

COMPARISON OF THREE PRIMARY READING SCHEMES IN TASMANIA

by

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This thesis contains no material which has been accepted for the award of any other degree or diploma in any University, and to the best of my knowledge and belief contains no paraphrase or copy of material previously published or written by another person, except where due reference is made in the text of this thesis.

Stephanie Bush

Stephanie Bush
September, 1979.

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ABSTRACT

A sample of 3135 grade 3 to grade 6 children from ten metropolitan Hobart, Tasmania primary schools was selected to contrast three reading schemes: Wide Range Readers (UK), the SRA Basic Reading Programme (USA), and SRA Reading Laboratories (USA). Standardised test results from the Tasmanian Education Department Sub-Junior and Junior General Ability Tests, the Raven's Coloured Progressive Matrices Sets and the Schonell Silent Reading Tests A and B for the period 1971 to 1976 were provided by high school Guidance Officers and primary school principals.

Schools were selected on the basis of using one reading scheme exclusively and only those children who were in continuous attendance were considered. Numbers per reading scheme were: Wide Range Readers, 1598; the SRA Basic Reading Programme, 501; SRA Reading Laboratories, 1036. The Commonwealth Bureau of Census and Statistics furnished data (1971 Census) which enabled the following grouping of classes by socioeconomic level: Lower, 1340; Middle, 1413; Upper Middle, 382.

Factors influencing children's reading achievement that have been considered in this study are: Reading scheme, sex, IQ, change of school, socioeconomic level and school grade. The following factors, outlined in the literature on children's reading, were not considered: Teaching style and teacher effect, effect of television and other media, parent's attitudes to education, parent's educational level, reading opportunities in the home, home stability, language spoken in the home, family size, child's position in the family, and various psychological and physiological problems. Experimental procedures were selected to minimise the influence of these factors.

Analysis of Variance, Analysis of Covariance, and a posteriori testing were performed on IQ and RQ (reading quotient) scores for the various groups with computer programmes provided by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the University of Tasmania.

With the significance cut-off taken at $p \leq 0.05$ no significant pattern of one reading scheme's effectiveness over another was found. Superior class mean RQ and IQ levels for middle socioeconomic level children were found, irrespective of reading scheme, with the exception of the grade 3 sample. Male and female reading achievement was not significantly different, with the exception of the grade 6 sample, where females' achievement was superior. Wide variation was found in reading achievement over time and SRA Reading Laboratories showed the most regular improvement.

Chapter 1

INTRODUCTION

1.1 AREA AND PROBLEMS

The present study was an investigation into primary reading schemes. The effectiveness of three particular reading schemes in Tasmania was assessed, schools being selected for maximum exclusivity of one scheme. In Tasmania adoption of foreign-based reading schemes has not been based on local research. American and English reading schemes have been increasingly used in Tasmanian primary schools.

At the same time concern over literacy and numeracy standards in Tasmania has grown. In October 1975 the Australian Council for Educational Research conducted tests in Tasmania as part of a national inquiry into levels of "literacy" and "numeracy" - these were extended by the Education Department in Tasmania in 1976 and 1977. Disappointingly low levels of reading and mathematical skill for large sections of the 14-year-old population were found (October, 1975).

Evidence for increased interest in reading schemes can be seen in the number of new schemes available in Australia. In the 1970's Tasmanian primary schools have been able to select from many schemes. Most schools have opted for a variety of reading schemes in order to recognise individual ability differences in children. Table 1 lists some of these newer schemes. Recently the fully Australian Reading Rigby scheme was developed to counter criticisms of the unsuitability of overseas schemes in cultural terms.

Despite this proliferation in use, to date there has been no verified Tasmanian research into the comparative effectiveness of any of these reading schemes. The present study attempted to correct this

Table 1. Representative reading schemes in Australia.

Country of Origin	Scheme	Publisher	Emphasis
USA	Reading Systems	Scott-Foresman	Language experience
USA	Basic Reading Program	SRA, Inc.	Phonics
UK	Series R	Macmillan	Comprehension, decoding
UK	Breakthrough to Literacy	Longman	Language experience
Australia	Endeavour	Jacaranda	Comprehensive
Australia	Reading 360 Australia*	Cheshire	Linguistic word analysis
Australia	Reading Rigby	Rigby	Language experience, decoding

* The Reading 360 Scheme originated in the UK.

situation and, to that end, has selected the most frequently used overseas scheme for comparison with the indigenous scheme that has dominated reading programmes in Tasmanian primary schools since 1960.

1.2 SCOPE OF STUDY

The SRA Basic Reading Program was selected as the overseas scheme to be contrasted with the Schonell Wide Range Readers. Further, SRA Reading Laboratories (boxed card kits) were also contrasted with these two schemes. SRA has a marketing office in Sydney, Australia, sales representatives in all States, and many of its reading materials have been reprinted in Australian editions. They have made a substantial effort to sell to the Australian market and at present would probably be the largest American firm selling educational materials to Australian schools.

The present study included 3135 children from ten metropolitan Hobart primary schools (that number reflecting recounting each child as a new data point for each year during the primary school years). Grades 3 to 6 inclusive participated. Three income groups were defined, lower, middle, and upper middle, using Commonwealth Bureau of Census and Statistics data (1971 Census). Standardised intelligence and reading test results for tests administered during 1971 to 1976 inclusive were also used. These included the Tasmanian Education Department Sub-Junior and Junior Test of General Ability, Raven's Progressive Matrices Test and Schonell Silent Reading Tests A and B, referred to as the R3 and R4 reading tests.

1.3 ASSUMPTIONS INHERENT IN THE STUDY

Three assumptions were made in the present study: (i) a normal population distribution was assumed in treating the data, (ii) a correlation between intelligence and reading ability was assumed to exist, and (iii) a large population sample was assumed as sufficient control (through randomisation) for the many factors besides intelligence that potentially influence reading achievement.

The literature frequently linked increasing intelligence with increasing reading ability (Plattor, 1959; Wurtz, 1960; Clymer, 1963; Belmont, 1966). Recent work from London University confirmed earlier findings, but stated that intelligence and reading achievement do not always bear the same relationship to each other (reported in Drummond and Wignell, 1975). Reading achievement was found to drop off less steeply than IQ over time and also to improve less steeply than IQ over time.

Recent studies linked many physiological, psychological and environmental factors to reading achievement. Sex has been shown to be a significant factor (Thompson, 1975); school attendance, father's occupation and general school programme have been seen as important (Hunt, 1973); the home has been cited as a major influence on achievement (Marjoribanks, 1972); and family size and position in family have also been shown to relate to achievement (Poole and Kuhn, 1973). Statistical evidence and numerous studies have however cited large population samples as experimentally more valid and reliable research tools than small samples, minimising the effect of these and other variables (Dr. G. Laslett, 1977, pers. comm.).

1.4 RATIONALE

SRA Reading Laboratories were selected as they have been in Australia for over 10 years. Wide Range Readers have declined in use as the new materials came in. Presently very few Tasmanian primary schools use Wide Range Readers exclusively as basic texts. From 1960 to about 1970 however they were the only graded readers on the Tasmanian market. Teachers' familiarity with this scheme was excellent. The SRA Basic Reading Programme in its present form was published in America in 1972 and first used in Tasmania during 1973. It spread rapidly into many Tasmanian primary schools.

Selection of schemes for this study was based on the principle that the longer a scheme was used, the greater the number of pupils that would have been exposed to it. Schemes chosen offered large population samples and contrast in that Wide Range Readers were very closely linked with Tasmanian education whereas SRA reading materials were a major American concern.

1.5 HYPOTHESES

This study set out to test the following two hypotheses:

- (a) That the SRA Basic Reading Programme was more effective in Tasmanian primary schools than both SRA Reading Laboratories and Wide Range Readers, and
- (b) That SRA Reading Laboratories were more effective in Tasmanian primary schools than Wide Range Readers.

The newer scheme, SRA Basic Reading Programme, should produce better results despite possible cultural (American-Australian) differences. It should offer children more up-to-date language, format,

content and scope. Further, SRA Basic Readers are available in Australian editions at the six lower levels, enhancing their applicability to Tasmanian children. SRA Reading Laboratories when used intensively according to the publisher's instructions, should be more effective than Wide Range Readers, as there is a large body of literature showing rapid gains in reading age over relatively short periods of time.

Chapter 2

THE READING PROCESS

The literature on the reading process is very extensive and the present chapter will review significant psychological and physiological aspects for the purpose of generally explaining, introducing and clarifying the discussion of the reading schemes in the chapters that follow.

2.1 PSYCHOLOGICAL ASPECTS OF READING

One literature review of the psychology of reading noted a close inter-relationship of factors such as language and perceptual development with psychological factors (Chester, 1974). Research in this area was hampered by studies of the 1930's and 1940's which were notably inadequate methodologically and which tended to over-generalise. For convenience the present discussion will follow in part Chester's format: intelligence, perception, comprehension, personality, language, readability, hygiene, home environment, teacher effectiveness, and stability or change over time.

2.1.1 Intelligence

The relationship between IQ and reading achievement has intrigued researchers for the past four decades. The standard procedure was to observe the correlations between certain tests of IQ and of reading ability. Tests used included the Stanford-Binet Intelligence Tests (Minkler, 1959) and the Weschler Intelligence Scale for Children (Belmont, 1966). Apart from some teachers' reliance on IQ scores as a basis for streaming into instructional levels, failure to recognise the

skill of reading as pre-requisite to achievement on an IQ test may have hindered remedial help where it was needed.

Joint Australian-Canadian work on intelligence investigated a two-moded information coding model known as Simultaneous-Successive Processing (Kirby and Das, 1977). In Simultaneous Processing the brain would integrate information spatially, enabling various points to be reviewed together. Successive Processing would be the brain functioning to place information in temporal order only. With reading vocabulary, comprehension, and both verbal and non-verbal IQ as dependent variables, the sample of 104 grade 4 Canadian males showed both modes of information processing required at high levels for high achievement to occur. If one mode alone was high only moderate achievement occurred. The researchers felt that educational programmes designed to promote these modes specifically would be beneficial.

2.1.2 Perception

Perception work over the past four decades tended to favour visual perception over auditory perception as the area of major importance in reading achievement. Researchers generally agreed that perception was basically a stimulus-response situation whereby graphic images transferred through a sensory process resulted in understanding of the printed word. Most relevant to teachers was the age at which this complex process occurred effectively. Some studies showed that, while many six-year-olds lacked sufficient skills to complete reading readiness tasks, there was a drop-off in perception-reading skill correlation from about grade 2 onward (Snyder and Freud, 1967; Robinson and Mozzi, 1960). It seemed that compensatory factors were operating by that stage, minimising the early deficit.

A recent British article listed three principle research designs for relating reading and visual perception-correlational studies,

comparisons between good and poor readers and predictive studies (Wedell, 1977). Inconclusive research findings led Wedell to discuss visual and auditory perception as related to reading achievement, which he viewed as a decoding task. In written discussion rather than experimental format he noted inconsistencies in researchers' use of the work "deficiency", the importance of selective attention of the reader to the task and individual differences in children.

Also related to perception, iconic or visual sensory memory has been related to reading performance (Riding and Pugh, 1977). Persistence of a word's image in the mind was measured in an attempt to discern any time variation of the image between individuals and possible effects on reading. The sample of 36 nine-year-olds was given a test of iconic persistence and four days later the Neale Analysis of Reading Ability Test. Moderate icon persistence was found best related to reading performance, rather than either short or long icon persistence.

Auditory discrimination has been less studied. Research findings supported the view that children lacking in auditory discrimination ability commonly encountered reading problems (Elkind and Larson, 1965; Lingred, 1969). A recent Scottish study measured children's ability to integrate audio and visual stimuli as it related to both their non-verbal intelligence and reading achievement (Rae, 1977). In both areas significant positive relationships were found. This was maintained even with the effect of IQ controlled over the sample. No significant differences in achievement were found between males and females. Rae failed to isolate specific reading skills which correlated with children's audio-visual integration ability. Further research appears warranted; alliance with medical personnel specialising in auditory disorders might be of value.

2.1.3 Comprehension

The development of factor analysis in statistics gave the earliest reliable experimental results for comprehension. Reading comprehension was found to involve a verbal factor, a perceptual factor, a word factor, a number factor and a "seeing relationships" factor (Langsam, 1941). Many others have noted the possible relevance of structure in reading passages and reader awareness of author's purpose and attitude. The relationship of syntax and sentence structure to comprehension has also been extensively studied. One researcher found more rapid verification of active versus passive sentences and positive versus negative sentences (Gough, 1966). Of more practical value to teachers was the finding that comprehension of good readers correlated with visual stimuli and comprehension of poor readers correlated with auditory stimuli (Oaken and Wiener, 1971). This finding would support teaching methods which emphasise oral language drill for poor readers. Benefits were noted of teacher serial story reading for poor readers; pupils appeared more motivated to read after hearing stories of interest read aloud by the teacher.

Reading comprehension also improved where paragraph headings and instructions on summarisation were given (Doctorow, Wittrock and Marks, 1978). With a sample of 488 American grade 6 children the researchers doubled comprehension and recall using the cues mentioned. Contextual clues were closely associated with increased comprehension levels.

2.1.4 Personality

The area of personality in relation to reading has been well studied over the past four decades. Research tended to concentrate on the general topics of motivation and interest, and anxiety-peer group image. Overall better readers were found more highly motivated than poor readers.

Males' and females' reading interests were found to vary widely (Rogers, 1963). Age of pupil was found relevant to motivation, changing as children grew older (Amatora and Edeth, 1951). All studies on reading interests gave animal stories good ratings for males and females. Males mainly preferred adventure, sports, science, and detective stories, while females selected fantasy and family life as reading topics (Rogers, 1963).

American work with 159 under-achieving pupils aged six to twelve years in special classes related reading and mathematics achievement to self-concept, measured both within each classroom and across all 17 participating classrooms (Rogers, Smith and Coleman, 1978). Across classrooms mathematics but not reading achievement was significantly related to self-concept. Both areas were significantly related to self-concept in the within-classroom assessment.

Further work investigated the effects of open classroom schooling on grade 1 children's self-concept and reading achievement (Pine, 1978). Twelve formal and open classrooms (257 children in all) participated in the one year study. Tests of reading readiness, self-concept values and intelligence were administered before and after the study. Readiness significantly affected achievement in both types of classroom. Self-concept possibly affected achievement in all classes (not at significant levels). Open classroom organisation and reading achievement interacted to positively affect self-concept at a significant level.

Emotional problems may be associated with reading problems, yet the writer located very few examples of supportive literature. In one study poor readers were found to be no more emotionally disturbed or anxious than good readers (Siegel, 1954). There was however evidence from this study that poor readers may be more insecure and dependent, and less well adjusted socially than good readers.

2.1.5 Language

One study found verbal language to be a good predictor of reading ability (Bougere, 1969). Most early researchers dealt with aspects of vocabulary and found a positive correlation with both oral and silent reading scores. Language has been studied as a comprehension process from approximately the mid-1950's. A significant correlation between reading comprehension and sentence structure was found (O'Donnell, 1963). Consistent with the statements of many others was Chester's view that "syntactical structure is possibly the most important determiner of reading comprehension" (1974).

2.1.6 Readability

Readability formulae and their supportive research were a product of the mid-1940's. The formulae were mainly based on word frequency and sentence length to determine the difficulty of reading material. Familiar names in the field include Dale-Chall (1948), Flesch (1949), Spache (1953), Taylor (Cloze) (1953), Fry (1963) and Bormuth (1964). The Taylor (Cloze) procedure (1953) purposely deleted every fifth word from a passage to measure how hard the particular passage was. The Bormuth test omitted certain words from a paragraph in an attempt to measure readability by stressing grammatical complexity. The reader filled in the correct word, based on his or her understanding of the passage. The use of computer technology in readability work might be expected to offer improved reliability in the writer's opinion.

2.1.7 Hygiene

The hygiene of reading refers to the areas of illumination and typography, both areas of interest to early researchers (Tinker, 1939; Tinker and Paterson, 1949). Size of type was presumed to have an effect on speed of reading. This theory was partially disproved when inconsistencies were found between type size and reading speed

(McNamara, Paterson and Tinker, 1953). Related topics of concern to researchers for the past four decades are print colour, use of overhead projection, format and listening rate. Generally there has been reduced interest in this area in recent years. It has been noted recently however that there has been an unfortunate lack of application of what results do exist (Chester, 1974).

2.1.8 Home Environment

Research pointed overwhelmingly to a connection between limited home economic circumstances and weakness in oral reading (Larsen and Tillman, 1973). This study concluded that in extensive testing of 100 males and females from mostly moderate income groups, "proportionately more boys than girls lagged in word recognition skills." A review of the role of family size showed only a small negative relationship between family size and reading ability. A possible tendency for children from larger families to receive less home verbal stimulation hence display oral reading weakness was noted (Larsen and Tillman, 1973).

Extensive research in Alabama (USA) schools with 637 white grade 3 to 6 children found females outachieving males in general ability tests (Touliatos, Lindholm and Rich, 1978). Children from higher social classes were better achievers than lower social class children. Children living with both parents outachieved those in other family situations. Smaller family children were superior to large family children. Omitting the only child family, middle children were outachieved by both older and younger children. Only children did not fit into the small family-high achievement category. The authors implied that over-compensatory actions by parents might have been in some way hindering achievement.

An Irish study examined relationships between six home environment factors and six measures of scholastic behaviour (Kellaghan, 1977).

Kellaghan cited other research correlating home variables more highly with verbal rather than non-verbal intelligence. Sixty eight-year-old children from disadvantaged homes were studied. Home variables were achievement pressure, language model, academic guidance, activeness of family, intellectuality and work habits. Multiple regression analyses found various degrees of correlation between home environment and achievement. Home factors related most closely to verbal IQ tests and to school subject attainment rather than to general intelligence. Slightly closer relationships between home factors and reading rather than mathematical skill for males and females emerged from the work.

Research to determine relationships between socio-economic status, home environment factors and IQ among 105 three-year-olds in America showed home variables as better predictors of IQ performance by themselves rather than when combined with socio-economic factors (Bradley, Caldwell and Elardo, 1977). Measures of home environment showed higher IQ performance among white children. Intelligence performance for females was found to relate to a wider variety of environmental inputs than for males. Reading performance was not measured in this study.

2.1.9 Teacher Effectiveness

American research cited two traditional criteria: simple, pupil achievement and more complex teacher-pupil behaviours deemed worthwhile (Shavelson and Russo, 1977). After reviewing literature on the subject the authors concluded that short-term versus long-term studies gave the most reliable data. Stable and consistent effects were noted from teachers covering the same content with similar pupils. Great variation in teacher effect was found where content varied and pupils remained similar. Strong teacher-pupil relationships appeared to correlate with achievement.

Teacher's attitudes and conduct were related to children's reading skills and interests (Schubert, 1978). Specific teacher personality traits were discussed. Competency was viewed as an inseparable merging of the teacher's personality with classroom teaching skill. Teacher insecurity, hostility, impatience, sarcasm and lack of a sense of humour were felt very important negative influences on children's learning in general. Schubert did not conduct any personal experiments to test his conclusions, relying on personal communication with teachers to support his views.

Intensive remedial help to teachers in reading was the subject of a recent Australian article (Whiting, 1977). Extra personnel were used to assist 20 children of below average ability with reading problems from grade 3 and grade 6, in a lower income area school. Establishment of a resource room, purchase of extra reading material and class teacher involvement provided the basis of the work over two school terms. Whiting concluded that young teachers in particular, but experienced teachers also, were poorly equipped to teach reading and exhibited poor self-concepts which were inevitably transmitted to the children. More teacher preparation time, better assistance to the young teacher and better training in reading teaching were required at the primary level.

2.1.10 Stability or Change Over Time

A major assessment of reading ability over time was conducted in America with 243 grade 6 pupils (Belmont and Belmont, 1978). Reading scores were compiled and the children grouped according to how many previous grades' scores (from grade 1 to grade 5) were available. A New York City school comprised of 80% white middle class pupils and 20% poorer black or Puerto Rican pupils took part in the study. Ratings for Word Knowledge and Comprehension sub-tests were established.

Correlational analysis suggested that the entire group was in the main consistent in test performance over time. Variability in Comprehension was however widespread, although limited to the poorer readers. Only a small proportion of those tested as "poorest" readers performed consistently poorly on the reading tests. Fluctuation on level over the grades was most common.

An English investigation used National Child Development Study data, which associated social class and family size with attainment, to assess stability of achievement levels in seven and eleven-year-olds (Fogelman and Goldstein, 1976). They found comparisons over time difficult and introduced new variables which they regarded as suitable for some age groups and not others. Achievement levels in mathematics and reading were found to increase with the father's occupation for the seven-year-olds. Females outscored males significantly in reading at age seven, but ANOVA on the data showed no significant differences in achievement in reading or mathematics at age eleven. Less variation in achievement was found over time as family size increased.

2.2 PHYSIOLOGICAL ASPECTS OF READING

Since the 1930's researchers have placed emphasis on the remediation aspect of physiological problems, neglecting somewhat the causal factors. Generally psychological and physiological aspects of reading were grouped together. The most widespread experimental procedure was to correlate a particular physiological condition, such as poor eyesight or hearing, with success or failure in reading as measured by standardised tests.

A review of the literature in this field (Smith, 1974) found experimental procedures lacking, and particularly noted a reluctance to present conflicting evidence. Further problems encountered by Smith in

studying the physiology of reading were the unrelatedness of physiological conditions and the learning to read process, unreliable research instruments, non-representative population samples and bias from individual researchers. The basic components of this area are vision and hearing, neurological problems, general health and physical development, speech, drugs and emotional anxiety.

2.2.1 Vision and Hearing

Conflicting research findings pointed out the relationship of reading performance to visual or auditory acuity. In a very early study which reviewed 50 other studies, conclusive evidence showed only insignificant differences in vision among good and poor readers (Spache, 1940). Other early research noted a trend in visual acuity supporting its relationship to reading performance (Russell, 1943). Modern interest in vision and hearing as relating to reading has declined (Smith, 1974). All studies reviewed however found acoustically impaired children to be poorer readers generally than children without hearing problems. A growing interest in the relationship of deafness to reading problems was noted as arising in the 1970's (Smith, 1974).

2.2.2 Neurological Problems

Relevant aspects of neurological problems are eye dominance, hand dominance and brain damage. Very early research found "no consistent tendency for eye dominance, single eye superiority in acuity, hand dominance or any combination of these to be related to achievement in reading." (Gates and Bond, 1936) However certain neurological anomalies were found to affect reading performance. A Danish researcher identified what he termed "congenital word blindness" as an inherited condition influencing reading (Hermann, 1960). Some studies of families with a history of serious diseases have shown a disproportionate incidence of

reading problems. Although research seemed to confirm a relationship between neurological problems and reading, poor experimental design was cited as a discrediting element in the field (Smith, 1974).

2.2.3 General Health and Physical Development

Many early studies found a direct correlation between physical illnesses and reading problems. A significantly higher incidence of reading failure among children who had experienced lengthy hospitalisation in early childhood was found (Stott, 1959). A more recent study associated poor readers with childhood diseases and physical defects (Morris, 1970). Despite agreement among most researchers current opinion discredited health problems in themselves as responsible for poor reading (Smith, 1974). Unavoidable school absences and poor concentration span were commonly linked with poor reading.

Retarded physical development was frequently associated with reading failure. Physical immaturity was also cited as a cause of reading problems. Uneven physical development was positively related to low achievement in reading (Gleason and Klausmeier, 1959).

2.2.4 Speech

Controversial findings on the relationship of speech to reading have hampered researchers. Initial work in this area stressed physical aspects, such as stuttering, and their relation to reading disorders. More modern research favoured the view that general oral or verbal ability was closely linked with silent reading skill. Particular speech skills have been conclusively related to reading ability in many studies. A Swedish study found that "silent speech occurs in the reading of all persons, that good readers engage in less silent speech than do poor readers and that the reading of difficult material results in more silent speech than the reading of easy material." (Edfelt, 1959)

2.2.5 Drugs

The general development and proliferation of drugs has been an area of study by educational researchers. The usage of drugs to enhance reading ability however attracted scant notice. One study found that the specific drug Deanol did not improve children's ability to read (Staiger, 1961; Shabaglian, 1962). In view of limited evidence, the question of the relationship of drugs to reading performance is uncertain.

2.2.6 Emotional Anxiety

In the writer's experience unsteady children who appear unable to concentrate on a single task may be found in all classrooms. An area of research has been assessing brain activity during oral and silent reading. Studies of children experiencing epileptic seizures of the jaw while reading, and pupil dilation in relationship to cerebral informational load were carried out (Lasater, 1962). Although experimental evidence was not located by the writer, it would be expected that unhappy, unsettled children would have more reading (and other) problems than better adjusted children.

2.3 SUMMARY

The reading process is influenced by all the above psychological and physiological factors. Individual children, by virtue of their unique characteristics, will experience relative ease or difficulty in mastering basic reading skills. The extent of the interaction of these factors can be expected to vary widely. Reading programmes may be assessed for their ability to account for the factors listed, particularly where those factors inhibit the child's progress. The present study, in attempting to evaluate the effectiveness of three primary reading schemes, acknowledges the complexity of psychological and physiological factors in the reading process and views the many factors as relevant to an assessment of a "scheme's" value.

Chapter 3

WIDE RANGE READERS

The Wide Range Readers were authored by Professor Fred J. Schonell in collaboration with Miss Phyllis Flowerdew. Originally published by the English firm Oliver and Boyd from 1948 to 1953, this scheme replaced the single class reader approach with graded books for the range of ability found in all classrooms. Wide Range Readers were intended for use in the Junior School (grades 3 to 6) as a follow-on for the already successful Schonell Happy Venture series. Both schemes resulted from many years' classroom and professional experience and reflected the beliefs of Schonell whose influence on educational practices in Australia has been considerable.

3.1 PROFESSOR SIR FRED JOYCE SCHONELL

Although in widespread use in the United Kingdom and Australia, there was surprisingly little research literature available on the Wide Range Readers. Short descriptive papers from Australia were periodically issued, largely in various State's Education Department publications. No significant British study on the introduction and use of the scheme could be located by the writer.

Several publications of Fred Schonell related to the Wide Range Readers. The Happy Venture series has an extensive Manual (1959) which contains general statements about reading which might apply to the Wide Range Readers as well. Additional pre-Wide Range Reader publications include: Backwardness in the Basic Subjects (1948), The Psychology and Teaching of Reading (1945) and two articles, "The Relation of Reading Disability to Handedness and Certain Ocular Factors" (1940, 1941) and "Silent versus Oral Reading" (1958).

While at the University of London, Fred Schonell undertook an investigation into handedness and eye preference as they related to reading disability (1940, 1941). He found in his sample of 104 backward readers of average ability that handedness alone did not account for reading problems. When eye preference was considered, particularly left-hand, right-eye combinations, more letter and partial word reversals seemed to occur. Incidence of mirror writing among left handers who also suffered from eye squint was notable. Schonell found a much higher rate of reversals in his backward group, when compared to a normal control group. This study formed part of a broader look at reading disability which culminated in Backwardness in the Basic Subjects.

Schonell wrote "Silent versus Oral Reading" while Professor of Education at the University of Queensland just before Happy Venture and Wide Range Readers appeared. He emphasised the need for early silent reading on two counts: (i) children would realise from the start that reading was a comprehension activity, and (ii) children in classrooms where oral reading predominated could not proceed readily at their own pace. Early reading experiences should establish a balance between silent and oral reading. Once the mechanics of reading were mastered, Schonell placed oral reading in its own category to be used less with more able pupils and continued with weaker pupils. Suggested oral reading teaching methods were: ability grouping; reading passages back to the teacher as a comprehension check; reading of prepared passages by individuals. Schonell set out a division of time for oral and silent reading. For the first year of school: three-quarters oral, one-quarter silent; second year of school: half oral, half silent; third year of school: one-third oral, two-thirds silent; by mid-fifth year: one-quarter oral, three-quarters silent. In summary Schonell stated that silent reading must be taught and cautioned teachers against assuming that reading developed independently of teacher influence.

3.2 RATIONALE FOR WIDE RANGE READERS

An early Schonell article stated a fundamental aim of all education as being the treatment of children as individuals (1951). This view has been cited as the greatest change in educational thought of this century (Editor, Schonell, 1951). The shift from the whole class reader to more individual methods suiting children's varying ability levels clearly encouraged Schonell to develop Wide Range Readers. There is no teacher's manual for Wide Range Readers, however the Happy Venture Manual and The Psychology and Teaching of Reading together presented Schonell's views of reading and as such provided statements of rationale for Wide Range Readers.

The Happy Venture Manual contains a passage where Schonell examines nine elements essential to any successful reading programme: pupil readiness to read, scientifically prepared material, success attainable for every child, developing word recognition skills, activity work in supplementary material, comprehension a major aim, use of a combination of methods, sophisticated production and presentation of materials, and pupils working at their own rate. Statements of rationale for Wide Range Readers might be extrapolated from this list. For example, Wide Range Readers were designed to allow pupils to work at their own pace; Wide Range Readers provided a variety of methods further catering to individual differences; Wide Range Readers stressed understanding of what was read; Wide Range Readers were scientifically controlled for vocabulary.

Pupil reading interests and the need for success were important considerations in structuring the Happy Venture Readers. Vocabulary controlled readers were not available in 1959 when the Happy Venture books first appeared, thus representing Australia's first infant readers to take into account different ability levels within the classroom.

Schonell's philosophy of reading became most explicit in The Psychology and Teaching of Reading (1945). Many of his views were expressed in the format and content of Wide Range Readers. In the second chapter Schonell discussed five factors which influenced reading ability: general maturity, general intelligence level, visual and auditory discrimination, environmental factors and emotional readiness. Graded readers such as Wide Range Readers attempted to accommodate the first two aspects. Supplementary materials in both Happy Venture and Wide Range Readers developed the third factor. Environmental and emotional factors were not specifically attended to in Schonell's readers. More recent reading schemes (USA: Scott-Foresman; Australia: Reading Rigby) have seemed more responsive to the cultural needs of their readers. Wide Range Readers however were probably no more inattentive to cultural and social factors than were other readers of that time. It is more arguable that reading materials over 15 years old lack the modern idioms, spellings, and contexts to be appealing to present-day children.

Readiness to read was regarded as highly important by Schonell. When a child reached the mental (not chronological) age of six, formal introduction to reading was recommended with the proviso that readiness experiences continued for those still in need. Reading instruction per Schonell should use all methods known - alphabetic, phonic, look and say, sentence, language experience - to suit the individual child. The use of parallel readers was also supported, in consolidation work.

Schonell stated that children in the Junior School, aged seven to eleven, required a planned reading programme with adequate testing and both oral and silent reading practice. The point was made that all pupils benefitted where an extensive supply of graded books was available. Wide Range Readers were graded according to reading age

not chronological age (Table 2). Two interchangeable parallel books at each level offered consolidation work, reflecting Schonell's views.

Table 2. Wide Range Reader Age Levels.*

Blue Book I and Green Book I	Reading Age	7 - 7½
Blue Book II and Green Book II	Reading Age	7½ - 8
Blue Book III and Green Book III	Reading Age	8 - 8½
Blue Book IV and Green Book IV	Reading Age	8½ - 9
Blue Book V and Green Book V	Reading Age	9 - 10
Blue Book VI and Green Book VI	Reading Age	10 - 11+

* Compiled from the Tasmanian Education Department Handbook on Reading (1964).

3.3 STRUCTURE AND FORMAT OF WIDE RANGE READERS

Oliver and Boyd published the basic Wide Range Readers in stages from 1948 (Blue Book I) to 1953 (Blue Book VI). At present two books at each of six levels are available. Four Quiz Books, published from 1966-1967, provide comprehension exercises for each story from the readers. Flash-cards are also available, with single words in various type sizes, word groupings and sentence flash-cards for eye span proficiency. Books I to VI cover children with reading ages up to eleven. Beyond that, Schonell recommended the Reading On series - Red and Yellow Books I and II - published by his collaborator in the Wide Range series, P. Flowerdew and Steward. In addition, Wide Range Readers offer extensive readers in the Interest Books I to IV, published also in 1966-1967. These books are to be read for pleasure with levels of difficulty roughly matching those of the basic Wide Range Readers.

The basic readers vary in length, averaging 100 pages, and are graded in size of type, picture to print ratio and vocabulary controlled. The Blue and Green books measure 19 cm x 14 cm. Originally sold in hardbound copies, sturdy paperback editions are now available. In the preface to Blue Book I Schonell gave aims and scope of the reader. Earlier books stress the story element and later books introduce factual material. Particular attention is given to drawings and overall layout. Illustrations in colour and black and white appear at least on every other page at all levels.

Content is quite varied. Historical material is presented in a fictional style, often using first person speech. Topics handled in this way include the Wright Brothers, Leonardo da Vinci, Tycho Brahe, Anna Pavlova, Jenny Lind, Helen Keller, the Royal Flying Doctor Service and others. Natural science topics in story form add interest for children. Poems and fiction tales vary widely, as can be appreciated from a random list from Blue Books I to VI: Strawberry Jam, Tortoise Speaks, Bobs the Monkey, The Punch and Judy Show, Silka the Sea Lion, Little Circus Girl, The Boys Who Made Aeroplanes, Kandy the Kangaroo and Shuri of the Gypsies. Interspersed among stories and poems are word puzzles and other short reading activities.

Wide Range Quiz Books vary from 20 to 30 pages long and were published to accompany Blue and Green Books I to VI. Some of these have answers at the back of the book and others require teacher marking. Up to 30 comprehension questions are given for the stories in the readers. Full sentences are usually required in response, although some multiple choice questions only require a single word response. Word matching exercises and sentence completion, depending on the level of the book, are also included. The first Quiz Book requires only single word responses. At the present time, with the variety of

comprehension material on the market, these books are not widely used in Tasmania. Teacher's notes prefacing the Quiz Books emphasise the dual reading objectives of word recognition and comprehension. Schonell supported the view that home environment training improved comprehension, despite what he perceived as a very close link between innate ability and comprehension skill. Four basic aims of comprehension reading, related to children's developmental levels, appeared in the Quiz Book preface:

- (a) Ability to understand the general idea of a paragraph or extract general information,
- (b) Ability to follow a sequence of events,
- (c) Ability to remember and recall specific points, and
- (d) Ability to, given certain information, indicate the outcome of events or to make an inference.

The Quiz Book format is varied, with illustrations on nearly every page.

Wide Range Interest Books supplement the basic readers at the following approximate levels (Table 3).

Table 3. Interest Book-Basic Wide Range Reader Correlation

Read Blue or Green Book I, II	Then Interest Book I
Blue or Green Book III, IV	Interest Book II
Blue or Green Book V	Interest Book III
Blue or Green Book VI	Interest Book IV

(Preface, Wide Range Interest Books.)

Schonell, Flowerdew, and Elliott-Cannon collaborated to produce the Interest Books. As extensive readers they may be useful not only as supplements to Wide Range Readers, but also as extension material for

other basal reading schemes. Stories have wide appeal, are well illustrated and print size is carefully controlled. Vocabulary levels match those of the Wide Range Readers. The books are the same size as Wide Range Readers and roughly the same length. Non-fictional topics have been chosen more often than in the basic readers, as seen from this random list of titles from Interest Books I to IV: Decimal Coinage, Louis Pasteur, War on Locusts, Tristan da Cunha, Artesian Wells, The Boy Handel and Snowflakes. Adventure, sports stories, animal tales and historical figures from around the world make the series quite appealing. As the stories are to be read for pleasure, specific teaching methods are not given.

The flash-cards accompanying basic readers are meant as essential components of the scheme. Schonell offered several suggestions on appropriate usage, but overall emphasised the need to introduce children to difficult language before reading each story. Eye span and general oral fluency are developed by the sentence cards. Word families on single cards are intended to help increase vocabulary and word attack skill at the same time.

The Tasmanian Education Department Handbook on Reading (1964, out of print) printed teaching notes to help implement the scheme. Recommended sequential procedures were as follows: show the children the look-and-say flash-cards for the new story, teach unknown words to the group, test the children's knowledge of these words by a simple game, present and make sure the children understand the relevant sentence flash-cards, teach the word family flash-cards for the story, have children read the story silently to themselves, and then have children practice reading the story orally in pairs or individually to the teacher. The Quiz Books would be the logical follow-up to this procedure.

3.4 AUSTRALIAN RESEARCH ON WIDE RANGE READERS

Very little experimentation with Wide Range Readers has been done in Australia. Prior to its introduction the whole-class reader was in common use. Early use of Wide Range Readers in Western Australia has been reported (Jackson, 1957). Grade 2 through grade 7 children were initially given the Schonell Graded Reading Test to determine which reader each pupil started on. Pupils then worked through their books at their own pace, irrespective of school grade level. Jackson's work was not intended as a scientific effort and there were no external control groups, no effort was made to standardise teaching methods and a Schonell test was used to evaluate a Schonell reader in a small experimental sample, introducing possible bias.

After 12 months, pupil progress was charted. Jackson's report mentioned plans for further follow-ups. He was cautious in asserting the experimental status of Schonell's readers, reflecting opinions of the times. Pupils below, at and above actual grade levels were represented in a chart including a group that completed all six basic books. Of those still progressing through the series no pupil was found to be reading below the grade level, after 12 months of exposure to Wide Range Readers. The majority read at their grade age. Specifically, of the 52 grade 4 pupils, seven completed all six books, 38 children were reading at their grade level after 12 months, 12 read above their grade level and none read below their grade level. The boredom factor often introduced by readers poorly suited to individual ability levels seemed absent from this study, since desire to learn shown through interest would be expected to be accompanied by good reading test scores.

Other early Australian research from Victoria compared the whole class reader approach to Wide Range Readers with 90 grade 3 children

(Ganderton, 1959). Reading time per week was controlled as was mental ability of the sample group, although Ganderton did not explain how he selected the children. The class reader group stressed oral reading, supplemented by silent and library reading. The experimental group had only one oral lesson weekly, two comprehension lessons weekly, used only selected library books and in groups read both the Happy Venture and Wide Range Readers. Further reading of the Oliver and Boyd publication "Reading to Some Purpose" completed their reading programme. Grouping was determined by the Schonell Grade Reading Vocabulary Test, introducing possibly the same bias mentioned in Jackson's work. The entire school year was devoted to this experiment.

In the whole class reader group, 50% initially read above their chronological age. After 12 months, 47% maintained that level. The experimental group had figures of 56% and 79% for before and after one year. Several silent reading tests were given during the year to pupils in grades 3, 4 and 5. The end-of-year test showed the experimental grade 3 group performance in silent reading equalled only by a non-experimental grade 5. The results seemed to favour ability-grouping in reading and use of graded readers. No further references to study of Wide Range Readers in Australia were located.

The Queensland and South Australia Education Gazettes gave cursory mention to Wide Range and Happy Venture Readers (May, 1958; July, 1959). The Queensland Gazette noted that from 1959 onward grade 1 pupils were to use the Happy Venture series. The South Australia Gazette simply announced the availability of the same series with prices and short descriptions. The Tasmanian Educational Record (1962) printed teaching notes for Wide Range Readers. These notes discussed word recognition, eye span and sentence reading, reading techniques, reading stories

silently and re-reading stories for meaning. They were written by Mr. A.D.J. Wood to introduce teachers to the scheme and re-appeared in the Handbook on Reading (Tasmanian Education Department, 1964, out of print).

3.5 WIDE RANGE READERS IN TASMANIA

The official history of Wide Range Readers in Tasmanian can be documented through records and minutes of the Primary School Curriculum Standing Committee (PSCSC), whose founding Constitution dated 20th June, 1950. PSCSC records provided the only official history of reading and other subject areas in reference to curriculum in Tasmania. It was extremely difficult to trace development of the scheme in primary schools, as official records were not kept.

PSCSC duties as stated in its Constitution were: (a) to examine the content and methods of Primary School Education; (b) to draft the Primary School Curriculum and to review it continuously; (c) to carry out any investigation deemed necessary by the Committee; and (d) to report and make recommendations to the Director of Education. Committee members at that time were Education Professor C.D. Hardie of the University of Tasmania, the Supervisor of Practice Teaching, a Senior Education Officer, a Psychologist, a Curriculum Officer, the Education Officer for Infant Schools, a District Education Officer and eight additional members nominated by the Director and the Teachers' Federation.

Earliest PSCSC mention of the grade readers which were in use before Wide Range Readers was in 1951. Minutes of the 22nd March, 1951 meeting showed these texts as approved: The Romance of Reading, The Adventure of Reading, Joy in Reading, The Heritage of Books,

Gateway Readers (grade 2), plus several others for backward readers. Minutes of the 19th September, 1951 meeting showed further discussion of suitable class readers, with The Heritage of Books favoured and the other listed texts to be acquired year by year. As of the 11th October, 1951 meeting, approval for purchase of 5000 each of Books I to IV for grades 3 to 6 respectively of The Heritage of Books was gained. Supply to schools of this reader as whole class texts was officially recommended on 4th December, 1951. As of 13th March, 1952, the Hobart Supply and Tender Department held stocks of this reader and the Gateway Reader for grade 2. Financial considerations occupied several Committee meetings during 1952. In 1953 these texts were officially introduced and remained the class readers in Tasmanian schools until approximately December, 1960.

Committee minutes of 28th September, 1960 cited a Mr. G. Lewis reporting on depletion of stocks for The Heritage of Books and suggesting the Committee investigate new approaches to reading. To quote these minutes: "Members stated that reading ability within one grade could spread over five or six reading levels. It was agreed that the use of one reader for all children in a grade was limiting to the better readers and gave little encouragement to the weaker readers." At that time Wide Range Readers were well known in Queensland, South Australia and Western Australia. These minutes further recorded a description of Wide Range Readers, and Supply and Tender prices for 8000 each of the Blue Books I to VI, also including 5000 of the Flowerdew and Stewart Reading On Book I. A circular to head teachers dated 11th November, 1960 stipulated Wide Range Readers as the recommended texts for 1961. Confirmation of adoption of Wide Range Readers was recorded in minutes of the 2nd December, 1960 meeting. The Heritage of Books was recommended as supplementary reading.

Happy Venture books were recommended for grade 2. On 12th December, 1960 a circular to head teachers and Infant Mistresses described the philosophy and content of Wide Range Readers. As of 1961, Wide Range Readers were officially adopted as grade 3 to 6 readers. No further discussion appeared in Committee notes until the 20th July, 1961 where a schedule for supply of reading aids for Wide Range Readers (flash-cards and related aids) was given.

Correspondence and personal communication with Education Department personnel gave some further details about introduction of Wide Range Readers in Tasmania, but specific dates were commonly missing. Correspondence received in March 1977 from Mr. L.E. McKenzie, retired headmaster from the Tasmanian Education Department, noted the visit to Tasmania of an American professor, David Russell from the University of California at Berkeley in 1959 or 1960. This visit introduced Tasmanians to new ideas in the teaching of reading, in particular the need to cater to all ability levels in the classroom. Mr. McKenzie cited the visit of Dr. Peggy Volkov at roughly the same time who presented information about individual differences in children. About 1961 two Victorian Education Department Research Officers came to Hobart sponsored by the Curriculum or Guidance Branch of the Tasmanian Education Department. Their theme was "The Widening Gap in Achievement". Outside contacts were, according to Mr. McKenzie, possibly quite influential in the change to graded readers. At that time Wide Range Readers were the only graded material on the market and, as Mr. McKenzie pointed out, the only selection available to teachers willing to use the new approach. He estimated that it took about three to four years to become the generally used scheme throughout Tasmania. The supplementary aids such as flash-cards made Wide Range Readers all the more appealing.

Personal communication with Mr. John Morgan, Guidance Branch, Tasmanian Department of Education, gave some further information. Mr. Morgan, together with Mr. McKenzie, conducted some informal studies of Wide Range Readers in the early 1960's. The Tasmanian Teachers' Journal reported experimentation with a grade 6 sample using Wide Range Readers, in an article, "A New Approach to Reading" (1960). Different readers, various time allotments for reading, and comprehension exercises were introduced to one group of children, while another group continued with the whole class reader; this conducted for the duration of the third term. No numerical results were reported. Testing was by the Schonell Word Recognition Test. Results were sufficiently encouraging for the staff at one school to prepare for full scale use of Wide Range Readers the following year. Apart from these two contacts, no further information could be located.

Present-day use of Wide Range Readers is diminishing, with the diversity of reading schemes on the market. Multi-level (catering to a range of ability in one grade level) approaches to reading are part of all modern schemes. The newer programmes offer up to date subject matter, extensive supplementary materials, attractive formats and attempt in some cases to provide subject matter suitable for the particular cultural group likely to read the material.

Chapter 4

SRA READING LABORATORIES

Science Research Associates, Inc. (SRA) is an American publisher offering an extensive range of educational materials. Broad subject areas listed in their 1975 catalogue included Distar Instructional System (Reading), Early Childhood, Reading, The Language Arts, Social Studies, Mathematics, Guidance Programmes and College Publications. International distribution of SRA materials is handled by a network of marketing representatives in four countries and the materials are available in many others. The trend in reading materials is toward locally published editions.

4.1 DEVELOPMENT AND ORGANISATION OF SRA READING LABORATORIES

Earliest research into the reading laboratories by the author Dr. Donald H. Parker dated from about 1951. Dr. Parker was a reading consultant for a number of Florida (USA) schools and found it difficult to provide materials to schools which catered to the range of abilities within the classroom. Early experimentation in Florida and later in other eastern USA states used his own materials which were multi-level and intended for single classroom use (cited in Silva, 1968). This early work with a sample of approximately 6000 children resulted in his 1957 doctoral dissertation on multi-level reading instruction in secondary schools. The first SRA Reading Laboratory was published in 1957. In 1958 the Elementary Edition followed, intended for use in secondary schools. Eight other laboratories were then published: Units IIb and c for grades 5 and 6, 1960; Units Ia, b and c, grades 1, 2 and 3, 1961; and Units IIIa, b and IVa, grades 7, 8 and 9, 1964.

Revisions were undertaken in 1969 and again in 1973. Latest editions cater for grades 1 through adult levels. Table 4 indicates American school grades, appropriate SRA Laboratory levels and reading skills covered.

The International Edition of the SRA Reading Laboratories first appeared in 1969, Unit IIa; Unit IIIa was published in 1972, in Canada. An Australian review of this Edition listed various objections Australian teachers had found using the American Editions: story content, non-availability in Australia of recommended follow-on reading, spelling and American phonic vowel sounds (Braithwaite, 1970). Dr. Parker also developed a Spanish language reading laboratory. Personal communication from New Zealand stated that in 1969 an estimated 35 million learners from kindergarten to adult level had used the reading laboratories, which were then available in 43 countries (Silva, 1975).

Dr. Parker presently heads the Institute for Multilevel Learning International, Big Sur, California, USA (known as the IMLI), a non-profit organisation which seeks to develop multi-level materials in various curriculum areas. The Spanish language and International Editions of the reading laboratory were IMLI projects. A variety of information in pamphlet, poster and article form is distributed by the IMLI. Dr. Parker also maintains an Exchange File including research papers on the reading laboratories from several countries.

WORD SKILLS			
	sub skill	grade	
PRIMARY	Ia/I	1	BASIC SIGHT WORDS
	Ia	1	1.2 1.4 1.7 2.0 2.3 2.6 3.0 GOLD AQUA PURPLE ORANGE OLIVE BLUE BROWN
	Ib	2	1.4 1.7 2.0 2.3 2.6 3.0 3.5 4.0 AQUA PURPLE ORANGE OLIVE BLUE BROWN GREEN RED
	Ic	3	1.4 1.7 2.0 2.3 2.6 3.0 3.5 4.0 4.5 5.0 AQUA PURPLE ORANGE OLIVE BLUE BROWN GREEN RED TAN GOLD
INTERMEDIATE	Ia	4	2.0 2.3 2.6 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 ORANGE OLIVE BLUE BROWN GREEN RED TAN GOLD AQUA PURPLE ROSE SILVER
	Ib	5	3.0 3.3 3.6 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 BROWN GREEN RED TAN GOLD AQUA PURPLE ROSE SILVER ORANGE OLIVE BLUE
	Ic	6	4.0 4.3 4.6 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 TAN GOLD AQUA PURPLE ROSE SILVER ORANGE OLIVE BLUE BROWN GREEN RED
SECONDARY	IIa	7-9	3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 ORANGE OLIVE BLUE BROWN GREEN RED TAN GOLD AQUA PURPLE
	IIb	8-10	5.0 5.5 6.0 7.0 8.0 9.0 10.0 11.0 12.0 BROWN GREEN RED TAN GOLD AQUA PURPLE ROSE SILVER
	IVa	9-13+	8.0 9.0 10.0 11.0 12.0 13.0 14.0 ORANGE OLIVE BLUE RED TAN AQUA PURPLE
COMPREHENSION SKILLS			
RATE AND CONCENTRATION SKILLS			
LISTENING SKILLS			
STUDY SKILLS			
LISTENING-NOTETAKING SKILLS			

Table 4. Programming of skills in the SRA Reading Laboratories. (Taken directly from the 1977-1978 SRA Catalogue of Educational Materials.)

4.2 RATIONALE FOR THE SRA READING LABORATORIES

The philosophical basis of the reading laboratories was found in Dr. Parker's 1957 doctoral dissertation. A later publication developed a practical schema for producing the best work from each pupil (Schooling for Individual Excellence, 1963, D.H. Parker). Dr. Parker's view in an article from that time was:

"It is necessary to provide a situation in which each child may start where he is, and move ahead as fast and as far as his learning rate and capacity will let him." (1962, p.67)

This expressed the underlying principle of SRA Reading Laboratories.

Five basic premises were set out in an early Teacher's Handbook (Elementary Edition, 1958).

1. Nearly every student can improve his present reading performance both in rate and comprehension.
2. Little improvement takes place when students are reading materials either too hard or too easy for them.
3. In the typical classroom, reading abilities range across six, eight or even ten grade levels.
4. Each student needs the opportunity to advance in reading skills as fast and as far as his learning rate and learning capacity will permit.
5. To be fully effective a programme in reading improvement must provide any class with a full range of reading materials covering many grade levels.

Other researchers substantiated Dr. Parker's work in multi-level materials (Moule, 1966; Gurney, 1966). Both conducted practical work with the reading laboratories and concluded that maximum learning took place where the learner started at his own level of competence and was allowed to move ahead when ready.

D'Arcy (1973) highlighted the beneficial features of multi-level programmes. He noted that children compete only against themselves, immediate goals can be attained, increased speed means increased enjoyment, separate reading skills are taught separately and self-marking develops pupils independence.

On a practical level this approach to learning can be seen in the manner in which the reading passages are to be studied. After suitable material is chosen, pupils follow a three-step procedure called the Survey-Question-Read (SQR) technique. The title, and the first and last paragraphs of short selections are read. Pupils are asked to compose questions arising from this first view. The entire passage is read. The central objective of the laboratories is comprehension skills which are developed in the exercises following each selection. Materials themselves are in colour, of high interest to children and pitched for the range of ability in the classroom.

4.3 STRUCTURE OF THE SRA READING LABORATORIES

The laboratories were intended for short-term intensive use in American schools as supplements to a basal reading scheme (Teacher's Handbook). The self-marking and self-reinforcing nature of the laboratories serves the purpose of releasing the teacher from managerial type duties for "the higher professional job of learning consultant" (Pearce, 1967).

At intermediate grade levels, grades 3 to 6, SRA Reading Laboratories consist of a compact box containing: 150 Power Builder cards at 10 instructional levels, Answer Key cards; grade 4 kits onward include 150 Rate Builder cards at 10 instructional levels, Rate Builder Answer Booklets, 10 coloured pencils for self-marking and charting progress, a Teacher's Handbook including 15 Listening Skill Builder

stories (most levels) and Student Record Books and Answer pages. Recommended time-tabling of the laboratories is left to teachers' discretion, but the publishers suggest approximately 12 weeks' use per school year, varying from two to five 30 minute sessions weekly.

Unit IIa, the grade 4 box, sets out the following schedule for use:

First four weeks - five sessions weekly; next two weeks - four sessions weekly; next two weeks - three sessions weekly; final four weeks - two sessions weekly. At this level each pupil receives a workbook for all record keeping. SRA issues its own placement guide to establish initial colour levels for most laboratories.

4.3.1 Power Builders

Power Builder cards are of sturdy cardboard, usually four pages long, with the cover largely consisting of an illustration and the final two pages devoted to comprehension exercises. Each kit has 10 different levels, differentiated by colour and 15 parallel difficulty cards at each level. These cards have been studied and found to cover comprehension of material read, recall, probing for main ideas, finding writer purpose, mastering new words, vocabulary and spelling skills (Mortlock, 1959). These aims are achieved by presenting short reading passages, approximately 500 words long at the grade 3 level, and exercises. The first set of exercises, entitled "How Well Did You Read?", assesses comprehension of the passage. The next exercises, "Learn About Words", concerns mainly vocabulary and word study skills. Additional exercises vary with the grade level. Power Builders usually require short answer responses. Answer key cards enable pupils to mark their work and the entire marking procedure is seen to have a reinforcing value. Pupils complete coloured bar graphs which visualise their achievement and are attractive to look at. Each colour level represents a growth in comprehension skill of four to six months.

This format has been reported to have high motivational value (Silva, 1970). Another evaluation of format noted interesting titles, attractive illustrations and factual content as good features (Pappas, 1970). Emphasis on non-fictional material has been criticised (Pearce, 1967).

4.3.2 Rate Builders

SRA has approached the problem of speed and comprehension by means of these cards containing short selections and questions. Altogether each reading laboratory above grade 3 level contains 150 Rate Builder cards, in 10 colour levels, matching colours of the Power Builders. Pupils commonly work however at different colour levels as SRA have treated the skills of comprehension and speed as entirely separate from one another. Three minutes are given to complete each Rate Builder. Pupils mark their own work. An average Rate Builder session might cover three cards over roughly 15 minutes' time.

Specific goals of Rate Builders have been noted as faster reading, high level of concentration, rapid understanding of main ideas and clear thinking under pressure of time (Pappas, 1970). The time element has been cited as motivational and a source of enthusiasm for children (Pearce, 1967). It was also noted that successful rate increase prevents adequate vocabulary and sentence structure analysis (Bush and Huebner, 1972).

4.3.3 Listening Skill Builders

The laboratory kits include approximately 15 Listening Skill Builder stories in the Teacher's Handbook, designed to improve children's ability to listen carefully and remember details (Pappas, 1970). Orally presented stories are followed by oral questioning with single letter multiple choice answers. It is suggested that the stories be re-read

the next day, and to this purpose further questions are provided, requiring pupils to group sentences in proper story time sequence. Stories vary from factual material to fairy tales and it is felt that they are of great value to children's listening skill practice.

4.4 ADVANTAGES AND DISADVANTAGES OF SRA READING LABORATORIES

Many researchers have expressed views about the rationale, format, content and method of use of the laboratories. They are outlined below.

Advantages:

1. Compactness yet varied (D'Arcy, 1973; Moyle, 1966)
2. Careful story selection (D'Arcy, 1973)
3. Attractive illustrations (D'Arcy, 1973)
4. Self-pacing (D'Arcy, 1973; Moyle, 1966; W.A. Education Department, 1965)
5. Self-responsibility for learning (D'Arcy, 1973)
6. Compact cards more fun than reading texts (D'Arcy, 1973)
7. All pupils succeed (D'Arcy, 1973)
8. High quality typography (Braithwaite, 1968)
9. Useful teacher's handbook (Braithwaite, 1968)
10. Teacher successes with remedial pupils (Silva, 1968; Moyle, 1966)
11. Incentives felt on an individual basis (Silva, 1968)
12. General student enthusiasm (Silva, 1968)
13. Development of good overall work habits (Silva, 1968)
14. Improved teacher attitudes to reading (Silva, 1968)
15. Careful analysis of reading skills (Moyle, 1966)
16. Teacher time available for individual help (Moyle, 1966)
17. American content a motivational factor (W.A. Education Department, 1965).

Disadvantages:

1. Inadequate question and answer format (D'Arcy, 1973)
2. Need for daily rather than 12 week intensive use (D'Arcy, 1973)
3. Lack of imaginative story content (D'Arcy, 1973)
4. Children's original responses not encouraged (D'Arcy, 1973)
5. Cost of materials (D'Arcy, 1973; Silva, 1968; W.A. Education Department, 1965)
6. American orientation confusing (D'Arcy, 1973; Silva, 1968; Moyle, 1966)
7. No explanation of method of grading selections (D'Arcy, 1973)
8. Tendency to favour brighter children (Silva, 1968)
9. No group discussion opportunities (Silva, 1968)
10. Critical reasoning ignored (Silva, 1968)
11. Discredited teacher role (Moyle, 1966)
12. Record books too elaborate (Moyle, 1966)
13. Rate Builders under-challenging (Moyle, 1966)
14. Unnecessary repetition of phonics work in Power Builders (Moyle, 1966)
15. Too few Listening Skill Builders (D'Arcy, 1973).

The same arguments have been used to both support and discredit the laboratories. In particular, items 10 and 17 under "Advantages" seem to contradict items 8 and 6 under "Disadvantages". In response to criticisms of American bias, the International Edition has largely British material and more open-ended questions are asked of pupils to counter the criticism that original thinking is not encouraged.

An interesting study contrasted the SRA Reading Laboratories with a Western Australian scheme entitled "The Western Australian Reading Development Scheme" (WARDS) (Braithwaite, 1968). WARDS was first

produced in 1964 by the Western Australian Department of Education. Similar in design to SRA kits, it includes "Power Promoters and Pace Promoters", directly equivalent to Power and Rate Builders. The kit contains 100 Promoters at 10 colour levels of difficulty and is available for grade 2 children to 4th form pupils. Power Promoter cards consist of short prose passages, comprehension questions and vocabulary-dictionary skill questions, with emphasis on Australian prose. There are 100 Pace Promoter cards at 10 colour coded levels with short selections and questions, intended for three-minute timed sessions as are the SRA Rate Builders. WARDS makes no provision for listening skills practice. Pupil self-marking procedures vary little from the SRA kits. WARDS was found to be more accurately graded for reading levels than SRA, especially at the higher levels (Braithwaite, 1968). Recent American research confirmed this finding, stating SRA Power Builder readability levels to be significantly at variance with publisher claims using the Dale-Chall formula (Rosen, 1976). In discussion of SRA Reading Laboratories it is worth noting the availability of an Australian equivalent for over 10 years.

Cost of the SRA kits is given below, based on the 1977 prices to schools:

Unit Ia	- US \$129.25
Unit Ib	- US \$129.95
Unit Ic	- US \$129.95
Unit IIa, b, c	- US \$129.95 each
Unit IIIa, b	- US \$134.95 each
Unit IVa	- US \$144.95

Supplementary material based on the laboratories includes the SRA Pilot Library series, short extensive reading booklets with comprehension questions to be used at the teacher's discretion.

They are numbered to correspond to the laboratories, increase in difficulty and cost US \$144.50 per set of roughly 70 booklets in 1977.

4.5 RESEARCH ON SRA READING LABORATORIES

Little of the 1958 to 1976 literature on SRA Reading Laboratories offered experimental reliability. In general these weaknesses were noted: poorly controlled experiments or lack of a control group, insufficient population samples for validity, inappropriate statistical procedures, inattention to certain important variables. There was also a notable shortage of research. Of 36 articles, Masters and Doctoral theses, reports and studies reviewed, 14 studies gave samples of less than 50 pupils, nine failed to specify the size of the sample, 20 used identical reading tests as pre-tests and post-tests, and only nine studies used the laboratories strictly according to the publisher's 12 week recommended programme. Most research did not control for socio-economic status of pupils, but some matched control and experimental group IQs. Findings varied considerably: one sample of 18 grade 10 pupils averaged 12 months' gain in reading over five months (Jalbert, 1958); however in another study an unspecified number of grade 7 pupils showed no significant reading gains (Pearce, 1960). Neither study controlled for differences in achievement in males and females, home variables, ability of the sample or previous or ongoing reading experiences.

Another early study found average gains in comprehension of 15 months over a four month period, using parallel forms of the same reading test before and after the experiment (Locke, 1962). The earliest study reviewed used the laboratories for two years with 50 grade 7 and 8 pupils (Neel, 1958). Testing was done sporadically but sub-groups of the

50 children were tested together and by parallel forms of several reading tests. No specific attention to IQ levels was given, although pupils selected were performing at or above grade level in mathematics and below grade level in reading. The grade 7 pupils gained 1.9 years' average in comprehension and vocabulary together after the first half year. Grade 8 pupils showed 2.2 years' average growth after one school year. More reliable literature is now examined in more detail.

4.5.1 Three American Investigations

The most significant early research was a doctoral dissertation (Sister Mary Madeleine, 1959). Working with grade 4, 5 and 6 pupils Sister Madeleine compared a group using the laboratories with a group exposed to a one level reading programme over a five month period. Strictly defined teaching methods were prescribed for both control and experimental groups. Using 12 schools with classes of 30 matched for IQ, Sister Madeleine established a mean IQ and correspondingly reduced her original sample of over 3600 to 2160. Analysis of Variance techniques were used. Classes using SRA Reading Laboratories followed procedures set out in the Teacher's Handbook. Clearly superior results in overall reading achievement, comprehension and vocabulary among the SRA group were found. Groups were matched again for IQ and overall ability and placed into three sub-groups. Sister Madeleine assumed her population to be equal in all other respects. Results tended to show greatest reading gains for the highest ability level group. An SRA test was selected for use as both pre-test and post-test instrument, but IQ was measured by the Otis Mental Ability Test. Sister Madeleine stated the need for more longitudinal research. Silva felt the Hawthorne Effect may have been operating during Sister Madeleine's experiment, that is, gains were in part due to the prestige felt by the experimental group at being singled out for study (1968).

Another doctoral dissertation examined altogether 703 grade 5 and 6 pupils from nine schools, who had been matched in pairs for mental ability and reading age (Dinnan, 1959). Reading instruction to experimental SRA and control groups was set at 150 minutes per week. The SRA group combined the laboratories with other unspecified reading materials. The sample was restricted to pupils from middle income homes and ran for five months. Parallel forms of the Iowa Silent Reading Test were used, with the SRA group achieving significant gains. Analysis of Variance techniques showed gains for the SRA group at all ability levels (.01 significance). Specific areas where the SRA group showed greatest improvement were for the grade 5 group: paragraph comprehension; sentence meaning; word location. Grade 6 gains were greatest for these areas also, but additionally reading speed and use of indexes improved with SRA kits. Overall the SRA group gained 8.1 months mean grade level compared with 7.2 months for the control group. Silva noted that use of Analysis of Covariance techniques would have eliminated the need for pairs and made most advantageous use of the large population sample (1968).

Later work in the field found, using Analysis of Variance techniques with a sample of 954 grade 2 pupils, no single facet of reading achievement for which the SRA Laboratory was better suited than was a regular basal reading programme (Waldrip, 1966). To quote Waldrip:

"The kindest conclusion might be, the SRA Program at grade 2, when used as a supplementary tool, does not appear to impede progress in reading." (p.423)

Ten reading skills were analysed: total vocabulary, words in use, word meaning, rate of meaning, total comprehension, recalling information, locating information, reading information, following directions and reading for description. The same test was used for pre-testing and post-testing. The experiment was divided into three distinct phases.

Phase one examined the SRA Reading Laboratory as a supplement to the grade 2 programme. Phase two regrouped pupils into three ability groups and preserved use of the laboratory as a supplement. Phase three employed the laboratory as a complete reading programme. Reading was taught precisely 1.25 hours daily to the control group of 420 pupils and to 534 SRA pupils for the seven month duration of the study. Both groups used basal readers throughout phases one and two, with the additional use of the SRA laboratory the only difference. Mean reading achievement measured in various ways did not vary significantly between control and SRA groups. Phase two results rejected the hypothesis that SRA Laboratories favour particular ability groups. Phase three selected eight pupils from each of the 18 classes and replaced their regular reading programme with exclusive use of the SRA Laboratory. Early studies had shown greatest gains in vocabulary for brighter pupils and greater gains in comprehension for lower ability pupils (Jones and Van Why, 1961; Kingsgrove High School, 1961; Enilane and Dalton, 1963). Waldrip's phase three work corroborated this finding, with the middle ability group gaining more in comprehension than the other two groups and the higher ability group gaining most in vocabulary. Size of sample, statistical procedures and ability grouping lent support to the reliability of Waldrip's findings. On the other hand, Waldrip exercised no controls over basal readers used in phases one and two. The ineffectiveness of SRA kits might have been a function of the basal readers or possibly teacher differences.

4.5.2 Three British Investigations

H.B. Pont's work (1966) with 205 grade 4, 5 and 6 pupils may be regarded as the most comprehensive British appraisal of SRA Reading Laboratories. The effect of SRA Laboratories on verbal reasoning and reading quotient was evaluated. Pupils from three Scottish primary schools

were matched for IQ. At one school an experimental group alone was selected while the other two schools used both control and experimental groups. Pre-testing and post-testing used the Schonell R4 Silent Reading Test. The experimental period was 12 weeks, following procedures outlined in the Teacher's Handbook. During that time the experimental group used SRA Reading Laboratories to replace normal reading lessons. Control groups continued with regular basal readers. Normal class reading programmes resumed after 12 weeks with a variety of material being used. Pont noted that this material was substantially similar in layout to SRA Power Builders and largely factual in content. Further post-testing was conducted seven months later. All groups made significant gains in reading quotient. Pont suggested that the Hawthorne Effect may have existed, or perhaps more enthusiastic teaching influenced the SRA group. The SRA group made significant gains, although not in the area of verbal reasoning ability. The seven month follow-up showed a 3.8 month increase in the reading quotient of the control group and no significant increase for the SRA group. As the control group had evidently "caught up" in the seven months following the study, Pont concluded that SRA Reading Laboratories aided not necessarily as "crash" reading programmes but rather in the following ways: removal of the teacher as central to the lesson, pupil self-scoring procedures, motivational value and remedial value. The higher ability group in this study benefitted most from the laboratories. The validity of Pont's results might be questioned on the basis of a three-time use of the Schonell R4 Reading Test introducing a memory factor.

Further British experimentation used 54 Cambridgeshire pupils in two classes with mean chronological ages of 9.9 and 10.4 over two three-month experimental sessions (Moyle, 1966). Specific efforts to

counter the Hawthorne Effect were made by using two experimental groups. Pupils in one experimental group used SRA Laboratories for three months followed by three months' normal English work. The other experimental group reversed the procedure. Moyle's pupils averaged three 45-minute laboratory sessions per week. Extensive pre-testing was conducted (Raven's PMS Non-Verbal IQ, Schonell Grade Word Reading Test, SRA Grading Test, Schonell Silent Reading Tests R3 and R4). At the mid-experiment stage both groups were re-administered the R3 and R4 test, with a third repeat at the finish of the experiment. The first group showed gains after three months of 15.1 months comprehension; after six months this group's gain lagged to a mean comprehension gain of 2.5 months. Overall the first group's mean comprehension age rose 17.6 months for the six month period. The second group showed an 8.5 month gain in comprehension after three months of regular English work; three months with SRA Laboratories raised the mean improvement to 12.0 months, with an overall improvement for the second group of 10.5 months. Weakness in the experimental design was however apparent. Selection of pupils was not on a matched basis but more generalised as "a good standard of attainment". IQ levels ranged from 75 to 130+ and the sample was too small for ability grouping. Ongoing English lessons were not controlled. Bright pupils made the greatest gains in both groups, however the lowest IQ pupil in the first group showed 10 months' comprehension improvement after three months' exposure to SRA kits.

In more recent work 37 secondary schoolboys from lower income Aberdeen, Scotland homes were selected (Shiach, 1971). Two classes of twelve-year-olds participated for nine weeks; the experimental group of 20 used SRA Reading Laboratories for four times weekly periods of 45 minutes each. The NFER Sentence Reading Test and Moray House Verbal IQ Tests served as pre-testing tools. The NFER test was re-administered after the experiment finished. Verbal IQ scores for the control and

experimental groups were roughly equal at the beginning of the session. Mean reading scores were found as follows:

	Pre-test	Post-test
Control	23.54	23.87
Experimental	24.05	25.15

Analysis of Covariance on reading data showed no significant performance differences between the groups. Shiach attempted to equate teaching methods through discussions with both class teachers. It is notable that home environment factors were tackled in this study, the participating schools being 400 yards apart. The small sample however diminished this benefit.

4.5.3 One New Zealand Investigation

Masters Degree work presented to the University of Otago (N.Z.) comprised the only comprehensive research found evaluating SRA Reading Laboratories in an Australasian setting (Silva, 1968). Working closely with teachers, headmasters, and education authorities, Silva arranged three subgroups from his sample of 737 pupils in various ways to determine the influence of previous experience of SRA Laboratories, achievement by sexes and different ability level achievement. Pupils were taken from three New Zealand schools, aged approximately eleven (Form 1 level), in the Dunedin area. Careful analysis of the reading tests used to measure achievement and Silva's own Reading Interest Survey made this work important. Subgroups were: the SRA experimental group; an "other" category comprising many reading schemes but excluding SRA Reading Laboratories; and a "placebo" group, using SRA Pilot Libraries for the duration of the 11 week experiment. The placebo group represented an attempt to counteract possible Hawthorne Effects.

The Otis Intermediate Intelligence Test Form B and both Diagnostic Reading Tests (USA) and an NZCER Comprehension Test, plus an Interest

Survey, evaluated pupil progress. Silva used Analysis of Variance techniques to establish initial equality of IQ across his sample. This comparison yielded higher mean IQs for females. The experimental group followed prescribed procedures from the Teacher's Handbook. As the "other" group used a variety of reading materials, the study did not attempt to measure the effectiveness of SRA kits against a particular reading scheme. Analysis of Covariance techniques gave these results:

Table 5. Achievement of three groups by experience, sex and ability.

	Group		
	Experimental SRA	Other	Placebo
<u>All pupils</u>			
Word recognition	equal	lowest	equal
Comprehension	favoured		
Vocabulary	equal	equal	lowest
Interest	not favoured		
<u>Sub-grouped pupils</u>			
Experienced	not favoured		
Sex	mod. favoured		
Ability	upper half favoured		lower IQ better than "other" but not SRA group.

The experimental group showed no significant reading gains over the other two groups. Previous experience with the laboratory did not enhance its effectiveness. Comprehension gains were greatest for the experimental group, which also found upper ability pupils to benefit most. Two comprehension tests were administered. The experimental group out-achieved the other groups on the New Zealand test, which as noted by Silva "appeared to contain more inferential comprehension items".

4.5.4 Three Australian Investigations

The past 15 years have seen widespread use of SRA Reading Laboratories and very little Australian research carried out to judge their effectiveness. Early work, although lacking sophisticated statistics, was important as the only Australian research of that time (Mortlock, 1958; followed up by Neal, 1959). Mortlock selected two classes in Western Australian secondary schools, comprising 44 First Year pupils and 48 Second Year pupils. The first group was described as Academic and the second group as non-Academic. ACER Reading Test Form C evaluated Word Knowledge, Speed and Reading for Meaning, and was given before and after the three months' experiment with SRA Reading Laboratories. Each reading skill tested showed an average 10 grade months' improvement during that time.

Based on these results the W.A. Education Department undertook more extensive investigations (Neal, 1959). Seven secondary schools and 971 second and third year pupils in three ability streams took part. A three month experimental period was prescribed and again ACER Silent Reading Tests Form A were used. The memory factor in the reading test (repeated tests) was gauged by a group of 100 first year pupils, who in three months' time gained just three months' reading age, ruling out that factor. Teaching method was controlled by instructing one teacher per school in the correct use of SRA kits. That teacher taught all teachers involved in the study how to use the materials. Average improvement for the entire sample after three months was 13.4 grade months. Third year pupils made the greatest gains but all classes benefitted. Slighter gains were made by the more advanced pupils, cited by Mortlock as being perhaps already at maximum reading levels. Results of Neal's work are shown in Tables 6 and 7.

Table 6. Western Australia study: improvement by year. (Neal, 1959)

Year	N	Improvement
First	481	12.8
Second	334	13.1
Third	156	16.0
Combined	971	13.4

Table 7. Western Australia study: improvement by ability. (Neal, 1959)

Reading ability shown by Pre-test	N	Improvement
Retarded -		
31+ grade months	42	30.3
19 to 30 grade months	123	25.1
7 to 18 grade months	203	17.5
Average	275	13.9
Advanced -		
7 to 18 grade months	133	10.3
19+ grade months	195	4.0
Combined	971	13.4

A later study in Australia evaluated SRA Reading Laboratories with a large sample of 778 grade 5 pupils (Moore, 1968). Testing included a Verbal IQ test, ACER Silent Reading Test Form A, Schonell Silent Reading Test R4 and the Jenkins Non-Verbal IQ test. These tests were repeated at the close of the experiment, with the ACER Silent Reading Test Form B substituted for Form A. Both experimental and control groups showed expected increases in scores between verbal and non-verbal IQ tests. The length of the experiment was not stated. The control group followed a standard reading course which also was not specified. Results of this study found the experimental group improving an average 28% in word knowledge. The SRA kit evidently had no significant influence on speed of reading. In reading for meaning, experimental group pupils made 11% greater gains than did control group pupils. Further groupings within the experimental group according to sex, ability and initial speed of reading scores failed to alter the non-effect of the laboratory on speed. To the contrary, sex grouping favoured males in the reading for meaning category and average ability pupils benefitted most in that category also. Lower ability pupils derived benefits in the word knowledge area. All ability level pupils in the experimental group made gains in verbal IQ.

4.5.5 Tasmanian Research

SRA Reading Laboratories were evidently first introduced in Tasmanian primary schools about 1960. A December, 1975 telephone survey conducted by the writer contacted 37 headmasters from Hobart metropolitan primary schools. Thirty-one schools were then using at least one laboratory typically as a 10 to 12 week intensive course. There has been no experimental work completed to date on the effectiveness of SRA Reading Laboratories in Tasmanian primary schools, excepting the present study.

4.6 SUMMARY

In this chapter the SRA organisation was identified and its range of instructional materials outlined. Development of the reading laboratories was traced to the author, Dr. Donald H. Parker, whose early research was summarised. Chronological development of the different kits was given. The multi-level philosophy was cited as part of the rationale for the laboratories. The physical structure of the laboratories followed with a description of each component part. Advantages and disadvantages taken from the literature were listed.

The remainder of the chapter described previous research; much early and some later work was felt to be experimentally unreliable. Early research was seen as generally favouring SRA Reading Laboratories over class readers. One of Dr. Parker's own studies noted a 112% improvement in 456 grade 7 pupils using the laboratory (1958). Later research seemed to show less advantages using the kits. This may have been due to more reading kits now available to schools, lack of novelty as time passed, or might have been a result of experimental procedures used in the studies reviewed.

Chapter 5

THE SRA BASIC READING PROGRAMME

Publication of the SRA Basic Readers began in 1964 with a field test edition of the Basic Reading Series (BRS) designed for use in grades 1 and 2. The readers in their present form were first published in 1973. They consist of 12 basic texts, named levels A to L. Levels A to F are called the Basic Reading Series. Aims of these texts include basic word recognition, literal comprehension, some appreciation and oral and silent reading practice. Levels G to L, the Comprehensive Reading Series (CRS), assume a moderate degree of reading independence and stress comprehension skills. Supplementary materials published specifically for these readers include the Alphabet Book, the Readiness Book, Wall Charts, Flash Cards, Satellite extensives for levels A to F, Reading/Writing Activity Pads, Spirit Masters, Word Pattern Charts, Workbooks, two Teacher Guides and Diagnostic Tests at all levels. Further supplementary material published by SRA and useful with the readers includes the Schoolhouse Kit, available for two age groups to develop word attack skills, and the Reading for Understanding card kits in Junior and Senior Editions, for further comprehension practice.

Pre-publication research extended over an eight year period from 1965 to 1973. SRA printed seven "Case Study Summaries" giving details about American research. Australian editions of levels A to F have been recently developed. Canadian Editions of levels G to L are common in Australian schools, although original American Editions are also used. Transcriptions to British spellings are the major difference. Problematical usage is also clarified, such as sidewalk and footpath, and elevator and lift.

5.1 PRE-PUBLICATION RESEARCH

One study using SRA Basic Readers selected 341 grade 2 and 3 pupils from lower and middle socioeconomic backgrounds from a midwestern American town (Karwacki, 1970). Groups were matched according to IQ, sex, and socioeconomic background. Extensive testing of several reading skills was initially done. The control groups used a basal reader which emphasised phonics and word recognition. Significant differences in achievement were measured by the Analysis of Variance technique, with a follow-up Analysis of Covariance programme, which analysed the possible effects of IQ on the reading achievement levels. In both cases, grade 2 and 3 pupils using the SRA material scored higher than those from the control group of similar grade levels. Exposure to the two schemes was for the period of one school year, although precise details of how reading was taught were lacking.

Three Arizona (USA) primary schools took part in a study with SRA readers (Jones, 1970). Three approaches to reading were contrasted: a programme stressing comprehension and word recognition plus supplemental phonics work; the SRA Reading Programme in grades 1, 2 and 3; and a team teaching approach designed to help low achieving pupils. Testing instruments included the SRA Achievement Series, administered in November, 1968 and in parallel form in April, 1969. The sample was restricted to pupils taking both tests and attending the same school throughout the primary years. Statistical results were taken from a random sample of 50 pupils from each of the three schools. Analysis of Variance showed no significant differences in pre-experiment and post-experiment reading scores among the schools for grade 1 pupils. Grade 2 results were also inconclusive. Significant differences were found only in the grade 3 sample, where the team teaching approach group showed higher mean raw scores than either the SRA group or the other basal reader group.

An earlier study compared SRA Basic Readers with the Scott-Foresman programme, the New Basic Readers (Stueckle, 1969). The sample of 79 grade 1 pupils from Mead, Washington (USA) was divided into an experimental and a control group. Pre-testing and post-testing was carried out interspersed by a 140 day teaching period. Analysis of Covariance used to measure relative achievement levels found significant differences with the Scott-Foresman group performing better in the three areas of word knowledge, word discrimination and reading (sic). Females outscored males in combined groups, but not sufficiently so to alter the overall results; sex differences were negated by ranking the children into three ability groups. Stueckle noted that his findings may reflect the linguistic similarity of the testing instruments and the Scott-Foresman readers, biasing scores in its favour.

Reading performance of "upper middle class suburban" grade 3 children was measured for six classes, two each using what was designated basal readers X and Y and the remaining using SRA readers (Chemler, 1965). Mean IQs were not equal, with the SRA group lowest (mean SRA IQ 109.81, mean basal X IQ 116.86, mean basal Y IQ 113.46). Numerous tests were given to the entire sample, finishing during the pupils' second month of grade 4. Mean reading scores for the SRA group were higher than means for the other groups and above the national average. Analysis of Covariance was then applied because initial differences in IQ were thought to introduce possible bias. The SRA group was still significantly higher in vocabulary, comprehension and reading (sic). Figure 1 and Table 8 present Chemler's results.

A study of grade 1, 2 and 3 pupils from middle income homes has been reported (Larsen, 1970). Pupils using the SRA Basic Reading Series were compared with pupils using a traditional basal reading programme. Four areas related to reading were tested using the Stanford Achievement Tests,

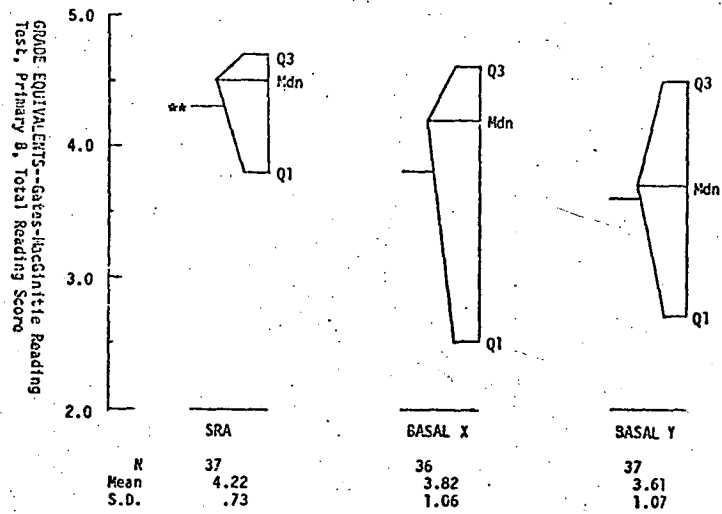


Figure 1. End of third grade total reading scores of three upper middle class groups of students using three different reading programmes. SRA group performed significantly higher (.01 level) than either basal X or basal Y. (Taken directly from Larsen and Chemler, 1965.)

Gates-McGinitie Reading Test	ADJUSTED MEAN GRADE EQUIVALENTS		ADJUSTED MEAN GRADE EQUIVALENTS	
	SRA	Basal X	SRA	Basal Y
Vocabulary	4.34*	3.93	4.32**	3.51
Comprehension	4.31**	3.60	4.28**	3.63
Total Reading	4.30**	3.74	4.27**	3.56

* SRA group significantly higher (.05 level)
 ** SRA group significantly higher (.01 level)

Table 8. Comparison of SRA Reading Programme with two other basal reading programmes at end of third grade. (Adjusted means from analysis of covariance, statistically controlling for differences in first-grade mean IQ.) (Taken directly from Larsen and Chemler, 1965.)

with the SRA group equalling or outperforming the basal reading group in three out of four areas. Teachers' own level of education was taken into account, as was children's ethnic background. Parents' level of education was recorded but not used in the statistical treatment of the data. Ability groups were formed in both groups and time allotment for reading was controlled. The IQ tests given to grade 1 pupils showed higher initial scores for the SRA group; Analysis of Covariance was carried out on the reading scores to control for IQ. Word meaning and paragraph meaning aspects of reading favoured the SRA group. Statistically significant differences were not found for spelling. The basal reading group was favoured for word study skills.

Larsen also reported a study carried out in 1965 with 76 grade 1 and 2 pupils, using the SRA Basic Reading Series and a traditional basal reading programme (1970). Seven aspects of reading were tested and the SRA group scored significantly higher on six of these. The SRA Primary Mental Abilities Test was initially given to beginning grade 1 pupils. Final results were taken midway into the grade 2 year. Syllabication was the only area in which the basal reading group outscored the SRA group.

Three studies were reported in Case Study Summary No. 7 (Raju, Cole and Fessler, 1970). Test scores were in each study compared for pupils using the SRA Reading Programme and those using a traditional basal reader. SRA pupils outperformed or equalled basal reader pupils in all aspects of reading under study. One study measured performance of grade 5 pupils who had used the SRA readers for five years; the second dealt with grade 4 pupils using SRA readers for four years; the third dealt with grade 3 pupils using the SRA readers for three years. Four pairs of schools were selected for these studies, enabling the same pupils to be followed through their primary school years. The Stanford Reading Test was used. Analysis of Covariance was applied to the data due to different

levels of ability found with the grade 2 pupils. Summary tables were taken from this work to demonstrate the superiority of the SRA readers (Figures 2 and 3; Table 9).

5.2 RATIONALE FOR SRA BASIC READING PROGRAMME

An SRA publication "Scope and Sequence", part of the information available to teachers, has stated the SRA rationale for the Readers.

"The SRA Reading Program (sic) for grades 1 to 6 is based on a skill the child already has when he enters school. He has learned to reason by induction." (p.1)

SRA evidently aims in this programme to develop independent readers, but critical thinking and listening skills are also catered to. Building on existing language skills, a variety of methods have been brought into use by SRA. Linguistic, phonic and sight-word approaches are used together, with known words introduced in controlled sentences, aiding children in recognition of word patterns. Seven behavioural objectives are claimed by SRA to form the basis of the programme.

5.2.1 Behavioural Objective 1: Readiness

In connection with reading readiness SRA texts seek to develop listening skills through teaching children to follow oral directions, remember related details and observe differences in sounds made by various objects. The Red Book has been developed to serve this purpose. Growth in motor coordination is accentuated by a variety of tracing, connecting and underlining exercises. Visual discrimination is practised at this stage with four areas of emphasis: seeing like and unlike in word and letter form, left to right progression, seeing the symbol-meaning relationship, and lower and upper case alphabet recognition. Readiness also requires auditory discrimination skill. Oral language work is included in the Red Book and the Alphabet Book. Readiness and

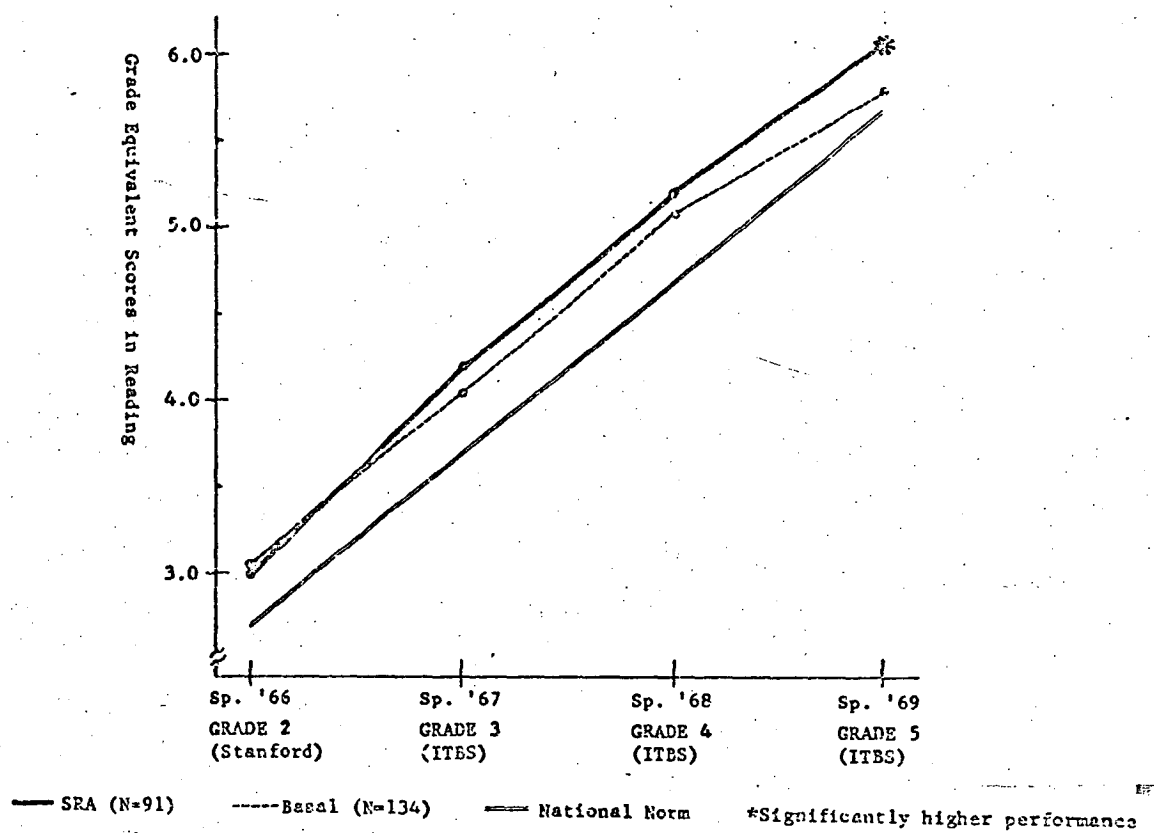


Figure 2. Mean reading scores of Duluth students in the SRA Reading Programme and another basal programme. (Taken directly from Larsen *et al.*, 1970.)

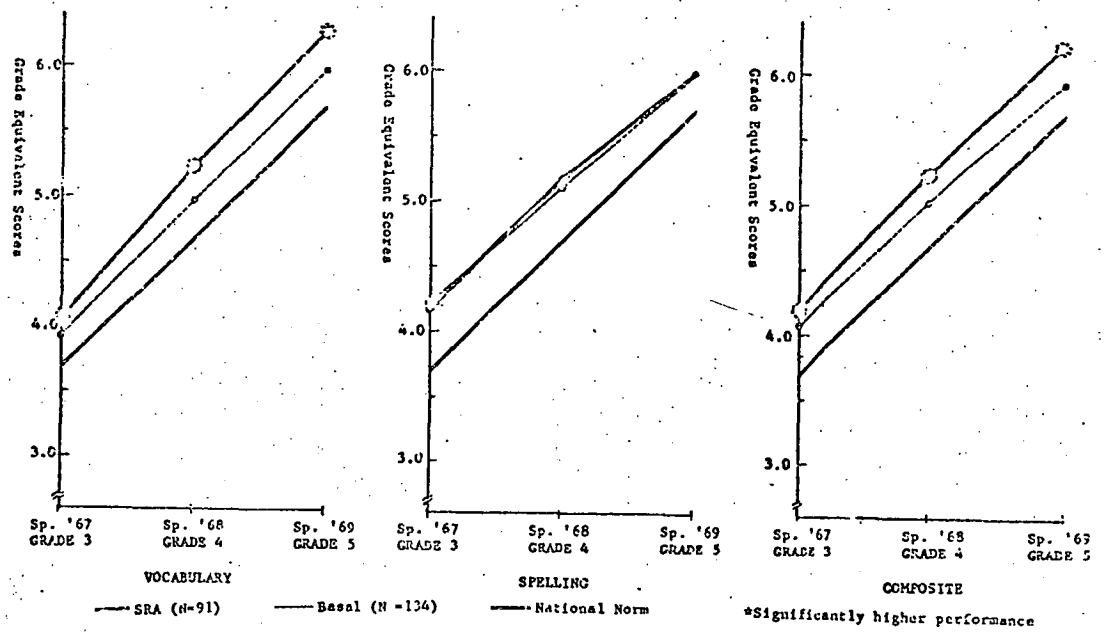


Figure 3. Mean ITBS scores of Duluth students in the SRA Reading Programme and in another basal reading programme. (Taken directly from Larsen *et al.*, 1970.)

GROUP PERFORMING SIGNIFICANTLY HIGHER ON THE IOWA TESTS OF BASIC SKILLS (Based on analysis of covariance controlling for Grade 2 reading scores)				
	READING	VOCABULARY	SPELLING	COMPOSITE
THIRD GRADE				
Study A	Equal	<u>SRA*</u>	Equal	<u>SRA*</u>
Study C	Equal	<u>SRA**</u>	Equal	<u>SRA*</u>
FOURTH GRADE				
Study A	Equal	<u>SRA**</u>	Equal	<u>SRA**</u>
Study B	<u>SRA**</u>	<u>SRA**</u>	<u>SRA**</u>	<u>SRA**</u>
FIFTH GRADE				
Study A	<u>SRA*</u>	<u>SRA**</u>	Equal	<u>SRA**</u>

**Very significant difference (.01 level)
 *Significant difference (.05 level)

Table 9. Summary of studies A, B and C - Comparing performance of Duluth students in the SRA Reading Programme and another basal reading programme. (Taken directly from Larsen *et al.*, 1970.)

motivation are viewed by SRA as closely linked and Teacher's Guides suggest several methods of motivating pupils giving no particular preferences.

5.2.2 Behavioural Objective 2: Word Recognition

Word attack skills are developed through context clues, and word form clues. Phonetic analysis is an important component of the Basic Reading Programme, as pupils are exposed to progressively more difficult vowel and consonant combinations. Syllabication is a related aim and drilled in the readers. Sequencing in word recognition begins with easy words, alphabetical order drills and easy compound words, progressing to hyphenated words and contractions, adverbs, prefix-suffix drills (Level G), locational skills (Level G), use of accent, word structure and pronunciation skills.

5.2.3 Behavioural Objective 3: Comprehension

Comprehension skills covered in the SRA readers include identifying main ideas in stories, restating main ideas, isolating sentences containing main ideas, relating story material to personal experiences, recognition of descriptive words, awareness of author's purpose, distinguishing fact and fiction, and independent evaluation of materials read.

5.2.4 Behavioural Objective 4: Purpose and Rate

SRA readers aim to direct pupils toward reading for specific purposes, generally established by the class teacher. Speed of reading is viewed as a related skill and Levels A to F specifically practice this through games. Level G introduces skimming and subsequent levels develop it further. Appropriateness of rate to purpose is also covered. Punctuation as a comprehension aid appears in Level A.

5.2.5 Behavioural Objective 5: Vocabulary Development

Based on context clues and structural analysis, SRA develops children's word recognition skills initially using known vocabulary, then gradually introducing word patterns to extend this. Words are learned only in relationship to their meaning in sentences. Synonyms and antonyms first appear at Level A and are used consistently to extend vocabulary through Level C and to some extent beyond. The difficult skill of identifying words with certain meanings coloured by figurative and idiomatic usage is developed in all levels, commencing with straightforward naming of objects at Level A. The SRA readers also develop vocabulary by teaching proper use of the dictionary. Specific exercises are included, such as matching best meanings in a context, and pupils are encouraged to check pronunciation in the dictionary.

5.2.6 Behavioural Objective 6: Study Skills

SRA particularly aims to develop skills which will enable pupils to conduct independent research. They are concerned with proper use of all reference materials. Specific examples of this development are following two or more step directions, discerning narrative from directions, use of the encyclopaedia, map and chart reading skills, proper use of parts of books especially for contextual clues (Level D onward), curriculum materials in mathematics, science, and social science, and pre-reading skills (Level J).

5.2.7 Behavioural Objective 7: Oral Interpretation

Oral language is most frequently used at Level A and declines in use through the other levels. Silent reading skills monopolise Levels B to L; Levels G to L do however require pupils to find evidence in their reading, to support or refute their opinions, and to state it orally. To develop oral reading skills the SRA readers stress reading groups of words,

seeing ahead for easier reading, proper pausing, oral extension of new information to classmates, understanding how to phrase words, and communicating sentence mood to others.

5.3 CONTENT AND FORMAT OF SRA READING PROGRAMME

The SRA Basic Reading Programme suits grades 1 to 6. The range of basic and supplementary materials has been listed. Readers and workbooks constitute the core of the programme. A supplementary series called Cracking the Code, designed for pupils in grades 4 to 9, features decoding and word attack skills practice. Table 10 illustrates the relationship of SRA reader levels to school grade levels and is taken from the SRA brochure, "Behavioural Objectives".

Table 10. SRA Readers and school grade levels.

Level		Grade
Red Book and Alphabet Book		
A & B	Pre-Primer)	First year of school.
C	Primer)	
D	First reader)	
E, F		2
G		2
H		3
I		3
J		4
K		5
L		6

Casual tabulation of story content from Canadian and American editions of the readers has been done and shows the incidence of different subject matter.

Table 11. Story content of SRA Basic Readers.

SRA Reader	A	B	C	D	E	F	G	H	I	J	K	L
Humour*	9	6	4	4	11	10	8	3	4	15	10	3
Animals	17	9	11	6	18	10	5	2	1	1	1	2
Fantasy			5	5	11	10	7	6	4	1	1	
Sport	5	1			1					1	1	
Adventure	3	4	5	4	8	4	1	1	2			1
Non-fiction	8	3	4	4	9	12	15	24	22	42	34	46
Science					2	2	7	9	5	6	11	7
Foreign lands						2	9	8	6	7	7	4
Poetry	7	7	11	9	30	24	13	9	7	16	8	8

* all relevant categories are counted where necessary, i.e.
humour and animals both checked for a funny animal story.

Lack of Australian content in the SRA readers would be expected from the American and Canadian editions. One item each in Levels J and K contain Australian poetry or prose. At the early Levels, A to F, emphasis is on animal stories and lives of famous persons. This reflects a common research finding showing animals as children's first choice in reading interest. Humour is present at all Levels, but fantasy does not appear until Level C and extends basically to Level I. At Level F historical, scientific and other non-fiction material is introduced. Its role from Levels G to L is extensive. SRA Reading Laboratories have also been found high in factual content (Chapter 4). By Level L in the Basic Reading Programme history and science obviously over-shadow all other categories. Historical content is almost exclusively American. Levels E, F and G seem to have the most poetry, but SRA has included poems in all the texts. A wide variety of poetic forms are introduced to children. Beyond Level E, adventure stories taper off in number. There is an absence of sports stories at most levels. Levels G to L contain many stories about foreign lands including legends and fables.

Format varies with Level and type of activity in the Basic Reading Programme. Illustrations are simple but multi-coloured for interest. Vocabulary is controlled throughout. A deletion and substitution technique enables children who know, for example, the words pig and beg, to read peg. Phonetic arrangements of new words at the beginning of each section in the readers help to introduce vocabulary and improve word attack skill. Unusual spellings are offset in special boxes and pupils are expected to memorise them with teacher follow-up. Typography is always simple and grades in size smaller over the levels. Teacher's Guides are particularly useful in that pupil pages are reprinted with overprints of suggested teaching methods. Levels G to L are well illustrated with pupil interest rather than acquisition of basic skills a goal. Scientific diagrams are sufficiently realistic without excessive detail. Follow-up activities increase in number and complexity through the Levels. In the Workbooks tiny coloured squares are placed beside teaching points and entire sentences are underlined. These sentences typically use new vocabulary and are isolated spatially from the rest of the page. The writing is never cluttered; spacing between lines decreases with higher Levels.

Based on school-price figures taken from the 1977 SRA Catalogue, the following calculations have been made:

A. Grade 4 Readers:	25 Level J Texts	US \$195.00
	25 Level J Workbooks	US \$ 43.75
	1 Teacher's Workbook	US \$ 3.70
	1 Teacher's Guide	US \$ 6.35
	25 sets Diagnostic Tests	US \$ 22.20
Extra:	25 copies Cracking the	
	Code - readers	US \$ 73.75
	workbooks	US \$ 38.75
	Tch. guide	US \$ 3.95

B. Grade 2 Readers:	25 total, Level E, F Readers	US \$96.25
	25 total, E, F, Workbooks	US \$33.75
	1 each E, F Tch. Workbook	US \$ 6.00
	1 each E, F Tch. Guide	US \$14.70
	25 sets, Diagnostic Tests	US \$11.80
	1 each Activity Pad	US \$ 5.10
	Spirit Masters - E, F	US \$59.00
	Word Pattern Charts - E, F	US \$36.70
Extra:	Basic Reading Series	
	Satellites Kit	US \$64.00

5.4 SRA BASIC READING PROGRAMME IN TASMANIA

First introduced in 1973 the basic readers are now fairly common in Tasmanian primary schools. Cost has been cited by teachers as the biggest obstacle, and only a few schools have been able to implement the scheme for each child throughout the school. Most schools use SRA readers in conjunction with other materials, particularly in Infant classes, where a variety of approaches to reading is common. Prior to the present study, no research into the effectiveness of these readers had been conducted in Tasmania or on the mainland of Australia. The problem of American content has been seen as a hindrance by some teachers while others find children are interested in this subject matter. Although not central to the present study, the influence of American television programmes may be gradually reducing comprehension problems caused by American terminology.

Chapter 6

THE PRESENT STUDY

6.1 DESCRIPTION

Three reading programmes were contrasted in the present study: Wide Range Readers, SRA Reading Laboratories and the SRA Basic Reading Programme. Children taking part were drawn from these 10 Tasmanian primary schools (each school used one of the above programmes exclusively) - Claremont, Trinity Hill, Bellerive, Bowen Road, Goulburn Street, Campbell Street, New Town, Mt Nelson, Mt Stuart and Warrane. Grades 3 to 6 inclusive were involved. Individual class sizes varied.

Procedures were to collect IQ and reading test results from the participating schools and to compile class lists showing the two scores and listing males and females separately. New testing was not carried out. Results of standardised testing in reading and for IQ which had been completed over a five year period were used. Reading quotients were found from the raw score on the Schonell Silent Reading Tests. These were matched and compared with IQ scores for each data point, covering a pupil's scores anew for each separate primary school year. The sample total of 3135 thus reflects a larger number than actually participated.

Statistical procedures were selected to accommodate unequal class sizes, large populations and several variables with the same treatment. ANOVA was performed on RQ and IQ separately for each school class from the 10 schools, which produced class mean RQ and IQ scores. Analysis of Covariance was then done using IQ as the covariate factor. This produced an adjusted RQ class mean, one which controlled for effects of IQ on RQ. The adjusted RQ figures were used in the following subsequent analyses: comparing males' and females' achievement in reading, analysing reading results by designating individual classes as the experimental unit to assess

the possible effects of different years on reading achievement, and to minimise effects of factors cited in Table 20; and analyses of the effects of different income areas on their achievement in reading. Finally, progress in reading over the primary years was calculated for the years 1971 to 1976 inclusive, using ANOVA of RQ. Classes were then grouped by reading scheme and within that, by school grades. Discussion of results was based on reading achievement across one school grade; where a school grade had been administered different IQ tests further sub-grouping was necessary. [As a follow-up to these analyses Duncan's New Multiple Range Test (1955) was carried out where significant results were found.]

Initial contact with schools in 1974 involved recording all reading materials then in classrooms. Appendix A includes a copy of the form completed at that time by teachers. In schools where new reading schemes had been introduced in, for example, 1974, only 1971 to 1973 data was collected.

Test scores were gathered for the following years and grades.

Table 12. Testing instruments relative to year and grade.

Year	Test	Grade
<u>IQ tests</u>		
71-71	Sub Junior	3
73	Sub Junior or Ravens	3
74-76	Ravens	3
71-73	Sub Junior or Junior	4
74-76	Junior or Ravens	4
71-76	Junior	5
71-76	Junior	6
<u>Reading Tests</u>		
71-76	Schone11 R3	3
71-76	Schone11 R4	4,5,6

All data was collected from Guidance Branch offices of the Tasmanian Education Department in Hobart and Launceston, from Guidance Officers attached to Tasmanian high schools, or from individual school's files. Selection of testing instruments depended on most commonly used standardised material. Guidance personnel have used these group tests consistently in Tasmania for many years. The verbal Sub-Junior General Ability Test for grade 3 was discontinued in 1973 and replaced by the non-verbal test of Ravens. Grade 4 pupils in some schools had been given verbal ability tests and in other schools non-verbal ability tests. As IQ testing was done at age levels, 8 years and 10 years, the grade 6 scores of necessity reflected the previous year's mark.

The numbers of children in the entire data set were tabled to highlight specific characteristics of reading scheme, socio-economic area and grade level totals (Tables 14, 15 and 16).

Tasmanian standardised reading testing is normally done in February or March and General Ability is during July or August. Statistically better measures of reading achievement were found with whole class groupings rather than individually, by year, sex, age or any other criterion. Controls exercised in treating the data were as follows: only same - grade classes were compared, only pupils in continuous attendance at the same school were included and the same testing instruments were given to each pupil in all comparisons.

Table 13 shows the four schools where record keeping procedures enabled the longitudinal ANOVA of RQ to be done.

While 1975 had 1976 records were fairly complete earlier results had gaps where records were either lost or misplaced. Results of Sub-Junior and Junior General Ability testing from the 1971 to 1976 period were nearly complete. They are centrally held by the Launceston Guidance Branch of the Tasmanian Education Department. Reading tests are held by

Table 13. School, grade, year available for longitudinal work.

School	Grades, Years								No. of listings	Total pupils
	Gr	Yr	Gr	Yr	Gr	Yr	Gr	Yr		
Campbell Street	-	-	4	71	5	72	6	73	3	153
	3	71	4	72	5	73	6	74	4	199
	3	72	4	73	5	74	6	75	4	155
Trinity Hill	3	73	4	74	-	-	6	76	3	54
Goulburn Street	-	-	4	72	5	73	6	74	3	51
	3	72	4	73	5	74	6	75	4	61
	-	-	4	74	5	75	6	76	3	34
Bowen Road	-	-	4	73	5	74	6	75	3	191
	3	73	4	74	5	75	-	-	3	173
Total										1071

Table 14. Total number in grades per reading programme.

	Grade				Total
	3	4	5	6	
SRA Basic	196	49	143	113	501
SRA Labs.	231	238	326	241	1036
Wide Range	621	381	327	269	1598
Total	1048	668	796	623	3135

Table 15. Total number of children by socio-economic area.

	SRA Basic Reader	SRA Lab.	Wide Range	Total
Lower	154	163	1023	1340
Middle	204	762	447	1413
Upper middle	141	0	241	332
				<u>3135</u>

Table 16. Reading programme and income group; grade.

Grade	SRA Basic				SRA Laboratory				Wide Range			
	3	4	5	6	3	4	5	6	3	4	5	6
Lower	68	31	14	0	60	65	42	50	324	279	188	160
Middle	72	11	49	0	159	144	193	191	176	77	111	83
Upper middle	0	0	45	98	0	0	0	0	41	5	3	5

individual schools or high school based Guidance Officers with the Department. The present study would have been considerably enhanced by a complete data set. The entire data set has been placed on microfiche card, listing pupil identifier, IQ and RQ, and attached as part of Appendix A.

6.2 THE POPULATION SAMPLE

Data analysis involved grouping schools into general income areas and assessing the effect of lower, middle and upper middle income home environments on reading achievement. For that purpose lower income area schools were designated as Trinity Hill, Campbell Street, Goulburn Street and Warrane. Middle income area schools were Claremont, Bowen Road, New Town and Mt Stuart. Bellerive and Mt Nelson were upper middle income area schools. As specific effects of socio-economic grouping were not a central aim of the present study, these casual divisions were partly based on the writer's own knowledge of the Hobart metropolitan area and also on 1971 population statistics made available by the Commonwealth Bureau of Census and Statistics. The present study mainly sought effects of reading programmes on achievement.

Overall neighbourhood characteristics were deduced from six factors: number living in the area, overseas born and occupied private dwelling numbers; major activity (home duties, student, in the work force); occupation of employed persons; levels of educational qualification; type of dwelling; and number of television sets. Tables reflecting this information have been placed in Appendix B. Summary comments follow.

6.2.1 Lower Income Area School Characteristics

Trinity Hill school had the highest percentage of overseas born persons (15%). Goulburn Street area had by far more occupied private

dwellings. The two larger populations at Warrane and Goulburn Street appeared to show different living patterns, with a high number of unoccupied dwellings in the latter area as compared with Warrane.

There was almost a total lack of men listed as involved in home duties from this group. Relative to overall population, Warrane had more children at school than Goulburn Street, showing it to be a suburban child-raising neighbourhood. Percentages of working women were: Warrane, 35%; Campbell Street, 43%; Goulburn Street, 50%; Trinity Hill, 46%.

Looking at levels of education and employment statistics in different areas appeared to relate well to the present study. Parents' own educational levels and attitudes have been shown to influence children's performances (Cashdan, 1973; Dorrizi, 1974; Karnes and Zehrback, 1975; Hubbard and Salt, 1975). Educational levels were clearly highest from the Goulburn Street school catchment area. Altogether only 74 men and 38 women received education to the level of Bachelor's Degree. Overwhelmingly, males were trained as tradesmen. Warrane showed many employed as clerical workers, shopkeepers, metal tradesmen, mechanics, and drivers. Campbell Street results were similar but numbers were considerably less. Goulburn Street was again similar but a larger sector of professional people such as teachers and nurses was found. Nurses, managers, clerical, fire and police and shopkeepers dominated the Trinity Hill area.

The social background of the various schools may possibly be gauged by the sort of homes in the neighbourhood. Warrane was essentially an area of separate homes; Trinity Hill, Campbell Street and especially Goulburn Street showed many flats. Children's exposure to media, especially television, has been found to influence their school performance (Childers, 1973; Feeley, 1973; Fowles, 1974; Bennett, 1974).

The large number of television sets in all areas might indicate that all school areas were equally effectively penetrated by this medium.

6.2.2 Middle Income Area School Characteristics

The highest overseas born population came from the New Town school catchment area. There were virtually no unoccupied dwellings in the Claremont area. Percentages of working women were: Mt Stuart, 13%; New Town, 35%; Bowen Road, 25%; Claremont, 30%. The variation of this figure in lower income areas evidently stabilised with this group and at a lower figure. Numbers in the student category varied little between lower and middle income areas.

More Bachelor's and Higher Degrees were obtained by this population than in the lower income area. Table 17 lists major occupations of this group.

Table 17. Main occupations: middle income area.

Mt Stuart	Teachers, draftsmen and technicians, managers, clerical, electricians.
New Town	Teachers, draftsmen and technicians, managers, clerical, metal tradesmen.
Bowen Road	Labourers, draftsmen and technicians, managers, shopkeepers, metal tradesmen.
Claremont	Shopkeepers, draftsmen and technicians, managers, millers and bakers, metal tradesmen.

There was much uniformity within this group. Far greater numbers in managerial positions were found. Numbers involved in professional capacities - architects, scientists, medical practitioners, law professionals - were low, as found in the lower income group. Claremont showed the most obvious homogeneity with separate house occupation.

As with the lower income area, television was in virtually every house or flat.

6.2.3 Upper Middle Income Area School Characteristics

This listing roughly paralleled the middle income area findings. Some occupations spanned all income areas (clerical, tradesmen), while others only began to appear in the upper middle income area (medical practitioners, lawyers).

Table 18. Main occupations: upper middle income area.

Mt Nelson	Nurses, managers, clerical, shopkeepers, metal tradesmen, process workers.
Bellerive	Nurses, teachers, draftsmen and technicians, metal tradesmen, clerical managers.

Fewer working women appeared here than in other income areas. Higher qualifications were in greater evidence than particularly the lower income area. Mt Nelson showed more heterogeneity of dwellings, a continued trend at the present time in the area with more flats and home units being built. Television figures paralleled those in other areas. There was no income group lacking television facilities, hence its effect on school achievement might to some extent be said to be equal throughout the sample.

6.2.4 Summary of Census Statistics

Table 19 lists what were felt to be the most relevant aspects of home environment as related to the present study.

Table 19. Summary, 1971 census data: three income areas.

School	Income area	Working women, %	Trade level	Bachelor's +	Occup.Pvt. Dwellings	Total pop.	TV
Warrane	Lower	35	358	16	1236	5375	965
Campbell Street	Lower	43	118	18	548	1828	375
Goulburn Street	Lower	50	433	82	1923	5601	1441
Trinity Hill	Lower	46	86	10	277	1439	181
Mt Stuart	Middle	31	250	160	1158	3771	917
New Town	Middle	35	355	109	1728	5961	1349
Bowen Rd	Middle	25	484	39	1852	6287	1502
Claremont	Middle	30	105	17	374	1387	319
Mt Nelson	Upper Middle	13	64	11	234	860	182
Bellerive	Upper Middle	11	285	56	1025	3528	829

6.3 READING AND INTELLIGENCE TESTING

Table 20 lists all factors thought to influence reading achievement in relationship to the present study. As all results were based on particular standardised tests, discussion of their format, intention and content has been included. The literature provided considerable evidence for their effectiveness. The present study used a Schonell reading test to measure a Schonell reading programme. The Schonell Reading Tests R3 and R4 were the only group test used consistently throughout the Tasmanian Education Department schools, hence the only choice available.

Table 20. Factors influencing reading and the present study.

Factor	Treatment by study
1. Reading programme	Being evaluated
2. IQ	Tested IQ scores used
3. Age	Same grade comparisons
4. Change of school	Eliminated from sample
5. Achievement differences between sexes	Reading test design
6. Teaching method and teacher	Comparable classes grouped
7. Effects of TV	Comparable income groups studied; size of sampling
8. Parents' attitudes to education	As for 7
9. Parents' level of education	As for 7
10. Reading materials in the home	As for 7
11. Home stability	As for 7
12. Language spoken in the home	As for 7
13. Position of the child in family	Size of sampling
14. Size of family	Size of sampling
15. Physiological problems	Size of sampling
16. Psychological problems	Size of sampling
17. Socio-economic level	Being evaluated.

6.3.1 Schonell Silent Reading Tests A and B (R3 and R4)

These are timed group comprehension tests. The R3 is used with grade 3 pupils and occasionally with weaker grade 4 pupils. The R4 is used with grades 4, 5 and 6. They were first published in 1942.

Paragraphs of increasing length and difficulty with decreasing size of print are numbered. Each paragraph is followed by one comprehension

question to be answered by a word or a short phrase. Chronological ages are matched with raw scores to produce reading ages using charts accompanying the tests. Separate norms have been made up for males and females. Appendix C comprises sample test copies of the following: R3 and R4 Test, Junior General Ability Test, Sub-Junior General Ability Test, and Ravens Coloured Progressive Matrices Sets.

Early research in Britain sampled results from 180 grade 3 children using the Gates Reading Tests, Schonell's Word Recognition Test (R1) and Schonell's R3 Reading Test (Kellmer, Pringle and Neale, 1957). Appropriateness of set norms to the English population was reviewed. Gates Tests were at that time widely used in America where children entered school about one year later than in England. Intelligence was first assessed by the Moral House Picture Test. Schools chosen represented a broad socio-economic range. Staggered testing occasions were selected during one school year. Results showed higher means attained for the Gates Reading Tests than for Schonell tests. The relevant correlation figure was between the Gates Paragraph Reading Test and the Schonell R3 Test 0.75 averaged for a two school sample. The Schonell test was felt to have a lower ceiling as several pupils attained maximum scores while none did so with the Gates test. Gates tests were found to be less steeply graded in the early stages. Poorer readers gained appreciable scores on the Gates test, while equal scores on the Schonell test gave very low reading ages. The Gates test was recommended as a suitable alternative to the R3.

Australian work using Schonell Reading Tests contrasted original English and Queensland norms for the R3, R4 and two Schonell mathematics tests and found significant variations (Andrews, 1965). Gradation of words relevant to Schonell's original population was considered inappropriate in the Queensland setting. As a result of this work the

presentation order of words on the Schonell Word Recognition Test was altered. Andrews also found important discrepancies in raw score increments and reading age increments using the R4 test. Average reading age increases for each correct response were 6.1 months for males and 5.9 months for females. However variation in the males' norms for the five consecutive scores from 29 to 33 correct answers showed reading age increases of 3, 5, 8, 11 and 15 months respectively. The author recommended standardisation for each population of test norms.

6.3.2 Group Intelligence Tests

Construction of the Tasmanian Education Department's verbal general ability tests used in the present study closely paralleled the well known Weschler Intelligence Scale for Children, or WISC (1949). Personal communication confirmed the extent to which the WISC format and content was adapted to produce the Sub-Junior (8 year old) and Junior (10 year old) Tests (Mr. J. Walker, 1975). Correlation between these two tests was found to be very high, 0.78 (Mr. J. Walker, 1975). To date no further study of these Tasmanian tests has been conducted in this State. Literature dealing with the WISC and the non-verbal Raven's Progressive Matrices Test which was used with some grade 3 pupils in the present study was located by the writer. Yearly variations in the Department's tests were slight; metric sums appeared from 1975 onwards and general knowledge questions changed to suit current events.

6.3.3 Raven's Progressive Matrices Sets (1938)

The Raven's test consists of a series of designs or matrices with one slot empty. Different forms for five to eleven-year-olds are available (Sets A, Ab, B). Themes of the matrices test were found to be continuous patterns, analogies between pairs of figures, progressive alteration of patterns, permutations of figures and resolution of figures into constituent parts (Burke, 1958). Children under eight usually take

the Coloured Matrices Series (1956 revision) while older children receive a black and white presentation. The 1947 revision also introduces Sets I and II, suitable for use up to adult levels. All versions are used extensively in England, and have been found of value with persons having specific physical and mental handicaps. Reported correlations between the Raven's test and the WISC were: total score 0.75, verbal score 0.69, performance score 0.70 (Burke, 1958). Reliability as a testing instrument was stated to be "fairly good" but conflicting evidence was cited (Burke, 1958). Item difficulty analysis usually found bunching of medium difficulty items (reported in Burke, 1958). Burke also reported a criticism by Weschler, the WISC creator, that the Raven's test gave too few items and was too single-faceted in determining intelligence.

Australian research with university students tested the hypotheses that more time given for completion of Raven's test and omission of some easier items would lift scores (Yates, 1963). Results were inconclusive, although the relatively small group of slow-but-accurate students benefitted from more time.

A New Zealand study of the Raven's test showed overall reliability as 0.89 with 159 six and seven-year-old pupils (Freyburg, 1966). Stability and inner consistency figures were also high. Test-retest correlations were, for three classes, 0.87, 0.83 and 0.81. Children's self-recording procedures were found to be suitable for that age group.

6.3.4 Weschler Intelligence Scale for Children (1949)

The WISC has been well studied. Test results are given as verbal and performance IQ, and an overall IQ result is also given. Early work in London recommended replacing the verbal and performance distinction with verbal-intellectual and space-performance notation (Maxwell, 1959).

In this study factor analysis of a correlation matrix of all sub-tests of the WISC was done. Grouping of the sub-tests was suggested as biasing both verbal and performance scores, too much being dependent on a single sub-test.

American work with black and white males aged about eight-years-old from lower and upper middle class homes found lower scores in sub-tests from lower class homes, but few other differences (Burnes, 1970). Socio-economic group was found a stronger influence on scores than racial characteristics.

A long literature review of the WISC stated that the WISC satisfied validity and reliability requirements (Zimmerman and Woo-Sam, 1972). The so-called Rosenthal Effect, the influence of the examiner and other situational factors on test scores, was not found in the bulk of research to be important. Culturally deprived groups obtained below average WISC scores, but most studies showed substantial correlations with school achievement.

Canadian research investigated socio-economic status and WISC scores in children with certain learning problems (Telegdy, 1973). Lower income area children scored below the normal population on both WISC verbal and performance scales. Upper income area children underscored the normal population only on verbal sub-tests. Learning problems were felt to equate socio-economic differences in verbal abilities, and performance sub-tests were below normal for lower and middle income groups only.

Further recent work with WISC test patterns compared bright and gifted achievers with bright and gifted under-achievers (Bush and Mattson, 1973). Normal level achievers and under-achievers were also studied. Significant differences were found between achievers and under-achievers in both the bright and normal groups. Secondary across-group comparisons

showed only the WISC Information sub-test to show deviation between bright and normal under-achievers. No such differences appeared in comparing bright and normal achievers.

Chapter 7

PRESENTATION OF RESULTS

7.1 DESCRIPTION AND RATIONALE FOR THE ANALYSES

Five statistical treatments were applied to the data: Analysis of Variance (ANOVA); Analysis of Covariance (ANCOVA); Pearson's Product Moment Correlation Coefficient (outlined in Klugh, 1974, pp.70-74); and Duncan's New Multiple Range Test (1955).

The CSIRO Division of Mathematics and Statistics assisted in the initial analyses covering the years 1975-1977. Further analyses completed in June 1979 at the University of Tasmania on the Burroughs 6700 computer used a statistical package named "Teddybear Statistical Programme", developed at the University of Otago, New Zealand, in 1978 by J.B. Wilson.

Experimental education has made wide use of "Teddybear" since its development. The CSIRO analyses predated "Teddybear", but differed only in the internal structure of the programme. Statistical tests applied to the data were essentially the same. Data given in Section 7.3 represents "Teddybear" findings. Longitudinal ANOVA was completed by CSIRO and not repeated in the "Teddybear" treatment.

"Teddybear" analyses appear more detailed than CSIRO analyses. In particular, CSIRO analyses did not seek interactions between elements such as sex, income group, reading scheme, whereas "Teddybear" did. These interactions may be considered essential components of educational research with experimental designs such as the present study (pers. comm., Mr. B. Foster, 1979). One further difference between the CSIRO and "Teddybear" analyses was that CSIRO completed ANOVA on both IQ and RQ, while "Teddybear" carried out ANOVA in IQ only. ANOVA on RQ was deemed unnecessary as ANCOVA procedure worked on RQ means adjusted for effects

of IQ (Ibid.). Where CSIRO analyses produced varying results due to their more generalised nature, an asterisk appears in the text with the CSIRO results bracketed. Otherwise it may be assumed that findings of the two analyses were the same.

ANCOVA was selected as the statistical treatment because of its suitability in cases where experimental units cannot be equalised on the important variables (Popham, 1973). The present study represented such a case, as pupils could not be allocated to reading schemes randomly. Instead, unequal numbers already grouped according to reading scheme, were found. A summary of assumptions underlying valid use of ANCOVA is given by Popham (1973):

- (a) random assignment of individuals to treatments; (Popham, 1973, modifies this requirement by suggesting that the subjects in each sub-group should be random samples from their corresponding populations.)
- (b) the slope of the regression line is the same for each treatment, i.e. there is no slope-treatment interaction;
- (c) the measures must be normally distributed in the sub-group populations;
- (d) the variances within the sub-group populations must be homogeneous;
- (e) subjects must be measured on the control variable (covariate) before any experimental treatment is administered;
- (f) covariate and treatment must be independent.

The present study has satisfied all but item (a), however subjects were selected randomly from their populations.

It has been shown that significant variations may be caused by factors other than those under study. It has been suggested that sufficiently large samples could show any variable bearing a significant relationship to any other (Klugh, 1974). A follow-up ANOVA was completed

to measure reading achievement over time. Duncan's a posteriori test (1955) was used to make individual paired comparisons between variables, in this instance between reading schemes, where ANCOVA had shown significant differences.

7.2 LIMITATIONS IN THE TREATMENT OF THE DATA

Personal communication with the CSIRO outlined various problems with the data (Dr. G. Laslett, 1977).

1. Only two schools represented the upper middle income group. One was a Wide Range Reader school. At the other, grades 3 and 4 used Wide Range Readers while grades 5 and 6 used SRA Basic Readers. Very limited comparisons were possible with this income group and it was omitted from most analyses.
2. Most schools in the study used Wide Range Readers. Random selection of teachers and reading schemes would have been the ideal situation.
3. Bias might be caused by the selection procedure which included only pupils in continuous attendance at a school. Participation of all pupils then attending the school might have produced different results.
4. Non-random allocation of reading scheme might mean that particular schemes were selected to match a school's unique population, hence be more effective, although there was no evidence from the State Education Department to support this.
5. Gaps in the data resulted in an incomplete data set.
6. Different teachers in different classes may be affecting achievement. Including many classes may minimise the teacher influence.
7. Longitudinal aspects of the data may have biased it towards a particular scheme, as teachers developed familiarity.

8. Unequal class sizes and unequal number of schools within each income group and reading scheme presented statistical problems.
9. Classes with less than five pupils were omitted from all analyses.
10. SRA Reading Laboratory schools had used that programme for not less than five years; it was not used as the total class reading programme and the present study has not controlled for possible influences of other reading schemes used concurrently with the kits.

Limitations can also be assets. Item three would be more biased if all pupils in the school participated in the study. The mobility of teachers within the Department might counteract the effects of item seven. Statistical procedures were used to minimise effects of item eight.

7.3 PRESENTATION OF RESULTS

7.3.1 Results, Grade 3, Verbal IQ Test Group

Summary tables of this and all other grades, listing mean IQ and RQ by individual classes, may be found in Appendix E (Tables 44 to 49 inclusive).

This group contained no members from the SRA Basic Readers because they were introduced in 1973, the same year the verbal IQ test was discontinued.

Class mean IQ and RQ favoured the middle income group. Wide Range Readers appeared superior to SRA Reading Laboratories in RQ, when not adjusted for the covariate IQ. The lower income group showed a lower class mean RQ than both middle and upper middle income groups.

Relative class positions of mean IQ and RQ have been plotted by computer. Appendix D contains these graphs for grades 3 to 6. The same class positions were again plotted but labels were for reading scheme rather than class number; these are also included for all grades in

Appendix D. The correlation between IQ and RQ was 0.84 ($P = <0.001$) with IQ accounting for 70.9% of the variance in RQ scores. CSIRO analyses found a 0.73 correlation ($P = 0.001$). Greater than 50% would indicate that variation in adjusted RQ was well accounted for by IQ. This test does not however identify which other factors are influencing the results. ANOVA on IQ revealed no significant differences between those classes using Wide Range Readers and SRA Laboratories with mean IQ scores of 101.8 and 105.3 respectively; or those classes classified as low and middle income groups, mean IQ scores 101.8 and 106.0 respectively; or between IQ scores of males and females, mean IQ scores being 104.3 and 102.7 respectively. Table 21 gives results of the ANOVA on IQ for the grade 3 verbal group.

Table 21. Analysis of Variance, IQ, grade 3, verbal.

	DF	MS	F	P
Reading scheme (R)	1	92.27	1.72	0.20
Income group (I)	1	176.33	3.29	0.08
Sex (S)	1	18.29	0.34	0.56
RI	1	338.77	6.32	0.02* SIG
RS	1	95.62	1.78	0.19
IS	1	21.95	0.41	0.53
RIS	1	12.91	0.24	0.63
Error	34	53.61		
Total	41	77.44		

Adjusted class mean RQ showed Wide Range Readers significantly higher ($P = 0.005$) than SRA Laboratories, with respective means of 110.40 and 104.89. Lower and middle income group RQ means were not statistically significantly different, with respective values of 106.27 and 109.02.

The RQ means of males and females were statistically nonsignificant, with respective values of 106.76 and 108.52. ANCOVA results are given in Table 22.

The significant interaction between reading scheme and income group showed middle income children and lower income children in the Wide Range Reader scheme with RQ means of 107.6 and 95.9 respectively.

A posteriori testing was not undertaken with this group as only two reading schemes were represented.

Table 22. Analysis of Covariance, grade 3, verbal.

	DF	MS	F	P
Reading scheme (R)	1	212.85	9.04	0.01*SIG
Income group (I)	1	50.65	2.15	0.15
Sex (S)	1	22.45	0.95	0.34
RI	1	14.42	0.61	0.44
RS	1	12.13	0.52	0.48
IS	1	0.00	0.00	0.10
RIS	1	0.58	0.02	0.88
Error	33	23.56		

7.3.2 Results, Grade 3, Non-verbal IQ Test Group

The upper middle income group was omitted from this analysis as only six pupils had data available. Wide Range Readers were not represented for the middle income group because the relevant school was included in the grade 3 verbal group. None of its pupils using the scheme had a non-verbal IQ test during the years for which data was collected.

No clear differences were seen across IQ. Unadjusted RQ class means favoured the middle income group over the lower income group. No advantages to males or females or to one reading scheme were found.

The correlation between IQ and RQ was 0.20 ($P = 0.37$), with IQ accounting for 4.1% of the variance in RQ ($r^2 = 0.041$, $P = 0.01$).

ANOVA found the average IQ of the SRA Basic Readers significantly higher than that of the Wide Range Readers which were in turn significantly higher than the average IQ of those classes using SRA Laboratories. No statistical significance was found between the average IQ of males (99.5) and females (96.8). [Reading scheme means were, in the order cited above, 102.30, 98.01 and 94.07 ($P = 0.01$).] Table 23 presents ANOVA results.

Table 23. Analysis of Variance, IQ, grade 3, non-verbal.

	DF	MS	F	P
Reading scheme (R)	2	247.87	4.30	0.02*SIG
Sex (S)	1	72.40	1.25	0.27
RS	2	0.18	0.00	0.10
Error	36	57.70		
Total	41	64.60		

ANCOVA revealed no significant differences among reading schemes with adjusted RQ means as follows: Wide Range Readers = 105.5; SRA Basic Readers = 104.1; SRA Laboratories = 103.7. No significant difference was found between the male RQ mean and the female RQ mean with values of 103.5 and 105.5 respectively.

ANCOVA findings are listed below.

Table 24. Analysis of Covariance, grade 3, non-verbal.

	DF	MS	F	P
Reading scheme (R)	2	11.56	0.15	0.86
Sex (S)	1	34.30	0.45	0.51
RS	2	23.02	0.30	0.74
Error	35	76.60		

7.3.3 Results, Grade 4, Full Data Set

Grade 4 pupils had taken the Verbal Sub-Junior or Junior IQ test depending on the school. An attempt to eliminate differences between these tests was made. The full grade 4 data set was first analysed and then the Junior IQ test group was analysed separately, as there were more classes taking this test.

The upper middle income group was omitted from this analysis because of small pupil numbers in many classes. Generally no significant differences were found for IQ or RQ, although the class mean RQ of the middle income group was slightly higher. No reading scheme appeared favoured on straight class means. No differences for males versus females were found.

The correlation between IQ and RQ was 0.70 ($P = <0.001$) with IQ accounting for 49.7% of the variance in RQ ($* 0.71$, $P = 0.001$).

ANOVA on IQ found no significant differences among the average IQ of classes using the reading schemes or between the average IQ of males and females, however middle income children had a significantly higher IQ than lower income children ($P = 0.02$). Table 25 shows this ANOVA.

Table 25. Analysis of Variance, IQ, grade 4, full data set.

	DF	MS	F	P
Reading scheme (R)	2	112.05	2.02	0.14
Income group (I)	1	306.23	5.52	0.02*SIG
Sex (S)	1	2.54	0.05	0.83
RI	2	203.17	3.66	0.03*SIG
RS	2	76.94	1.39	0.26
IS	1	0.40	0.01	0.93
RIS	2	80.06	1.44	0.24
Error	60	55.51		
Total	71	65.56		

ANCOVA revealed no significant differences among adjusted RQ means (Wide Range Readers = 99.8, SRA Basic Readers = 96.0, SRA Laboratories = 97.8). Middle income group children showed higher class mean RQ than lower income group children (100.8 and 95.0 respectively; $P = 0.006$). Male and female adjusted RQ means showed no significant differences (adjusted figures: males 97.4, females 98.4). ANCOVA results are presented in Table 26.

Table 26. Analysis of Covariance, grade 4, full data set.

	DF	MS	F	P
Reading scheme (R)	2	45.47	1.35	0.27
Income group (I)	1	272.08	8.11	0.01*SIG
Sex (S)	1	9.71	0.29	0.60
RI	2	58.37	1.74	0.18
RS	2	26.31	0.78	0.46
IS	1	8.77	0.26	0.61
RIS	2	31.34	0.93	0.40
Error	59	33.56		

No significant interactions were found.

7.3.4 Results, Grade 4, Junior IQ Test Set

Only two small classes represented the upper middle income group and were therefore omitted from the analyses. For the middle income group SRA Laboratories had lower mean unadjusted class IQ and RQ than Wide Range Readers and SRA Basic Readers. Wide Range Readers showed slightly better mean class IQ. SRA Laboratories appeared to have higher RQs than Wide Range Readers and SRA Basic Readers over both income groups. Females marginally out-averaged males for both IQ and RQ.

Correlation between IQ and RQ was 0.75 ($P = <0.001$), with IQ accounting for 56.4% of the variance of RQ ($* 0.69$, $P = 0.001$).

ANOVA found no significant differences among average class IQ means for all reading schemes, and between average male IQ and average female IQ. The average IQ of middle income group children was significantly higher than that of lower income group children ($P = 0.007$). Table 27 gives this result.

Table 27. Analysis of Variance, IQ, grade 4, Junior IQ set.

	DF	MS	F	P
Reading scheme (R)	2	113.67	2.53	0.09
Income group (I)	1	355.16	7.89	0.01*SIG
Sex (S)	1	4.80	0.11	0.75
RI	2	43.84	0.97	0.39
RS	2	109.21	2.43	0.10
IS	1	3.80	0.08	0.77
RIS	2	107.39	2.39	0.11
Error	38	44.99		
Total	49	58.88		

Adjusted class mean RQ showed no reading scheme to be superior (Wide Range Readers = 95.8, SRA Basic Readers = 95.2, SRA Laboratories = 99.1). For lower and middle income group children no significant difference was found between the adjusted class RQ means (95.1 and 98.2 respectively) and similarly for males and females (96.5 and 96.9 respectively). ANCOVA results are given in Table 28 below.

Table 28. Analysis of Covariance, grade 4, Junior IQ set.

	DF	MS	F	P
Reading scheme (R)	2	31.28	1.12	0.34
Income group (I)	1	49.12	1.75	0.19
Sex (S)	1	1.29	0.05	0.83
RI	2	60.47	2.16	0.13
RS	2	10.53	0.38	0.69
IS	1	13.16	0.47	0.50
RIS	2	12.37	0.44	0.65
Error	37	28.04		

7.3.5 Results, Grade 5, Total Data Set

The upper middle income group was omitted from the analysis because it was represented by only one class with three pupils. The middle income group had higher unadjusted class mean IQs and RQs. Highest mean IQs were found in the Wide Range Reader group. Females' mean RQ was higher than males'.

The correlation between IQ and RQ was 0.75 ($P = <0.001$) with IQ accounting for 55.9% of the variance in RQ ($* 0.74$, $P = 0.001$).

ANOVA showed the average IQ of Wide Range Readers to be significantly superior to that of SRA Basic Readers and SRA Laboratories, the latter two

displaying no statistically significant differences between them (Wide Range Readers = 104.0, SRA Basic Readers = 94.6, SRA Laboratories = 94.3). No statistical significance was found between average male IQ and average female IQ (97.1 and 98.2 respectively). The average IQ of middle income group children was significantly greater than that of lower income group children in the analyses (102.4 and 92.9 respectively).

Table 29 gives the ANOVA in IQ result for grade 5.

Table 29. Analysis of Variance, IQ, grade 5.

	DF	MS	F	P
Reading scheme (R)	2	628.81	14.77	0.00*SIG
Income group (I)	1	801.16	18.81	0.00*SIG
Sex (S)	1	11.15	0.26	0.61
RI	2	15.36	0.36	0.70
RS	2	8.46	0.20	0.82
IS	1	14.08	0.33	0.57
RIS	2	9.25	0.22	0.81
Error	56	42.59		
Total	67	61.32		

Adjusted class mean RQ showed no statistical difference among the reading schemes (Wide Range Readers = 101.1, SRA Basic Readers = 101.3, SRA Laboratories = 101.6). The mean RQ of middle income group children was superior to that of lower income group children (103.7 and 99.0 respectively, $P = 0.02$). Males and females displayed no significant differences on RQ mean scores (99.8 and 102.9 respectively, $P = 0.08$). The ANCOVA result incorporating adjusted class mean RQ is given in Table 30.

Table 30. Analysis of Covariance, grade 5.

	DF	MS	F	P
Reading scheme (R)	2	0.98	0.03	0.97
Income group (I)	1	149.94	5.33	0.02
Sex (S)	1	86.70	3.08	0.08
RI	2	79.13	2.81	0.07
RS	2	23.48	0.83	0.44
IS	1	6.58	0.23	0.63
RIS	2	11.53	0.41	0.67
Error	55	28.15		

Duncan's test produced this ranking: Wide Range Readers higher than the other two schemes, the latter two being statistically not significantly different from each other ($P = 0.05$). No reading scheme however was found to be statistically significant.

7.3.6 Results, Grade 6, Total Data Set

The upper middle income group was omitted as it had only 22 pupils. Wide Range Reader pupils showed the highest unadjusted class mean IQ. Consistent with other grades' findings the middle income group showed higher IQ and RQ. SRA Basic Readers were represented by a small grade 6 sample compared with other grades, hence were eliminated from the analyses.

Correlation between IQ and RQ was 0.71 ($P = <0.001$), with IQ accounting for 50.3% of the variance in RQ ($* 0.72, P = 0.001$).

ANOVA on IQ scores revealed no statistically significant difference between mean male IQ and mean female IQ scores (99.0 and 100.0 respectively). The mean IQ of Wide Range Readers was significantly higher than the mean IQ of those using SRA Laboratories (103.3 and 95.4 respectively, $P = <0.001$). Consistent with other grades' findings, the mean IQ of middle income group children was significantly greater than that of lower income group children

(102.0 and 96.7 respectively, $P = 0.007$). Table 31 gives the result for grade 6 ANOVA on IQ.

Table 31. Analysis of Variance, IQ, grade 6.

	DF	MS	F	P
Reading scheme (R)	1	759.23	17.20	0.00*SIG
Income group (I)	1	351.64	7.97	0.01*SIG
Sex (S)	1	8.37	0.19	0.67
RI	1	27.47	0.62	0.43
RS	1	2.26	0.05	0.82
IS	1	127.88	2.90	0.09
RIS	1	0.07	0.00	0.97
Error	50	44.13		
Total	57	57.66		

Adjusted class mean RQ showed no significant differences between reading schemes (Wide Range Readers = 103.3, SRA Laboratories = 101.1). Middle income group children possessed significantly higher mean RQs than lower income group children (103.8 and 100.6 respectively, $P = 0.03$). The adjusted RQ mean for females was significantly greater than that for males (103.9 and 100.5 respectively, $P = 0.01$). ANCOVA results are shown below:

Table 32. Analysis of Covariance, grade 6.

	DF	MS	F	P
Reading scheme (R)	1	45.10	2.25	0.14
Income group (I)	1	105.15	5.25	0.03*SIG
Sex (S)	1	137.09	6.85	0.01*SIG
RI	1	60.30	3.01	0.10
RS	1	4.70	0.24	0.63
IS	1	0.01	0.00	0.99
RIS	1	0.19	0.00	0.98
Error	49	20.01		

7.3.7 Results of Longitudinal Analysis

All pupils with three or four RQ scores available were studied to detect possible influence of time on reading achievement. An ANOVA was performed on the RQ data, using reading scheme, school class and sex as classification factors. The variate under study was the difference between the pupil's most recent RQ score and the closest available previous RQ score; that difference was divided by the number of years between the two tests. All RQ score differences could then be placed on a per year basis. Six groupings of the data were made for this analysis.

1. All pupils, grades 3 to 6, classified by reading scheme.
2. As for (1), pupils in grades 4 to 6 only.
3. Pupils in grades 4 to 6, classified by school classes.
4. Pupils with no gaps in grade 4 to 6 data; classified by reading scheme.
5. As for (4), classified by school classes.
6. Pupils in grades 4 to 6, classified by sex.

Table 33 summarises results of these six ANOVA measures of RQ, as affected by time.

Grade 3 results were omitted from all but the first analysis as the R3 reading test is not totally identical to the R4 taken by grades 4, 5 and 6. Considerable variation hence highly significant differences in reading achievement levels over time were found when class means were used (items 3 and 5, Table 33). The range of class means was about five times greater than the reading scheme means for the same data. Differences possibly caused by IQ were tested in items 2 and 4; change in RQ score was found not to correlate with IQ. No difference between males and females was found for reading achievement over time. Apparent declines in RQ may be due to small sample sizes, particularly in the SRA Basic Reader group.

Table 33. Longitudinal ANOVA for RQ.

Description of ANOVA	Data Set	Classification Factor	Mean RQ change		
			WRR	SRA B	SRA L
1. Variate = difference between most recent and nearest available RQ score.	All data, grades 3, 4, 5, 6.	Reading scheme	-3.40	01.99	0.08
2. As in (1).	All data, grades 4, 5, 6.	Reading scheme	-2.05	0.50	1.09
3. As in (1).	All data, grades 4, 5, 6.	Class	-	-	-
4. Variate = difference between grade 6 and grade 4 score.	Grades 4, 5, 6, where all three RQs are available.	Reading scheme	0.38	-6.50	0.71
5. As in (4).	As in (4).	Class	-	-	-
6. As in (1).	As in (2).	Sex	Males: 0.08 Females: -0.93		

Chapter 8

DISCUSSION, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

8.1 GENERAL DISCUSSION

Superior reading and IQ levels for the middle income group were found over the entire data set irrespective of reading scheme, with the exception of a part of the grade 3 sample. Other factors besides reading scheme need both further research and attention of class teachers in the primary school. In particular, teacher effect, effect of television and other media, and aspects of the home environment may be relevant. The grade 3 sample may be expected to show less consistent results due to the range of reading skills, including non-readers, found at that level. The literature has supported hypotheses of rising levels of achievement related to higher socio-economic status (Larsen and Tillman, 1973; Kellaghan, 1977; Bradley, Caldwell and Elardo, 1977). The present study would appear to lend further support to these.

Despite adjusted norms on the Schonell reading tests (higher for females), females out-achieved males only in the grade 6 data set. This finding could reflect several influences. The school situation itself may possibly be more attentive to females in reading. Fewer behavioural problems found among females (from the writer's personal experience) may create a closer and friendlier pupil-teacher relationship, which might have lifted achievement. Possibly more sympathetic bonds are formed between females and the predominantly female staffs found in primary schools. Differences of physical development, supposedly catered for by the use of separate norms, might be greater than previously thought. Re-norming could be needed, or perhaps the reading test itself was inappropriate for other reasons. The present study did not explain this higher reading achievement of grade 6 females.

The wide range of IQ and RQ scores found within a grade level using whole class means, as much as 35 points between lowest and highest classes in a grade, may be attributed to the income group of the particular class. Invariably lowest class means came from the lower income group and highest means from the middle or upper middle income groups. This might indicate a strong influence of socio-economic status, as contrasted with reading scheme, on achievement.

The more erratic scoring patterns of grade 3 pupils in both reading and IQ as contrasted with grade 6 pupils, might reflect greater familiarity with the scheme among older pupils. Fewer possible influences of infant methods and schemes would remain with the grade 6 pupils. It is therefore likely that upper primary IQ and RQ results were more useful experimentally and better measures of actual achievement than grade 3 and 4 results.

8.2 GRADE 3 SAMPLE

Both verbal and non-verbal sub-groups showed wide variations in IQ and RQ scores. Generally lower income area classes produced statistically equatable scores, not lending support to the notion of socio-economic status as an indicator of reading achievement (*CSIRO middle income group superior). Grade 3 class teachers would encounter more dependent readers than would teachers of older primary grades, hence the mechanical skills necessary for reading would occupy more of the reading programme at this grade level. The diversity of approach and content required to handle grade 3 reading might have produced the wide range of achievement found in the present study.

Over the non-verbal IQ test data set, increase of RQ with IQ was poor. This finding would possibly indicate the relevance of non-verbal IQ tests to younger primary children and the irrelevance of a comparison between non-verbal IQ and a verbal reading test. The correlation between

IQ and RQ for the verbal IQ data set was the highest of all the grades. It supports income group as a factor in reading achievement. As RQ can be expected to rise with IQ (Kirby and Das, 1977; Riding and Pugh, 1977), the poor increase found could reflect the complexity of teaching grade 3 reading or perhaps the wide range of achievement previously noted for this grade.

Classes from one school, verbal IQ test data set, middle income area, Wide Range Readers, appeared well above any others in adjusted RQ scores. This finding would lend further support to income group rather than reading scheme as an achievement indicator.

The ANCOVA result of Wide Range Reader superiority over SRA Laboratories in the grade 3 verbal data set illustrated its suitability across sexes and income groups. As previously noted, SRA Laboratories were not intended as total class reading schemes although they may be used in that way. It would appear reasonable that Wide Range Readers, with the publisher's intended use as a comprehensive reading scheme, produced the better results.

8.3 GRADE 4 SAMPLE

Support for the idea of regular (rather than widely varying) achievement levels with a reading scheme was found with the total grade 4 data set, as few classes were excessively above or below the rest in class mean IQ and RQ. The homogeneity of this group might also have resulted from factors not central to the present study - settling into primary school routines, mastery of reading mechanics or other factors inherent in the data set itself. A wide variation of individual pupil IQ and RQ was still a feature within some classes.

Statistical results from the grade 4 total data set supported grade 3 findings of no superiority to either sex in reading. Further, no significant differences were found among the three reading schemes.

Although not subject to conclusive proof, grade 4 results would suggest that:

- a) reading scheme was not a statistically significant achievement parameter for this age group;
- b) infant school and reading mechanics learning may have affected the findings;
- c) females' achievement did not differ significantly from males'; and
- d) middle income area schools out-achieved lower income area schools irrespective of reading schemes.

Class sizes were often smaller with the grade 4 sample. Major standardised reading and IQ testing, as previously noted, featured at the grade 3 and grade 5 levels. Gaps in the data were therefore more concentrated at grade 4 and grade 6 levels. Although numbers were sufficient, results from these grades must be viewed with some caution, particularly at grade 4 level, where familiarity with the scheme was relatively low. Grade 6 pupils' disadvantage with smaller numbers was likely offset by their four year exposure to a particular reading scheme.

8.4 GRADE 5 SAMPLE

Despite being the largest and most complete data set of all the primary grades studied, class mean IQ and RQ still showed wide variation. Individual differences in the classroom may have accounted for this, which is supported in the literature (Schonell, 1945, 1951; Harris, 1964; Ramsey, 1967).

Strong support for income group as related to reading achievement was shown in the grade 5 data set, where the middle income area schools generally had superior class mean adjusted RQ over lower income area schools. There were no pupils from grade 5 representing upper middle income areas, to further test this result. Three schools in particular, each of which used a different one of the schemes under study and all from the middle income group, were superior with respect to positioning on the graph of class mean RQ position to class mean IQ position (Appendix D; Figure 8). As ANOVA on IQ and ANCOVA found statistical significance for income group, it may be that reading scheme at the grade 5 level was less related to achievement than was income group.

Class mean IQ and RQ were generally higher for grade 5 than for either grade 4 data set. This may have been due to the fact that the IQ test was designed for 10-year-olds and those turning 10 during a school year, mostly found in grade 5. More valid scores may be expected where a test was best matched to its intended population. Grade 4 pupils of the appropriate age may have been biased by a test set for grade 5.

The ANOVA on IQ results, which favoured Wide Range Readers over the other two schemes, may reflect circumstances at one particular school, in a lower income area. Gaps in the data were found in middle income area schools and this lower income area school was nearly complete in terms of data. Assessing family background, teacher attitudes, school environment and other factors within this school might explain this finding.

8.5 GRADE 6 SAMPLE

As the highest class mean RQ came from a middle income area school, there would seem to be further support for the role of income group in reading achievement. Results found in previous grades continued with this age group: significant superiority of the middle income group, and relative homogeneity in class mean RQ to IQ positions when graphed (Appendix D; Figure 9). ANOVA on IQ found Wide Range Readers to be significantly superior to the other two schemes.

Females out-achieved males, which was possibly a result of their earlier maturity with its attendant higher levels of concentration and more complex reasoning skills (Piaget, 1960).

8.6 LONGITUDINAL ANOVA ON ADJUSTED RQ

As the Schonell Reading Test is adjusted for chronological age, it would be an indication of maintaining the same level of skill if the scores remained the same over the primary school years. Changes upward might therefore indicate improvements and vice versa. Improvements over time using any of the three reading schemes in general were not found. It could also be argued that consistent RQ over time indicated steady progress and not a decline in reading skill. Where reading scheme was the classification factor negative scores were shown for Wide Range Readers and SRA Basic Readers, seeming to imply declines in reading level. One possible explanation would be the tendency of children to develop reading skills more rapidly at first (up to grade 3), then to "level off" and improve more gradually. Because of steep grading at early stages (few correct items for relatively high reading age) of the Schonell R3 and R4, children can seem to decline over time when in fact they have maintained a certain level of reading ability. In these analyses the

wide variation in classes irrespective of reading scheme was significant. Achievement levels with SRA Laboratories appeared to increase most regularly over time. Although at grade 6 level females were significantly higher achievers than males in ANCOVA findings, females were not superior to males in the ANOVA over time, where insignificant statistical differences were found.

8.7 CONCLUSIONS

No clear pattern of one reading scheme's effectiveness over another was found.

- (a) For grade 3 verbal IQ test data set, Wide Range Readers were better than SRA Laboratories; SRA Basic Readers were not included in this analysis.
- (b) For grade 3 non-verbal test data set, no significant differences were found among the three schemes.
- (c) For grade 4 data set overall, no significant differences were found among the three schemes.
- (d) For grade 4 Junior IQ test data set, no significant differences were found among the three schemes.
- (e) For grade 5 data set, no significant differences were found among the three schemes.
- (f) For grade 6 data set, no significant difference was found between Wide Range Readers and SRA Laboratories.

The two hypotheses for the present study as stated in Chapter 1 were: that SRA Basic Readers were more effective in Tasmanian primary schools than SRA Reading Laboratories and Wide Range Readers, and that SRA Reading Laboratories were more effective in Tasmanian primary schools than Wide Range Readers. The findings above from (a) to (f) can be related to the hypotheses. Grade 3 verbal results rejected both hypotheses.

With the exception of grade 3 verbal results, both hypotheses were rejected over all grades. Relative to CSIRO findings the following may be said: Grade 3 non-verbal results rejected both hypotheses overall, but partially accepted the first hypothesis; Grade 4 overall results rejected both hypotheses; Grade 4 Junior IQ results rejected both hypotheses; Grade 5 results accepted both hypotheses; Grade 6 results accepted the first hypothesis and rejected the second hypothesis; Grade 5 and 6 results were possibly more valid than earlier results for reasons previously discussed. Grade 5 results might be important in practical terms, as there was a greater quantity of data available and grade 5 alone accepted both hypotheses.

Although income group was not specifically tested for, overwhelmingly the middle income group was favoured. Exclusion of the upper middle income group due to lack of data in many cases prevented further testing of this effect.

Differences in achievement between sexes were very slight. Despite different norming procedures in reading for males and females, females occasionally out-achieved males. This result is supported in the literature (Touliatos, Lindholm and Rich, 1978). The present study appeared to confirm the ability of the Schonell reading tests to "equalise" females' and males' achievement with the two separate norms. Variations in IQ were less pronounced between males and females.

Reading schemes varied in effectiveness within school grades. Implementation in Tasmania of the schemes being evaluated has not been based on local research. The present study's findings represent the only such research to date. The difficulty of locating both a large and unmixed sample (exposure to one scheme only) may be insurmountable. A larger sample would have been desirable. It would be unreasonable to expect classes to be of equal size and evenly spread through income group

areas, hence practical decisions about which reading scheme to use may show SRA Basic Readers to be the most cost effective. The class teacher would benefit from using the more effective scheme, reducing difficulties to some extent caused by class sizes of 30 or more.

8.8 IMPLICATIONS OF THE STUDY

Results of the present study strongly support the influence of factors within a classroom and socio-economic status on reading achievement. This might imply that improvements in the quality of Tasmanian primary reading teaching should consider both community needs and the environment created by the teacher. Small class sizes were not disadvantaged by the chosen statistical treatment, however a more complete data sample would possibly have enhanced findings. Further research into reading schemes' effectiveness might use larger classes to greater advantage.

Ideally there would be one teacher teaching as many classes as possible in a study, to control for teacher effect. As this would not be a feasible model for a primary school study the present study was probably the best available. The strength of the class teacher's effect on reading achievement has been supported by recent work (Shavelson and Russo, 1977). The study of grades 5 and 6 for reading would seem advantageous. Most common complaints of early reading research as noted by Chester (1974) were small experimental samples and incorrect or inappropriate statistical treatments of data.

The present study would suggest that further work concentrated on incorporating needs of particular income groups into school reading programme design.

One further implication arising from the present study is that reading scheme influences achievement far less than does income group.

8.9 RECOMMENDATIONS OF THE STUDY

Better record keeping procedures are needed in some Tasmanian primary schools. Complete reading test results were not retained by all schools in the present study. Central storage areas for these results are recommended.

Results of the grade 5 and 6 data sets suggested that SRA Basic Readers may be of value in Tasmanian schools, this recommendation based on possible educational significance found rather than statistical significance. Marketing procedures are well established in Tasmania and the availability of Australian editions might enhance their suitability.

It is recommended that increased attention to community traits and needs be given. The lower income area schools appear to require more assistance with reading, as both IQ and RQ were below levels of the middle income group schools. It may be advisable to increase remedial reading staff within these schools.

A possible area for investigation would be expanded Covariance Analysis work, using additional covariates apart from IQ. Covariance work with particular reading levels, or ranges of reading levels, might further evaluate the effect of reading schemes and also give an indication of the effectiveness of different teaching styles.

Some means of measuring teacher attitudes and methods is needed, together with further work relating to teacher effectiveness. Other variables might be assessed as they affect reading achievement. A method for assessing the influence of the home environment in the Tasmanian context might be valuable.

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Appendix A

Microfiche Card (1) of Complete Data Set

"Classroom Reading Materials" Form.

ORIGINAL DATA

1

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School _____

Grade _____

Year _____

	Name	Term Introduced	Approximate % of Total Reading Prog.*
Basal Reading Scheme(s)	1.	1.	1.
	2.	2.	2.
	3.	3.	3.
	4.	4.	4.
	5.	5.	5.
Reading Comprehension Materials	1.	1.	1.
	2.	2.	2.
	3.	3.	3.
	4.	4.	4.
	5.	5.	5.
Extensive Reading Kits, Series, etc.	1.	1.	1.
	2.	2.	2.
	3.	3.	3.
	4.	4.	4.
	5.	5.	5.
Other Reading Materials	1.	1.	1.
	2.	2.	2.
	3.	3.	3.
	4.	4.	4.
	5.	5.	5.

* Note: Each section (Basal Reading Scheme, etc.) should be made to total 100%.

Appendix B

Tables 35 to 43 - 1971 Commonwealth Bureau of
Census and Statistics information about school
catchment areas.

Table 35. Population summary: lower income area.

School	Reading Scheme	Population		Overseas Born	Occupied Private Dwellings	Unoccupied Private Dwellings
		M	F			
Warrane	WRR	2688	2687	431	1236	19
Campbell Street	WRR	899	929	256	548	50
Goulburn Street	SRA L	2652	2949	833	1923	112
Trinity Hill	SRA B	759	680	214	277	36

Table 36. Usual major activity: lower income area.

School	Working		Home Duties		Non-school child		Child at school		Full time student	
	M	F	M	F	M	F	M	F	M	F
Warrane	1478	517	0	1013	402	365	677	676	19	31
Campbell Street	513	222	0	356	102	73	164	169	29	71
Goulburn Street	1706	850	0	1261	208	219	383	447	76	70
Trinity Hill	472	219	0	256	58	43	67	122	50	13

Table 37. Educational qualifications: lower income area.

School	Trade		Technician		Non-Deg.		Bachelor's		Higher	
	M	F	M	F	M	F	M	F	M	F
Warrane	327	31	36	42	31	33	10	4	2	0
Campbell Street	115	3	9	14	6	17	11	7	0	0
Goulburn Street	393	37	66	80	57	79	45	26	7	4
Trinity Hill	78	8	12	21	10	10	8	1	1	0

Table 38. Occupied dwellings, television: lower income area.

School	Separate House	Semi-Det. House	Attached House	Terrace House	Villa Unit	S.C. Flat	Caravan etc.	TV
Warrane	1178	27	2	0	2	24	1	965
Campbell Street	275	76	11	44	2	91	0	375
Goulburn Street	1214	115	20	26	7	477	1	1441
Trinity Hill	62	24	8	30	2	109	0	181

Table 39. Population summary: middle income area.

School	Reading Scheme	Population		Overseas Born	Occupied Private Dwellings	Unoccupied Private Dwellings
		M	F			
Mt Stuart	WRR	1863	1908	481	1158	59
New Town	WRR	2756	3205	833	1728	156
Bowen Road	SRA L	3224	3063	618	1852	55
Claremont	SRA B	692	695	172	374	5

Table 40. Usual major activity: middle income area.

School	Working		Home Duties		Non-school child		Child at school		Full time student	
	M	F	M	F	M	F	M	F	M	F
Mt Stuart	1117	504	0	806	111	114	419	399	95	53
New Town	1491	798	0	1349	176	174	489	477	62	93
Bowen Road	1950	661	0	1445	260	250	659	579	56	38
Claremont	417	176	0	273	64	73	165	150	10	9

Table 41. Educational qualifications: middle income area.

School	Trade		Technician		Non-Deg.		Bachelor's		Higher	
	M	F	M	F	M	F	M	F	M	F
Mt Stuart	223	27	69	93	100	90	90	54	15	1
New Town	315	40	51	102	73	83	61	36	9	3
Bowen Road	450	34	53	47	44	40	29	7	3	0
Claremont	98	7	15	17	17	13	12	4	1	0

Table 42. Occupied dwellings, television: middle income area.

School	Separate House	Semi-Det. House	Attached House	Terrace House	Villa Unit	S.C. Flat	Caravan etc.	TV
Mt Stuart	938	4	6	0	8	192	0	917
New Town	1292	29	18	5	29	308	0	1349
Bowen Road	1664	17	30	0	1	113	4	1502
Claremont	351	9	2	0	0	11	0	319

Table 43. Combined living characteristics: upper middle area.

	Mt Nelson	Bellerive
Total male population	416	1743
Total female population	444	1785
Overseas born	63	388
Occupied private dwellings	234	1025
Unoccupied private dwellings	11	40
Working male	245	1002
Working female	115	395
Percentage working female	13	11
Home duties, male	0	0
" , female	183	808
Non-school child, male	37	165
" , female	29	153
Child at school, male	85	410
" , female	84	352
Full time student, male	4	40
" , female	5	37
Trade level, male	58	269
" , female	6	16
Technician level, male	8	61
" , female	11	48
Non-degree tertiary, male	5	68
" , female	18	55
Bachelor's degree, male	7	38
" , female	4	14
Higher degree, male	0	3
" , female	0	1
Separate house	171	937
Semi-detached house	7	7
Attached house	7	6
Terrace house	0	0
Villa unit	3	6
Self-contained flat	44	61
Caravan, etc.	0	1
TV	182	829

Appendix C

Standardised Test Copies - Schonell Silent Reading Test A

Schonell Silent Reading Test B

Sub-Junior Test of General Verbal
Ability, 1972

Junior Test of General Ability,
1976, 1979

Raven's Coloured Progressive Matrices,
Sets A, Ab, B. (sample pages).

THE SCHONELL READING TESTS

TEST R3.

SILENT READING TEST A

Instructions for administering the test, with average number of questions correct and times taken, are given in *Backwardness in the Basic Subjects*, by F. J. SCHONELL, pp. 510-512, and in *Reading and Spelling Tests Handbook of Instructions*.

Read carefully each paragraph and the question at the end of it. Write the answers to the questions on your answer paper. [Time—9 minutes.]

(a) I have a cat. It is black and white. It is one year old. It sleeps in a box. It likes to play with a ball of wool.

Where does the cat sleep?

(b) Every now and then along the roads we see low wooden houses with tightly shut windows and little gardens stocked with flowers.

Choose the word below that tells about the windows, and write it on your answer paper :

half-open open closed apart

1. I am a wild bird. My home is in a tree.
I can fly high in the air. I can sing a song.

Where is the bird's home?

2. We have a baby. When we speak to him he waves his little hand. He has ten teeth.
He sleeps in a cot most of the day.

How many teeth has the baby?

3. Last Monday we went to the Zoo. We spent much time in front of an iron cage which held seven monkeys. They made us laugh when they put out their paws for nuts.

What was the monkeys' cage made of?

4. It was getting so dark that Alice thought there must be a storm coming on. "What a thick black cloud that is!" she cried. "And how fast it comes! Why, I do believe it's got wings."

Do you think the sun was shining? Yes. No. Cannot tell.

5. Hans took the stone and went off with a light heart; his eyes sparkled for joy and he said to himself, "I must have been born in a lucky hour; everything that I wish for comes to me of itself."

Was Hans happy or unhappy?

6. In some cities coloured lights are used to direct the cars at cross streets. A red light means "Stop," an orange light means "Get Ready," and a green light means "Go."

What light is used for "Get Ready"?

7. There was once a shoemaker who worked very hard and was very honest, but still he could not earn enough to live on, and at last all he had in the world was gone except enough leather for one pair of shoes.

Choose the word below that tells what the shoemaker was and write it on your answer paper :
lazy dishonest hardworking proud idle

8. When a duck wants to come to rest on water it draws its head backward, tilts its body upward, thrusts its feet forward and spreads its tail outward.

Choose the word below telling how the duck places its head. Write it on your answer paper :

upward forward backward downward

9. I can skip, I go to school every day, I wear a pretty dress, I have long hair.

What am I?

10. Long ago there lived on the sea coast of Japan a young man named Yaina, a kindly fellow and clever with his rod and line.

Write the word Yaina on your answer paper. If you think he was a fisherman, put a line under his name ; if you think he was not, put a cross under his name.

11. The daylight is dying
Away in the West,
The wild birds are flying
In silence to rest.

Do these lines tell about evening or morning?

12. Over the meadow
In the reeds on the shore
Lived a mother water-rat
And her little water-rats four.

How many water-rats altogether lived in the reeds?

13. December is a winter month in England, but in Australia it is summer at that time of the year. Christmas Day comes on 25th December.

Choose the word below which tells what Christmas Day in Australia is likely to be. Write it on your paper :

windy freezing hot cold frosty

14. A sailor dropped the captain's silver tea-pot into the sea. The captain went to the sailor and said to him, " You let my tea-pot fall into the sea, did you not? It is

lost." "No, no," said the sailor, "I know where it is. It is at the — of the sea."

Write the word that has been left out.

15. If you are waiting on shore for a ship to come in, the first thing you see is the smoke, later the funnels and masts come in sight, and lastly the hull of the ship itself is seen.

Suppose you were watching a ship leaving the land. Choose the word below that tells you the last thing you would see. Write it on your paper :

people masts smoke funnels hull

16. Behind the little house were apple trees, a plum tree and two or three pear trees. Then came a stretch of rough grass and a stone wall with a gate leading into the pasture.

Was the stone wall in front, behind, or at the side of the house?

17. A field mouse had a friend who lived in a house in town. Now the town mouse was asked by the field mouse to dine with him, so out he went and sat down to a meal of wheat.

Where did they dine? At the field mouse's home, or at the town mouse's home?

18. Upon a mountain height, far from the sea,
I found a shell,
And to my listening ear the lonely thing
Ever a song of ocean seemed to sing,
Ever a tale of ocean seemed to tell.

Which seemed to sing a song? The mountain, the shell, or the ocean?

THE SCHONELL READING TESTS

TEST R4.

SILENT READING TEST B

Instructions for administering the test, with average number of questions correct, are given in *Backwardness in the Basic Subjects*, by F. J. SCHONELL, pp. 512-513, and in *Reading and Spelling Tests Handbook of Instructions*. [Time—15 minutes.]

Read each paragraph. You will notice that there are spaces marked with the letters A and B. Write on your answer paper the one word from row A that will make the best sense when put in space A, and write on your answer paper the one word from row B that will make the best sense when put in space B. Like this:

1. Fred had five white mice. He kept them in a tiny hutch made of wood and — (A). One day when he went to feed the mice he found that they had gone. He looked around and found a small — (B) in the wire.

(A) bread, sand, wire, leaves, paper.

(B) pot, nut, pole, stick, hole.

2. They came to the church tower, and all the crows flew out in fright. "Caw! Caw!" they cried. "Go away! You must not peep in at our —" (A).

And then Tom and his friend went high, high up in the balloon till the church looked as small as a Noah's Ark and the sheep and the cows were like dots on the — (B).

(A) game, hat, nests, books, dinner.

(B) plate, river, house, trees, fields.

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3. One day a poor fisherman was casting his net into the sea, hoping to catch some — (A). As he pulled in his net he saw in it a small glass bottle, but no fish. He picked up the — (B) and looked at it. It seemed to be quite empty.

(A) wood, fruit, seaweed, fish, shells.

(B) fish, rope, bottle, stick, shell.

4. The king had just had a good sleep, for it was a hot day ; and now he drank a cup of coffee and smoked a long pipe, and was happy.

His chief servant came in, and crossing his — (A) upon his breast bowed low before him.

“Sir,” he said, “there is a pedlar outside, and he has many costly things in his pack.”

“Bring him in at once,” said the — (B).

(A) feet, flowers, pipe, head, hands.

(B) servant, man, pedlar, king, boy.

5. Just then the moon came out, and they saw an owl perched up on a beam, and wiping the tears from her great, brown eyes. “Why do you weep?” asked the king.

“I am so —” (A), said the owl. “I am not really a bird, but a princess. A wicked man gave me a magic drink which changed me into an —” (B).

(A) happy, long, fat, sad, glad.

(B) sparrow, woman, owl, man, beam.

6. A boy's name was ROSS SMITHSON, so that each time he wrote his name he would write altogether — (A) letters, and of these letters — (B) of them would be the letter S.

(A) eight, ten, eleven, nine, twelve.

(B) two, five, three, four, six.

7. A boy was once fishing, and he had by his side a very large can in which to put the fish he caught. So far he had caught nothing. A man who was passing saw that the lad had a bite and waited to see whether he would bring the fish to land or not. He said to the boy, "How many fish have you caught, Tommy?" The boy replied: "When I have caught this — (A) and — (B) more I shall have three."

(A) cold, one, line, two, worm.

(B) bites, two, three, one, fish.

8. The big Polar Bear, which lived among the cold, snowy forest trees, hated the fire and the people who had it. He was greedy and wanted the North land all for — (A), and he watched for a chance of putting out their — (B).

(A) nothing, morning, himself, playing, others.

(B) fire, food, clothes, home, garden.

9. A pair of sparrows had built their nest in a hollow place near the top of a chimney. The wind sometimes blew the — (A) about them; but they did not mind that much for most of the day they spent in the

streets below, chasing one another, peeping in at shop windows, or picking up crumbs from the village — (B).

(A) leaves, stones, clouds, smoke, food.

(B) plates, streets, chimneys, roofs, trees.

10. In Paris, in the old days, it was quite common to find very rich and very poor people living near to each other. In a large building the underground rooms might be rented by the very — (A) while in the large chambers above, where there was plenty of air and light, might live people who were very — (B) indeed.

(A) rich, poor, old, fat, tired.

(B) poor, happy, rich, young, hungry.

11. Hundreds of years ago it was the custom for young men and women to go before day-break on the first of May to a wood near at hand ; some played music and some blew horns as they walked to the wood. They broke down branches of trees and gathered flowers. When they returned home about sunrise they decked their houses with the — (A) and flowers. They spent the afternoon dancing around the Maypole which was placed in a suitable part of the village and which stood there until next — (B).

(A) ribbons, paint, nuts, branches, flags.

(B) autumn, winter, October, holiday, May.

12. A farmer visiting the National Gallery stopped before a portrait of a man sitting in a high-backed chair. On a card at the foot of the picture the farmer read these words : "A portrait of Edward Jefferies, by himself." The old fellow laughed to himself, saying, "How foolish these city people are. Anybody looking at that picture would know that Jefferies was by —— (A). There isn't anyone in the —— (B) with him."

(A) an artist, chair, himself, portrait, light.

(B) picture, gallery, farm, name, chair.

13. Birds travelling long distances usually fly at night and are attracted by the bright lamps of lighthouses. In the past, thousands of birds have been killed by dashing themselves against the thick glass. Nowadays, many of our lighthouses have been fitted with special frames on which the —— (A) perch and rest, and this has saved the —— (B) of countless numbers of birds.

(A) lights, sailors, birds, storm, fish.

(B) lives, ships, wings, flight, homes.

14. Two friends were travelling on the same road together when they met a bear. The one, in great fear, without a single thought of his companion, climbed up into a tree and hid himself. The other, seeing that he had no chance single-handed against the bear, had —— (A) left but to throw himself on the ground and feign to be dead;

for he had heard that a bear will never touch a dead — (B). As he thus lay the bear came up to his head, muzzling and sniffing at his nose and ears ; but the man held his — (C) and the bear, supposing him to be dead, walked away.

- (A) nothing, something, only, perhaps, neither.
- (B) fly, leap, body, horse, orange.
- (C) hand, paw, coat, gun, breath.

15. When the bear was fairly out of sight, his companion came down out of the tree and asked what it was that the bear whispered to him, "For," said he, "I observed that he put his mouth very close to your ear."

"Why," replied the other, "it was no great secret ; he only bade me beware how I kept company with those who, when they get into a — (A) leave their — (B) to look after themselves."

- (A) stream, difficulty, house, train, road.
- (B) money, pupils, goods, friends, horses.

16. The sailors who manned Cæsar's ships, too, made a mistake. There being a full moon and a Spring tide, the ships that he had grounded (for easier landing for his soldiers) were caught, badly anchored, by the rising — (A) and several were dashed against each other and — (B).

- (A) moon, soldiers, sun, fields, tide.
- (B) saved, painted, helped, lost, found.

17. So long as icebergs sail over deep water they move freely about as the currents or winds may drive them. But when they get into water shallow enough to allow their bottoms to grate along the sea floor, they tear up the mud or sand there until they are at last stranded. The coast of Labrador is often fringed with such grounded icebergs, some so small as to be driven on to the — (A), others so large as to run aground while still a long — (B) from the shore.

(A) pier, fields, beach, streets, rivers.

(B) miles, view, ship, rope, way.

18. The flowers of the hop plants are collected and taken to the "oast house" or kilns to be dried. The oast house is shaped like a cone. At the top there is a big black funnel of tin which swings round in such a way as to prevent the wind blowing in the hole at the top of the cone. Inside the oast house the hops are dried on wire netting above a furnace. While they are — (A) they must be turned over and over or they would be — (B).

(A) boiling, drying, smouldering, cooking, raining.

(B) ripe, soft, wet, clean, spoiled.

19. Cotton goods cannot be made in every place. For spinning and weaving cotton well there must be moist air, plenty of water and plenty of coal. If the air is dry, the

cotton threads snap when they are tightly stretched. The south-west winds which blow across Lancashire are moist or wet winds. They keep the air — (A) so that — (B) can be easily spun and — (C).

- (A) hot, dry, warm, moist, cool.
- (B) wool, plants, rope, clothes, cotton.
- (C) sold, woven, bought, coloured, worn.

20. One day we were becalmed among a group of small islands, most of which appeared to be uninhabited. As soon as we were in want of fresh water, the Captain sent the boat ashore to bring off a cask or two. But we were mistaken in thinking there were no natives, for scarcely had we drawn near to the shore when a band of — (A) rushed out of the bush and assembled on the beach, brandishing their clubs and spears in a threatening — (B).

- (A) pigs, animals, savages, pirates, horses.
- (B) wave, manner, help, yell, speech.

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EDUCATION DEPARTMENT OF TASMANIA

**SUB-JUNIOR TEST OF GENERAL
VERBAL ABILITY FOR PRIMARY
SCHOOLS 1972**

No. of correct answers.....
Mental Age
I.Q.
Rating

Name

School Grade

Date of Birth Boy or Girl

Age on Date of Examination years months

Date:

PART I

READ THIS CAREFULLY

On the other pages of this paper are some questions. Before you turn over and begin the paper, try these for practice :-

1. Beside the word below write another word or words that mean the same or nearly the same:

(a) quick.....

(Did you write fast?)

2. Write the answer to this question:

(a) What is the capital of Tasmania?.....

(Did you write Hobart?)

3. Write in the missing figure in the sum below:

(a) + 3 = 5

(Did you write 2?)

**NOW WAIT FOR YOUR TEACHER TO TELL YOU TO TURN OVER THE
PAGE AND START WORK**

PART I

1. Beside each of the words below write another word or words that mean the same or nearly the same.

- (a) large
- (b) fall
- (c) say
- (d) begin

2. Write the answers to these questions -

- (a) How many eyes have you?
- (b) From which animal do we get wool?.....
- (c) At what time of day do we have breakfast?
- (d) How many days are there in a week?.....

3. Write in the missing figures in the sums below -

- (a) $4 + 3 =$
- (b) $8 - 4 =$
- (c) $2 +$ = 5
- (d) $7 -$ = 5

4. Beside each of the words below write another word or words that mean the same or nearly the same -

- (a) quick
- (b) difficult
- (c) remain
- (d) require

5. Write the answers to these questions -

- (a) From what do we make flour?.....
- (b) Which is the hottest season of the year?.....
- (c) Which fish is most dangerous to swimmers?
- (d) What is the Prince of Wales' first name?.....

6. Write in the missing figures in the sums below -

(a) $5 + \dots + 2 = 8$

(b) $9 \div \dots = 3$

(c) $4 \times 3 = \dots$

(d) $\frac{1}{2}$ of 8 = \dots

7. Beside each of the words below write another word or words that mean the same or nearly the same -

(a) unhappy

(b) alter.....

(c) plank

(d) quake

8. Write the answers to these questions -

(a) What is the capital city of Australia?.....

(b) What is a negro?

(c) What is a telescope?.....

(d) Where is Vietnam?

9. Write in the missing figures in the sums below -

(a) Six is two less than.....

(b) If you halve six and then take away two you have

(c) If you double three and then add four you have

(d) Half of a half is a

PART II

READ THIS CAREFULLY

On the other pages of this paper are more questions. Before you turn over and begin them, try these for practice:

1. Put in the missing word in the sentence below -

(a) As sky is to blue so is grass to
(Did you write green?)

2. Answer the question below -

(a) Mrs. Smith has three jugs. She bought two more. How
many jugs had she then?
.....
(Did you write 5?)

3. In the set of words below five are alike and one is different.
Underline the one that is different.

(a) chair table cupboard dog bed wardrobe

(Did you underline dog?)

4. Write in the missing word in the sentence below -

(a) A tool used for driving nails is called a.....
(Did you write hammer?)

PART II

1. Write in the missing words in the sentences below -

- (a) As shoe is to foot so is glove to
- (b) As milk is to drink so is apple to
- (c) As fire is to warm so is ice to
- (d) As rabbit is to fast so is snail to

2. In each of the sets of words below five are alike in some way and one is different. Underline the one that is different.

- (a) bowl saucer jug cup box plate
- (b) apple orange peach grape pear book
- (c) car bicycle aeroplane bus lorry truck
- (d) wife father sister aunt daughter grandmother

3. Answer the questions below -

- (a) How many letters are there in the line below?
A B C Z T
- (b) If I cut a sheet of paper in half, how many pieces
shall I have?
- (c) Jim had five nuts and his mother gave him four more.
How many had he then?
- (d) Sally found eight eggs but lost five of them. How
many eggs had she left?

4. Write in the missing words in the sentences below -

- (a) A person who makes and sells bread is called a
- (b) A young sheep is called a
- (c) A long piece of iron used for stirring a fire is called a
- (d) A string of beads worn round the neck is called a

5. Write in the missing words in the sentences below-

- (a) Sugar is to sweet as lemon is to
- (b) As sad is to happy so is cry to
- (c) As four is to square so isto triangle.
- (d) As crow is to nest so is rabbit to

6. In each of the sets of words below five are alike in some way and one is different. Underline the one that is different.

- (a) blossom bud flower leaf bird branch
- (b) father pup kitten baby chicken calf
- (c) big large tiny small little purple
- (d) aeroplane rocket balloon kite wind airship

7. Answer the questions below -

- (a) Tony broke three pieces of chalk in half. How many pieces did he have then?
.....
- (b) Six boys had twenty-four marbles. They shared them equally. How many marbles did each boy get?
.....
- (c) Tim, who is four feet tall, is five inches taller than John. John is three inches shorter than Bill. How tall is Bill?
.....
- (d) Jane's three dolls each have two pairs of shoes. How many shoes have they altogether?
.....

8. Write in the missing words in the sentences below-

- (a) A leather seat used when riding a horse is called a
.....
- (b) A person who makes and sells clothes is called a
.....
- (c) Meat from a pig is called
.....
- (d) A thin band of metal worn on the finger is called a
.....

9. Write in the missing words in the sentences below -

- (a) As yellow is to orange so is blue to
- (b) As grasshopper is to insect so is to animal.
- (c) As..... is to day so is month to year.
- (d) As string is to parcel so isto envelope.

10. In each of the sets of words below five are alike in some way and one is different. Underline the one that is different.

- (a) oven fire blanket table heater radiator
- (b) bush wood forest orchard jungle
- (c) queen prince duke doctor lord king
- (d) wash chop clean sweep dust polish

11. Answer the questions below -

- (a) In a leap year February 27th is a Wednesday. What day of the week is it on March 2nd?
.....
- (b) Eight pens cost two dollars. How much would twelve pens cost?
.....
- (c) A blue tin is full of lead and weighs a pound. A red tin is full of feathers and weighs a pound. Which tin is the bigger?
.....
- (d) A man made three boxes in twelve minutes. How long should it take him to make five boxes?
.....

12. Write in the missing words in the sentences below -

- (a) A person who shows people where their seats are at the pictures is called
.....
- (b) A thin piece of iron or steel used for joining pieces of wood is called a
.....
- (c) The light, thin growths that cover a bird's skin are called
.....
- (d) A person taking special steps in time with music is
.....

EDUCATION DEPARTMENT OF TASMANIA
JUNIOR TEST OF GENERAL ABILITY
for Primary Schools
1976

No. of correct answers.....

Mental Age.....

I.Q.....

Rating.....

Name.....Grade Mark.....

School.....Grade.....

Boy or Girl.....Age on Date of Examinationyearsmonths

Date of Birth.....Time: One hour

READ THIS CAREFULLY

On the other pages of this paper are some questions. Before you turn over and begin the paper, try these for practice.

1. Beside the word below write another word or words that mean the same or nearly the same:

(a) little.....
(Did you write small?)

2. Write the answer to this question:

(a) How many eyes has a cat?.....
(Did you write two?)

3. Write in the missing figure in the sum below:

(a) + 2 = 4
(Did you write 2?)

4. Put in the missing word in the sentence below:

(a) As pig is to grunt so is dog to.....
(Did you write bark?)

5. In the sets of words below five are alike in some way and one is different. Underline the one that is different:

chair table cupboard bed dog wardrobe (Did you underline dog?)

6. Carry out the instructions given below:

(a) Print the first letter of Tasmania.....
(Did you print 'T'?)

(b) Write the missing word in the sentence below:

A man who serves in the army is called a
(Did you write soldier?)

7. Answer the question below:

(a) Mary had 4 cards and Tony gave her 2 more. How many cards has she now?.....
(Did you write 6?)

NOW WAIT FOR YOUR TEACHER TO TELL YOU TO TURN OVER THE PAGE AND START WORK.

1. Beside each of the words below write another word or words that mean the same or nearly the same:

(a) start.....

(b) put.....

(c) continue.....

(d) labour.....

2. Write the answers to these questions:

(a) What is the name of Queen Elizabeth's husband?

(b) How many is a score?.....

(c) In which season are hockey and football played?

(d) What is a gull?

3. Put in the missing figures in the sums below:

(a) $6 + \dots = 10$

(b) $9 - \dots = 5$

(c) $3 \times \dots = 15$

(d) $16 \div \dots = 8$

4. Write in the missing words in the sentences below:

(a) As bread is to eat so is milk to.....

(b) As pencil is to paper so is to blackboard

(c) As ink is to black so is snow to.....

(d) As hair is to head so is nail to.....

5. In each of the sets of words below six are alike in some way and one is different. Underline the one that is different.

(a) leg eye nose hand lolly car mouth

(b) gum oak cow wattle pine willow fir

(c) plate cup spoon jug apple fork knife

(d) one four six two some eight eleven

6. Carry out the instructions given below:

(a) Draw a circle with a square inside it.....

(b) Print your first name in capitals.....

(c) Draw four crosses in a line and put a circle round the middle two. Use only one circle.

(d) Print the name of this state, and cross out the first and last letters.....

7. Answer the questions below:

(a) Tom had five books. He brought two more. How many had he then?.....

(b) How many circles are there in the line below?

○ + * ○ - - + ○ - ○ × - + ○

(c) Helen had nine lollies. She gave six away. How many had she left?.....

(d) Tom, Bill and Dan went fishing. They each caught four fish. How many did they catch altogether?

8. Beside each of the words below write another word or words that mean the same or nearly the same.

(a) aid.....

(b) extend.....

(c) select.....

(d) vanish.....

9. Write the answers to these questions:

(a) When is next leap year?.....

(b) For what sport is the Great Lake famous?.....

(c) Where is Indonesia?.....

(d) What is a cockroach?.....

10. Put in the missing figures in the sums below:

(a) $5 + \dots + 5 = 12$

(b) $\dots - 4 - 3 = 5$

(c) $4\frac{1}{2} + \dots = 7$

(d) $\dots = \frac{1}{4} \text{ of } 12$

11. Put in the missing words in the sentences below:

(a) As aunt is to niece so is to nephew.

(b) As one is to pair so is single to.....

(c) As spade is to dig so is..... to chop.

(d) As sheep is to lamb so is pig to.....

12. In each of the sets of words below five are alike in some way and two are different. Underline the two that are different.

(a) flour sugar basin butter eggs pan lard

(b) kennel roof hive house sty window cage

(c) bag case bottle tin curtain box pencil

(d) fairy elf king pixie gnome dog goblin

13. Carry out the instructions given below:

(a) Draw a square and divide it into two triangles. Put a cross in the upper triangle and two dots in the lower triangle.

(b) Write in the missing word in the sentence below:

A person who sells meat is called a.....

(c) Draw a line about six centimetres long and divide it into three equal parts. Number the parts, starting from the left.....

(d) Write in the missing word in the sentence below:

A baby's bed on rockers is called a.....

14. Answer the questions below:

(a) Each day last week Bill bought an icecream for 6 c and an orange for 4c. How much did he spend

altogether?.....

(b) I left school ten minutes early, but my friend left five minutes late. How long did I have to

wait for him?.....

(c) A girl saved 3 dollars a week until she had 33 dollars. How many weeks did it take her?

.....

(d) January 1st was a Tuesday. Which day of the week was January 27th?.....

15. Beside each of the words below write another word or words that mean the same or nearly the same:

(a) expose.....

(b) ideal.....

(c) cavity.....

(d) nomad.....

16. Write the answers to these questions:

(a) What is the name of the world's largest ocean?

(b) For what are meters used?.....

(c) Where is Cuba?.....

(d) Where were the last Commonwealth Games held?

17. Put in the missing figures in the sums below:

(a) $3 \times 4 = 2 \times \dots$

(b) $15 + 13 = 30 - \dots$

(c) $25 - 1 = 4 \times \dots$

(d) $24 \div 8 = 6 \div \dots$

18. Write in the missing words in the sentences below:

(a) As horn is to cow so is to elephant.

(b) As length is to metres so is to years.

(c) As cloudy is to sunny so is to smile.

(d) As day is to night so is work to

19. Beside each set of words below write a word that is like the words in the set in some way:

(a) week hour year month minute

(b) hammer spanner screwdriver wrench drill

(c) swallow hen sparrow duck crow

(d) coat shirt vest helmet shoes

20. Write in the missing words in the sentences below:

- (a) A person who studies the stars is called.....
- (b) Your grandfather's sister is your.....
- (c) A person who helps another in committing a crime is.....
- (d) Something that blocks the way is.....

21. Answer the questions below:

- (a) Three boys are standing in a row. Peter is to the left of Kevin and Tom is to the left of Peter.
Which boy is in the middle?.....
- (b) Three-quarters of a case of apples were good. Twenty-four apples were bad. How many apples were in the case altogether?.....
- (c) Six small boxes are packed into one large box. Each small box contains two smaller boxes.
How many boxes are there altogether?.....
- (d) Each pupil in a class of twenty needs three exercise books a term. How many dozen books would the class need for a year?.....

TASMANIAN JUNIOR TEST OF GENERAL ABILITY-III

PART I

NAME: GRADE:

SCHOOL: DATE:

In this test there are 4 types of question. You will be given 2 practice examples for each type and later you will be asked to do the test.

The first type of question will be like this:

Write the missing number at the end of the line:

Example A:

14 13 — 11 10 9 ()

Example B:

2 2 3 3 — 4 ()

The second type of question will be like this:

Find the missing letter at the end of each group and write it in the brackets at the end of the line. Note that the whole alphabet is printed at the bottom of each page to help you.

Example C:

E F G H I J K — ()

Example D:

V T R P — ()

The third type of question will be like this:

Write the two missing numbers at the end of the line:

Example E:

3 5 7 9 11 — 15 — 19 (,)

Example F:

3 2 5 4 7 — 9 — 11 (,)

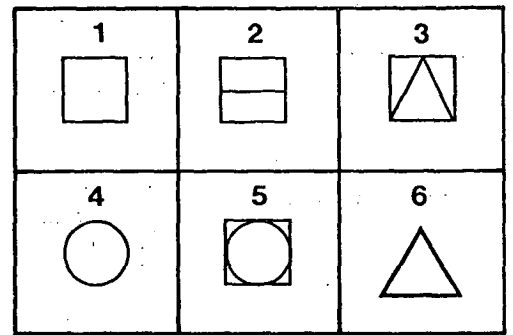
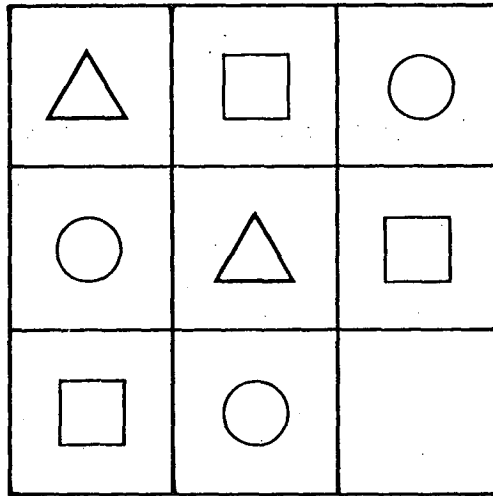
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

2

The last type of question looks like this:

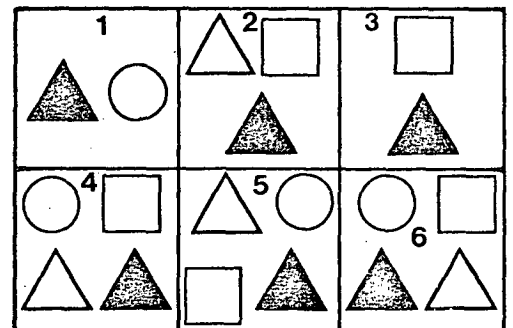
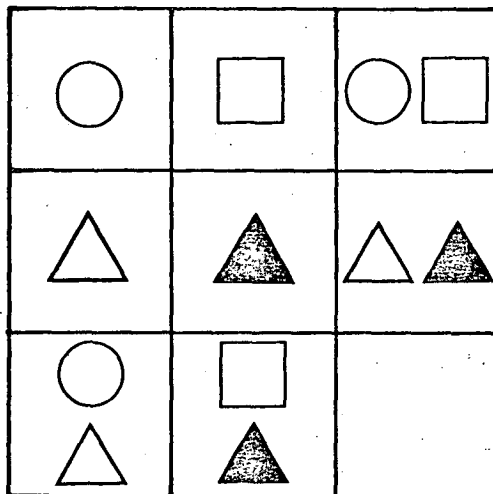
Which of the six pieces in the long box is the one missing from the picture at left.
Write your answer in the brackets.

Example G:



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Example H:



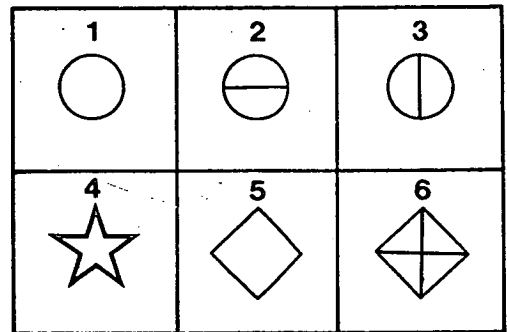
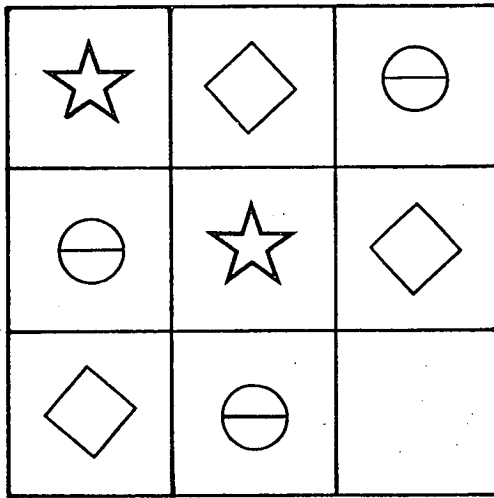
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3

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1.



()

2. 13 11 9 — 5 3

()

3. 14 — 34 44 54 64

()

4. Q R S Q R S T U V T —

()

5. H I J U V W H I J U —

()

6. 31 — 53 64 75 86

()

7. 25 23 21 — 17 — 13 11

(,)

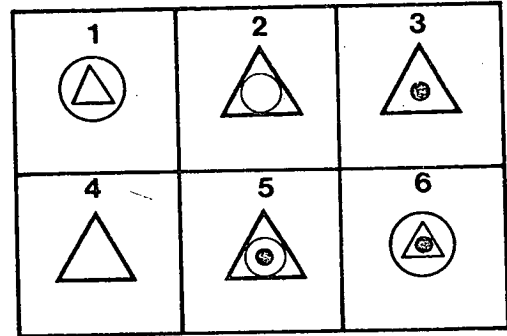
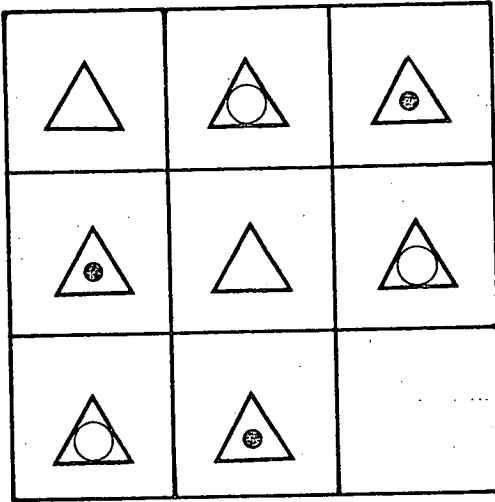
8. 5 4 7 6 9 — 11 —

(,)

ABCDEFGHIJKLMNOPQRSTUVWXYZ

5

9.



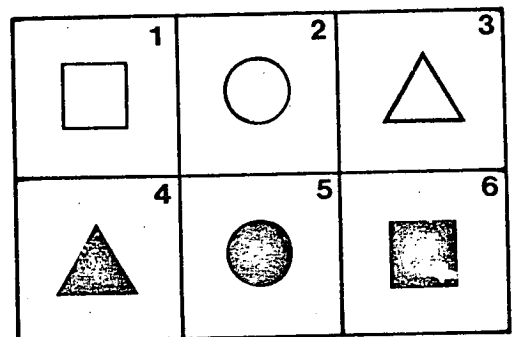
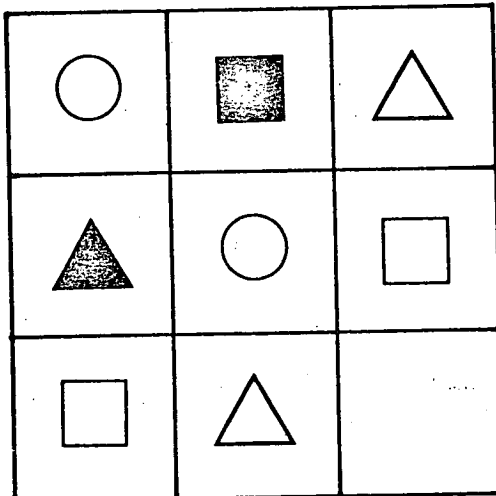
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10. O P Q O P R O — ()

11. 25 15 45 35 65 — 85 — (,)

12. 7 11 13 — 19 23 ()

13.

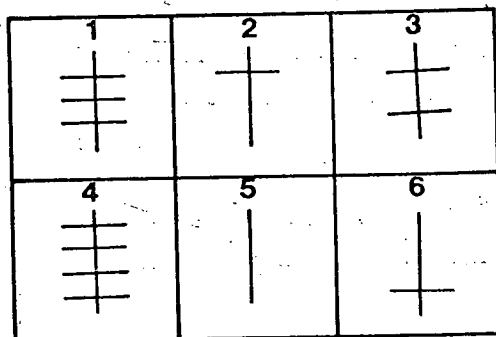
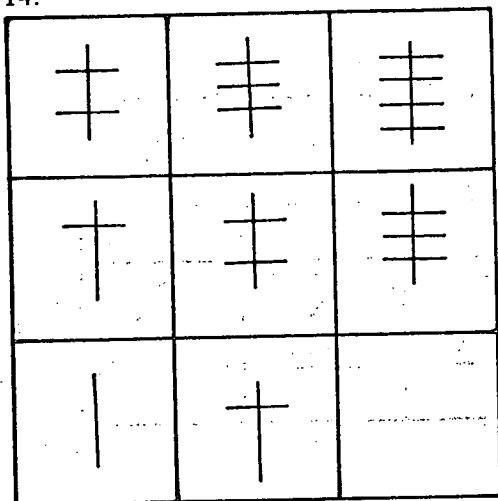


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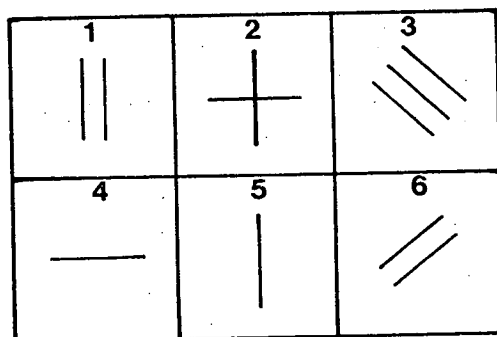
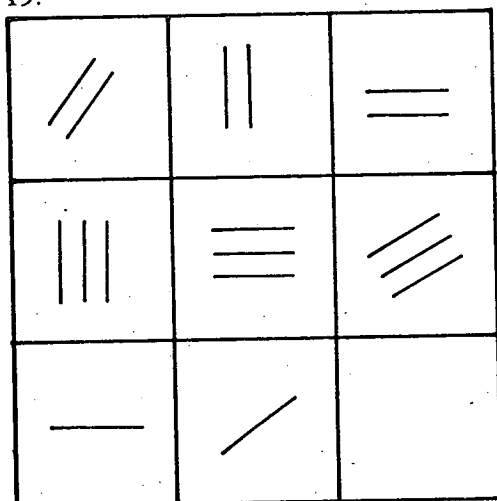
ABCDEFGHIJKLMNOPQRSTUVWXYZ

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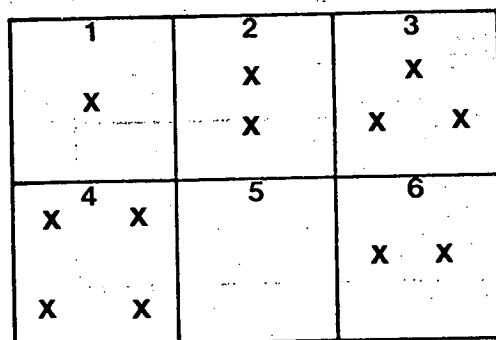
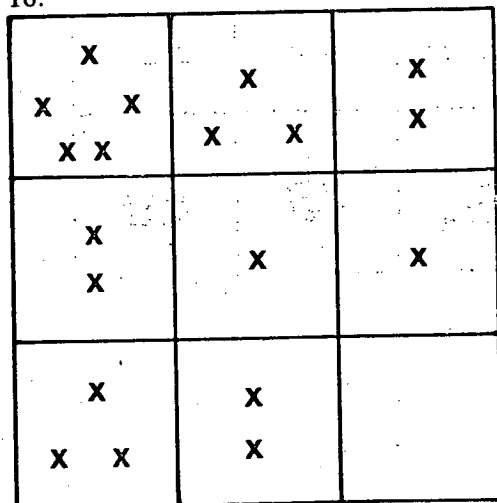
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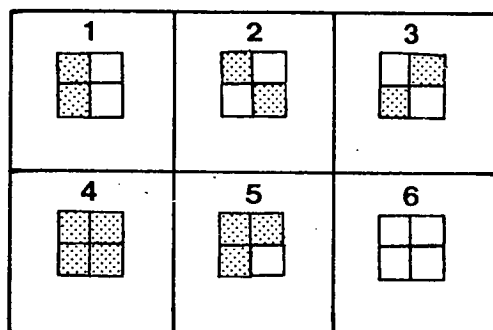
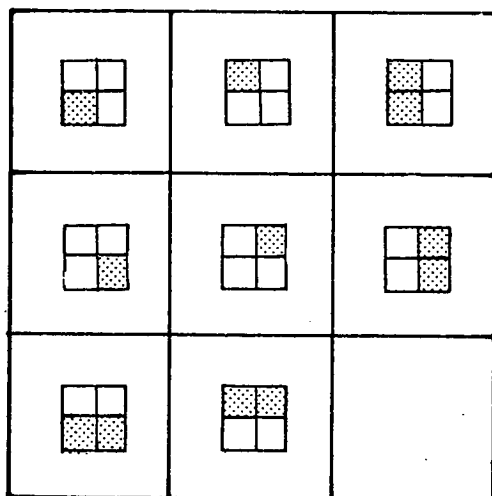
16.



A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

7

17.



()

18. D E Y E F X F G W — ()

19. S T U G F E V W X D C B — ()

20. 4 6 5 8 6 — 7 — (,)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

TASMANIAN JUNIOR TEST OF GENERAL ABILITY-III

PART 2

NAME: GRADE:

SCHOOL: DATE:

This is a test to see how well you can think. Below, there are some practice questions which we will do together.

EXAMPLES

Pretty means nearly the same as

- (1) girl (2) small (3) beautiful (4) flower (5) good ()

Wet is the opposite of

- (1) cool (2) sticky (3) moist (4) dry (5) water ()

Which of the following tells best what a **shotgun** is?

- (1) a tool (2) shooting (3) a weapon (4) kills
(5) dad has one ()

Paper is to pencil as Blackboard is to one of the following:—

- (1) teacher (2) pen (3) writing (4) block (5) chalk ()

Which of the five things below does not belong with the others:

- (1) orange (2) apple (3) carrot (4) pear (5) plum ()

Peter had 16 marbles. He gave 3 to each of his 4 friends. How many did he have left? ()

These are the types of question you will find in the test. When I tell you to start you will open your booklets and work at your own speed through the test. If you find any question too hard, you may skip it and return to it later, if you have time, but don't skip too many questions at the beginning because they are quite easy. They do get harder as you go on.

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2

1. The opposite of big is
(1) large (2) man (3) small (4) hill (5) giant ()
2. Tuesday was hot and rainy, Wednesday was dry and windy and Thursday was warm and wet. On which day was there definitely no rain?
(1) Tuesday (2) Wednesday (3) Thursday ()
3. Start means nearly the same as
(1) begin (2) early (3) first (4) handicap (5) stop ()
4. In my class there are 13 girls. Altogether there are 21 children. How many boys are there? ()
5. Four of the following are alike; which is the other word?
(1) sheep (2) pig (3) pork (4) cow (5) goat ()
6. If the 7th August is a Monday, what day of the week is the 11th August?
(1) Monday (2) Sunday (3) Wednesday (4) Saturday
(5) Friday (6) Thursday ()
7. Certain is the opposite of
(1) ignorant (2) curious (3) sorry (4) lonely (5) doubtful ()
8. Rabbit is to fur as bird is to
(1) wings (2) fly (3) egg (4) sparrow (5) feathers ()
9. A partly empty tank had 150 litres of water in it. After 60 litres were used, another 90 litres were added. How many litres would be in it then? ()
10. If Peter's aunt is my mother, what relation is Peter's father to my brother?
(1) father (2) cousin (3) step father (4) uncle (5) grandfather ()
11. Four of the following words are alike; which two are the other words?
(1) turnip (2) cabbage (3) apple (4) marrow
(5) orange (6) bean (and)
12. What figure is missing from this multiplication sum? Write that figure in the brackets at the end of the line.

$$\begin{array}{r}
 124 \\
 \times \quad 6 \\
 \hline
 744
 \end{array}$$

()

3

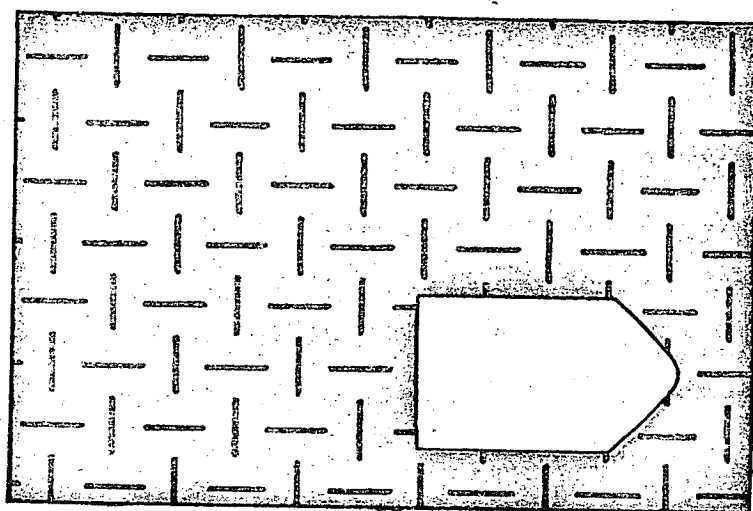
13. Anne, Stewart and Jim were in the kitchen. Jim spoke to Anne, then Anne spoke to Stewart, and Jim spoke to Stewart. Which one had not spoken?
(1) they all spoke (2) Anne (3) Stewart (4) Jim ()
14. If I add together three different odd numbers the answer is 9. What is the largest number of the original three? ()
15. If a piece of wool shrinks from 25 cm to 20 cm when washed, by how many centimetres will a piece 75 cm shrink? ()
16. Four children divided equally among themselves sweets from 3 packets. Each packet had 12 sweets in it. How many sweets did each child get? ()
17. Something that will last only a short time is
(1) altered (2) useless (3) little (4) temporary (5) ghostly ()
18. The opposite of never is
(1) sometimes (2) often (3) usually (4) not at all (5) always ()
19. John, Jim and George are sitting at a round table. John is on Jim's left. Who is on George's left?
(1) John (2) George (3) Jim ()
20. If John's uncle is my father, what relation is John's sister to me?
(1) niece (2) step sister (3) cousin (4) aunt (5) second cousin ()
21. Jack is taller than Helen. Peter is taller than George. George is as tall as Jack. Who is the tallest?
(1) Jack (2) George (3) Peter (4) Helen ()
22. Honesty is to rogue as is to saint.
(1) prayers (2) monk (3) sin (4) salvation (5) church ()
23. Four of the following words are alike; which are the other two words?
(1) nation (2) friend (3) tribe (4) enemy (5) society (6) clan ()
24. A material that can be seen through is best described as:
(1) glass (2) plastic (3) thin (4) opaque (5) transparent ()

4

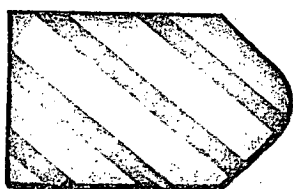
25. Neatness is to disorder as is to war.
 (1) tanks (2) soldiers (3) bombs (4) army (5) peace ()
26. How many days in a leap year? ()
27. Four of the following words are alike; which is the other word?
 (1) pretty (2) clean (3) attractive (4) beautiful (5) alluring ()
28. The word which means most nearly the same as an agent is:
 (1) representative (2) gentleman (3) estate
 (4) insurance (5) banker ()
29. Hour is to time as metre is to
 (1) clock (2) minute (3) run (4) distance (5) yard ()
30. A small inlet of the sea is a
 (1) cape (2) promontory (3) cove (4) beach (5) river ()
31. Sculptor is to statue as is to book.
 (1) pages (2) author (3) story (4) chapter (5) publishes ()
32. Four of the following words are alike; which two are the other words?
 (1) bewilder (2) anger (3) surprise (4) amaze
 (5) astonish (6) dismay (and)
33. Four girls were in a race. Joan and Karen tied and Anne beat Heather. If Heather ran faster than Karen, which girl won?
 (1) Joan and Karen (2) Heather (3) Anne (4) Joan (5) Karen ()
34. Four of the following are alike; which is the other word?
 (1) song (2) trumpet (3) tune (4) melody (5) aria ()
35. The opposite of collect is
 (1) gather (2) throw (3) save (4) spread (5) stamp ()

— A —

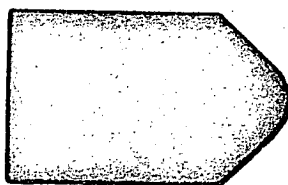
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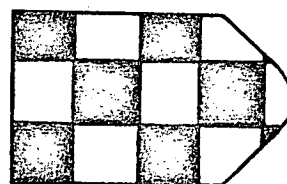
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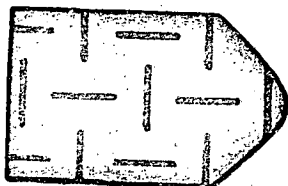
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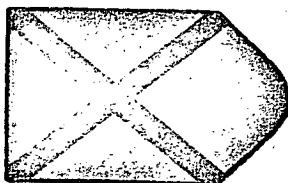
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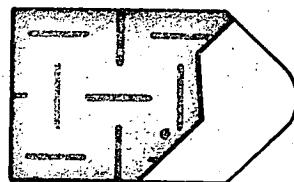
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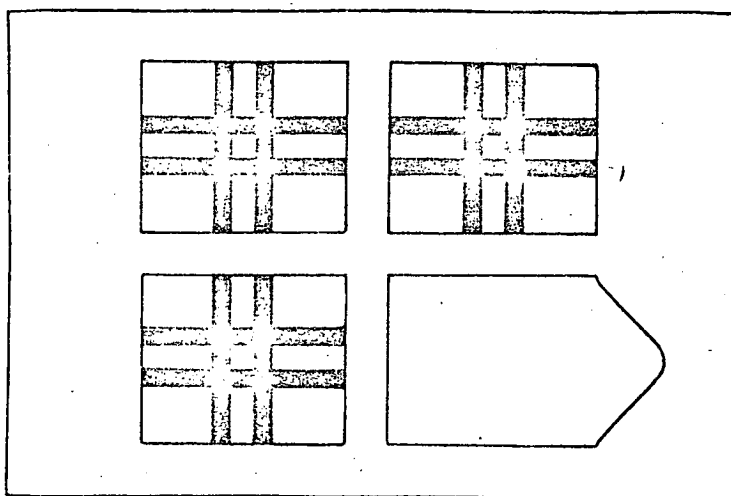


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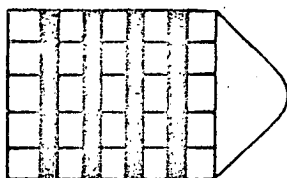


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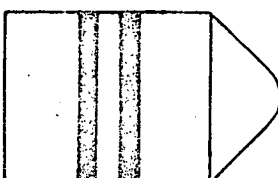
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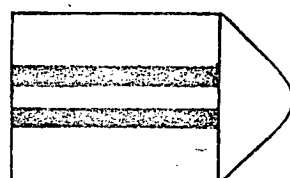
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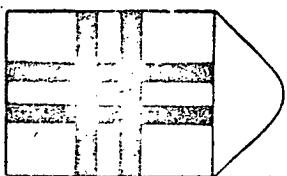
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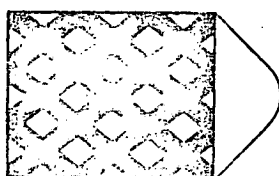
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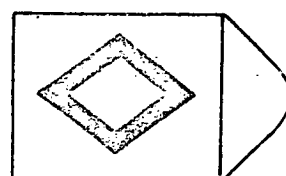
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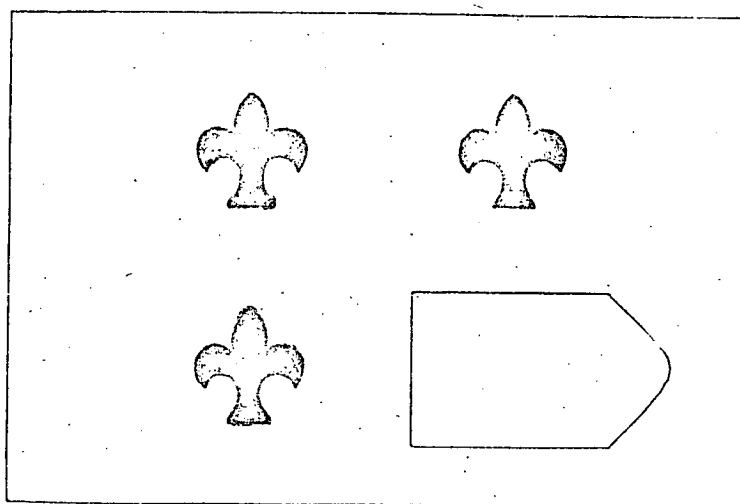


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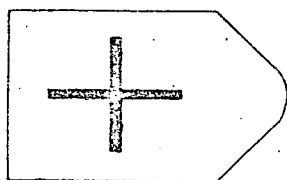


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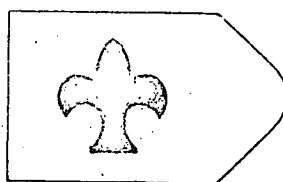
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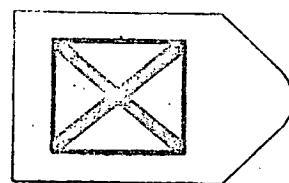
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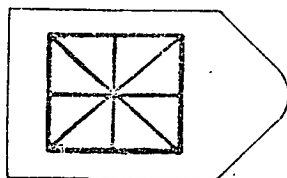
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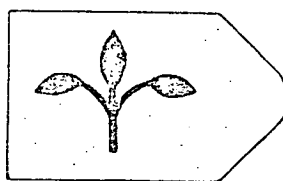
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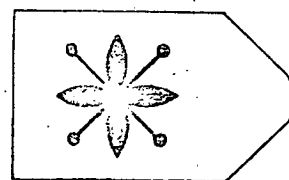
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Appendix D

Figures 4 to 9. Class RQ and IQ positions for grades 3 to 6 (CSIRO data).

Figures 10 to 15. Class RQ and IQ positions for grade 3 to 6, with reading scheme indicated (CSIRO data).

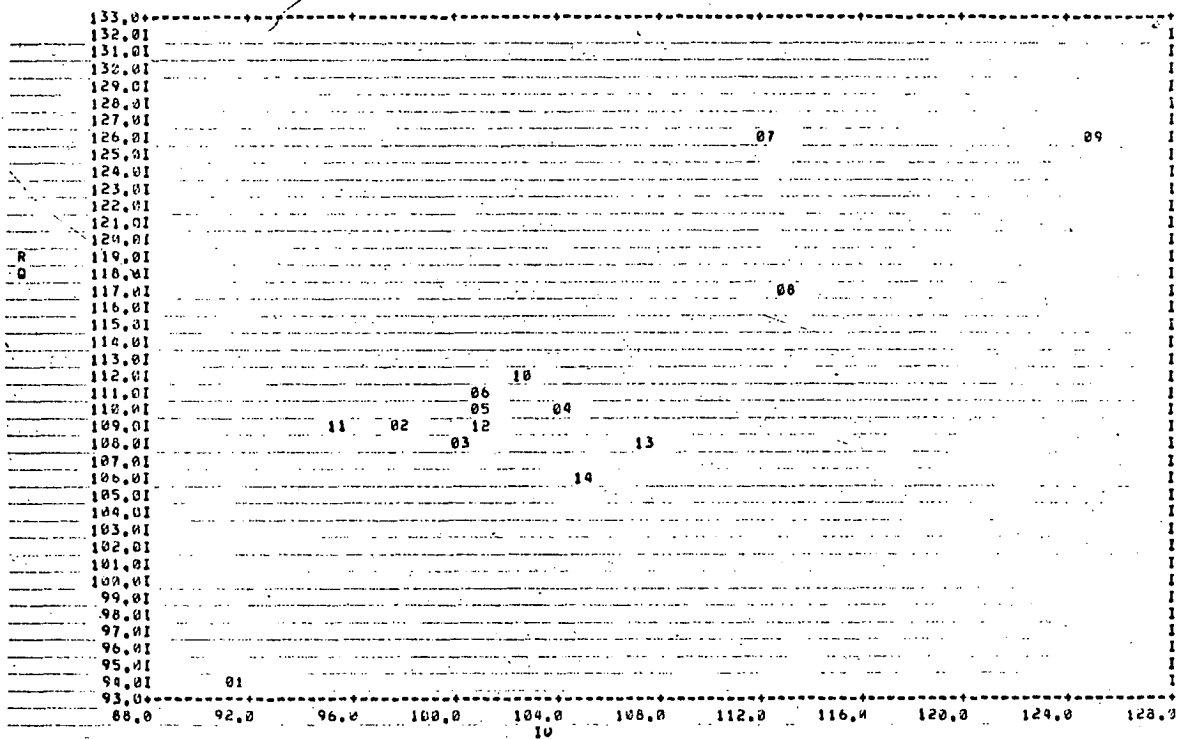


Figure 4. Class RQ and IQ positions, grade 3 verbal, CSIRO data. Numbers refer to school classes given in table at right. Abbreviations: Cl, class; No., Number in class; WRR, Wide Range Readers; SRA L, SRA Reading Laboratories.

Cl	School	Year	Income Group	Scheme	No.
1	Warrane	1971	Lower	WRR	94
2	Campbell St	1971	Lower	WRR	65
3	Campbell St	1972	Lower	WRR	51
4	Campbell St	1973	Lower	WRR	19
5	New Town	1971	Middle	WRR	49
6	New Town	1972	Middle	WRR	50
7	Mt Stuart	1971	Middle	WRR	29
8	Mt Stuart	1972	Middle	WRR	24
9	Mt Stuart	1973	Middle	WRR	23
10	Mt Nelson	1971	UMiddle	WRR	20
11	Mt Nelson	1972	UMiddle	WRR	15
12	Bellerive	1972	UMiddle	WRR	47
13	Goulburn St	1972	Lower	SRA L	20
14	Bowen Road	1973	Middle	SRA L	84

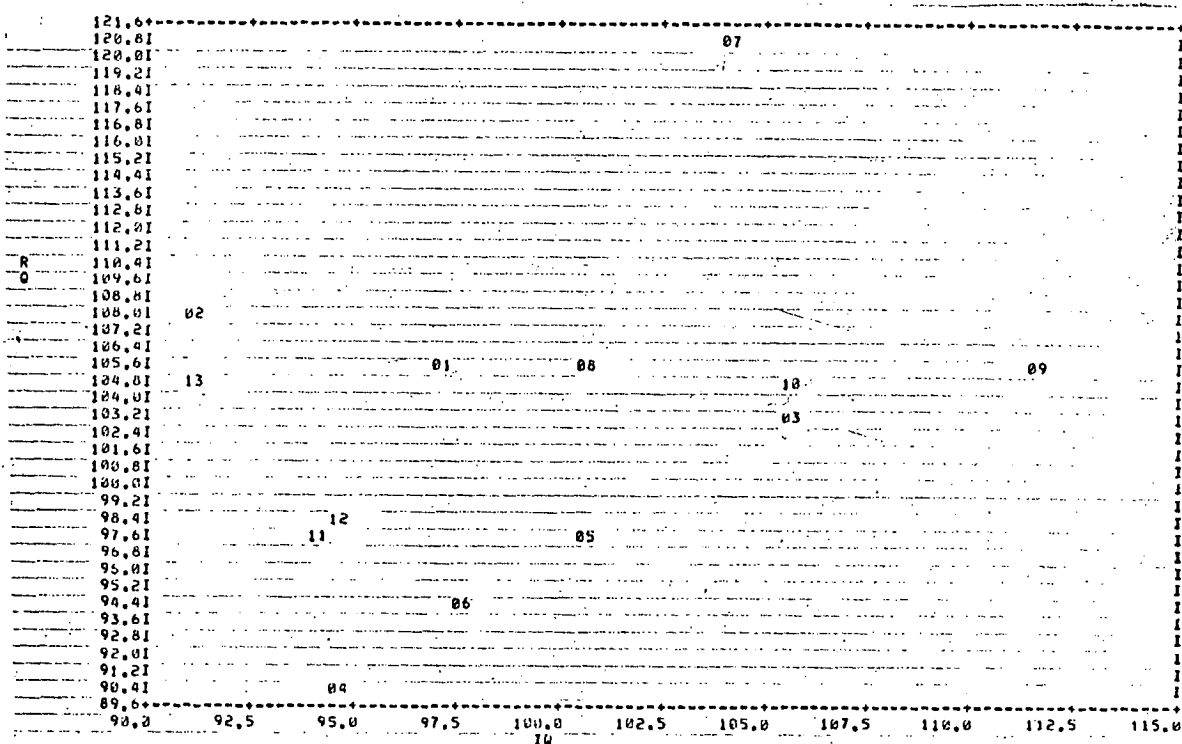


Figure 5. Class RQ and IQ positions, grade 3 non-verbal, CSIRO data. Numbers refer to school classes in table at right.

Abbreviations: Cl, class; No., Number in class; WRR, Wide Range Readers; SRA B, SRA Basic Readers; SRA L, SRA Reading Laboratories.

Cl	School	Year	Income Group	Scheme	No.
1	Campbell St	1974	Lower	WRR	48
2	Campbell St	1975	Lower	WRR	44
3	Campbell St	1976	Lower	WRR	33
4	Trinity Hill	1973	Lower	SRA B	29
5	Trinity Hill	1974	Lower	SRA B	23
6	Trinity Hill	1975	Lower	SRA B	16
7	Claremont	1974	Middle	SRA B	30
8	Claremont	1975	Middle	SRA B	42
9	Claremont	1976	Middle	SRA B	57
10	Goulburn St	1974	Lower	SRA L	19
11	Goulburn St	1975	Lower	SRA L	21
12	Goulburn St	1976	Lower	SRA L	12
13	Bowen Road	1975	Middle	SRA L	75

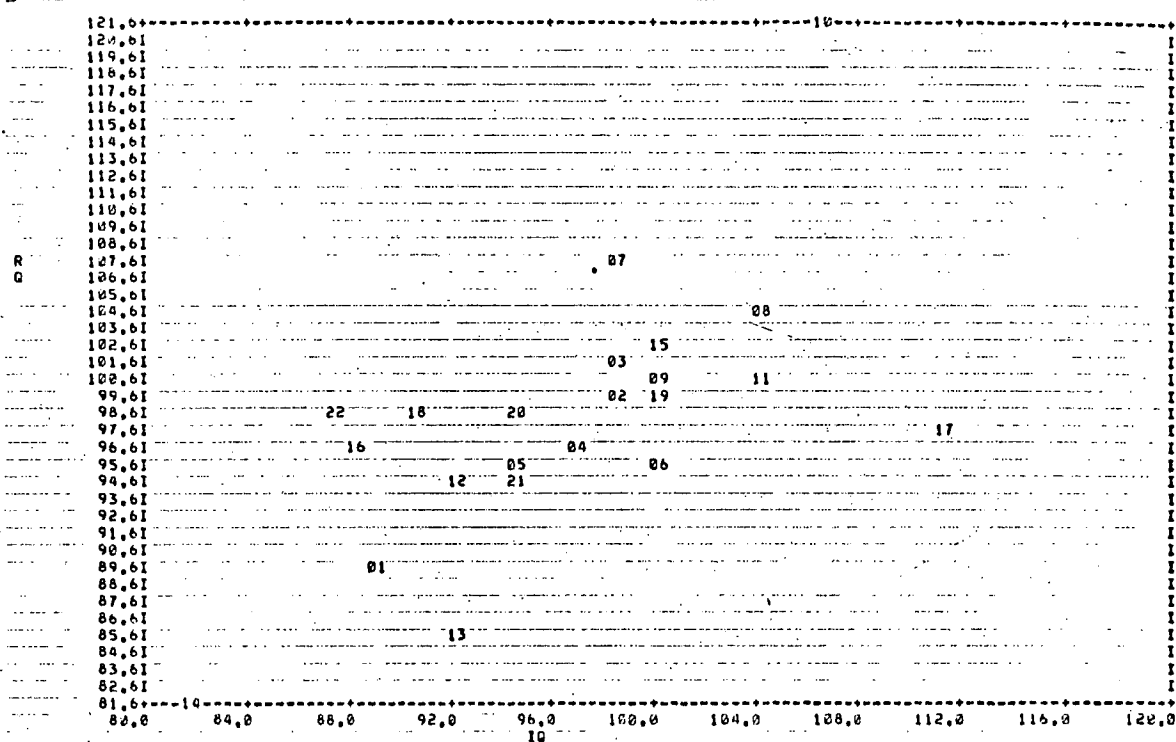


Figure 6. Class RQ and IQ positions, grade 4, full data set, CSIRO data. Numbers refer to school classes in table at right.

Abbreviations:

Cl, Class;

No., Number in class;

WRR, Wide Range Readers;

SRA B, SRA Basic Readers;

SRA L, SRA Reading Laboratories.

Cl	School	Year	Income Group	Scheme	No.
1	Warrane	1973	Lower	WRR	60
2	Campbell St	1971	Lower	WRR	62
3	Campbell St	1972	Lower	WRR	54
4	Campbell St	1973	Lower	WRR	27
5	Campbell St	1974	Lower	WRR	18
6	Campbell St	1975	Lower	WRR	14
7	Campbell St	1976	Lower	WRR	7
8	New Town	1971	Middle	WRR	24
9	New Town	1973	Middle	WRR	22
10	Mt Stuart	1971	Middle	WRR	22
11	Mt Stuart	1973	Middle	WRR	8
12	Trinity Hill	1974	Lower	SRA B	10
13	Trinity Hill	1975	Lower	SRA B	10
14	Trinity Hill	1976	Lower	SRA B	7
15	Claremont	1975	Middle	SRA B	10
16	Goulburn St	1972	Lower	SRA L	19
17	Goulburn St	1973	Lower	SRA L	14
18	Goulburn St	1974	Lower	SRA L	14
19	Bowen Road	1973	Middle	SRA L	74
20	Bowen Road	1974	Middle	SRA L	44
21	Bowen Road	1975	Middle	SRA L	23
22	Bowen Road	1976	Middle	SRA L	29

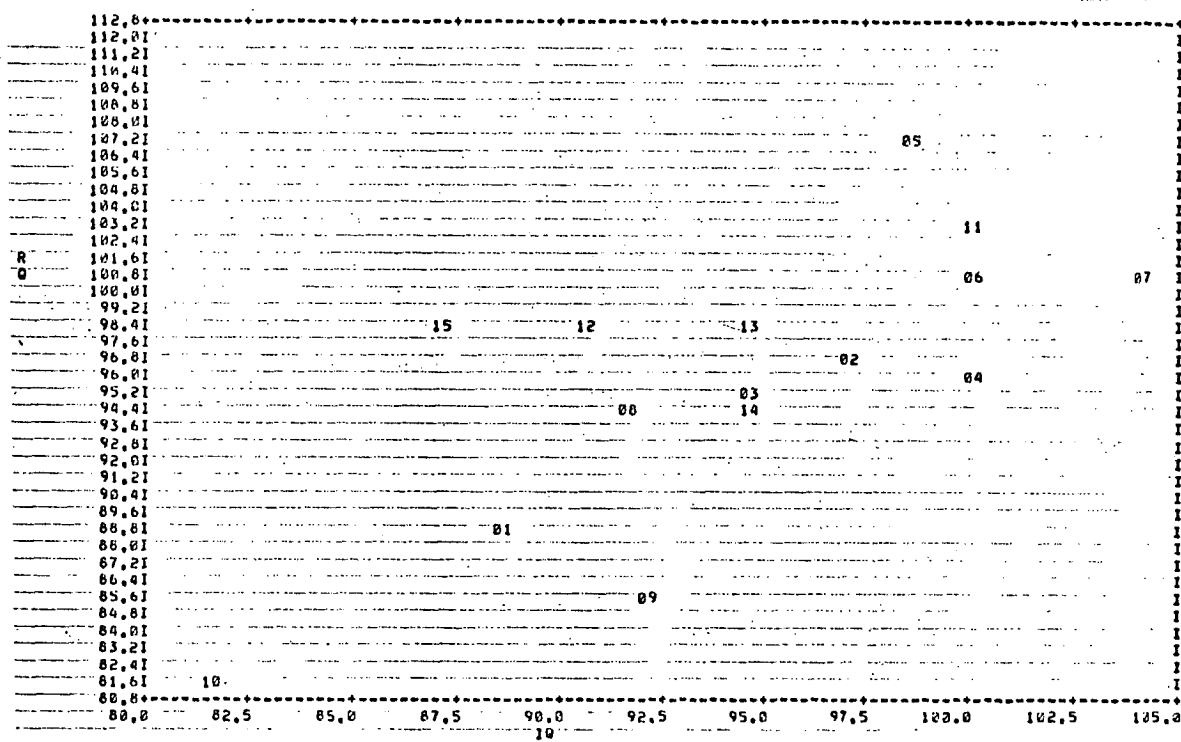


Figure 7. Class RQ and IQ positions, grade 4, Junior IQ set, CSIRO data. Numbers refer to school classes in table at right.

Abbreviations:

Cl, Class;

No., Number in class;

WRR, Wide Range Readers;

SRA B, SRA Basic Readers;

SRA L, SRA Reading Laboratories.

Cl	School	Year	Income Group	Schema	No.
1	Warrane	1973	Lower	WRR	60
2	Campbell St	1973	Lower	WRR	27
3	Campbell St	1974	Lower	WRR	18
4	Campbell St	1975	Lower	WRR	14
5	Campbell St	1976	Lower	WRR	7
6	New Town	1973	Middle	WRR	22
7	Mt Stuart	1973	Middle	WRR	8
8	Trinity Hill	1974	Lower	SRA B	10
9	Trinity Hill	1975	Lower	SRA B	10
10	Trinity Hill	1976	Lower	SRA B	7
11	Claremont	1975	Middle	SRA B	10
12	Goulburn St	1974	Lower	SRA L	14
13	Bowen Road	1974	Middle	SRA L	44
14	Bowen Road	1975	Middle	SRA L	23
15	Bowen Road	1976	Middle	SRA L	29

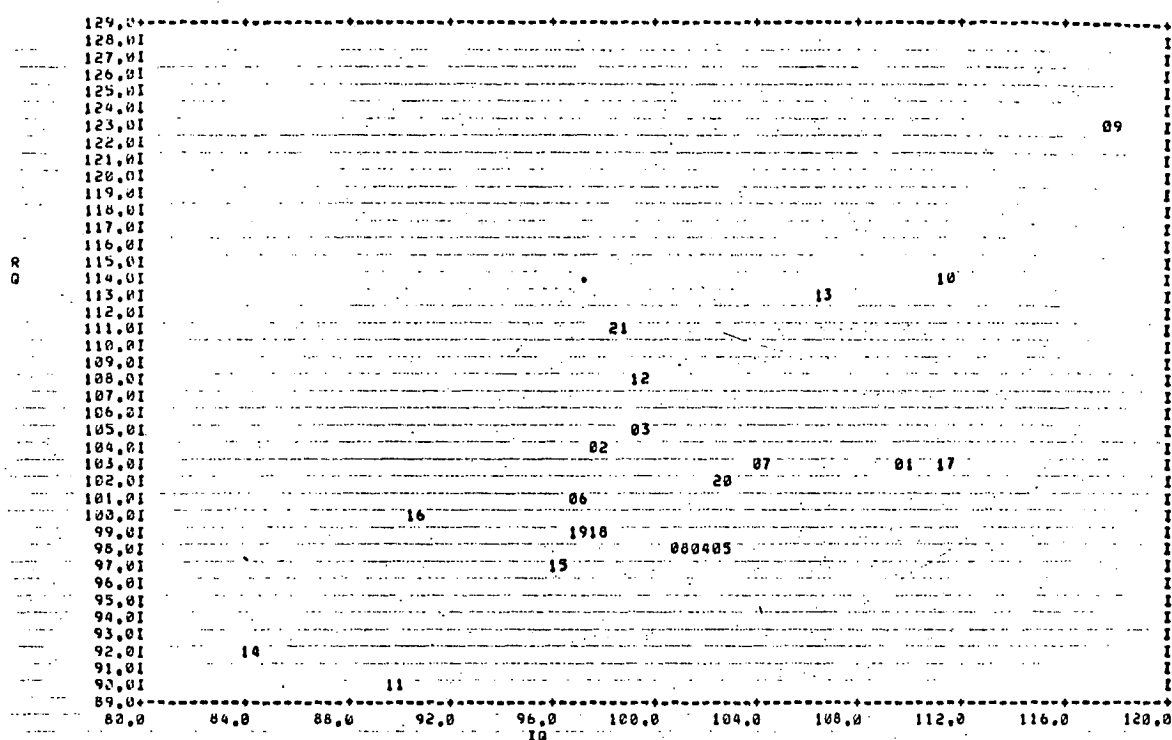


Figure 8. Class RQ and IQ positions, grade 5, CSIRO data. Numbers refer to school classes in table at right.

Abbreviations:

C1, Class;

No., Number in class;

WRR, Wide Range Readers;

SRA B, SRA Basic Readers;

SRA L, SRA Reading Laboratories.

C1	School	Year	Income Group	Scheme	No.
1	Campbell St	1971	Lower	WRR	17
2	Campbell St	1972	Lower	WRR	51
3	Campbell St	1973	Lower	WRR	43
4	Campbell St	1974	Lower	WRR	40
5	Campbell St	1975	Lower	WRR	31
6	Campbell St	1976	Lower	WRR	25
7	New Town	1971	Middle	WRR	36
8	New Town	1973	Middle	WRR	34
9	Mt Stuart	1971	Middle	WRR	22
10	Mt Stuart	1973	Middle	WRR	19
11	Trinity Hill	1976	Lower	SRA B	19
12	Claremont	1975	Middle	SRA B	49
13	Claremont	1976	Middle	SRA B	16
14	Goulburn St	1973	Lower	SRA L	16
15	Goulburn St	1974	Lower	SRA L	14
16	Goulburn St	1975	Lower	SRA L	11
17	Bowen Road	1971	Middle	SRA L	18
18	Bowen Road	1973	Middle	SRA L	65
19	Bowen Road	1974	Middle	SRA L	65
20	Bowen Road	1975	Middle	SRA L	44
21	Bowen Road	1976	Middle	SRA L	46

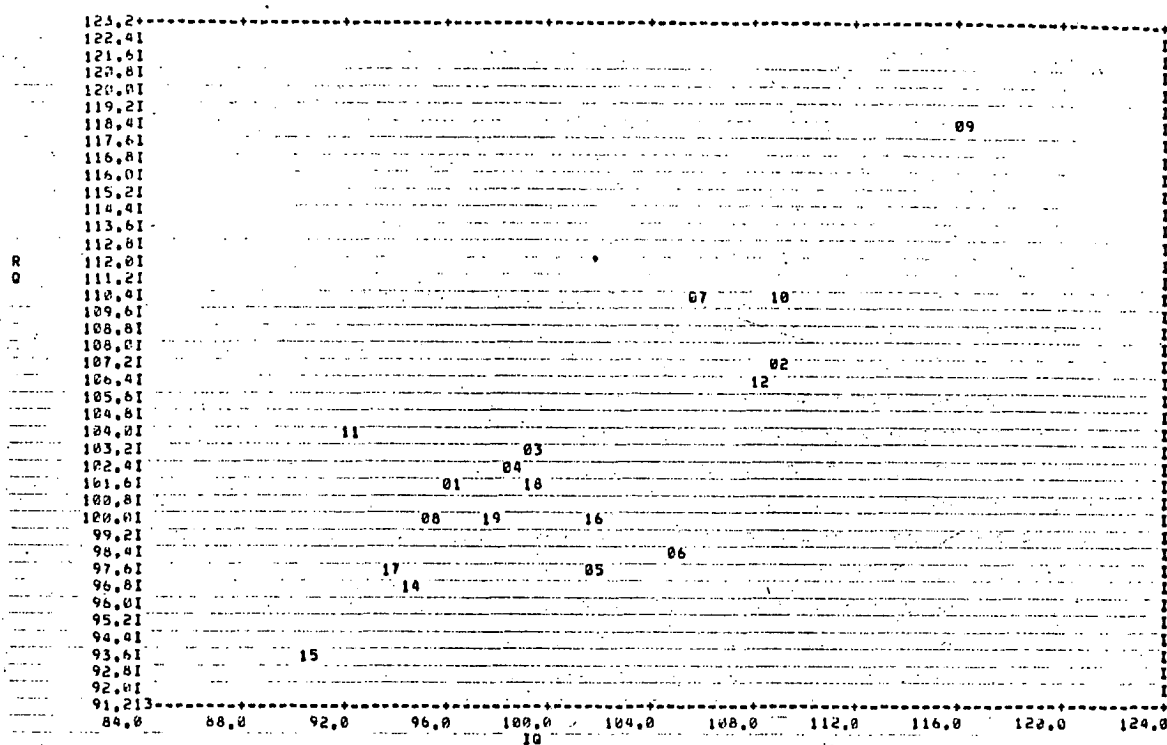


Figure 9. Class RQ and IQ positions, grade 6, CSIRO data. Numbers refer to school classes in table at right.

Abbreviations:

C1, Class;

No., Number in class;

WRR, Wide Range Readers;

SRA B, SRA Basic Readers;

SRA L, SRA Reading Laboratories.

C1	School	Year	Income Group	Scheme	No.
1	Campbell St	1971	Lower	WRR	33
2	Campbell St	1972	Lower	WRR	15
3	Campbell St	1973	Lower	WRR	40
4	Campbell St	1974	Lower	WRR	37
5	Campbell St	1975	Lower	WRR	37
6	Campbell St	1976	Lower	WRR	13
7	New Town	1971	Middle	WRR	32
8	New Town	1973	Middle	WRR	11
9	Mt Stuart	1971	Middle	WRR	22
10	Mt Stuart	1973	Middle	WRR	18
11	Trinity Hill	1976	Lower	SRA B	15
12	Goulburn St	1972	Lower	SRA L	21
13	Goulburn St	1974	Lower	SRA L	16
14	Goulburn St	1975	Lower	SRA L	13
15	Goulburn St	1976	Lower	SRA L	9
16	Bowen Road	1972	Middle	SRA L	5
17	Bowen Road	1973	Middle	SRA L	78
18	Bowen Road	1974	Middle	SRA L	55
19	Bowen Road	1975	Middle	SRA L	52

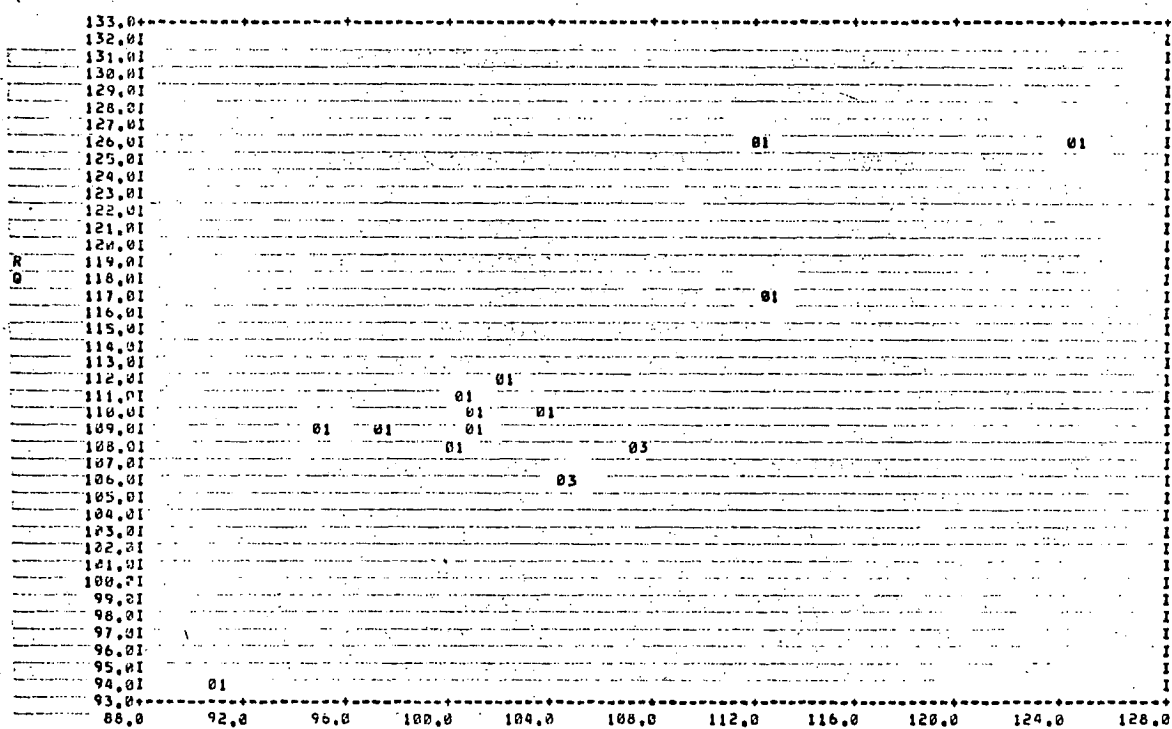


Figure 10. Class RQ and IQ positions by reading scheme, grade 3 verbal CSIRO data. Abbreviations: 1 - Wide Range Readers; 2 - SRA Basic Readers; 3 - SRA Reading Laboratories.

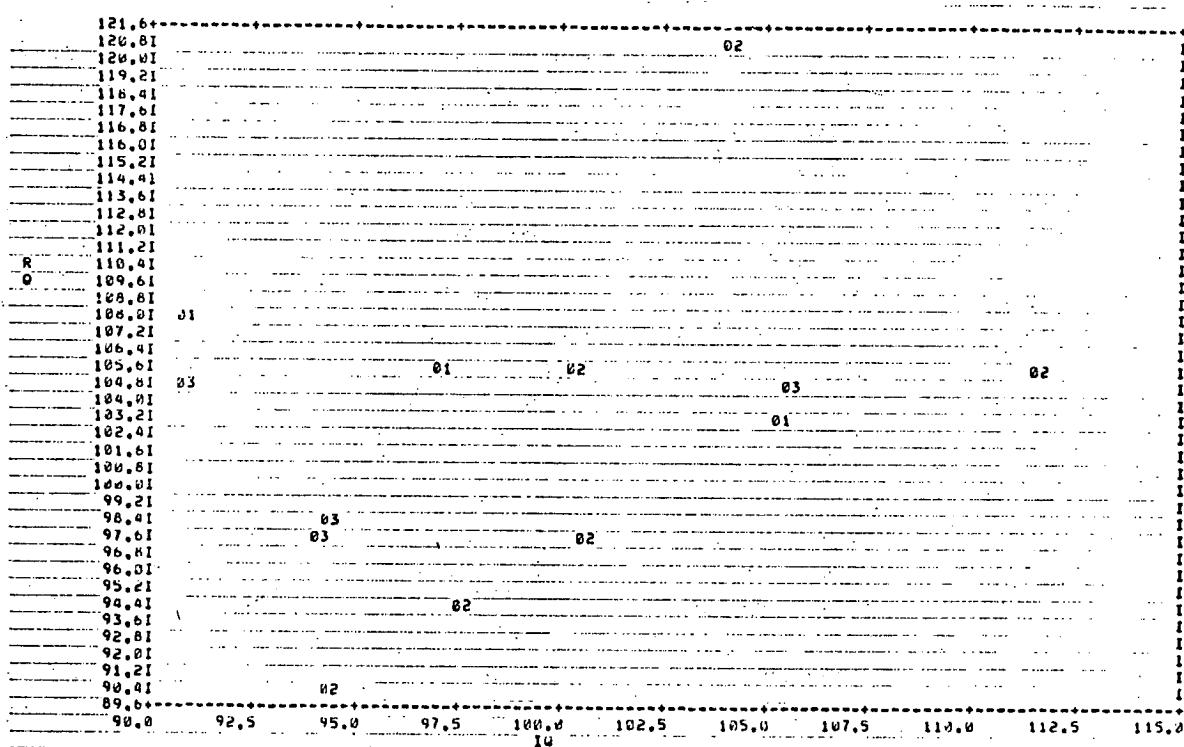


Figure 11. Class RQ and IQ positions by reading scheme, grade 3 non-verbal, CSIRO data. Abbreviations: 1 - Wide Range Readers; 2 - SRA Basic Readers; 3 - SRA Reading Laboratories.

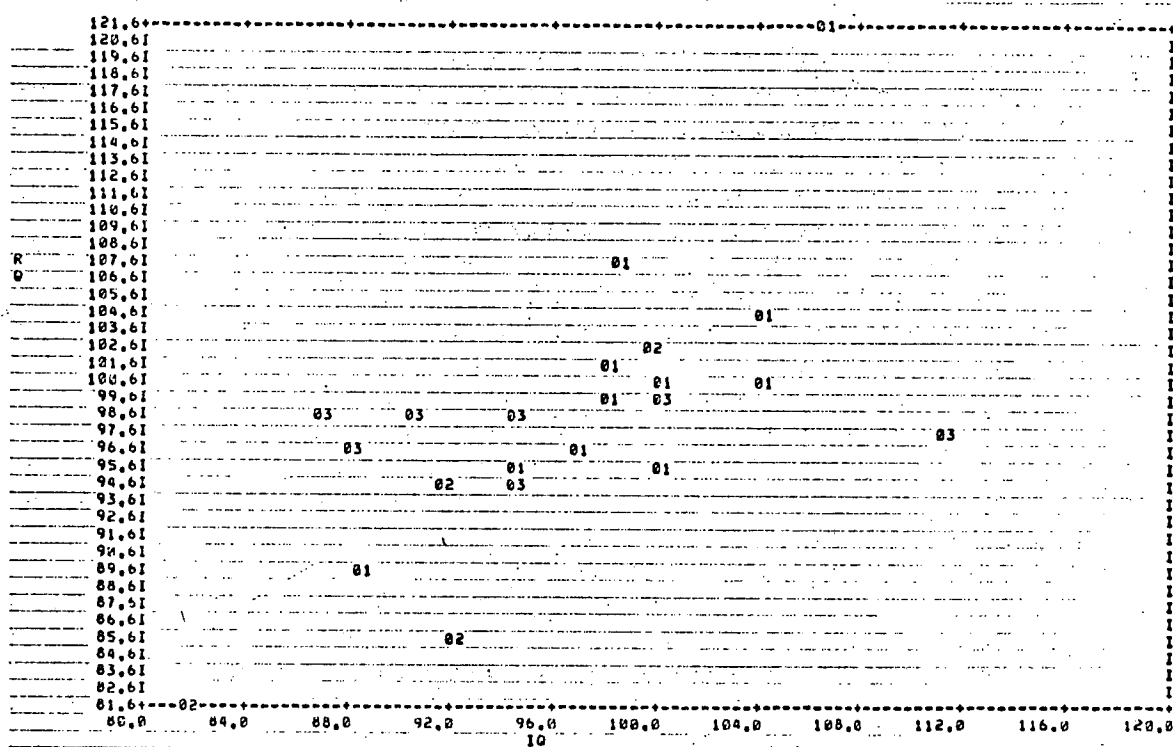


Figure 12. Class RQ and IQ positions by reading scheme, grade 4, full data set, CSIRO data. Abbreviations: 1 - Wide Range Readers; 2 - SRA Basic Readers; 3 - SRA Reading Laboratories.

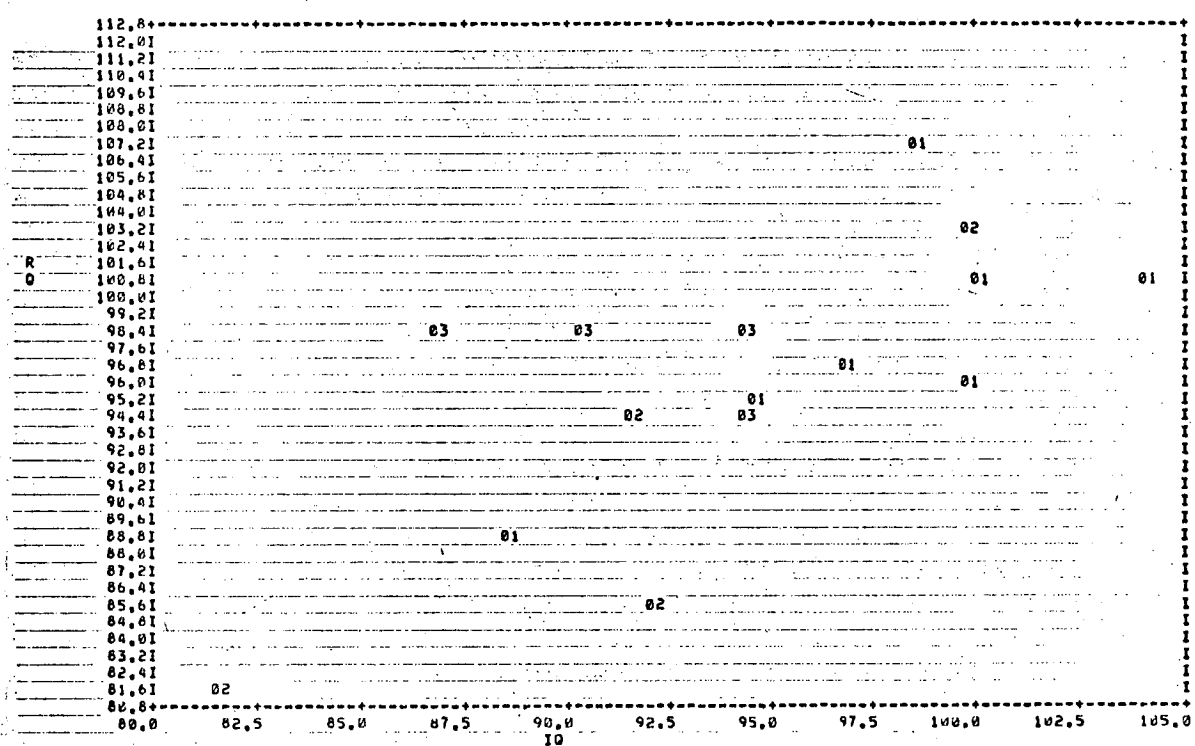


Figure 13. Class RQ and IQ positions by reading scheme, grade 4, Junior IQ set, CSIRO data. Abbreviations: 1 - Wide Range Readers; 2 - SRA Basic Readers; 3 - SRA Reading Laboratories.

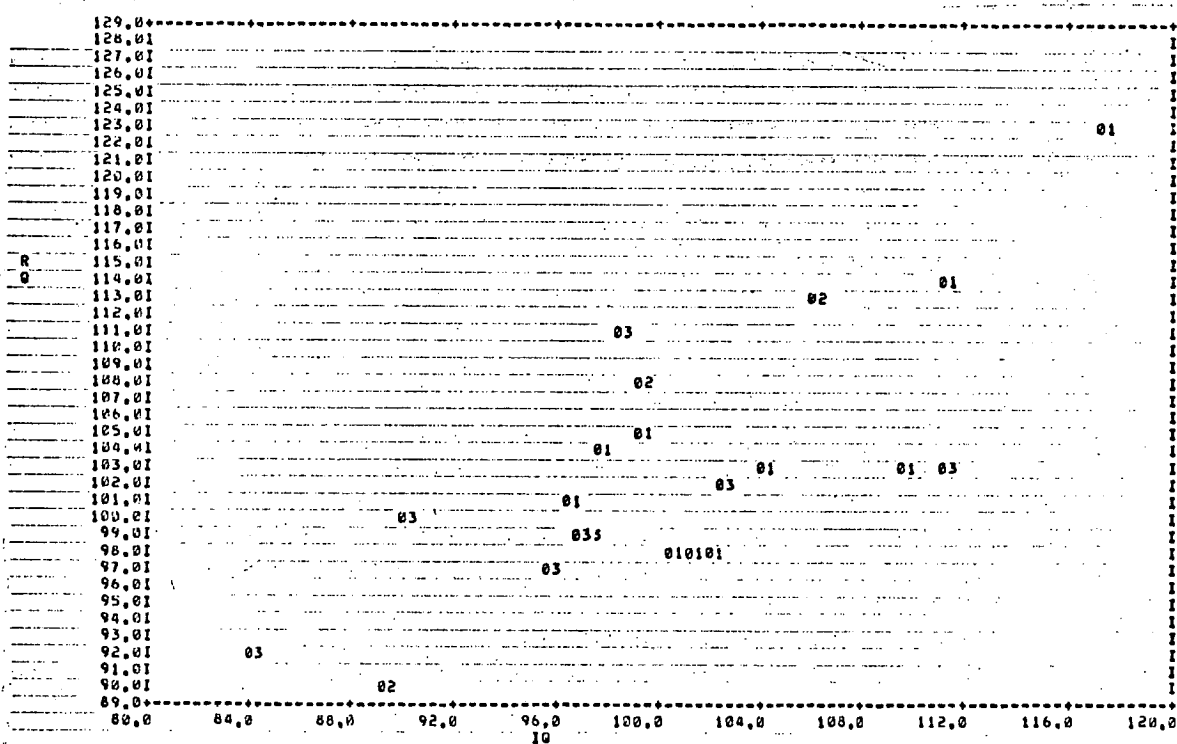


Figure 14. Class RQ and IQ positions by reading scheme, grade 5, CSIRO data. Abbreviations: 1 - Wide Range Readers; 2 - SRA Basic Readers; 3 - SRA Reading Laboratories.

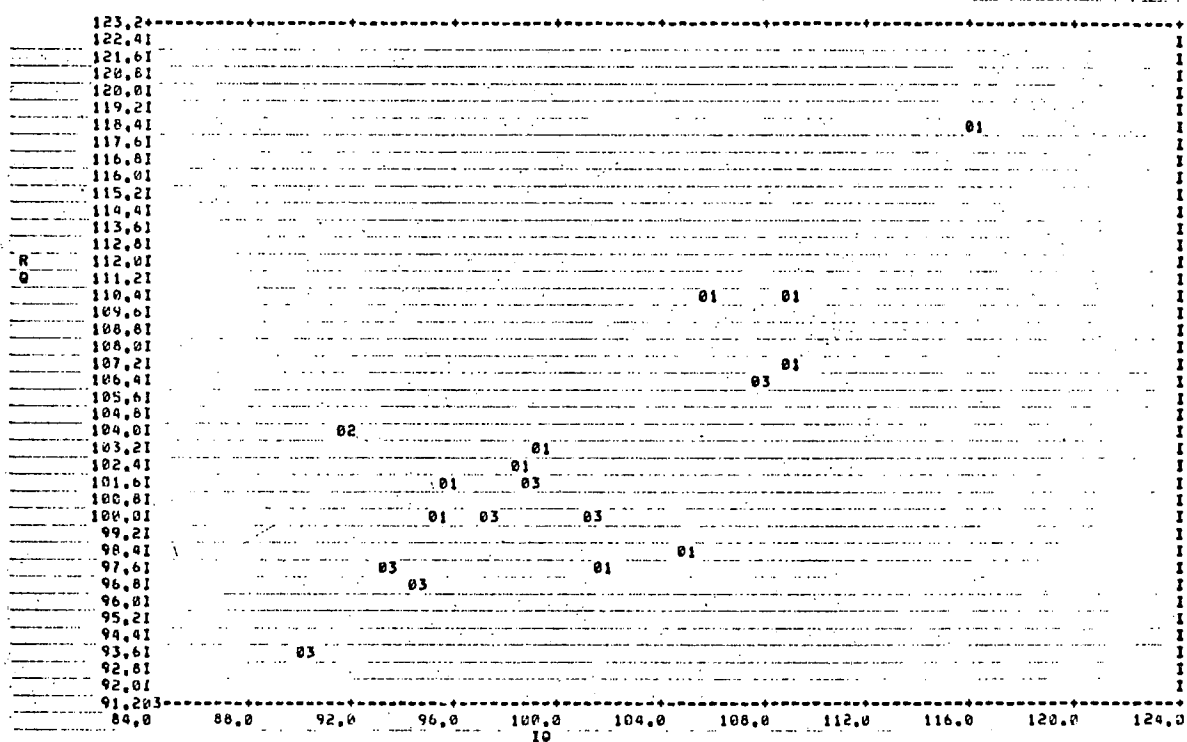


Figure 15. Class RQ and IQ positions by reading scheme, grade 6, CSIRO data. Abbreviations: 1 - Wide Range Readers; 2 - SRA Basic Readers; 3 - SRA Reading Laboratories.

Appendix E

Summary tables for grades 3 to 6 (University of
Tasmania data).

Table 44. Summary, grade 3 verbal, University of Tasmania data.

Class	N	Reading Scheme	Income Group	Mean IQ		Mean RQ	
				M	F	M	F
Warrane 1971	28	WRR	Lower	87.50	95.58	90.75	102.17
"	24			86.92	89.27	92.46	93.64
"	23			86.71	95.89	89.71	98.67
"	19			95.38	93.17	92.77	90.83
Campbell St 1971	31	WRR	Lower	98.84	103.58	109.21	111.58
"	34			92.95	96.00	105.86	111.54
Campbell St 1972	26			103.79	94.45	107.86	97.64
"	25			101.08	98.92	113.85	101.17
Campbell St 1973	19			99.11	107.30	101.44	117.30
New Town 1971	23	WRR	Middle	97.00	102.30	104.69	119.40
"	26			101.94	101.60	109.81	107.00
New Town 1972	28			98.47	99.44	109.95	114.00
"	22			98.38	107.44	107.62	113.11
Mt Stuart 1971	29	WRR	Middle	116.00	109.12	128.17	124.00
Mt Stuart 1972	24			108.93	117.50	115.50	120.20
Mt Stuart 1973	23			126.75	121.45	129.50	122.55
Goulburn St 1972	20	SRA L	Lower	110.44	104.27	106.33	110.18
Goulburn St 1974	19			104.17	106.08	105.50	104.62
Bowen Road 1973	28	SRA L	Middle	103.60	97.88	105.20	100.38
"	28			113.07	102.93	110.79	106.71
"	28			108.73	100.00	109.33	104.92

Table 45. Summary, grade 3 non-verbal, University of Tasmania data.

Class	N	Reading Scheme	Income Group	Mean IQ		Mean RQ	
				M	F	M	F
Campbell St 1974	27	WRR	Lower	101.43	95.62	105.29	99.77
"	21			95.18	94.40	108.73	110.90
Campbell St 1975	21			93.45	92.70	110.00	105.10
"	23			85.31	93.30	102.85	113.90
Campbell St 1976	20			119.22	95.82	111.56	101.00
"	13			102.22	107.50	100.11	97.00
Trinity Hill 1973	29	SRA B	Lower	92.88	96.08	90.44	89.62
Trinity Hill 1974	23			104.90	97.23	97.10	97.92
Trinity Hill 1975	16			97.71	97.22	90.43	97.44
Claremont 1974	18	SRA B	Middle	108.63	109.80	120.25	127.30
"	12			101.00	89.40	109.29	126.60
Claremont 1975	20			99.15	99.71	104.15	96.14
"	22			102.42	99.80	110.67	109.10
Claremont 1976	29			113.94	110.69	109.44	106.31
"	28			112.13	108.69	101.53	105.69
Goulburn St 1974	19	SRA L	Lower	104.17	106.08	105.50	104.62
Goulburn St 1975	21			97.00	90.60	95.82	99.10
Goulburn St 1976	12			95.00	93.00	100.29	95.60
Bowen Road 1975	26	SRA L	Middle	93.35	84.56	99.82	110.11
"	24			96.07	86.91	104.46	105.18
"	24			86.13	96.00	101.40	112.50

Table 46. Summary, grade 4, full data set, University of Tasmania data.

Class	N	Reading Scheme	Income Group	Mean IQ		Mean RQ	
				M	F	M	F
Warrane 1973	13	WRR	Lower	94.50	85.14	88.67	88.43
"	19			90.55	90.63	86.55	89.63
"	15			80.22	88.67	80.33	91.17
"	13			90.57	90.17	95.43	97.83
Campbell St 1971	31	WRR	Lower	100.27	94.56	102.13	95.69
"	31			106.57	92.29	99.43	99.29
Campbell St 1972	28			96.65	105.91	99.12	107.09
"	26			95.00	96.45	99.13	103.64
Campbell St 1973	27			99.64	93.77	97.29	96.77
Campbell St 1974	18			86.33	98.50	91.00	97.33
Campbell St 1975	14			101.50	97.67	95.50	96.33
Campbell St 1976	7			94.75	103.67	110.75	102.67
New Town 1971	24	WRR	Middle	105.21	102.00	103.86	106.30
New Town 1973	10			92.75	110.17	95.50	104.00
"	12			92.50	108.25	96.63	107.00
Mt Stuart 1971	22	WRR	Middle	106.25	106.40	114.58	129.60
Mt Stuart 1973	8			98.25	109.75	94.75	106.75
Trinity Hill 1974	10	SRA B	Lower	84.00	96.67	94.25	94.33
Trinity Hill 1975	10			96.60	87.20	85.00	86.20
Trinity Hill 1976	7			78.50	85.67	77.75	86.67
Claremont 1975	10	SRA B	Middle	105.00	94.40	108.60	97.00
Goulburn St 1972	19	SRA L	Lower	88.44	87.60	96.11	96.60
Goulburn St 1973	14			117.43	105.29	98.29	97.29
Goulburn St 1974	14			92.13	87.67	98.00	98.67
Bowen Road 1973	23	SRA L	Middle	98.38	104.20	96.00	101.50
"	26			101.14	98.92	95.86	97.42
"	25			96.93	102.80	99.93	106.10
Bowen Road 1974	18			93.22	95.89	99.11	99.56
"	14			93.67	88.63	95.33	96.75
"	12			103.44	80.67	102.67	93.00
Bowen Road 1975	8			96.20	95.67	95.40	94.67
"	7			89.00	87.00	87.60	90.00
"	8			96.50	102.00	96.83	103.00
Bowen Road 1976	10			86.29	97.57	94.00	92.33
"	10			82.17	83.00	103.83	94.00
"	9			84.00	100.33	92.33	110.67

Table 47. Summary, grade 4, Junior IQ set,
University of Tasmania data.

Class	N	Reading Scheme	Income Group	Mean IQ		Mean RQ	
				M	F	M	F
Warrane 1973	13	WRR	Lower	94.50	85.14	88.67	88.43
"	19			90.55	90.63	86.55	89.63
"	15			80.22	88.67	80.33	91.17
"	13			90.57	90.17	95.43	97.83
Campbell St 1973	27	WRR	Lower	99.64	93.77	97.29	96.77
Campbell St 1974	18			86.33	98.50	91.10	97.33
Campbell St 1975	14			101.50	97.67	95.50	96.33
Campbell St 1976	7			94.75	103.67	110.75	102.67
New Town 1973	10	WRR	Middle	92.75	110.17	95.50	104.00
"	12			92.50	108.25	96.63	107.00
Mt Stuart 1973	8	WRR	Middle	98.25	109.75	94.75	106.75
Trinity Hill 1974	10	SRA B	Lower	84.00	96.67	94.25	94.33
Trinity Hill 1975	10			96.60	87.20	85.00	86.20
Trinity Hill 1976	7			78.50	85.67	77.75	86.67
Claremont 1975	10	SRA B	Middle	105.00	94.40	108.60	97.00
Goulburn St	14	SRA L	Lower	92.13	87.67	98.00	98.67
Bowen Road 1974	18	SRA L	Middle	93.22	95.89	99.11	99.56
"	14			93.67	88.63	95.33	96.75
"	12			103.44	80.67	102.67	93.00
Bowen Road 1975	8			96.20	95.67	95.40	94.67
"	7			89.00	87.00	87.60	90.00
"	8			96.50	102.00	96.83	103.00
Bowen Road 1976	10			86.29	97.57	94.00	92.33
"	10			82.17	83.00	103.83	94.00
"	9			84.00	100.33	92.33	110.67

Table 48. Summary, grade 5, University of Tasmania data.

Class	N	Reading Scheme	Income Group	Mean IQ		Mean RQ	
				M	F	M	F
Campbell St 1971	17	WRR	Lower	110.89	108.00	101.00	106.25
Campbell St 1972	24			107.82	90.62	104.00	101.69
"	27			102.00	91.69	103.57	105.92
Campbell St 1973	21			100.67	102.56	95.42	110.22
"	22			94.29	100.75	104.64	114.75
Campbell St 1974	21			107.83	98.78	102.42	97.22
"	19			99.10	96.89	91.80	98.56
Campbell St 1975	17			104.33	105.18	95.00	102.64
"	14			88.40	103.44	89.80	99.44
Campbell St 1976	25			95.80	97.60	100.07	102.30
New Town 1971	20	WRR	Middle	101.83	107.38	97.08	106.88
"	16			100.27	110.60	100.18	119.20
New Town 1973	15			99.62	112.00	97.31	112.50
"	19			98.58	100.86	92.67	102.00
Mt Stuart 1971	22	WRR	middle	115.60	120.14	122.00	125.29
Mt Stuart 1973	19			116.86	107.92	118.71	111.75
Trinity Hill 1976	19	SRA B	Lower	87.43	90.33	90.86	89.25
Claremont 1975	24	SRA B	Middle	102.08	95.64	109.69	105.36
"	25			99.00	98.08	106.75	111.08
Claremont 1976	16			96.40	11.055	101.80	117.55
Goulburn St 1973	16	SRA L	Lower	80.75	86.88	89.88	95.13
Goulburn St 1974	14			98.00	92.50	96.13	97.50
Goulburn St 1975	11			92.14	86.25	99.29	101.75
Bowen Road 1971	18	SRA L	Middle	113.40	108.63	102.90	103.50
Bowen Road 1973	26			101.57	92.08	99.79	96.08
"	18			95.64	93.00	99.91	94.43
"	21			95.77	105.88	98.77	105.00
Bowen Road 1974	25			93.38	92.31	98.25	98.33
"	20			95.40	103.00	95.90	109.20
"	20			96.20	94.90	99.20	102.40
Bowen Road 1975	23			101.69	99.20	102.31	103.90
"	21			106.78	102.58	103.67	100.00
Bowen Road 1976	21			96.85	96.13	108.00	109.38
"	25			91.45	106.07	102.36	120.57

Table 49. Summary, grade 6, University of Tasmania data.

Class	N	Reading Scheme	Income Group	Mean IQ		Mean RQ	
				M	F	M	F
Campbell St 1971	19	WRR	Lower	97.33	92.90	107.33	96.90
"	14			89.40	100.22	93.80	104.33
Campbell St 1972	15			110.89	105.33	107.89	107.00
Campbell St 1973	24			105.00	95.00	104.33	110.33
"	16			104.00	90.57	97.67	94.14
Campbell St 1974	17			98.17	105.80	104.17	102.40
"	20			97.70	95.50	101.30	100.40
Campbell St 1975	21			107.60	102.33	99.27	107.17
"	16			97.20	92.64	89.80	95.18
Campbell St 1976	13			105.00	104.50	92.40	102.75
New Town 1971	16	WRR	Middle	102.00	101.00	103.00	108.67
"	16			106.30	114.83	110.90	120.83
New Town 1973	11			94.67	97.00	99.22	102.00
Mt Stuart 1971	22	WRR	Middle	115.00	117.78	117.46	120.11
Mt Stuart 1973	18			106.64	111.71	106.45	116.14
Goulburn St 1972	21	SRA L	Lower	106.82	108.80	105.64	106.40
Goulburn St 1974	16			81.25	86.88	89.75	92.75
Goulburn St 1975	13			98.00	88.20	95.75	98.80
Goulburn St 1976	9			92.00	86.00	94.00	93.33
Bowen Road 1972	5	SRA L	Middle	101.00	101.00	90.67	114.00
Bowen Road 1973	25			90.76	97.13	94.24	98.25
"	27			91.22	98.00	96.44	98.78
"	26			92.44	97.00	96.06	105.00
Bowen Road 1974	14			98.71	96.43	105.43	99.86
"	18			98.91	99.14	103.18	101.00
"	23			97.07	104.25	97.67	107.38
Bowen Road 1975	17			92.00	104.14	94.80	99.57
"	19			98.82	105.13	104.64	106.25
"	16			89.75	94.00	92.88	100.38