, on average, 6.0 raw score points from pretest to posttest but gained a further 2.75 raw score points from posttest to far posttest, these latter gains moving them into the gifted range. It is reasonable to assume that the additional gains made by these children at far posttest were not just practice effects but also due to the result of the continuing impact of the socio-emotional strategies. This notion is supported by fact that two (s49 and s69) of the four children from the Control Group and one (s26) of the Intervention Group children who reached the gifted benchmark improved substantially from posttest to far posttest. In total, seven of the fifteen study children who reached the gifted 85th percentile band benchmark improved from posttest to far posttest.

Individual gain scores from pretest to posttest can be used to give an indication of the level of underachievement of a child. The individual score changes from pretest to posttest that occurred in the Intervention Group during the dynamic testing process were extremely variable, raw score changes ranging from plus 31 to minus 6. It is important to note that many of the study children improved little while others improved dramatically, suggesting variable levels of underachievement, while others regressed. For example, student s40 (Intervention) scored in the 61st percentile band on all three testing occasions and was described by her teacher as a conscientious student who seemed to be working to her potential. Further, this child has parents who are keenly involved in education and are strongly supportive of her educational efforts. In contrast student s43 (Intervention) moved from the 2nd percentile band to the 80th percentile band at the posttest. The large posttest gain was probably the result of her noted impulsive answering habits which were remediated in the intervention. Twelve of the study students regressed in the posttest, suggesting that some students were not reached by the metacognitive and socio-emotional strategies or were negatively affected. Only three of the regressed posttest scores came from the Intervention Group and it is likely that the metacognitive intervention was effective in reducing the number of score regressions in the Intervention Group.

Conclusion

The research presented in this paper has shown that the dynamic testing method used was effective in identifying high academic potential in an encouraging proportion of the study children. Furthermore, as most of these children were previously unidentified as having high academic potential, many were also newly revealed as underachievers. Hence, dynamic testing holds the hope of positively influencing Aboriginal education by better identifying academic potential in Aboriginal children and by improving the school performance expectations of teachers, the children themselves and members of the Aboriginal communities. Nevertheless, with this optimism a warning must be given: dynamic testing must be conducted with trained personnel as misuse carries the risk of invalid outcomes, a result that can only serve to reinforce deficit views. Social-emotional and cultural considerations must be fully understood and sensitively implemented, as must the technical aspects of the intervention process.

The underachievement on the RSPM pretest by the children in this study supports the finding by Lidz & Macrine (2001), Lovaglia et al. (1998), Skuy et al. (1988), Skuy et al. (2001) and Tzuriel and Feuerstein (1992) that even relatively culture fair nonverbal

standardised tests may not reveal the true academic potential of culturally different and low SES children. Indeed, their 'invisible' underachievement on such tests continues to reinforce deficit views and culturally stereotypes. On the other hand, the success in this study of dynamic testing in revealing some of this hidden potential offers the hope of a more realistic, constructive and equitable approach to the challenge of identifying giftedness in all sectors of our society.

References

Anastasi, A. (1988). *Psychological Testing*. New York: Macmillan.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review*, *84*(2), 191–215.

Borland, J. H., & Wright, L. (1994). Identifying young, potentially gifted, economically disadvantaged students. *Gifted Child Quarterly*, *38*, 164–171.

Braggett, E. J. (1985). *education of gifted and talented children: Australian provision*. Canberra: Commonwealth Schools Commission.

Brophy, J. E. (1981). Teacher praise: A functional analysis. *Review of Educational Research*, *51*, 5–32.

Budoff, M. (1987). Measures for assessing learning potential. In C. Lidz (Ed.), *Dynamic Assessment* (pp. 173–195). New York: The Guilford Press.

Butler–Por, N. (1993). Underachieving gifted students. In K. A. Heller, F. J. Mönks, & A. H. Passow (Eds), *International handbook of research and development of giftedness and talent* (pp. 649–668). Oxford: Pergamon.

Carlson, J. S., & Wiedl, K. H. (1979). Toward a differential testing approach: Testing-the-limits employing the Raven Matrices. *Intelligence*, *3*, 323–344.

Colangelo, N. (2002). Counseling gifted and talented students. *The National Research Center on the Gifted and Talented Newsletter*, Fall, 5–9.

Craven, R. G., Marsh, H. W., & Debus, R. L. (1991). Effects of internally focused feedback and attributional feedback on enhancement of academic self-concept. *Journal of Educational Psychology*, *83*, 17–27.

Davis, G. A., & Rimm, S. B. (1998). *Education of the gifted and talented*. (4th ed.). Needham Heights: Allyn and Bacon.

de Lemos, M. M. (1989). *Standard Progressive Matrices. Australian Manual*. Hawthorne: Jenkin Buxton Printers.

Embretson, S. E. (1987). Toward development of a psychometric approach. In C. S. Lidz (Ed.), *Dynamic assessment* (pp. 141–170). New York: Guilford Press.

Feuerstein, R., Rand, Y., & Hoffman, M. B. (1979). *The dynamic assessment of retarded performers*. Baltimore: University Park Press.

Ford, D. Y. (1996). *Reversing underachievement among gifted black students*. New York: Teachers College Press.

Frasier, M. M. (1997). Gifted minority students: Reframing approaches to their identification and education. In N. Colangelo & G. A. Davis (Eds), *Handbook of gifted education* (Vol. 2, pp. 498–515). Needham Heights, MA: Allyn and Bacon.

Gagné, F. (1995). From giftedness to talent: A development model and its impact on the language of the field. *Roeper Review*, *18*(2), 103–111.

Gagné, F. (1998). A proposal for subcategories within gifted or talented populations. *Gifted Child Quarterly*, *42*(2), 87–95.

Gallagher, J., & Coleman, M. R. (1992). *State Policies for the Identification of Gifted Students from Special Populations: Three States in Profile*, University of North Carolina.

Glutting, J. J., & McDermott, P. A. (1990). Principles and problems in learning potential. In C. R. Reynolds & R. W. Kamphaus (Eds), *The handbook of psychological assessment of children. Intelligence and achievement* (pp.296–347). New York: Guilford Press.

Grigorenko, E. L., & Sternberg, R. J. (1998). Dynamic testing. *Psychological Bulletin*, *124*(1), 75–111.

Gross, M. U. M. (1989). The pursuit of excellence or the search for intimacy? The forced–choice dilemma of gifted youth. *Roeper Review*, *11*(4), 189–194.

Harslett, M. (1996). The concept of giftedness from an Aboriginal cultural perspective. *Gifted Education International*, *11*, 100–106.

Jensen, A. R. (1981). *Straight Talk about Mental Tests*. London: The Free Press.

Kanevsky, L. (2000). Dynamic assessment of gifted students. In K. A. Heller, F. J. Monks, R. J. Sternberg, & R. F. Subotnik (Eds.), *International handbook of giftedness and talent* (pp. 283–295). New York: Elsevier.

Lidz, C. S. (1997). Dynamic assessment approaches. In D. S. Flanagan, J. L. Genshaft, & P. L. Harrison (Eds), *Contemporary intellectual assessment* (pp. 281–296). New York: The Guilford Press.

Lidz, C., & Macrine, S. L. (2001). An alternative approach to the identification of culturally and linguistically diverse learners: The contribution of dynamic assessment. *School Psychology International*, *22*, 74–96.

Lovaglia, M. J., Lucas, J. W., Houser, J. A., Thye, S. R., & Markovsky, B. (1998). Status processes and mental ability test scores. *American Journal of Sociology*, *104*(1), 195–228.

Lovaglia, M. J., Thompkins, D., Lucas, J., & Thye, S. (2000). *The shadow of the future: How negative expectations cloud test performance*. Paper presented at the Fifth Biennial

Wallace National Research Symposium on Talent Development, The University of Iowa, Iowa City, USA.

Matthews, D. J. (1988). Raven's Matrices in the identification of giftedness. *Roeper Review*, *10*, 159–162.

McConnochie, K. (1982). Aboriginal and Australian education: Historical perspectives. In J. Sherwood (Ed.), *Aboriginal Education: Issues and Innovations* (pp.17–32), Perth: Creative Research.

Ogbu, J. U. (1994). Understanding cultural diversity and learning. *The Journal for the Education of the Gifted*, *17*(4), 355–383.

Pendarvis, E. D. (1990). *The abilities of gifted children*. Englewood Cliffs, NJ: Prentice Hall.

Reis, S. M., & McCoach, D. B. (2000). The underachievement of gifted students: What do we know and where do we go? *Gifted Child Quarterly*, *44*(3), 152–170.

Richert, E. S. (1985). Identification of gifted children in the United States. The need for pluralistic assessment, *Roeper Review, 8*, 68–72.

Rieber, R. W., & Carton, A. S. (Eds.). (1987). *The collected works of L. S. Vygotsky* (Vol. 1). New York: Plenum Press.

Rosenthal, R., & Jacobson, L. (1968). *Pygmalion in the classroom: Teacher expectation and pupils' intellectual development*. New York: Holt, Rinehart and Winston.

Ryan, W. (1976). *Blaming the victim*. New York: Vintage Books.

Schunk, D. (1991). Self-efficacy and academic motivation. *Educational Psychologist*, *26*, 337–345.

Skuy, M., Kaniel, S., & Tzuriel, D. (1988). Dynamic assessment of intellectually superior Israeli children in a low socio-economic status community. *Gifted Education International*, *5*, 90–96.

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, *69*(5), 797–811.

Sternberg, R. J. (2001). Giftedness as developing expertise: A theory of the interface between high abilities and achieved excellence. *High Ability Studies*, *12*(2), 159–179.

Taylor, S. D. (1998). *Minority students and gifted and talented programs: Perceptions, attitudes and awareness*. PhD Thesis, University of Sydney.

Tzuriel, D., & Feuerstein, R. (1992). Dynamic group assessment for prescriptive teaching: Differential effects of treatments. In H. C. Haywood & D. Tzuriel (Eds), *Interactive assessment* (pp. 187–206). New York: Springer–Verlag.

Valencia, R. R., & Solorzano, D. G. (1997). Contemporary deficit thinking. In R. R. Valencia (Ed.), *The evolution of deficit thinking* (pp. 160–210). London: The Falmer Press.

Vygotsky, L. S. (1974). *Thought and language*. Cambridge: The M.I.T Press.

Whitmore, J. R. (1987). Conceptualizing the issues of underserved populations of gifted students. *Journal of the Education of the Gifted*, *10*(3), 141–153.