

Are Australian Boys Underachieving?

**An Analysis Using a Validity-Reliability
Framework Based on the Work of
Lee Cronbach and Pamela Moss**

**Paper presented by Gabrielle Matters at the
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Association for Educational Assessment
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Abstract

Recently, in Australia, many newspaper headlines have announced that girls are outperforming boys academically. Educational journals have published articles on the topic and conference speakers have referred to it.

This paper examines the achievement of boys in modern classrooms. By referring to Cronbach's perspectives on validity arguments (1988), especially the political and operationist perspectives, and Moss's notions of reliability warrants (1994), especially as they relate to inconsistency and critical community, we use a previously promulgated 'validity–reliability' framework to analyse the academic achievement of boys. In the process, we refer to the relative achievements of girls and boys in the common curriculum and we explore the thesis that the feminisation of education contributes to apparent shifts of balance in achievement between the sexes.

Introduction

At the Queensland Board of Senior Secondary School Studies we are developing a treatise ‘Notions of validity and reliability in a system combining moderated school-based assessment and statewide cross-curriculum testing’. Its development includes presenting parts of it at national and international forums, and refining and redeveloping it after we note the audience’s reactions.

Based in perspectives on validity arguments propounded by Cronbach (1990), and notions of reliability warrants described by Moss (1994), we have constructed a framework for reporting our experiences in a system that integrates internal and external assessment regimes.

We have stated (Matters, Pitman & O’Brien, 1995) that the Cronbach–Moss framework helps in negotiating the validity–reliability impasse and we have listed two particular attractions of this framework:

- its tighter notions of validity (the broad scope of the prevailing literature tends to obscure the definition of validity)
- its broader notions of reliability (the narrow scope of the prevailing literature tends to obtrude on the definition of reliability).

Earlier papers have discussed the conceptual framework, the primacy of validity, the validity–reliability tradeoff in the marking of short-response items (IAEA, Wellington, 1994); privileging standardisation and contextualised judgments (IAEA, Montreal, 1995); and internal consistency measures for a test comprising three modes of assessment (IAEA, Beijing, 1996).

The topic of this paper makes a glancing reference to the framework we have constructed. This leads us to localise our references to those parts of the framework which are important to the topic, and they are ‘fairness’ from the *political*, and ‘contents’ from the *operationist*, perspectives of Cronbach and, from Moss, the aspects of ‘inconsistency’ and ‘critical community’ from *generalising across tasks* and *across readers* respectively.

Summary of the Cronbach–Moss framework

Questions about tests originate in five *validity* perspectives (Cronbach, 1990):

1. **Functional** (worth): antecedents and consequences
2. **Political** (fairness): democracy and accountability
3. **Operationist** (content): demands & delivery; range & balance
4. **Economic** (statistical): relevance and utility
5. **Explanatory** (interpretative): adequacy and appropriateness

Moss (1994) provides *reliability* notions in three layers:

1. **Privileging contextualised judgments**
 - criteria and standards schemas
 - accountability in public education
 - the hermeneutic approach
2. **Generalising across tasks—**
 - inconsistency: a puzzle to be solved
 - latitude in selecting assessment products
3. **Generalising across readers**
 - students (and parents) become part of the dialogue by evaluating and challenging conclusions
 - critical community

Girls outperform boys?

Consider this statement: ‘Girls are outperforming boys.’ Do we believe it? This is a multiple-multiple-choice question and there are more than the traditional four or five options—there are seven:

- (a) maybe no, if you correct for population differences
- (b) maybe yes, if you just look at summary statistics
- (c) maybe yes, but only because methods for calculating university entrance scores force inclusion of scores from the subjects done better by girls
- (d) yes, and about time too (gender equality means that the girls should be ahead)
- (e) the newspapers are lying; journal article authors and conference participants are hallucinating
- (f) who cares? gender is just a convenient tag for curriculum background
- (g) none of the above

We believe that the correct response, the *key*, to this multiple-choice question is the last one, (g), because we suspect that the original wording is flawed. By adding a qualification, we can create another statement that we do agree with: girls are outperforming boys *in a feminised curriculum*.

Certainly there is a perception that the girls are outperforming the boys at school ... full stop, no qualification (just look at the newspapers). Even if that perception is wrong there is the danger that it will cause a change in behaviour—and for the wrong reasons.

The argument

This paper argues that replacing the original question: ‘do girls have equal educational opportunities’ with the question: ‘do boys have equal educational opportunities’ is a sad reflection on the inability or unwillingness of some to appreciate that a legitimate answer to either question immediately determines the answer to the other.

As this paper will show, the emphasis should be on producing *students* and exploiting the different learning styles used by each *student*. The sex difference can be subordinated or even taken off the agenda completely.

Some excuses for poor performance such as ‘boys are not so mature as girls of the same age’ or ‘boys have to be taught to create a caring environment’ can be seen as suggesting a redefinition of masculinity which is yet again about intervention and control. Apart from these excuses, very little has been said about what we consider to be more obvious explanations for the boys’ poorer performance, explanations like:

- lack of variation of teaching strategies to take into account differing learning styles
- curriculum changes that cater better for the orientation of girls, but at the expense of alienating boys
- devaluing performance in the subjects boys excel in, often by those who are ignorant of them
- sociological factors that contribute to the higher retention rate to Year 12 for girls than for boys
- increasing numbers of female teachers and markers who unknowingly value the perspectives of boys less than those of girls

- extra encouragement and resources for girls to lift their game in mathematics and science, without any such consideration being given to helping boys in English and the humanities
- increased concentration on group, rather than individual, activities
- school discipline policies that fail to allow for the predisposition of boys to challenge, rather than cooperate with, authority
- a general acceptance of the preponderance of female employees as equity officers in government departments—are men incapable of being equity practitioners?

In the discussion that follows, some of the above explanations will be expanded upon, others will be mentioned *en passant*, while a couple are merely listed for the record.

Commentary on the incorrect responses—the distracters

Distracters (a), (b) and (f)

Implicit in the 1996 report by Allen and Bell is a rebuttal of the distracters (a), (b) and (f).

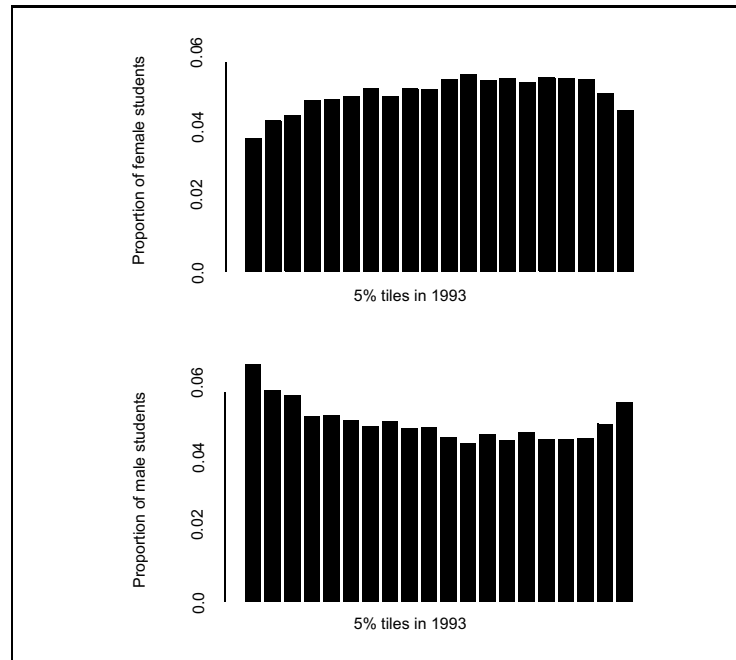
It is true that girls on average do better than boys; that boys are more likely than girls to be found at the extremes, both top and bottom; that boys and girls experience school differently—their subject choices are not the same; and that different proportions of boys and girls complete senior studies.

The imbalance of females and males completing secondary school in Queensland has changed since 1987 and the trend continues. Every year since 1987 there have been more females than males completing senior and receiving a tertiary entrance result. The following figures give an example for 1992–1996. (The figures, from the Queensland Core Skills (QCS) Test, are for a cross-curriculum test in three modes of assessment (multiple-choice, short-response and extended writing) sat by students in their final year of schooling.)

QCS populations 1992–1996					
	1992	1993	1994	1995	1996
populations	31 847	30 513	29 317	28 345	28 336
% female	52.0	52.9	53.2	53.7	54.1
% male	48.0	47.1	46.8	46.3	45.9

The trend to an increasing imbalance of girls and boys may reflect changing perceptions of the importance of a senior education and its relevance to future employment. Changes in allowances, unemployment benefits and the prospect of immediate employment may also have had some effect. Schools may also be responding in different ways to the different challenges brought about by the increasing retention rates overall (or read *curriculum changes in the name of dreary relevance*).

Media debate often focuses on average scores and this is particularly misleading. The two graphs in the illustration below show the proportions of girls and boys in each of 20 groups each representing 5 per cent of the total population eligible for an Overall Position (OP). They show that about 4.5 per cent of girls are in the top 5 per cent of the population and that about 5.5 per cent of boys are in the top 5 per cent of the population (Allen & Bell, 1996).



The marked feature of these graphs, and for the graphs produced every year since, is how different they are—one curves up in the middle and the other curves down in the middle. Boys are proportionately more likely to appear at the extremes, both top and bottom. A big change in this trend, which would be a result of great importance, could in theory occur without *any* change in average results. Actually, the convex–concave big picture has not changed since 1993, but recent years have seen an increase in the number of girls with results in the middle and upper third of the range, effectively pushing the less successful boys down towards the lower end.

It is interesting to speculate on whether labour force participation statistics for 17-year-olds would support the conjecture that girls who would not be successful at school would be more likely than boys to leave school and join the workforce.

Because girls and boys are not equally likely to complete senior the outcomes are not the same, and we should not expect them to be; nor should the existence of problems necessarily be inferred.

Distracter (f)

Teese (1995) said this about gender equity in higher-level mathematics, and how it was influenced by social class and geographical factors:

- should we even measure differences by sex? Perhaps there is no profit in talking sex; talking about subgroups and social backgrounds may give us a truer picture of academic achievement.
- measuring boys against girls obscures other reasons for academic differences
- 'upmarket social area' girls participate well in maths
- 'downmarket social area' girls participate less well in maths
- 'country girls' participate least well in maths
- more concentration on maths = less time spent on other subjects and this is not good
- there are possibly too many people doing maths but doing it badly, and this distorts results
- too many failures in maths results in a pattern of failure being established
- girls participate less in maths, but those who do it, do it well
- 'upmarket social area' girls do very well in maths
- 'downmarket social area' girls do badly in maths
- 'middlemarket social area' girls are somewhere in the middle
- children of tertiary-educated parents do well—'tertiary' parents live in the same area, and develop 'people like us' schools
- 'people like us' schools have an atmosphere that encourages study—students do well
- boys 'feel' they 'should' do well at maths, so they do
- 'upmarket social area' boys do maths very well
- 'downmarket social area' boys have poor relations with teachers and do not do well at English
- 'downmarket social area' boys over-enrol in maths because they 'feel' they should do it—but they do not do it well

Teese concludes:

- (a) never measure performance without measuring participation
- (b) disaggregate information to show *which* boys and *which* girls are doing what
- (c) maths achievement must be balanced by humanities achievements

Further, a study by Allen and Bell (1996, p. 5) comparing the completion rates of Year 12 male students against female students in Queensland across different Board subjects shows that boys are relatively under-represented in history, languages, Speech & Drama, Music and Secretarial Studies, while girls are relatively under-represented in Health & Physical Education, Engineering

Technology, Geometrical Drawing, Mathematics I and II, Chemistry, Physics, and Earth Sciences. The fact that these patterns of participation persist to date might be interpreted as suggesting how enduring are the cultural factors that sort and sift students into different school subjects.

Distracter (c)

In New South Wales, the method of calculating the tertiary entrance rank (the 'scaling model') forces the inclusion of scores from subjects in the humanities which, for whatever reasons, are done better by girls.

In Queensland, post-Viviani (a 1992 report to government that created the Queensland SEP (Student Education Profile)) there is the notion of a balanced curriculum and the inducement to pursue it by a certification model which profiles achievements in the different areas and dimensions of the curriculum, and emphasises cross-curriculum cognitive skills, overtly tested by the QCS Test. But this notion is not so pervasive as to require mandatory inclusion of any subject in a student's study pattern. The more compelling principle is one espousing choice and diversity. The argument is that once students move to the post-compulsory phase of their education, the need for balance in subject-specific content is less important than is the opportunity to achieve highly in studies more related to the interests and aptitudes of the individual.

Distracters (d) and (e)

Distracter (d) is covered in the next section under subheading 'The impact'. We would not expect you to have taken (e) too seriously!

The original questions

The history

It is an indisputable fact that the last few decades have seen marked changes in the levels of student participation in secondary education; whether overall student performance standards have also changed significantly during the same period is more contentious. Regardless, discussion has focused on student participation and performance according to sex, irrespective of the fact that other things such as social class or ethnicity might very well be much more important influences. The original question of whether girls have equal educational opportunities has now been replaced with that of whether boys have equal educational opportunities.

The focus on sex or gender (and we do realise there is a difference) has certainly produced much-needed favourable outcomes for the education of girls. As the effects of male domination of women in economic, political and social life were exposed, so too were the effects on girls of male domination of secondary schools. Their headmasters, previously revered, were now seen as epitomising and reinforcing notions of masculinity then current and, implicitly, of reinforcing a rational rather than an intuitive approach to learning. Schools' mostly male teachers were seen to have been unwittingly, or else unconcernedly, presenting their female students with masculine interests and attitudes, and male-oriented preferences for particular teaching and learning styles.

The impact

Needless to say, recognition of the deficiencies of girls' education was quickly translated into intervention, and the impact of all of this on the design and content of the curriculum and on assessment practices cannot be overstated.

Examples of the changes are:

- cutting out topics in which boys show advantage, e.g. solid geometry
- decreased emphasis on technical correctness in English
- redefinition of mathematics (as it loses its general abstract power so does it alienate)
- concentration on the local rather than the global, e.g. geography
- test items, especially in mathematics, stemming from the need to contextualise
- increased inclusion of vocational education—yet men are still more likely to have to remain in jobs for a lifetime if they have no skills to transfer

The eventual success of this intervention has been measured using yardsticks of various lengths, the only commonality being the propensity of the measurement for girls to be longer than that for boys. This, we feel, deals with distracter (d).

The initial and understandable reluctance to suggest that there might now be a need to reassess relative priorities has given way to the suspicion, if not fear, that the point at which girls obtained equality in secondary education has been well and truly passed.

It is tempting to concentrate only on the question of whether or not boys are experiencing educational disadvantage—after all, if they are, surely it is simply a matter of implementing the sorts of programs that have proved effective in raising the aspirations, and subsequently the achievement, of girls. But is the situation in which boys find themselves truly similar to that previously encountered by girls?

The confusion

Girls enmeshed in the scientific revolution of the 1950s and early 1960s could hardly claim to have been confused about what was expected of them by society generally, and by schools in particular—with a few exceptions, it was not much. It may not have been flattering to be considered incapable of succeeding at science, but at least the girls knew what society expected. Major changes were called for if women were to have any chance of real advances, first in education and then in general society.

The boys of today do not seem to know what is expected of them by society and their inconsistency in performance is one of the 'puzzles to be solved'. If boys are suffering from educational disadvantage, it cannot be because men have little power in the wider society. After all, the view is well held that men are still dominating the corridors of power, although we do agree with the view of the Chancellor of Sydney University, Professor Dame Leonie Kramer (*Sydney Morning Herald*, 1995) who says that there is no glass ceiling (for women). Nor can it be that boys are unaware of the relationship between learning and career success, a relationship that has been heartily endorsed by their parents. Perhaps the declining participation and performance of boys in secondary education can

be seen as reflecting some inherent mismatch of boys and learning—yet the boys of the past generally had no trouble in trouncing their female counterparts in mathematics and science at least, and in advancing Western civilisation generally as an afterthought.

Do we now have goody-goody girls and non-compliant boys? Consider this illustration of test-taking behaviour.

In the multiple-choice subtest of a high-stakes test of achievement taken by a large 1995 sample of 17-year-old Australian students, the omit rates were minuscule, and there was no significant difference by sex or type of school attended (Matters & Burnett, in press).

In the short-response subtest for the same students, where an item can be 'worth' up to five times that of a single multiple-choice item:

- omit rates for various subgroups were between ten and twenty times that for multiple choice
- government school students omitted significantly more items than did non-government school students ($p < .01$)
- the male omit rate was significantly higher than the female omit rate ($p < .01$)

In short-response format, the difference between sex subgroups in omit rates was the reverse of that reported in the literature for multiple-choice. Also, for both formats, girls in single-sex schools omitted significantly fewer items than did females in coeducational schools ($p < .01$).

Boys' problems not parallel with girls'

The problems faced by boys *cannot* be paralleled with those faced previously by girls. The movement toward equality for girls occurred on at least three fronts:

- the status of women in society generally was being raised, even though some of the more snobbish parents in 'upper-class' or affluent suburbs may have given conflicting messages to their sons and daughters
- female teachers were gradually becoming the dominant force in the secondary school
- there was deliberate intervention to exploit the learning styles of girls within content relevant to their predilections

Any movement now for equality for boys must contend with two facts:

- there is little justification for their general status in society being raised
- the likelihood that the numerical dominance of female teachers will not be reversed, especially since the representation of females in the caring professions will reflect their recent superior academic success as well as their orientation

The correct response—the 'key'

The only viable option is to value and delineate masculine and feminine learning styles and orientations, and then assess the extent to which each is encouraged, either directly through curriculum and school organisation, or through implicit transmission by male and female teachers. Then we can move on to the much harder questions of how a single educational framework, and individual institutions, can balance the conflicting needs of students without incurring the known social costs attached to institutionalised differential treatment of boys and girls.

We must learn from successful teaching methods that have demonstrated how to exploit individual learning styles—and learn how these methods put the emphasis on a boy or a girl being a *student* first, a boy or girl second. We must learn to keep the hormones where they belong.

The explanations

To explain the recent reported academic underachievement of boys as a group, we could look first at these common worldwide social trends:

- rising unemployment
- decreasing stability of families [for this oft-spoken cliché, read *missing fathers*—missing (and not always by their own choice) in the sense that their children miss the generative aspect of the father role with its biological, child-rearing, and cultural accompaniments (Snarey, 1993)]
- the impact of videogames

But, interesting and helpful as this might be, an elementary explanation can be found by looking at secondary education itself. It is simply that secondary schools have been feminised at a much faster rate than the surrounding society; the preparation for a masculine world has become distinctly feminine.

Girls are doing better at school because it *is* feminine, at the potential cost of performing at a lower level than expected in the wider masculine society for which they have consequently been inadequately prepared.

Boys, on the other hand, are facing a double disadvantage: unsuited to learning in a now highly feminised school environment, they also have no guarantee that, even if they survive it, their education will reap benefits later. The successes of boys over girls later in their lives may well be attributed to their inherent masculine traits valued by the marketplace or, if such things can be demonstrated not to exist, their willingness to take on the notions of masculinity presented to them outside school and which they often stubbornly maintain within it.

Because legislative and social imperatives have supported the educational advancement of females, there has been a rapid rise in the number and proportion of women occupying management positions within the secondary school and associated educational bodies, and their views are highly influential.

Women in the primary teaching population rose from 70 to 74 per cent between 1983 and 1993, and they made up 61 per cent of the secondary teaching population in 1993 compared with 45 per cent in 1983.

Many of these female administrators and teachers may have developed positive attitudes toward female participation in society, but it was, at first, a natural tendency for them to bring to their schools and classrooms the subject orientations, knowledge, learning styles, thinking patterns and attitudes they had developed in their prime which, as it was probably in the 1950s and 60s, was well before the educational emancipation of girls.

For example, only a rare few of those teachers who did not do mathematics and science as students would have later undergone the extensive training in these disciplines necessary to gain an informed appreciation of their methodology, distinctiveness and values. This also contributes to the alienation of ‘scientific males’ in staffrooms—the lack of research methodology by non-scientific female administrators for school-based decision making, the confusion of correlation and cause-and-effect, and so on.

The value of attributing

More important than proving that schools have been feminised is identifying the extent to which feminisation has occurred, a challenge inextricably linked to identifying the manifestations of feminine influence in secondary school curricula.

Although we must challenge ignorant or bigoted stereotyping, it is as well to remember that the stereotypical descriptions of male and female traits and behaviours were the very things that were instrumental in the past in raising awareness of the difficulties that girls faced. A similar technique must, then, be admissible to convey the difficulties faced by boys. Also, there is little point in discussing differences between two groups if we insist on maintaining the assumption that there are no collective differences between them.

To move on, then, we must allow ourselves the luxury of attributing characteristics, realising that there is a difference between attributing and stereotyping. Stereotyping, in a social context, has evolved into a pejorative term for labelling all people within a certain social group regardless of the characteristics of each individual; attributing is a careful calculation of characteristics that will help direct the maximum effort to exploiting the learning styles of individual students.

We must also restrict ourselves at first to discussions on the way things are perceived to be now, not what they might be or how we want them to be.

The perceived gender differences

So, here are the *perceived* differences between male and female students; many have already been acknowledged by the educational community in that they have been used as foundations for programs aimed at improving education for girls.

Feminine attributes	Masculine attributes
concepts are developed inductively	concepts are developed deductively
concepts are most meaningful when embedded in, or applied to, a specific context	concepts are most meaningful when disassociated from a particular context, so that they become applicable to a range of contexts
emphasis is on the concrete	emphasis is on the abstract
emphasis is on the intuitive	emphasis is on the formal logic
focus is on personal relationships or emotional responses	focus is on performance of task
supported by everyday language	supported by specialist language
receptive	enquiring
preferred text is written or pictorial	preferred text is symbolic, diagrammatic or graphical

Although the language has discrete sets, the reality is the existence of overlapping sets; and this is where we should work at treating the individual student.

Let's get gender off the agenda! Let's use terms other than *gender*, terms that help us discuss our problem without their giving an instant, graphic 'mind picture' whenever they are uttered!

When we use the descriptors *feminine* and *masculine*, they have the connotation: 'generally from one side of the gender fence or the other' rather than 'female or male' as in 'XX' or 'XY' chromosome counts. This is a more useful differentiation than others such as 'verbal' versus 'quantitative', as used for the different approaches that have occurred or are occurring in English and mathematics. The labels *feminine* and *masculine* are derived from the sex in which each view has been shown to predominate—obviously, individuals of either sex might be termed feminine or masculine in these senses. The topic of androgyny will be looked at later in this paper.

The significance of this distinction between masculine and feminine attributes for the QCS Test lies in the unbalanced representation of males and females among marking populations. For example, the effects linking success on the writing task to gender and genre as indicated in the next table can, in the absence of other information, be explained solely by the hypothesis that a largely feminine marking population has more affinity with feminine writing and tends to devalue, albeit subconsciously, the argumentative essay or factual exposition.

Most popular genres (Crew & McKenna, unpub.)

Overall	Male	Female
✓ short story	✓ ↗ recount	✓ short story
✓ ↗ personal	↘ description	✓ ↗ personal
↘ ✗ expository	↘ ✗ argument	persuasive/reflective

Legend

↗ = high QCS score

↘ = low QCS score

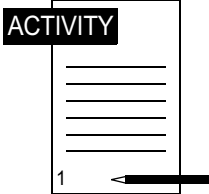
✓ = high English result

✗ = low English result

Example. Recount was the most popular form of writing chosen by the boys in the Writing Task (which is why it is top of the list). Boys who chose recount were the boys with a high QCS score and a high English result.

This hypothesis is supported by the decreasing emphasis in English syllabuses on argumentation, and this has most likely been caused by the increased participation of women and girls as teachers, students, and syllabus writers.

On the 1996 Writing Task, it was a real surprise to find boys assuming a female persona in their writing. And there wasn't just one isolated case. Whether this 1996 phenomenon repeats itself in 1997 remains to be seen. But it is fascinating to speculate on whether the boys are finally seeing the light and taking test-wiseness to the extreme; by so obviously playing the role of female, are they playing a very smart game of feminist one-upmanship?—and coming out on top? Or do they believe the story that the Writing Task is feminine and marked by a predominantly female marking pool who value the feminine perspective?



Is the Writing Task feminine?

Observe exhibits from 1995 and 1996 and form your own opinion:

.....
‘live’ discussion when paper was presented.
.....
.....
.....

Is the marking pool predominantly female?

For the 1996 QCS Test, the Writing Task marker pool was 71 per cent female, and that for the short-response subtest was 63 per cent female.

Is the feminine perspective overvalued by the marker pool?

Regardless of whether the pair of markers is female/female, female/male or male/male, there do not seem to be any significant differences in the disparity of the marks awarded.

There is, however, room for further investigation into particular components of the general effects. This is especially the case if the distinction is drawn between two markers agreeing in general, and the two markers agreeing when they encounter scripts in a particular genre.

Further examination of the possible differences in the total distribution of marks awarded by markers of each sex could reveal tendencies of individual markers to mark ‘harder’, ‘softer’ or ‘wider’ than other markers. Such effects might be found to be localised to one subinterval of the marking scale.

Androgyny research

Androgyny research has been hampered by a dependency upon traditional masculine and feminine sex roles, and terms, for definition purposes. The terms *masculine* and *feminine* conjure up the graphic mind pictures we referred to earlier.

Bakan’s (1966) concept of ‘agency’ and ‘communion’, which is analogous to the concept of ‘masculinity’ and ‘femininity’, refers to behavioural competencies that involve a way of interacting with the environment. Such descriptors, which are devoid of gender designations and cultural variations, ensure that the person hearing them does not automatically conjure up the ‘mind pictures’ associated with the words *masculine* and *feminine*. ‘Agency’ is

characterised by self-protection, self-assertion and self-efficacy. 'Communion' is manifested through contact, openness, and union. Hawkins (1993) showed that a person's self-perceived sex role systematically influences his/her self-attributed agentic and communal competencies.

Androgynous and feminine-typed subjects reported significantly higher levels of communal competencies than did masculine-typed and undifferentiated subjects. Androgynous and masculine-typed subjects reported significantly higher levels of agentic competencies than did feminine-typed and undifferentiated subjects. Androgynous subjects reported high levels of both communal and agentic competencies, while undifferentiated subjects reported low levels of both.

Based on the findings, 'agentic' and 'communal' may be considered as possible alternatives to *masculine* and *feminine*. Androgyny may be our goal as the alternative to the established stereotypes (and not 'females with balls' or 'male cretins who are creative' either). Is it possible that some of our lost boys are communal and some of our misplaced girls are agentic?

Perhaps the established gender stereotypes are contributing to the minority group of agentic girls feeling out of place in the restricted, communal domain in which they find themselves. Distanced from their preferred learning style, agentic girls may also be contending with perceptions that they are not operating in a manner true to their sex. As far as boys are concerned, the prevalence of communal teaching styles which are associated with girls is problematic no matter whether a boy's learning style is agentic or communal. Like their agentic female counterparts, agentic boys may be excluded by not having the opportunity to learn in the way that suits them. Boys who prefer to operate communally, however, may still be under pressure to mask their behaviours if they are to avoid what can often be a devastating attack on their socially defined masculinity.

Clearly, social acceptance of androgyny theory allows students of both sexes to develop both their agentic and communal skills and exploit their preferred learning style without facing the turmoil of having to choose whether to operate in a way contrary to that expected for their sex.

The myth of the male chauvinist plot

In 1980 we were worried that, by acknowledging women of achievement as a race apart we were only propagating the myth that there is some conflict between the need to be independent and the need to be taken care of. One of the authors of this paper is on record as saying that there is no male chauvinist plot to keep girls out of top jobs but that if girls choose not to take what is offered to them and opt to be defined by men, then they do it to themselves—they make choices.

Women have seemed to wait for something external to transform their lives. The insulting concept was, and sometimes still is, that some single girls were simply marking time until something better turned up (preferably alive, and with XY chromosomes).

In spite of all our rhetoric, kids learn by example: the bread winner is passé; the cake winner is portrayed as the married woman who works to pay off the mortgage before she has children, and waits until after the children have left school before she buys luxuries.

Traditional feminists and new feminists, and science

Women are now entering law, medicine, and dentistry in record numbers. (How long they stay is another story, well told by Spencer & Lewis (1989).)

Some say it's thanks to the women's movement. We say it's thanks to other social changes such as the abolition of up-front university fees, the expansion of the curriculum to include subjects with 'softer' demands, and perhaps one or two other things.

Why is this trend in law, medicine, and dentistry not matched in the physical sciences or in computer science?

Of course there are possible answers that relate to economics and greed—so many bright people are finding they can avoid 'difficult' subjects and thus follow an easier path to the almighty dollar—but, assuming that some people are intellectual snobs, and that some still choose to study things that turn them on, could certain feminist stances be part of the problem?

Koertge (1994) contrasts two types of feminist analysis: according to traditional feminist analysis, the problem was to discover how to remove the distorting factors so women could fit comfortably into science. On the new feminist agenda science must change so that it fits women's special talents and becomes a suitable occupation for a feminist to pursue.

These two views are diametrically opposed. Traditional feminists wanted little girls to overcome maths anxiety and learn calculus and statistics. New feminists want science to become less quantitative to accommodate the qualitative methods of inquiry at which women allegedly excel. Traditional feminists believe science should be an equal-opportunity career. The new feminists argue that 'science is saturated with patriarchal male values' (Koertge, 1994).

She goes on to parody some feminist philosophers for whom the agenda of the hard sciences has always been to dominate nature and to penetrate its secrets, things that are presumably destructive. In their view, the much-flaunted scientific goals of objectivity, controlled experiments, precise measurement, isolation of variables, and abstract models, are all seen as potentially destructive. So if little girls haven't the stomach for dissection or the patience to work out vector representations, then presumably we should remove these things from the curriculum, not try to socialise girls into the narrow, often life-destroying habits of white male scientists.

Males and females, and choices

Does society *really* think that women are prevented from choosing what they want to do in a man's world? Here is another story about choice. We refer to a letter to *The Courier-Mail*, Brisbane's daily newspaper, from one Joe Moldovan, reacting to Dale Spender, a well-known Australian feminist, pushing her barrow along the infobahn about gender bias on the Internet. And

we quote from Mr Moldovan: 'Who is preventing Ms Spender and her sisters from gaining access to Cyberspace? One of the major and well-known features of the Internet is that it is almost impossible to control it. Anyone in the world can join it, anyone can load any kind of information on to it, information which then becomes instantly accessible to everyone else, both male and female. It takes about fifteen Australian bucks a month, a little motivation, a little keyboarding skill and about the time it takes to put on makeup, to overcome the roadblocks to information nirvana.'

Perhaps a simpler explanation for the lack of women on the Internet is that they are simply not that interested in it. In our society, women have the luxury of choice. This is just one illustration of the point we made earlier about women choosing what they want to do and what causes, or caused, them to choose the way they do.

Identity politics

Given the view that it is wise for teachers to accommodate as many learning styles and cognitive preferences as possible, it is a real disservice to students if we pretend that heavy reliance on mathematical reasoning is a patriarchal plot or that intuition and inductive reasoning are 'sissy' things. Maybe we all need to expand our cognitive repertoires instead of tailoring them to the service of identity politics. You cannot be more prejudiced than when you condescend. Isn't it a parody of affirmative action to classify people by reference to their victimhood by saying, for example: 'The girls can't do this because ...' There are many women (including one of the authors of this report) who find it insulting to have women listed as a 'target' group in Queensland's *Anti-Discrimination Act 1991*. As a target (we presume the authorities are aiming at us to help us!), we seem to be classed as victims.

Counteracting underachievement in boys

Research in the UK

There seems to be some sort of answer from research in the UK (Gold, 1995) which has this simple message—*the schools where the boys do well are the schools that seem to enable boys to be students, rather than having to be boys*. Is it possible that the corollary has proved to be true (at least for Australian females) who have chosen to be students first and girls second? Forget the hormones!

The research found that a number of popular theories for boys' underachievement did not stand up to scrutiny. For example, there appeared to be no link with ability and no link with literacy although earlier studies by Jesson's team at the University of Sheffield (cited in Gold, 1995) had shown that the best predictor of a 16-year-old's academic performance in any subject is her/his reading score between the ages of 10 and 12 (this applies to girls as well as to boys).

But back to the underachieving boys. The factors that did crop up repeatedly were in social categories: patterns of poor attendance, misbehaviour and, for the northern hemisphere, 'summer birthdays' (results for boys born in the northern summer were measurably different from the results of the boys born in winter).

We've all observed that girls are much more likely to obey instructions from a teacher, that they are much more organised (they bring a pencil, a pen, a sharpener, and a ruler), and that they put pretty borders around their assignments. In the language of the testing literature (Ennis, 1995), they are compliant.

Boys who are disorganised and indifferent do not necessarily display great bravado about not achieving; those boys are quietly saying (but probably not being heard): 'I really wish I could do this but I can't'. An important step would seem to be to realise that boys will need, and always have needed, more checking up on even if they don't ask for it, they need more supervision to make sure they are organised, and they seem to need help to be students rather than boys having to be boys.

Also, the past decade's emphasis on equal opportunities for girls in science and mathematics may have been damaging without an equivalent emphasis on equal opportunities for boys in subjects like English. Some schools have experimented with writers in residence but these people, although physically there, may not always be taken seriously by some of the staff. Gary Crew, an award-winning Australian children's author, believes that creativity is still seen as a cop-out by those same staff members.

We must ensure that boys do better in English by continuously sending the message, explicitly and implicitly, that English language and literature are valued, and why they are valued by society in general.

We read a great story recently about a school that had systematically, in the name of equal opportunity or political correctness, weeded out all books that could be classified as macho. Later, a teacher, believing that the very act of reading is more important initially than what is read, went out and bought books which were full of adventures and violence, material similar to that in the boys' favourite videogames. The boys, previously less than enthusiastic about reading, began to work harder. At the next set of tests their reading scores had caught up with the girls'.

Conclusion

The only way to improve achievement among boys, girls, blue eyes, brown eyes, working class, 'people like us'—take your pick!—is to provide every student with a better education. Better, in our view, means tailored to individual learning styles with less emphasis on the largely irrelevant question of gender or sex, whether socially or biologically imposed.

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