Chapter 8: Discussion and Conclusions

Introduction

In Chapters 6 and 7 the results of the research, which investigated the six hypotheses generated by the research questions, were presented. Research Question 1:

Can dynamic testing effectively identify high academic potential in the sample of 79 Australian Aboriginal children participating in the present study?

sought to evaluate the effectiveness of dynamic testing in identifying high academic potential in a specific population (Australian Aboriginal children) who were seen as both underachieving in schools (Braggett, 1985) and underrepresented in programs for the gifted (Taylor, 1998).

The locus of control and self-concept constructs have both been viewed as giving insights into the academic performance of an individual (Hattie, 1992). These constructs became the focus of Research Questions 2 and 3.

Research Question 2: *How do the internal academic locus of control scores of the children identified as gifted by the dynamic testing method compare with those of the Total Group and the Intellectual Achievement Responsibility Questionnaire normative population?*

Research Question 3: *How do the self-concept scores of the children identified as gifted by the dynamic testing method compare with those of the Total Group and the Self-Description Questionnaire I normative population?*

The school experience of eight children identified as having high academic potential in the present study was investigated in an attempt to bring to light factors that influenced their academic performance. This understanding was sought through Research Question 4.

What factors influence the school environment and academic performance of the study children with high academic potential?

In this chapter the outcomes and implications of the research that investigated Research Questions 1, 2, 3 and 4 are discussed. Each research question is discussed separately. Finally, conclusions related to the research questions are presented along with implications for educational policy and suggestions for future research.

Research Question 1

Hypothesis 1a

Dynamic testing will produce a significant (p<.05 level) improvement in performance on the Raven's Standard Progressive Matrices test (cognitive variable) for the children participating in the study.

Changes in the Intervention Group Scores at Pretest, Posttest and Far Posttest

It was found that the dynamic testing procedure resulted in significant improvements in performance in the cognitive variable as measured by the RSPM. Hypothesis 1a sought a significance level of $p<.05$ for the differences between pretest and posttest scores, whereas a significance level of $p<.001$ resulted from analysis using the doubly multivariate form of MANCOVA. This finding strongly supports the hypothesis that dynamic testing will 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 impact of this strategy is fully discussed, below, in the context of the Control and Intervention Group score changes. 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 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 support the idea 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. This finding supports the 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).

Changes in the Control Group Scores at Pretest, Posttest and Far Posttest

In order to ensure that the metacognitive intervention was the sole independent variable in the dynamic testing, a Control Group was added to the experimental design (Grigorenko & Sternberg, 1998). The main possible sources of variation that might contaminate the effects of the metacognitive intervention were practice effects (Glutting & McDermott, 1990; Grigorenko & Sternberg, 1998) and a Hawthorne Effect (Cohen & Manion, 1994).

Practice effects of up to three raw score points have been noted for timed tests when giving the RSPM twice within a relatively short space of time (de Lemos, 1989, p. 22). However, in the case of untimed administration no practice effect was noted (de Lemos, 1989, p. 22). In the present research the untimed administration of the test was used, suggesting that little practice

effect could be expected. However, practice effects may still occur using the RSPM with young disadvantaged children despite the de Lemos (1989) findings. Firstly, a dynamic testing study by Tzuriel and Feuerstein (1992) using the RSPM (untimed) and Control Group with young children (Grades 4–6) noted gains of 1.6 raw score points for the Control Group, a finding that suggests that practice effects may have been operating. Secondly, the de Lemos (1989) findings on practice effects were derived from a general Australian population which contained a small percentage of Aboriginal children. It is possible that the involuntary minority status of the participating children, along with their young age and generally low (mean 30th percentile band) pretest scores (LeGagnoux, Michael, Hocevar & Maxwell, 1990), may have generated practice effects from pretest to posttest due to generally low academic confidence and self-efficacy of the participating children, despite the untimed administration of the RSPM.

A possible Hawthorne Effect was countered by administering to the Control Group a placebo intervention that was identical in physical presentation to the metacognitive intervention. The aim of this strategy was to make both groups feel equally 'special' so that any Hawthorne Effect was cancelled out. The effectiveness of this strategy was supported by the fact that there was not a single case recorded in the data collection notes where a child commented that the different groups had done different things. Further, I did not note any Control or Intervention Group differences in application or attitude following the intervention. It is reasonable to assume that any differences between Intervention and Control Group scores at the RSPM posttest were not due to a Hawthorne Effect generated by one group feeling more special than the other.

The Control Group RSPM mean scores increased by 2.8 raw score points (from 26.3 to 29.1 raw score) from pretest to posttest. While this difference is not statistically significant in the Rasch analysis ($p<.238$), the posttest raw score is substantively higher and merits discussion. The increased mean score from pretest to posttest is similar to that noted by de Lemos (1989) as practice effects in timed administrations of the RSPM. However, in this research the RSPM was administered in the untimed version and so no practice effects were expected (de Lemos, 1989) although practice effects were entirely possible for this population. The cause of the pretest to posttest gain for the Control Group may reside, at least partially, in the strategies employed in the present study to counter a number of factors that were perceived as possible sources of

academic underperformance by Aboriginal students in general. The involuntary minority status of Australian Aboriginal people and expectation issues are likely to cause a range of reactions to schooling that can result in academic underachievement. The issues include the forced-choice dilemma (Gross, 1989; Lovaglia et al., 2000), teacher expectation (researcher in this case) (Godfrey et al., 2001; Rosenthal & Jacobson, 1968), stereotype threat (Steele, 1997) and teacher–student relationships (Godfrey et al., 2001).

Impact of Socio-Emotional Factors on Control Group RSPM Performance

The Forced-Choice Dilemma

The forced-choice dilemma involves choosing between achieving well at school or retaining peer affiliation by not achieving well at school. This is a general problem for children in involuntary minority communities. Oppositional attitudes adopted by involuntary minority peoples to many aspects of the dominant culture can create a powerful forced-choice dilemma with respect to education (Ford, 1996). The effect of the forced-choice dilemma on test performance of African-American students (another involuntary minority group) has been researched by Lovaglia et al. (2000) who concluded that fear of the consequences of doing well (such as losing peer affiliation) can cause significant underachievement in test scores. While this issue may create a dilemma for many involuntary minority children it is the gifted child who is likely to be most affected (Gross, 1989). The problem of a forced-choice dilemma was addressed in the present study group through a number of strategies: de-emphasising the test, minimal pressure and positively working with the children in an interest area where it was perceived to be acceptable to excel.

Fear in the Expectation of Future Success — a Specific Example of a 'Shadow of the Future' Effect

Although it was expected that the major forced-choice dilemma issue for the children in the present study would be the fear of losing affiliation with their cultural peers, one child in the Intervention Group produced evidence of another fear usually associated with older students (Lovaglia, M. 2000, personal communication). Student 2,2,B (Intervention Group, eight years old) produced a pretest score in the 88th percentile band (43 raw score) but fell to

the 73rd percentile band (39 raw score) at posttest. Regression to the mean for high scoring students is well recognised in test-retest situations (Wiersma, 1991) and was considered as a possible source of this scoring pattern. However, there are a number of reasons why this was viewed as unlikely in this case. Firstly, this student's gain score of minus four raw score points was in contrast to the mean Intervention Group gain of 8.4 raw score points. Furthermore, the other two Intervention Group students who scored above the 80th percentile band at pretest gained four and five raw score points respectively at posttest. Secondly, regression to the mean is often associated with lack of effort through factors such as boredom (Wiersma, 1991). Student 2,2,B appeared to be enthusiastic and keen throughout all phases of the data collection so there was no reason to think that lack of effort was an issue. It is likely that the answer lies elsewhere. 2,2,B has an older sister (12 years old) who is academically very able and won a scholarship to a boarding school 12 hours' drive from her home (I acted as a consultant to the program that identified her giftedness and recommended her for a scholarship). She had a very distressing first year away from home which affected the whole family as frequent phone calls were made and were often very emotional. This situation could easily have translated to a fear of doing well in the dynamic testing for an eight-year-old who did not want to leave home as his sister had done (Lovaglia, M. 2000, personal communication). Further, it is likely that these reactions are out of the control of the individual and operate at a subconscious level (Lovaglia et al., 2000). It is possible that 2,2,B really did try hard as I observed but still produced a posttest score below his potential.

Teacher Expectation

The review of the literature highlighted that the effect of teacher expectation on test scores can be significant (Brophy, 1983; Rosenthal & Jacobson, 1968). In this research I had the role of the 'teacher' and as such created positive expectations of students by using one strategy. The strategy was simply to assume that the participating children were underachieving academically and were not academically less able than their school peers. Expectation is generated by belief. The importance in the learning process of the rapport between a teacher and the Aboriginal child is considerable (Collins, 1993; Munns, 1998). The establishment of a respectful, positive relationship with the participating students was an important goal deemed necessary to create a

positive learning environment and to support the expectations of their performing well.

Stereotype Threat

A student's fear of fulfilling a negative stereotype (stereotype threat) has been identified as a possible inhibitor of test performance with African-American students (Steele, 1997). In order to minimise stereotype threat as a factor in test underachievement in this research a number of strategies were employed. Firstly, as previously discussed, the RSPM was not presented as a test but simply as 'some puzzles'. De-emphasising the test was reinforced by not giving any feedback regarding RSPM performance until the completion of all three testing occasions. Lastly, the positive expectation environment was made culturally supportive by having an Aboriginal adult at all dynamic testing events.

There was evidence that the strategies employed to counter socio-emotional factors associated with underachievement were responsible for, at least, some of the change from pretest to posttest for the Control Group. As discussed above, it is unlikely that the non-significant change from pretest to posttest was due to practice or Hawthorne effects. Further, the pretest was administered before any of the socio-emotional strategies was employed. It could be concluded that the Control Group increase from pretest to posttest, which was insignificant, may have been a chance statistical event. However, individual test performances provided evidence that substantial positive changes occurred for some individuals that cannot be attributed to practice or Hawthorne Effects. The 2.8 mean raw score increase of the Control Group was far from uniform at the individual level, with a number of large increases noted. There were six students who recorded raw score increases between nine and twelve, for a total gain of 66 raw score points. This represents an average of 1.73 raw score points for every child in the Control Group, and accounts for 63% of the Total Group gain. The individual raw scores and percentile band placement of these students is presented in **Table 8.1** (below). If the gains made by these six students were not the result of practice or Hawthorne Effects, they may reflect the reversal of underachievement in the pretest because of the strategies adopted to overcome socio-emotional inhibitors to test performance.

Further supporting the idea that some of the increase in the Control Group RSPM scores resulted from the socio-emotional strategies, the mean Control Group far posttest score further increased from the posttest (0.9 raw points), producing a now significant difference in the Rasch analysis ($p<.018$) from the mean pretest score. Moreover, the mean increase at the far posttest was, once again, highlighted by a small number of large individual score increases (see **Appendix 6.2**) which suggests underachievement in previous tests.

Table 8.1: High Gain Students from the Control Group

Student	Pretest Raw Score	Pretest Percentile Band	Posttest Raw Score	Posttest Percentile Band	Raw ScoreGain
4, 2, B	35	37	47	93	12
9, 10, J	18	16	28	31	10
5, 1, A	27	34	39	75	12
6, 4, D	22	5	34	19	12
7, 4, D	30	24	41	69	11
2, 6, F	24	22	33	46	9
Group Mean	**26**	**23**	**37**	**56**	**11**

An Individual Example of the Forced-Choice Dilemma as a 'Shadow of the Future' Effect

Student 4,2,B (Control Group, nine years old) scored in the 37th percentile band (35 raw score) in the RSPM pretest. He missed the placebo intervention due to sickness, but did experience the other socio-emotional strategies employed. At the pretest 4,2,B appeared to try hard and did not give any signs of sickness or any other distress. In the posttest his score improved to the 93rd percentile band (47 raw score), with the gain largely retained at the far posttest six weeks later (46 raw score). The pretest score was clearly a gross underachievement, the most likely reason being a forced-choice dilemma. This conclusion was reached for a number of reasons. Firstly, he is a child who is of high academic potential, as indicated by his posttest score, and it is the gifted child who is at most risk of the forced-choice dilemma (Ford, 1996; Gross, 1989). Secondly, his pretest score represented a substantial underachievement with regard to his teacher's expectations. Lastly, there seemed no reason to conclude that fear of future success or stereotype threat were issues. 4,2,B was one of the case studies (Sam) and will be further discussed later in this chapter.

Impact of Socio-Emotional Factors on Intervention Group RSPM Performance

The equal immersion of both the Control and Intervention Groups in the socio-emotional strategies and the gains produced by the Control Group suggest that socio-emotional factors are a component of the total gains produced by the Intervention Group following the metacognitive intervention. A thorough search of the literature revealed no research that used dynamic testing with Aboriginal children with which to compare this study and hence develop some insight into the gain scores measured in this research. However, two studies that have a number of similarities to the present research were conducted by Skuy, Kaniel and Tzuriel (1988) and Tzuriel and Feuerstein (1992) in Israeli communities. Both used the RSPM as a basic measurement tool in a dynamic assessment method, worked with disadvantaged students and investigated the performance of the gifted students. Both studies also used the untimed administration of the RSPM (Tzuriel, D. 2001, personal communication). Skuy et al. (1988) used a dynamic assessment method that required 15 hours of testing and mediation, although this time must have been dominated by testing as five assessment tasks were used in the total study. The exact amount of intervention time for the RSPM was not stated. A mean gain of approximately 5.6 raw score points on the RSPM resulted. A control group was not used. Tzuriel and Feuerstein (1992) used a number of intervention times. The High Teach (three-hour) intervention produced gains of approximately 4.0 raw score points, the Low Teach (one-hour) intervention produced gains of approximately 2.0 raw score points, while the No Teach (zero hours) produced gains of approximately 1.6 raw score points. While the No Teach group appears as a control group, no placebo intervention was used to counter a possible Hawthorne Effect. In the present study the Intervention Group produced a mean gain of 8.4 raw score points, substantially higher than the Skuy et al. (1988) outcomes and more than twice the magnitude of the Tzuriel and Feuerstein (1992) findings for the High Teach (three-hour) intervention.

The difference in raw score gains discussed above could have had its origin in a number of factors. Firstly, the different raw score gains in the two studies cited and the present study may represent different degrees of underachievement of the participating children. The pretest mean scores on the RSPM of Skuy et al. (1988) (approximately 31 raw score points) and Tzuriel and Feuerstein (1992) (approximately 36 raw score points) are higher than the

pretest mean scores of the children in the present study (27.1 raw score points). All of these mean scores were reported to be below the mean scores in their respective societies, although those among the Aboriginal children in the present study were substantially lower than the others. The lower mean pretest score of the children participating in the present study when compared to the Skuy et al. (1988) and Tzuriel and Feuerstein (1992) studies has a number of possible sources. In the Tzuriel and Feuerstein (1992) study approximately half of the children were from disadvantaged schools, and attended Grades 4–6, hence were a little older than the children in the present study. The higher average SES of the Tzuriel and Feuerstein (1992) student group was a likely contributor to the higher pretest mean score (approximately 36). However, when the study participants were divided into low, medium and high performance categories during data analysis it was found that the low performance students showed higher gains at the High Teach (three-hour) level than in the other groups, supporting the notion of a high level of underachievement by this group (Tzuriel & Feuerstein, 1992). In the Skuy et al. (1988) study all students were from Grades 4–6 and from schools in low SES areas. The lower pretest mean score (approximately 31) measured in their research would appear to be due to SES as the ages of the children in both studies were similar. In the present study all students were from Grades 3–5, from an involuntary minority group and almost entirely of low SES backgrounds. The lower pretest score (27.1) would have been partly due to the younger average age of the children, but the age difference does not explain the full difference of 4 raw score points when compared with Skuy et al.'s (1988) study. This unexplained difference can best be accounted for as a greater degree of underachievement. If the children in the present study were underachieving to a greater degree than the children from the Skuy et al. (1988) and Tzuriel and Feuerstein (1992) studies, then it can be claimed that if the sources of underachievement were addressed, greater gains in the dynamic testing would be possible.

It follows that the inclusion of strategies designed to counteract socio-emotional issues associated with the academic underachievement of involuntary minority children from disadvantaged backgrounds may be necessary to facilitate optimal participation in both the metacognitive intervention and the testing situation. As previously discussed, these strategies were suggested as the cause of the gains observed in the Control Group from pretest to posttest. Furthermore, when the Control Group gain

(2.8) was subtracted from the Intervention Group gain (8.4) a net figure of 5.6 resulted, the same as the gains reported by Skuy et al. (1988).

Self-Efficacy and Dynamic Testing

The development of self-efficacy as part of the metacognitive intervention was considered important to enable the participating children to perform close to their potential. It was anticipated that factors associated with low self-efficacy, such as poor motivation and poor concentration, were likely to inhibit any metacognitive development. Self-efficacy is defined as "People's judgements of their capabilities to organise and execute courses of action required to attain designated types of performance" (Bandura, 1986b, p. 391). Bandura (1977) noted that it is possible to understand what needs to be done to succeed, but it is another matter altogether to believe that you can actually do it. An individual's self-efficacy will determine how much effort will be expended and how long it will be sustained in the face of difficulties (Bandura, 1977, p. 191). This is especially relevant for children who do not experience academic success in everyday school. In the context of this study it was important that the participating children should persevere at a task even when it became difficult, if a true indication of their academic potential was to be gained. With this in mind the metacognitive intervention was designed so that self-efficacy development was a targeted outcome.

Bandura (1977) identified a number of factors that could positively develop self-efficacy. Two of these were adopted in this study. First, and more powerful (Bandura, 1977), was the use of repeated success to raise personal mastery expectations. The negative effects of task failure on test performance have been noted (Haywood & Wingenfeld, 1992). Bandura (1977) observed that self-efficacy expectations developed in this manner can result in self-motivated persistence and sustained effort, and may generalise to other situations. In the present study each student achieved constant success in the metacognitive intervention, especially in the early part of the intervention. This was achieved using the metacognitive strategies, feedback and as much scaffolding as necessary. The second, although much weaker (Bandura, 1977), strategy used was verbal persuasion. This strategy was entirely incorporated in the feedback strategies (Craven et al., 1991) discussed in the Method chapter. Lovaglia et al. (1998, p. 201) have hypothesised that self-efficacy is affected by "status processing", that is expectation issues arising from belonging to an

involuntary minority group. This connection with self-efficacy was addressed using the socio-emotional strategies previously discussed. One indication that self-efficacy did improve during the metacognitive intervention was the better concentration, perseverance and effort observed during the second hour of the intervention. This occurred even though the cognitive tasks used became harder in the second hour. In a number of cases solutions were more readily reached in the more difficult second session.

In the context of this study I considered that the development of self-efficacy was dependent upon the development of positive socio-emotional outcomes.

Matched Intervention and Control Group Pretest Scores

The experimental design called for matched Control and Intervention Groups based on the pretest RSPM scores. Achieving perfectly matched groups proved to be difficult due to the fact that the data were collected from eight different and often widely separated primary schools. Consequently, small differences in Control and Intervention Group means at each school resulted in a small net difference in Control and Intervention total group pretest scores. The data analysis revealed that the mean pretest scores of the Control and Intervention Groups were marginally but non-significantly different ($p<.665$). However, the small difference in pretest scores (1.7 raw score points) made it more difficult for the Intervention Group to make gains from pretest to posttest as this group began with the slightly higher pretest score. Consequently, the difference in pretest scores of the Intervention and Control Groups could only diminish the statistical effect of the intervention and can be ignored.

Hypothesis 1b

Dynamic testing will identify high academic potential in the children participating in the study.

In the following section the effectiveness of the dynamic testing method developed in the present study as an identification tool for giftedness is discussed. Additionally, dynamic testing is contrasted with other commonly used identification methods for use with culturally different, involuntary minority and/or low SES groups.

Identifying Gifted Underachievers from Cultural Minorities and/or Low SES Groups

The identification of gifted underachieving students from cultural minorities, involuntary minorities and/or low SES groups has proved to be difficult. Children from these populations are consistently underrepresented in programs for the gifted (Braggett, 1985; Ford, 1996; Taylor, 1998). This fact has a number of possible explanations. One is that there are few academically gifted children from these groups, an explanation that can be discarded as a remnant of the deficit thinking paradigm (Valencia & Solorzano, 1997). Another is that the identification methods used are inadequate in finding children from these groups who are of high academic potential but fail to demonstrate their potential for a variety of reasons associated with their cultural, involuntary minority and/or SES status.

The relationship between the giftedness and talent construct and underachievement is, therefore, central to the successful identification of children from cultural minority, involuntary minority and/or low SES groups. This relationship is discussed below.

Underachievement has been unsatisfactorily defined for many gifted disadvantaged and involuntary minority students who perform below their potential in both the classroom and on some measure of potential for high achievement. The need to define clearly the invisible underachiever and use specific strategies to identify these children is discussed below.

Identifying 'Invisible' Gifted Underachievers

Underachievement has been adequately defined for children who perform well on some measure of potential for high achievement, but achieve poorly in the classroom (Whitmore, 1987). However, children from culturally different, involuntary minority and/or low SES backgrounds often perform below their potential on generally accepted measures of academic ability (Ford, 1996). While this issue is well recognised (Ford, 1996; Ogbu, 1994; Whitmore, 1987), there are no definitions of underachievement that specifically recognise underperformance of some gifted children in the classroom and on some measure of potential for high achievement. It is here that the practical problems of the Whitmore (1987) definition arise. *If children from culturally different, low SES and involuntary minority groups are to be*

identified as being of high academic potential, they must first be recognised as being underachievers. If these children are not recognised as underachievers they are easily categorised as less able than the dominant population. This outcome can have a number of undesirable results. Proponents of the deficit thinking paradigm argue that their lower than average scores on IQ tests indicate that this population is academically less able than the rest of the population (Jensen, 1981). In the absence of evidence to the contrary this is a tempting conclusion to reach.

The need to recognise students who have high academic potential, but who underperform in the classroom and on some measure of potential for high achievement, is essential if culturally different, low SES and involuntary minority groups are to be recognised as gifted. It is then, and only then, that identification methods to find these students will be actively sought.

In the absence of a consistent term for students who underperform on some measure of potential for higher achievement and in the classroom, these students are described as "invisible underachievers" for the purposes of this study. Furthermore, to highlight the difficulty in identifying these children a paragraph was added to Whitmore's (1987) definition of underachievement:

> Underachievement is defined as school performance judged to be significantly below the level expected, based on some reliable evidence of potential for higher achievement. This pattern can be revealed through significant discrepancies between tests or subcomponents of tests, or between observed intellectual behaviour and grades or test scores.
>
> Whitmore (1987, p. 1).

However, it must be recognised that culturally different, involuntary minority, and/or economically disadvantaged students may underperform on standardised and/or achievement tests and that intellectual potential may be heavily masked. Those seeking to identify gifted underachievers in cultural minority, involuntary minority, and/or economically disadvantaged groups should recognise these possibilities and seek appropriate measures or indicators to help ensure that the 'invisible' gifted underachievers are not overlooked.

Australian Aboriginal people are both a cultural and involuntary minority, and in a majority of cases have low socio-economic status. The suitability of

identification methods generated by particular conceptions of giftedness for the identification of Aboriginal children is discussed below.

Suitability of Commonly used Methods for Identifying Gifted Aboriginal Children

Static Standardised IQ Tests

The use of static standardised IQ tests to identify invisible gifted underachievers is unlikely to be successful due to factors related to the nature of the test and to socio-emotional issues, rather than to the academic potential of the child. If static standardised IQ tests are used with groups who are likely to contain invisible underachievers high scores should be accepted but low and even average scores should be ignored (Borland, 1986) as, in some cases, these scores do not truly reflect the academic potential of the child. Furthermore, underachievement on these tests is potentially destructive to the future academic development of the invisible underachiever if the score is used to confirm poor classroom performance as a true reflection of potential.

The failure of static standardised IQ tests to measure the true academic potential of students who are from culturally different and/or low SES backgrounds is well documented (Babad & Budoff, 1974; Borland, 1986; Brown & Ferrara, 1985; Brown & French 1979; Campbell & Carlson, 1995; Feuerstein et al., 1979; Ford, 1996; Gardner, 1983; Kaniel & Reichenberg, 1990; Passow, 1972; Tzuriel & Feuerstein, 1992). The below average performance of particular groups on IQ tests has been used by some individual researchers (Herrnstein & Murray, 1994; Jensen, 1981) to propagate deficit thinking views regarding the genetic and/or cultural equality of these groups. Little regard has been given to the socio-emotional and cultural issues that could cause underachievement on the test itself (Tzuriel & Haywood, 1995).

In the present study the RSPM was used as the instrument to measure the cognitive variable. Despite its being described as a culture-fair test (Feuerstein et al., 1979; Matthews, 1988) the mean pretest score for the Total Group in the dynamic testing process was the 27.41 percentile band. This outcome supports the view that the one-off use of IQ tests is inappropriate for involuntary minority students.

The recognised failure of IQ tests, alone, successfully to identify gifted students from all sections of society has led to a multi-dimensional approach to identifying giftedness. The most commonly used identification methods are now discussed in the context of their merit in identifying Aboriginal children.

Multi-Dimensional Approaches to Identifying Giftedness

The existence of "traits, characteristics, and behaviours that are universally associated with talent potential and performance" (Passow & Frasier, 1996, p. 201) have underpinned a multi-dimensional approach to the identification of gifted students from all parts of society. In this section checklists and rating scales, quota systems, teacher, parent, peer and self nomination and creativity are discussed with respect to their value in identifying high academic potential in Aboriginal children.

Checklists and Rating Scales

The use of checklists and rating scales in identifying giftedness in all sections of a society is philosophically in tune with Passow and Frasier's (1996) views. The value of recognising traits, characteristics and behaviours that are culture specific is an obvious advantage and, potentially, offers a way to identify academically gifted children who are invisible underachievers. Frasier (1997) developed the F-TAP model for African-American children, while in Australia Harslett (1993) and Gibson (1997) independently developed checklist models for Australian Aboriginal children. Checklists have been criticised for a number of reasons that are relevant to gifted Aboriginal children. Firstly, the general nature of checklists makes it difficult to use them to quantify the gifted status of children. Consequently, in the absence of other evidence of academic giftedness teachers may find these data hard to interpret. This is especially so if the invisible underachiever belongs to a minority group in a class with a teacher from the dominant culture. More significantly, the validity and reliability of any checklist relies on the ability of the user (usually a teacher) to apply it (Denton & Postlethwaite, 1985). In the case of Aboriginal children, the way teachers complete a checklist may be strongly influenced by their own cultural background (Eckermann, A-K. 2002, personal communication). This may include cultural stereotyping and deficit views of Aboriginal children with respect to academic potential. Additionally, teachers

are often confronted by oppositional behaviours, such as poor classroom performance and attitudes, conditions that are not conducive to good relationships between teacher and student (Godfrey et al., 2001). However, a strong positive relationship between teacher and child is important if the Aboriginal child is to learn effectively in school (Collins, 1993; Munns, 1998). Behaviours that indicate an Aboriginal child may be gifted may not be apparent to teachers due to low expectations on their part, and behaviours generated by the forced-choice dilemma on the student's part.

Checklists and rating scales provide an appropriate means of identifying some gifted children from disadvantaged backgrounds. However, their use with Aboriginal students may be compromised by teachers who take too general an approach, teachers having low expectations of Aboriginal children's intellectual potential, and forced-choice dilemma generated behaviours by the children.

Quota Systems

Quota systems remove the need initially to identify gifted students, and as such guarantee that students from disadvantaged groups are not underrepresented in programs and classes for the gifted. The quota system has been successfully used with disadvantaged African-American students (Smith et al., 1991). However, the problem of determining degrees of giftedness still exists. The major problem for quota systems involving Aboriginal children lies in the ability of teachers correctly to identify the gifted children. The existence of a forced-choice dilemma may lead to further masking of gifted aptitudes and behaviours when inclusion in gifted programs is suggested, making it even harder to ascertain the true potential of these children. One solution to this problem has been to offer gifted programs for Aboriginal students only, as was done in northern New South Wales with the Anaiwan Project and the Ngali Dhiirilli Project in 1998/9. Both projects were readily accepted by the students and the local Aboriginal communities, and student involvement was consistently positive.

While quota systems are philosophically sound and guarantee that Aboriginal children will be proportionally represented in gifted programs, they do not reduce problems in identifying the most appropriate children and can exaggerate already difficult situations for the gifted Aboriginal child.

Teacher, Parent, Peer and Self Nomination

Teacher nomination has been one of the most widely used methods of identifying giftedness in the classroom. However, the ability of teachers accurately to identify gifted children from culturally different groups has to be questioned (Braggett, 1985). Teachers are more likely to nominate "teacher pleasers" (Davis & Rimm, 1994) or students who exhibit teacher-affirming language or behaviours (Peterson & Margolin, 1997). In the present study the eight teachers who figured in case studies all felt, to varying degrees, that their case study child was underperforming compared to potential. However, only one teacher came close to recognising the high academic potential of the child as indicated by the dynamic testing. The other seven teachers described their case study child as of about average academic potential. The effectiveness of teacher nomination of Aboriginal students for inclusion in programs for the gifted must be viewed with considerable doubt.

Peer and self nomination have been recognised as potentially useful identification tools (Gagné, 1989; Richert, 1997, p. 83). However, for use with Aboriginal students these tools are brought into question by the forced-choice dilemma that many involuntary minority students experience. The problem is that many underachieving involuntary minority students do not wish to be recognised as being gifted, so as Ford (1996, p. 30) commented: "These students are not likely to nominate themselves."

Parent nomination of giftedness in their children has been shown to be reasonably good for young children (Ciha et al., 1974; Jacobs, 1971). Parent nomination for the identification of giftedness in Aboriginal children has the advantage of providing a cultural perspective that might otherwise be unavailable. However, many Aboriginal parents have experienced limited education opportunities and consequently may not recognise the signs of academic giftedness (Davis & Rimm, 1994; Passow, 1982; Whitmore, 1986). For accurate parent identification to take place their knowledge of these signs is necessary. In the present study six of the eight case study parents indicated that they thought that their child was bright or clever in the academic sense. However, the parents of the highest scoring child in the study (at both pretest and posttest) did not consider their child was academically bright or clever, a point they repeated a number of times. The ability of this group of parents to recognise their child's academic potential suggests that parent nomination for Aboriginal children for giftedness may be a possible area of further research.

Creativity

The use of creativity tests to identify giftedness in populations who are difficult to identify using other more popular means has received considerable support (Kirschenbaum, 1989; Renzulli, 1978; Sternberg, 2000; Torrance, 1998). Creativity testing for 'creative positives' (Torrance, 1998) with Aboriginal children may well provide a useful means of gaining insights into giftedness. This is particularly so for Aboriginal children due to the availability of figural tests of creative thinking, which are more appropriate than verbal forms for many of these children. However, creativity tests taken in isolation will only provide indications of academic potential and will need further support.

The methods discussed above for identifying academic giftedness in Aboriginal children have generally not been successful, as witnessed by the low participation rates of Aboriginal children in programs for the gifted. In contrast, dynamic testing offers a valuable additional tool for the identification of high academic potential in Aboriginal children as it specifically addresses metacognitive and socio-emotional factors that contribute to the limited success of other methods. Consequently, *Hypothesis 1b is supported.*

In the following section the outcomes of the dynamic testing used in the present study are discussed with respect to its theoretical, philosophical and practical application as an identification tool for gifted Aboriginal childen.

Dynamic Testing as an Identification Tool in the Context of the Present Study

Dynamic testing has its theoretical foundations in Vygotsky's Zone of Proximal Development (ZPD) and as such has underachievement or unfulfilled potential as a focus. Dynamic testing seeks to determine what a child could achieve on a given task when socio-emotional and metacognitive barriers to optimal cognitive performance are removed. Consequently, dynamic testing offers a method of identifying gifted Aboriginal underachievers who perform below their potential under observation or in a static (one-off) application of a standardised test.

Group Dynamic Testing Outcomes

Raven's Standard Progressive Matrices (RSPM) assesses non-verbal reasoning ability and is considered to be one of the best measures of Spearman's *g* (de Lemos, 1989; Matthews, 1988). For this reason the RSPM can be used as a measure of academic potential. The RSPM has been recommended as a possible identification tool for the identification of giftedness in culturally different and/or low SES populations due the culture-fair nature of the test for several decades (Feuerstein et al., 1979; Matthews, 1988). However, the performance of culturally different and/or low SES populations in one-off applications of the RSPM have not equalled that of the general population (Lovaglia et al., 1998; (Skuy et al., 1988; Skuy et al., 2001; Tzuriel & Feuerstein, 1992) despite the supposed absence of substantial cultural disadvantage in the test structure itself. A comparison of RSPM performance by Aboriginal children in Australia has not been possible as the literature does not reveal any studies using the RSPM with Aboriginal students.

Dynamic Testing Outcomes Reveal Underachievement on the RSPM Pretest

In the present study the mean pretest scores 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 RSPM pretest scores 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 application of 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 culture-fair tests has been linked to sociocultural factors (Skuy et al., 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. In the following section individual student score changes in the dynamic testing process will be discussed.

Individual Dynamic Testing Outcomes

Interpreting Individual Dynamic Testing Outcomes

The use of raw score changes to measure the effectiveness of dynamic testing has been criticised (Embretson, 1987; Glutting & McDermott, 1990; Grigorenko & Sternberg, 1998). As previously discussed, the inappropriateness of using raw score changes to measure group dynamic testing performance differences in the context of the present study was recognised. Consequently, the Rasch model of Item Response Theory was used in the analysis of the RSPM dynamic testing group data. However, 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 1,4,D 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 underrepresentation of these 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 the intervention students performed to their potential at posttest despite the strategies employed to help reveal their academic potential, as this would mean that all students were successfully and fully reached during intervention. **Appendix 6.2** summarises the dynamic testing scores for the participating children. An examination of this table will reveal a wide variety of gain scores from pretest to posttest. 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 6.4**. 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 8.2**.

Table 8.2: RSPM Test Occasion on which the Child was Identified as Gifted

Student	Intervention Group			Control Group		
	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			

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. It was these latter gains that moved these students into the gifted range. The magnitude of these gains from posttest to far posttest suggests that they are unlikely to be largely due to practice effects as most gains due to

practice effects would logically occur at the posttest. It is, therefore, 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 on the test performance of the children with high academic potential. 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 15 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 ranged from plus 31 to minus 6. In the context of this study 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. These data are presented in total in **Appendix 6.2**. For example, student 4,1,A (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 3,1,A (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. Student 2,2,B who scored in the gifted range at pretest but regressed at posttest has already been discussed in this chapter. 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.

Research Question 2 sought to investigate the trends in the internal academic locus of the children identified as gifted by dynamic testing. The research outcomes are discussed in the following section.

Research Question 2

Hypothesis 2a:

There will be no substantial difference between the mean internal academic locus of control score of the group of children identified as gifted and the Total Group mean.

Hypothesis 2b:

There will be no significant difference between the mean internal academic locus of control score of the group of children identified as gifted and the instrument norms.

Factors Affecting Locus of Control

Internal locus of control has been positively associated with academically achieving students (Crandall et al., 1965; Lefcourt, 1982). The significantly lower mean internal locus of control and the below average academic performance of the children in the present study support the above findings. This association has been further confirmed in the present study by the significant ($p<.001$) positive correlation between IAR and RSPM scores at pretest, posttest and far posttest (see **Table 6.19** and **Figures 6.8, 6.9** and **6.10**).

The low internal academic locus of control mean scores have a number of potential sources. Academic underachievement has been associated with lower internal locus of control scores (Kanov et al., 1980; Laffoon et al., 1989). In the present study the dynamic testing outcomes and the eight case studies reported in Chapter 7 suggest that many of the children are academic underachievers. This is especially so for the children identified as gifted. Risk factors such as previous grade failures, poor attendance, prior disciplinary actions, low family income, and the number of parents in the family have also been linked to low internal locus of control (Browne & Rife, 1991). The children in the present study were generally from low SES backgrounds and were likely to have experienced some of the risk factors noted by Browne. Low internal locus of control scores have also been associated with involuntary minority status (McLaughlin & Saccuzzo, 1997; Shorr & Young, 1984). The significantly low internal IAR scores achieved by the Aboriginal

children in the present study support the previous evidence that locus of control is negatively influenced by underachievement, involuntary minority status and particular risk factors.

The Gifted Group and Locus of Control Performance

High internal locus of control has been positively associated with academically achieving gifted students (Crandall et al., 1965; Harty, Adkins & Hungate, 1984; Karnes & McGinnis, 1996; Lefcourt, 1982; McLaughlin & Saccuzzo, 1997). The internal locus of control mean scores of the group identified as gifted in the present study were substantially higher (see **Table 6.5**) than those of the Total Group, but were slightly (non-significantly) below the instrument norms. This outcome supports the research that suggests a positive relationship between giftedness and locus of control. Further, the higher internal locus of control scores of the identified Gifted Group suggests that the dynamic testing used in the present study was successful in identifying the gifted students.

Locus of control has been shown to demonstrate short-term stability (Crandall et al., 1965; Lefcourt, 1982). The locus of control data in the present study show non-significant changes at posttest and far posttest, demonstrating the short-term stability of academic locus of control of these children.

Research Question 3 sought to investigate the trends in the self-concept of the children identified as gifted by dynamic testing. The research outcomes are discussed in the following section.

Research Question 3

Hypothesis 3a:

There will be no substantial difference between the mean academic subscale self-concept scores of the group of children identified as gifted and the Total Group means.

Hypothesis 3b:

There will be no significant difference between the mean academic subscale self-concept scores of the group of children identified as gifted and the instrument norms.

The focus of the present study was the identification of academic giftedness in Aboriginal children. Consequently, the following discussion focuses on the academic subscales of the SDQ I data for the Total Group and for the Gifted Group. The SDQ I non-academic subscales are briefly discussed to help establish the overall self-concept perspective. The mean self-concept subscale scores as measured by the SDQ I are presented in **Table 6.6**.

The graphical presentation (**Figure 6.11**) of the SDQ I Total Group data and the SDQ I norms reveals a number of findings. Firstly, the children in the present study produced scoring patterns that generally follow the same trends as the SDQ I norms (see **Figure 6.11**), showing that the participating children are not substantially different from the norm children with respect to the general pattern of their self-concept. However, when the individual subscale mean scores were compared to the SDQ I norms there were differences, some of them significant. The three academic subscales scores (Maths, Reading and General School) were higher than the SDQ I norms, with Reading and General School significantly so ($p<.001$). This outcome is at variance with a commonly reported correlation between academic performance and self-concept (Hattie, 1992). However, it does support the findings of Soares and Soares (1969) and Marsh and Parker (1984) that low SES children score higher than the instrument norms on self-concept measures. Studies involving Australian Aboriginal children have also shown average or above average self-concept outcomes (Wright & Parker, 1978; Pedersen & Walker, 2000; Purdle et al., 2000; Randhawa, de Lacey & Hunt, 1988). These outcomes may be the result of low academic expectations held for these children who are functioning according to the expectations of parents and teachers and are thus satisfied with their low level performance, which resulted in a positive self-concept (Hattie, 1992; Marsh & Parker, 1984; Soares & Soares, 1969).

The children in the present study performed in the classroom at a lower than average level academically and it is likely that teacher expectations for their academic performance were similarly lower. In the present study this likelihood is supported by the generally average expectations of academic

performance held by the teachers for the eight case study children, all of whom scored at or above the 80th percentile band on the dynamic testing. While the above mean scores of the study children on the academic subscales do not reflect higher than average academic performance, they are likely to reflect student satisfaction with below potential academic performance as these children are functioning according to the expectations of teachers.

The Gifted Group and Academic Self-Concept

The group identified as gifted by the dynamic testing also exhibited the same general scoring pattern as the SDQ I norms (see **Figure 6.12**). However, the mean scores of the three academic subscales were quite different from those of the Total Group (see **Tables 6.6**). The Reading subscale was non-significantly above the SDQ I norms while the Maths subscale was non-significantly below the norms and the General School subscale was slightly below the norms. Using the same expectation link expressed by Hattie (1992) and Soares and Soares (1969) these self-concept outcomes suggest that the Gifted Group were expected to do better at maths and were dissatisfied with their performance. Conversely, the high Reading self-concept mean score suggests student satisfaction with reading outcomes. The almost average General School mean score suggests reasonable satisfaction with school in general. The large difference between the Maths and Reading (see **Figure 6.12**) subscale mean scores suggests that the Gifted Group students were aware of their maths shortcomings.

The Peer Relations subscale produced the only significantly ($p<.001$) lower mean scores for the Gifted Group when compared with the SDQ I norms. When compared with the Total Group the Gifted Group Peer Relations subscale scores were substantially lower. These outcomes suggest that the identified Gifted Group students were dissatisfied with their peer relationships. This finding supports the belief that gifted children experience peer pressures not to achieve academically as the result of the forced-choice dilemma, negatively affecting peer relations (Ford, 1996; Gross, 1989). This is especially so for involuntary minority status children. Further, the significantly low Peer Relations subscale outcome represents another indication that the dynamic testing used in the present study did correctly identify the gifted children.

The self-concept mean scores of the Gifted Group and the Total Group were also very similar in general scoring pattern (see **Figure 6.13**). However, in all cases the Gifted Group scores were lower than those of the Total Group. These differences suggest that the group identified as academically gifted using dynamic testing had different expectations from the Total Group across all SDQ I subscales. A thorough search of the literature revealed no research with respect to gifted invisible underachievers identified by dynamic testing and self-concept. The findings in the present study suggest that this may be a valuable area for further research.

The case studies revealed a number of factors that influence the school environment and the academic performance of the children. The following discussion centres on the academic performance of the children participating in the case studies and the factors that influenced that performance.

Research Question 4 — Case Studies

Academic Performance

Status as 'Invisible' Underachievers

The children participating in the case studies were selected on the basis of their performances in the dynamic testing. All scored at or above the 80th percentile band on at least one testing occasion, while most showed high gain scores between the pretest and posttest. The status of the case study children as 'invisible' underachievers can be determined by comparing their classroom performance with the dynamic testing outcomes. Teacher estimations of academic performance and potential and the RSPM dynamic testing scores for the children participating in the case studies are presented in **Table 8.3**.

Table 8.3: Teacher Expectations of Academic Performance and RSPM Percentile Band Scores at Pretest, Posttest and Far Posttest for Case Study Children

Name	Teacher Estimation of Academic School Performance	Teacher Estimation of Working to Academic Potential	RSPM Pretest Percentile Band	RSPM Posttest Percentile Band	RSPM Far Posttest Percentile Band
Jill	Just below average	No	2	80	52
Adam	Average	No	18	69* 91	58
Nola	Slightly below average	No	43	81	83
Kate	Well above average	No	58	91	96
Sam**	Probably average	No	37	93	90
Ian	Average	No	86	97	93
Linda	Just below average	No	42	75	91
Claire	Average	No	28	81	72

* First posttest
** Control group

Only Ian scored above the teacher expectation for his school performance in the RSPM pretest and consequently fitted the Whitmore definition of an underachiever. In contrast, the dynamic testing performance of Jill, Adam, Nola, Kate, Sam, Linda and Claire suggested that they were 'invisible' underachievers. That is, the one-off test (RSPM pretest) that served as an assessed aptitude for achievement did not reveal them as underachievers. However, the dynamic testing posttest did reveal academic potential substantially above the teacher's estimation of academic performance which confirmed the status of Jill, Adam, Nola, Kate, Sam, Linda and Claire as 'invisible' underachievers.

The dynamic testing method used in the present study was successful in revealing seven of the eight children participating in the case studies as 'invisible' underachievers. Four of the seven 'invisible' underachievers would now be considered gifted, using the 85th percentile band cut-off point employed in the present study. As Ian was identified as an underachiever by the RSPM pretest, all of the children participating in the case studies were now shown to be underachieving when compared with their academic potential. These findings suggest that the dynamic testing method used in the present study represents a suitable method to determine assessed aptitude for achievement for the study population (Gagné, F. 2000, personal communication).

In the following section the factors that contributed to the underachievement of the case study children are discussed.

Factors Contributing to the Underachievement of the Case Study Children

The academic underachievement of the case study children is the result of a number of interacting factors, many associated with involuntary minority status and expectation issues. By integrating factors perceived to contribute to underachievement in school, a model that can provide a better understanding of the underachievement the participating children can be developed. In the following section such a model is developed.

Lovaglia et al. (1998) have extended status characteristic theory to explain intelligence test score differences between advantaged and disadvantaged groups. The resulting status process model (Lovaglia et al., 1998, p. 201) links group membership and expectations for ability to self-efficacy and ultimately test score performance. It is suggested that the interaction of the expectations of others, self-expectations and the expected rewards and costs can result in low self-efficacy for low status groups (including involuntary minority groups) and, consequently, in underperformance on intelligence tests. It is logical to extend this model to involuntary minority children in the classroom. Low self-efficacy over a long period is likely to influence a range of skills, attitudes and outcomes. The development of basic metacognitive skills is likely to be hindered, resulting in classroom performances that represent an underachievement compared with cognitive potential. Aspects of school such as attendance and homework are likely to suffer as interest wanes. Classroom behaviour is likely to be oppositional, resulting in either withdrawn or aggressive manner. In the present study behaviours consistent with low self-efficacy were revealed in the data collection sessions (see field notes **Appendix 6.1**). This was especially obvious in the metacognitive intervention where motivation and focus improved dramatically in most children as the strategies designed to enhance self-efficacy were employed. In a cyclic fashion, these below potential learning outcomes then reinforce negative self and teacher expectations. In the following section the underachievement of the case study children is viewed from the perspective of expectations, metacognition and the day-to-day school manifestations of the components of the status process. Finally, a model that integrates the factors contributing to the underachievement of the case study children is presented.

The RSPM Pretest

The general level of underachievement of the children in the RSPM pretest is similar to that of other involuntary minority peoples (Lovaglia et al., 2000). The perceived causes of this underachievement have been previously discussed at length and were used to design the dynamic testing method used in the present study. In this section I will use the case studies to examine possible sources of underachievement of the study children.

Expectation

The influence of teacher expectation on student academic performance is well documented (Lovaglia et al., 1998; Rosenthal & Jacobson, 1968). In the present study the case study teachers generally held an expectation of academic potential lower than that revealed by the dynamic testing. Only Teacher K held expectations of classroom performance and academic potential for Kate that approached the academic potential revealed by the dynamic testing. The longer-term teacher expectations of academic success for these children were also generally pessimistic, only Teacher I predicting future academic success.

The issue of school homework revealed an aspect of teacher expectations toward the case study children. Of the eight case study children Jill, Adam, Nola and Claire regularly completed homework but rarely handed it in, while Ian sometimes handed in homework. Further, their respective teachers did little to seek the due work which revealed a lack of expectation that it would be completed. Only Kate and Sam (same school) regularly completed and handed in homework. In these cases the teachers insisted that homework was handed in. Kate commented: "You always have to bring your homework in."

The expectations of the children themselves can also influence school participation and performance. I have identified the forced-choice dilemma (Gross, 1989) as a dominant factor for the participating children. In the following section the influence of the 'shadow of the future' (Lovaglia et al., 2000) on the case study children is discussed.

The 'Shadow of the Future'

Fear of the consequences of doing well in school or test situations has been described by Lovaglia et al., (2000) as the 'shadow of the future'. In culturally

different and involuntary minority groups these fears can be substantial (Ford, 1996; Lovaglia et al., 2000). As all of the study children were Aboriginal they were all likely to be influenced, to varying degrees, by 'shadow of the future' effects. However, isolating such effects is not always possible, although the interview and the RSPM dynamic testing data of Adam, Linda and Sam suggested that the low RSPM pretest scores of these children were linked to a 'shadow of the future' effect.

The forced-choice dilemma has been identified as a factor in the academic underachievement of gifted students generally (Gross, 1989), but is especially strong for children from culturally different and involuntary minority groups (Ford, 1996). The forced-choice dilemma can produce a 'shadow of the future' effect (Lovaglia et al., 2000) but isolating the impact of this effect in the present study was, in most cases, difficult as the development of metacognitive efficiency undoubtedly contributed to most gain scores of the Intervention Group. However, there is evidence that points to the forced-choice dilemma as a contributor to the underachievement of Adam and Sam in the RSPM pretest.

Adam scored in the 18th percentile band on the RSPM pretest, a performance level well below Teacher A's 'average' assessment of his classroom performance. As well, Adam had scored in the 10th (numeracy) and 25th (literacy) percentile bands in the statewide Basic Skills Tests (BST), again substantially below Teacher A's expectations. Adam was in the Intervention Group and scored in the 69th percentile band in the RSPM posttest. Even though this score represented a large gain from the pretest, I felt it still represented an underestimation of Adam's ability due to his outstanding performance in the intervention activities. Consequently, I sought Adam out at his home (with his parent's permission) and asked him to do the RSPM again the next day. However, I stressed that he should only do it if he would do his best. He agreed, and the next day scored in the 91st percentile band. This increase in score suggests that the first attempt at the posttest was an attitude-based underachievement. It is clear that the RSPM pretest and BST outcomes represent a substantial underachievement when compared with both Teacher A's estimation and the dynamic testing outcome. Adam is academically gifted, a factor which carries the potential for a forced-choice dilemma (Gross, 1989). Further, Adam is a member of an involuntary minority group, a factor shown to be associated with a 'shadow of the future' effect in African-American students (Lovaglia et al., 2000).

Sam also gave indications that the forced-choice dilemma influenced his RSPM pretest outcome. Sam scored in the 37th percentile band in the RSPM pretest, an outcome below Teacher S's 'probably average' assessment of his classroom performance. In the RSPM posttest Sam scored in the 93rd percentile band, despite being a member of the Control Group and also missing the placebo intervention. Sam's RSPM pretest score represented an underachievement with respect to both Teacher S's assessment and the RSPM posttest. Furthermore, it is clear that the RSPM pretest underachievement was unrelated to metacognitive issues or academic potential. Sam is academically gifted, a factor which carries the potential for a forced-choice dilemma (Gross, 1989). Further, Sam is a member of an involuntary minority group, a factor shown to be associated with a 'shadow of the future' effect in African-American students (Lovaglia et al., 2000).

It would appear that Linda experienced a 'shadow of the future' effect that arose from a different source from that of Adam and Sam. Linda substantially underachieved in the RSPM pretest (42nd percentile band) compared with the RSPM posttest (75th percentile band) and the RSPM far posttest (91st percentile band). The RSPM posttest score (75th percentile band) following the metacognitive intervention suggests that the pretest score and the 'just below average' classroom performance both represented a substantial underachievement compared with Linda's cognitive potential. However, the far posttest improvement to the 91st percentile band suggests that even the much stronger posttest represents a substantial underestimation of Linda's cognitive potential. A possible source for this continued improvement is contained in Parent L's schooling history. Parent L revealed she had very bad school experiences and this was made clear to Linda who felt that her mother would not like her if she was good at school (fully discussed in Linda's case study). The 'shadow of the future' effect in Linda's case possibly lay in her fear of losing her mother's affections if she did well at school.

The academic underachievement of the other case study children could not be clearly attributed to any one expectancy issue, although teacher expectations and the forced-choice dilemma were likely contributors, along with inefficient metacognition and low self-efficacy. In Jill's case impulsive behaviour was the obvious source. All of these issues were addressed as part of the socio-emotional strategies and the metacognitive intervention.

Other Issues

Extra Help

Aboriginal children in the participating schools generally receive extra help in school in the form of Aboriginal Education Assistants (AEAs). The case study children universally supported the presence of AEAs in the school, in line with the findings of Russel (1997) who found that the school AEA has been perceived as important in the school life of successful Aboriginal children. However, it appears that, for the gifted children, help in remediating skill gaps and deficits was not forthcoming from this source as the AEAs' time was largely taken helping less able students. This approach may be understandable but it does help perpetuate the 'invisible' underachiever status of the ablest Aboriginal students by not supporting skill building where gaps in learning have occurred.

Lack of Knowledge of What is Needed to Succeed in School

Aboriginal children who successfully complete school possess some Western cultural knowledge and attitudes which are important for success at school, leading to academically purposeful learning behaviours (Day, 1992). In Day's study this knowledge and these attitudes were also shared by their parents. The case studies in the present study reveal that parents had an understanding of Western cultural knowledge for school success but the strategies and motivation necessary for active pursuit of these goals were sometimes lacking. The previously reported differences between expressed views and actual behaviours toward attendance and homework provide a notable example. Four of the eight case study children had attendance records that caused their teachers serious concern, yet their parents all expressed the opinion that school attendance is important. In a similar way homework was perceived as being important by six of the eight case study parents whereas four of the eight children attempted homework but rarely handed it in to the teacher. At least part of the answer to this apparent contradiction may lie in low self-efficacy and the involuntary minority status of the parents. Bandura (1977) noted that if self-efficacy is low it is possible to understand what needs to be done to succeed but it is another matter altogether to believe that you can actually do it. Despite all parents indicating that they believed that their child had as much chance of succeeding as anyone, the apparent contradictory behaviour is also consistent with involuntary minority status behaviours

where it is often perceived that it would be hard for them to succeed in the dominant society even if they were academically successful (Ogbu, 1994). One outcome of low self-efficacy is that the motivation to do what you know is required to succeed can be negatively affected. A combination of low self-efficacy toward education and a lack of strategies of how to reach known goals provide one way of explaining the contradictory behaviours regarding homework and attendance.

The previously reported dissonance of view between parents and teachers regarding the educational future of the case study children is likely to have its origin in the above contradiction. The teachers understand what is required to succeed later in school and can see that many of these things are not happening even at this early stage of the child's education. The case study parents were expressing attitudes, knowledge and aspirations but lacked the will and strategies to ensure that the basic requirements of academic success, such as regular attendance and homework submission, were met. In addition, most of the case study parents had had negative educational experiences themselves so lacked first-hand knowledge of achieving academically in school.

Teacher Lack of Knowledge of Causes of the Underachievement of Aboriginal Children

The 'invisible' underachiever status of seven of the case study children reflects the problem that teachers must experience in recognising gifted Aboriginal children. The outcome of this lack of recognition is that the teachers simply assume that giftedness is not an issue. Although all teachers acknowledged that the case study children were working below their potential, none suggested that the children were gifted (or used similar terms). The lack of recognition by teachers of substantial underachievement in the case study children suggests a lack of knowledge of the causes and behaviours associated with underachieving gifted students from Aboriginal communities.

Aboriginality

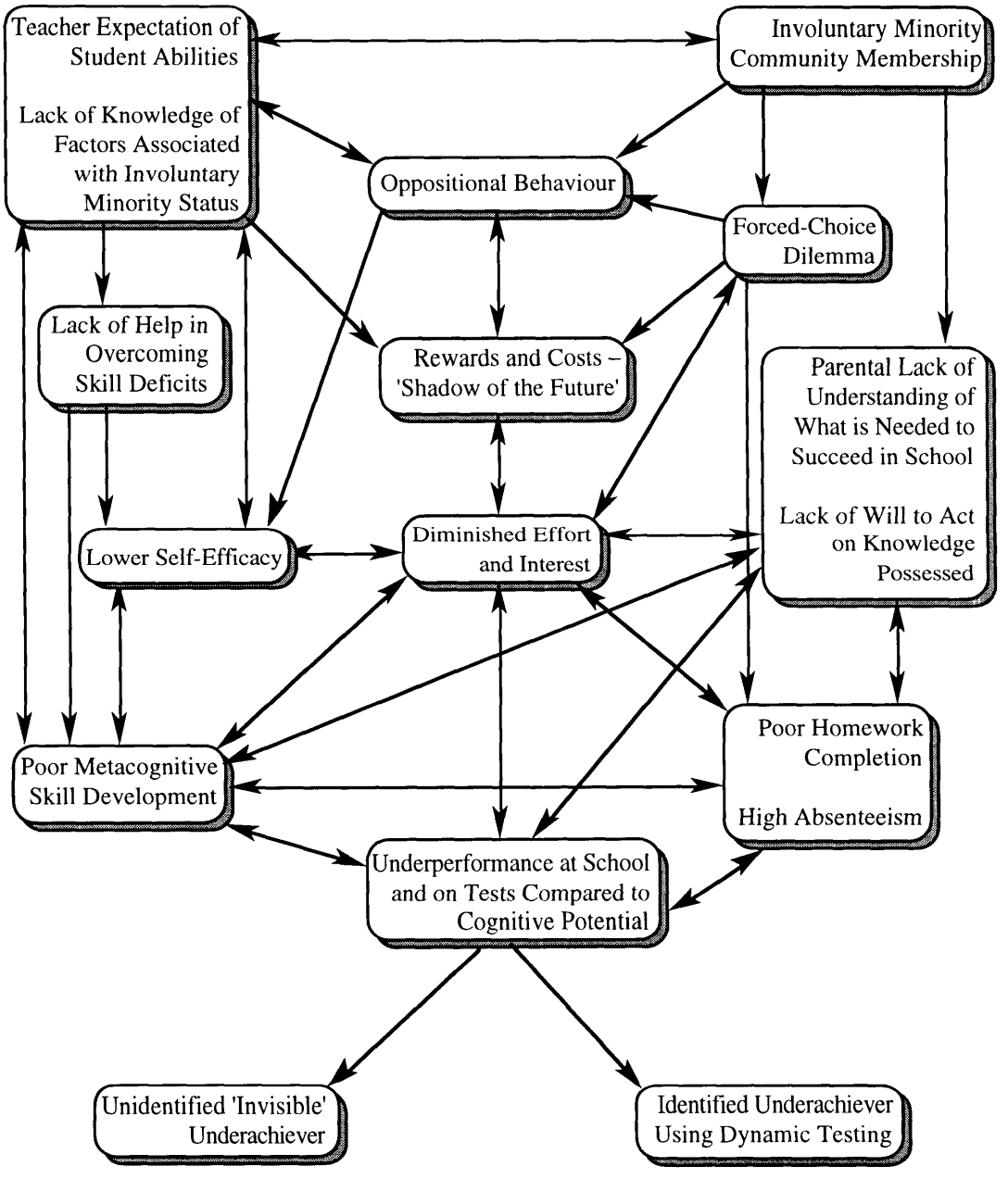
The case study children all expressed pride in their Aboriginality. This finding is in line with the findings of Day (1992) and Russel (1997) who observed that

academically successful Aboriginal students expressed security in their identity as Aboriginal people.

The issue of racism was not deeply explored but several points emerged. Racism was not seen as an inhibiting factor in the education of the case study children. Further, all the case study children expressed non-racist views with regard to their non-Aboriginal school peers.

Factors Contributing to Underachievement in the Classroom

The classroom underachievement of the children participating in the case studies is the result of a number of interacting factors. The literature, case studies and the dynamic testing outcomes have revealed an interaction of factors contributing to the school and test underachievement of the children in the present study. **Figure 8.1** contains a model of the interacting factors leading to underachievement for the case study children.



Note: The arrows refer to all statements in any given box

Figure 8.1: A Model of the Interacting Factors Leading to Underachievement for the Case Study Children

Conclusion

The primary focus of the present study was to investigate the effectiveness of dynamic testing as an identification tool for Aboriginal children with high academic potential. The dynamic testing outcomes were complemented by locus of control, self-concept and case study data on factors associated with the academic school performance of these children. In this section the findings of

the present research are summarised. Implications for gifted education policy and practice, and Aboriginal education in general are discussed, as are suggestions for future research.

The Study Focus — Research Question 1

Research Question 1 concerns the effectiveness of dynamic testing in identifying high academic potential in Aboriginal children. In order to investigate this issue a specific dynamic testing method was developed to optimise the test-taking performance of the participating children by addressing factors perceived to be negatively affecting that performance. The identified factors were associated with inefficient metacognition and socio-emotional issues.

The dynamic testing method was successful in identifying high academic potential in the participating children. Additionally, the children identified with high academic potential were found in the same approximate proportions to the RSPM normative population.

When the dynamic testing mean pretest and posttest scores were compared, it was clear that the pretest scores represented substantial underachievement. Had the first application of the RSPM (dynamic testing pretest) been a one-off measure of potential few of the study children would have been identified as academically gifted. Yet, the RSPM is widely recommended as a relatively culture-fair test to identify giftedness in culturally different groups, including Aboriginal children.

The case study and dynamic testing data revealed that most of the case study children were 'invisible' underachievers. Seven of the eight children would not be considered underachievers by using the RSPM pretest scores alone as "reliable evidence of potential for higher achievement" (Whitmore, 1987). It was the dynamic testing that revealed the case study children as 'invisible' underachievers with high academic potential.

The dynamic testing method featured an intervention that focused on reducing the effect of test performance inhibitors, notably inefficient metacognition and socio-emotional factors. The socio-emotional factors predicted to inhibit the academic performance of the study children were

largely associated with involuntary minority status, namely the forced-choice dilemma and expectation issues. The dynamic testing and the case study data both provided evidence that socio-emotional factors were implicated in the underachievement of some of the study children.

Low self-efficacy has been implicated in underachievement (Bandura, 1977; Lovaglia et al., 1998). Consequently, improving self-efficacy was seen as a necessary step toward developing a child's intellectual potential by facilitating improved motivation and task concentration. In the present study a combination of socio-emotional and metacognitive strategies was effective in improving the study children's self-efficacy in the dynamic testing process, thus facilitating the realisation of cognitive potential.

The under-representation of Aboriginal children in programs for the gifted suggests that academically gifted Aboriginal children are hard to identify using currently available methods. The most commonly used identification methods are static standardised tests or are teacher-centred. The failure of these methods fully to identify academic giftedness in Aboriginal children has a number of origins. Static standardised tests only measure a child's current level of cognitive development. If a child is working to her/his potential the standardised test is likely to provide a good indication of that potential. However, if the child has performance inhibitors, such as inefficient metacognition or socio-emotional issues, the child is unlikely to give a true indication of his/her academic potential in a standardised test. This is the case with many Aboriginal children. The effectiveness of teacher-centred identification methods is inhibited by inadequate teacher understanding of the factors contributing to the school performance of Aboriginal children. Further, these methods are, too often, affected negatively by low teacher expectations of the academic potential of the child. Finally, teacher-centred identification methods are made less effective due to heavy masking of academic giftedness in Aboriginal children.

The dynamic testing method used in the present study is a suitable tool to identify academic giftedness in Australian Aboriginal children for the following reasons:

- The dynamic testing method was successful in identifying high academic potential in the study children. The RSPM pretest identified 3.8% of the study children in the 85th percentile band or higher while the dynamic

testing identified 17.1% of the Intervention Group in the 85th percentile band or higher.

- The dynamic testing method used was culturally appropriate. The RSPM itself is considered to be culture-fair while the intervention included strategies to ensure cultural appropriateness. The intervention strategies could be adjusted to suit other cultural groups.

- Most other methods used to identify academic giftedness in Aboriginal children have proved to be inadequate due to non-cognitive factors. The dynamic testing method attempts to account for academic performance inhibitors and is consequently a suitable identification method for Aboriginal children.

- The dynamic testing method used was successful in identifying previously unidentified 'invisible' gifted underachievers. The present research shows that many of the study children identified as having high academic potential were 'invisible' underachievers.

- The dynamic testing method used is time and cost efficient.

The present study was premised on two fundamental assumptions. Firstly, Aboriginal people have the same level of cognitive potential as the non-Indigenous population. The dynamic testing outcomes support this assumption, with 17% of the Intervention Group scoring in the 85th percentile band or higher. Additionally, the mean score of the Intervention Group was in the 54th percentile band. The scores presented as percentile bands should be used to provide only general comparisons as the non-Indigenous school population was not dynamically tested to assess dynamic test gains.

The second assumption was that of cognitive modifiability. The large gains in the RSPM at posttest, following intervention, supported this assumption. Additionally, the fact that the pretest underperformance of the study children was reversed suggests that their classroom underachievement may also be reversible.

Research Questions 2, 3 and 4 were designed to explore factors that generally affected the school performance of the participating children, especially those

identified as having high academic potential. A summary of the findings with respect to these research questions is presented below.

Research Questions 2, 3 and 4

Research Question 2 sought to investigate the relationship between the internal academic locus of control scores of the children identified as gifted, the Total Group and the IAR instrument norms. As a group, the mean internal academic locus of control scores of the study children were significantly lower than the instrument norms. However, the mean internal academic locus of control scores of the children identified as gifted (≥85th percentile band) were substantially higher, and only marginally below the instrument norms. Furthermore, the individual internal academic locus of control scores were significantly and positively correlated with the RSPM scores. These findings suggest that internal academic locus of control scores may provide a useful indicator of potential academic giftedness in Aboriginal children. Consequently, these scores may provide indications of giftedness in 'invisible' underachievers when other methods do not. Finally, giftedness is associated with high internal locus of control. Thus, the high internal academic locus of control displayed by the Gifted Group supports the idea that the children with high academic potential were correctly identified by the dynamic testing.

Research Question 3 sought to investigate the relationship between the academic subscale self-concept mean scores of the children identified as gifted, the Total Group and the SDQ I normative population. The mean scores of the study children in the Reading, Maths and General School academic subscales were higher than the instrument norms, with Reading and General School significantly so. One explanation for the high academic self-concept of these children who were generally achieving below average academically, is that they were performing to teacher expectations and were thus content with their academic outcomes. In contrast, the children identified as gifted scored below the SDQ I norms in the Maths and General School subscales. This suggests that the gifted children were less satisfied than their academically less able peers with their school performance. The gifted children scored below the Total Group on all SDQ I subscales. However, the Peer Relations subscale mean score was significantly below the SDQ I norms and substantially below the Total Group mean scores. This finding suggests that the gifted children

were experiencing peer relations problems. A likely explanation for this is that these children were experiencing a forced-choice dilemma, a phenomenon common in gifted children (Gross, 1989). This further supports the conclusion that the gifted children have been correctly identified.

Research Question 4 sought to investigate the factors that influence the school environment and academic performance of children with high academic potential participating in the study. The eight case study children were selected on the basis of their high academic potential (≥80th percentile band) as indicated by the dynamic testing. All of the case study children were identified as academic underachievers. However, only one child was identified as an academic underachiever when RSPM pretest scores were used in isolation. The other seven children were identified as 'invisible' underachievers when the dynamic testing posttest scores were used as an indicator of academic potential.

The case studies and literature revealed a number of factors that interacted and contributed to the school academic performance of the children. A model suggesting how these factors have interacted and contributed to the underachievement of the case study children is presented in **Figure 8.1**. The involuntary minority status of the case study children seems a major factor behind their academic underachievement. Involuntary minority status is often accompanied by a powerful forced-choice dilemma with associated oppositional behaviours and poor academic endeavour in the school environment. Additionally, teacher expectations are negatively affected by poor classroom behaviours and performance. Over time metacognitive skills develop poorly and self-efficacy diminishes. Underachievement is the result.

The Aboriginal children participating in the present study have underachieved substantially compared with their learning potential as revealed by the dynamic testing. However, too frequently this learning potential is not brought to maturity in the form of academic performance in formal education and participation in programs for the gifted. The long-term 'invisible' underachievement by Aboriginal people has helped mould and sustain deficit thinking views with regard to their intellectual ability. Teachers today are faced with an Aboriginal school population many of whom underachieve academically. However, the time is right for change. The social conscience of non-Indigenous Australians with respect to Aboriginal people has been raised through issues such as Mabo and the

reconciliation process. If Aboriginal education is to move forward Aboriginal people need to be recognised as academic underachievers and not as academically less able. Strategies need to be put in place to inform teachers and Aboriginal communities about the causes of this long-term academic underachievement. Consequently, the present study suggests a number of implications for gifted education policy and practice, and Aboriginal education generally.

Implications for Gifted Educational Policy and Practice

- The present study has highlighted the importance of definitions in determining who will be perceived as gifted or as an underachiever. If gifted underachievers are to be identified for inclusion in programs for the gifted then the definitions adopted in gifted educational policies must clearly elaborate the concept of underachievement to ensure that 'invisible' underachievers are not overlooked.

- This research has revealed that many of the study children identified as having high academic potential were 'invisible' underachievers. The implication is that one way to help overcome the current under-representation of Aboriginal children in programs for the gifted is to ensure that the definitions of giftedness and underachievement used in gifted education policies clearly embrace the gifted 'invisible' underachiever.

- The dynamic testing method used in the present study was successful in identifying previously unrecognised academic giftedness in Aboriginal children. Further, the dynamic testing method was designed to be readily used in the classroom by trained providers and is both time and cost efficient. Used in parallel with other commonly used identification methods, dynamic testing promises to improve considerably the ability to identify 'invisible' gifted underachievers. However, *dynamic testing with Aboriginal populations must be used with caution.* Providers must be comprehensively trained as misapplication of the dynamic testing method is surely doomed to failure and will serve only to reinforce deficit attitudes. If applied appropriately an identification tool now exists that can identify high academic potential in Aboriginal children in a quantitative and practical way.

The implication of this finding for gifted education policy is clear. Dynamic testing can be used as a tool to identify the 'invisible' gifted underachiever and can help remedy the current under-representation of Aboriginal children in programs for the gifted.

- The RSPM pretest mean scores identified an under-representative percentage of the study children as gifted. However, RSPM pretest scores represented a substantial underachievement when compared with the RSPM posttest scores. The failure of one-off application of the RSPM to identify giftedness in the study children was not linked to the cultural fairness of the RSPM but to metacognitve inefficiency and socio-emotional issues such as teacher expectation and the forced-choice dilemma. The implication is that the RSPM, although considered to be culture-fair, should not be relied on in a one-off application to identify academic giftedness in Aboriginal children as the outcomes may serve to reinforce deficit views.

  Although the present study was centred on the identification of high academic potential in Australian Aboriginal children, a number of implications for Aboriginal education generally have emerged. These are presented below.

Implications for Aboriginal Education

- The dynamic testing outcomes demonstrated that the mean RSPM pretest score of the Intervention Group (30th percentile band) represented a substantial underachievement compared with the mean RSPM posttest scores (54th percentile band). The implications of this finding for Aboriginal education are potentially important. Firstly, the dynamic testing outcomes suggest that the study children, as a group, were underachievers and not academically less able as implied by the pretest scores. If academically gifted Aboriginal children are identified steps can be taken to develop their potential whereas if these children remain unidentified it can only serve to perpetuate low expectations.

  Secondly, the success of the dynamic testing intervention strategies to highlight the initial underachievement of the study children suggest how this underachievement might be remediated in the classroom. **Figure 8.1** presents a model that shows how factors interact to produce academic

underachievement in the study children. Two of the key factors, teacher expectation and knowledge, and Aboriginal community issues will be expanded on below. The implication is that while many of the children in the present study were 'invisible' underachievers, this underachievement can be reversed if the conditions are right.

- Teacher expectation of children's learning potential is a central issue in reversing academic underachievement. The key to this process for Aboriginal children is the recognition that many Aboriginal children are academic underachievers. Dynamic testing can reveal levels of underachievement. The successful revelation of previously unidentified academic potential has the power to alter positively the academic expectations of teachers with respect to Aboriginal children. Additionally, the expectations of the children and their families are likely to be affected similarly. The implication for Aboriginal education is that by changing how people view the learning potential of Aboriginal children, academic expectations will be raised and the influence of the deficit thinking paradigm will be further eroded.

- The case studies revealed that a lack of knowledge existed in both the teachers and the parents with respect to the children's education. Teachers generally showed little awareness of the children's involuntary minority status and its consequences, so accepted at face value the children's current levels of academic performance. The outcome was lowered expectations for their academic performance, abilities and long-term outlook. Parents showed that they did not fully understand what was needed for their child to succeed in school. This seeming lack of understanding may be compounded by a lack of belief that their children will eventually be successful in the broader society even if they do well in school (Ogbu, 1994). To address this a process of school–community liaison aimed at informing and including the Aboriginal community in the educational process, would be most helpful. This should be preceded by a staff development program that focuses on Aboriginal culture and the factors associated with academic underachievement in involuntary minority and/or low SES groups. Optimally, this process would begin in the initial stages of teacher training.

- The present study revealed that the children identified by dynamic testing as having high academic potential were the greatest underachievers. This finding supports Ford (1996) who maintains that it is the brightest

minority children who are most affected by underachievement. If Aboriginal children with high academic potential can be identified at an early age (eg eight years old) then programs and classroom strategies may be employed to develop their academic gifts. If successful, these children will become role models for future generations of gifted Aboriginal children. By demonstrating that it is acceptable to do well at school it may be possible to lessen the impact of the forced-choice dilemma, especially if the underachievement of Aboriginal children generally is recognised.

Research based on gifted Aboriginal children is very limited. Consequently, most aspects of education for gifted Aboriginal children are in need of further research. Specific suggestions for future research emerging from the present study are presented below.

Suggestions for Future Research

- The children participating in the present study were drawn from rural communities in north-western New South Wales. It is reasonable to assume that these communities have different cultural, social and economic environments from Aboriginal communities in large urban (eg Sydney) or remote (eg the far north of Western Australia) areas. Consequently, it is important that this study be replicated to investigate the effectiveness of dynamic testing for identifying high academic potential in other Aboriginal groups such as these.

- The involuntary minority status of Aboriginal children affects how they behave and how teachers perceive them. It would be a useful area of future research to investigate how the involuntary minority status of Aboriginal children affects their schooling. The central theme of this research could relate to expectation issues for teachers, the children and the broader Aboriginal community.

- The present study revealed that teachers generally held academic expectations of the case study children below the levels of their revealed cognitive potential. Therefore, it would be useful to investigate how teacher expectation influences the school performance of gifted Aboriginal children, especially if they were identified as 'invisible' underachievers.

- The present study revealed that the children generally had self-concepts above those of the SDQ I normative population, a trend usually associated with academic achievement. However, the identified Gifted Group had generally lower self-concepts. The lower mean self-concept scores of the Gifted Group may be an indicator of higher teacher expectations, but needs to be investigated more fully with a larger and more diverse group of Aboriginal children.

- In the present study the internal academic locus of control outcomes were significantly correlated with the RSPM scores. Also, the group identified as gifted had a substantially higher internal academic locus of control mean than did the Total Group. Consequently, it would be a useful area of future research to investigate if internal academic locus of control scores could be used as another indicator of giftedness for Aboriginal children.

- 'Invisible' gifted underachievers are likely to be present in other populations in Australian society, especially in culturally different and/or low SES groups. Hence, it is highly desirable that future research investigate the use of dynamic testing to identify giftedness in these groups. Adjustments would have to be made to the intervention strategies to account for social and/or cultural differences.

- Australian Aboriginal people share involuntary minority status with international populations such as the New Zealand Maori, Canadian First Nations and African-American peoples. These groups also share similar problems, including underachievement in school and under-representation in programs for the gifted. Consequently, it is hoped that research will soon be initiated to investigate the effectiveness of dynamic testing for identifying high academic potential in these groups. Again, the intervention strategies would need to be made appropriate for the particular cultural group.

- A natural extension of the current research would be to conduct a longitudinal study to investigate what becomes of Aboriginal children identified as gifted using dynamic testing. This study could also seek to determine if giftedness or talent later emerge in children not identified by dynamic testing.

- It would be informative to conduct research to determine how best to train potential dynamic testers, for the misuse of dynamic testing is

potentially counterproductive. If the dynamic testing intervention fails to effectively engage the children in the metacognitive training then outcomes are likely that do not truly reflect the academic potential of the child.

- Research to investigate the effectiveness of dynamic testing with different age groups will help to determine how best to utilise this method. As it is desirable to identify giftedness as early as possible, especially in underachievers, it would be useful to determine the youngest age for the effective use of dynamic testing.

Concluding Statement

The research presented in this thesis 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 improving the school performance expectations of teachers, the children and the Aboriginal communities. 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. The case studies have given an insight into factors contributing to the school performance of Aboriginal children identified as having high academic potential. Consequently, these findings may help educators to understand why academic underachievement often occurs for Aboriginal children with high academic potential. When understanding exists, steps toward helping 'invisible' underachievers realise their potential can begin.