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BOOK REVIEW

Revised by E. B. Thornton

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TOWARDS EQUALITY: PROGRESS BY GIRLS IN MATHEMATICS IN AUSTRALIAN SECONDARY SCHOOLS

Jillian D. Moss ACER 1982

Experts in educational measurement in Australia tend to cherish two major illusions regarding mathematics. One is to think that their **testing** activities give them the right to prescribe about **teaching** and **learning** mathematics, of which they appear to know relatively little. The other is to think that mathematics learning is easy to measure!

Alas, labouring under this delusion, the book under review seeks to find evidence about girls and mathematics by analyzing the Australian data from the 1964 IEA international comparative test investigation project and from a 1978 project, which used basically the same tests. Nevertheless, there are some interesting features in Moss's book.

The first two chapters outline the situation and review the literature. There is some worthwhile work on this subject by mathematics educators, and the second chapter may point the reader towards it. The third chapter describes the samples and the test instruments. The IEA projects tested at age 13 and at terminal secondary level, and the results for these two age levels form the subject matter of the following two chapters. Then there is a chapter on 'Holding Power and Yield'. Some results gleaned from these three chapters include:

- At age 13, boys did better on the sub-tests labelled 'geometry', 'Advanced Arithmetic' and 'Higher Mental Processes', and girls excelled on those for 'Basic Arithmetic', 'Lower Mental Processes' and 'Algebra'.
- Over the 14 years between the IEA and Australian projects there were increases for both boys and girls in Year 12 in the 'Yield', defined as the area under the cumulative percentile curve of Year Cohort against Score.
- A Multiple Classification Analysis, assuming 'no interaction among predictors' showed that "the predictors behaved in a similar manner for the two sexes in each case", and, when sex was included as a

predictor variable, it "contributed least to an explanation of the variation in mathematics achievement" (i.e. test scores).

Chapter 8 is particularly interesting. Here five descriptive and attitude scales are discussed, and the items themselves are available in an Appendix. The 'descriptive' scale aims to discover whether students regard the approach used by their own teacher as emphasizing problem-solving or rote-learning. A high score indicates that the student believes that the teacher is emphasizing the former. Girls scored higher than boys in 23 of the 32 results shown for various States, projects and populations, although only six of these differences are regarded as significant.

I am fairly certain I have interpreted this correctly, as the author says (on p. 60), 'It was of some interest to find that girls at both age levels were, in general, more inclined than boys to view the teaching of mathematics as emphasizing problem-solving procedures rather than rote learning'. But one does have to work quite hard at this book if one wishes to be sure.

Of the attitude scales, 'School and School Learning' shows that girls like school more than do boys (8/32 significant); 'Difficulty of Mathematics' showed little difference at age 13, but by Year 12 boys, in general, found it easier (4/32); 'Importance of Mathematics' indicated that boys think more of its importance than do girls (8/32); and 'Man and Environment' suggested that, in 1978, though both sexes had less belief in man's control of nature than they had had in 1964, boys still had more faith than girls (4/32 significant, all for the younger age group).

The final chapter reviews the various results discussed. There are no recommendations; the author merely asks pertinent questions about some of the results presented, and points out that any 'intervention programmes' will need to confront questions of attitude, including girls' 'apparent reluctance to engage in problem-solving tasks'.

A simple hypothesis may answer her questions, though it will need expert mathematics educators to test it (not **educational measurement** experts). Girls mature faster than boys, especially as far as language is concerned. So they have less trouble with the rote-teaching commonly found in primary schools, which comes, in turn, from the over-emphasis placed on (testable) 'skills' by educational measurement experts and others. As a result, girls get a very false idea of nature of mathematics,

which later lets them down and disillusion them. Boys, by contrast, have to develop some problem-solving ability simply to cope. Whether this hypothesis is correct or not, at least two major intervention programmes are needed: one to improve the approach to mathematics in primary schools; and the other to keep educational measurement experts away from mathematics teaching and learning!