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A STANDARDISATION OF THE BURT WORD READING  
TEST (MANAWATU, 1976)

A thesis presented in partial fulfilment of  
the requirements for the degree of  
MASTER OF ARTS in Education  
at Massey University.

by

Edwin McLean Eggers  
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## ABSTRACT

The extent of the current use of the Burt Word Reading Test was investigated as a prelude to the production of normative data which would be valid for the Manawatu region.

A review of the history of the development and use of word recognition tests, and a review of the literature related to word recognition, were undertaken.

Initially, schools in the area within, and adjacent to, Palmerston North were canvassed in order to obtain information regarding the extent to which the Burt Test remained in use, and the purposes for which teachers administered the test. Strong support was obtained for the production of meaningful data in which teachers could have confidence, together with evidence that teachers still found the Burt to be a useful test.

The co-operation of third year students at the Palmerston North Teachers' College was obtained, in administering the Burt to a large sample of pupils, and obtaining the other necessary subject data.

Results obtained support the view that the Burt Test remains a worthwhile instrument for use by teachers in the evaluation of reading behaviour. Significant correlations were obtained between Burt scores and scores on the Progressive Achievement Tests of Reading Comprehension and Vocabulary.

Norms for pupils aged six to thirteen years were extracted and presented in ranges applicable to age groups, a new departure in the presentation of data for the Burt Test.

Evidence was obtained that the order of the words on the Burt (Rearranged) Word Reading Test as produced by Vernon (1938) is not appropriate for the testing of children in the Manawatu area of New Zealand, since there are marked cases of words being well out of difficulty order.

It appears that although the Burt Test samples only a limited aspect of reading behaviour, teachers may give some weight to the results they obtain as an indication of a child's level of reading progress.

Other implications for teachers were considered as were implications for further research.

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## INTRODUCTION

The Burt Word Reading Test has been used by New Zealand teachers, New Zealand Department of Education Psychological Service personnel, and no doubt many other individuals with a desire to evaluate reading, for many years. No precise dates can be stated.

In the climate prevailing in education which tends to be critical of test results and their relevance, teachers while continuing to use the Burt, have frequently placed unwarranted confidence in the results they obtained from its administration, for there have never been any New Zealand norms.

The research project which gave rise to this thesis was stimulated initially by an awareness that the order of the words was probably inappropriate, and also by a desire to carry out a project which would have a strong practical application.

### The Purpose of the Investigation

Initially it was desired to show that the Burt Test remained in widespread use. Once that was established, norms were wanted and since some basic data about each subject was needed, it was decided to attempt to gather data concerning the performance of the subjects on the New Zealand Council for Educational Research Progressive Achievement Tests (1969) in the hope of correlating those results with the Burt scores and obtaining correlations which might validate the continued use of the Burt to gauge children's reading levels.

The study canvassed the opinions of teachers and principals as to the value of the Burt Test and the uses to which it was put in schools. The gathering of the data was done by the third year students at Palmerston North Teachers' College, following a training period, during their major six week posting at the start of the second school term of 1976.

Included in the sample are rural and urban children, aged six years and over, attending schools to which the students were assigned.

### The Genesis of the Investigation

It has been the writer's experience as a teacher for some

fifteen years, and latterly as a member of the Psychological Service of the New Zealand Department of Education, that the Burt Test, during that time, was widely used and that not only did it have a function as an indicator of a child's current reading level but that it also, as Burt (1948) suggested, had a function as a diagnostic tool.

Some shortcomings in the Burt were also apparent since it was often necessary in administering the test, to go outside of the instructions for administration first formulated by Burt (1923) and later endorsed by Vernon (1938). It appeared that this was largely due to changes in the order of difficulty of many words which resulted in children experiencing many early failures during the test's administration.

The writer's experiences and impressions were confirmed in informal discussions with teachers and principals at schools he visited while on the staff of the Psychological Service, and in other discussions with members of the staff of that service.

At a relatively early stage too, the views of members of the staff of the New Zealand Council for Educational Research were also sought. Some doubts about the true extent of the continuing use of the Burt Test were raised in these latter discussions and accordingly an initial survey of use was undertaken late in 1975. Details of this survey are set out in Chapter Three.

## CHAPTER ONE

### WORD RECOGNITION: THEORIES, RELATED STUDIES AND THE PERCEPTUAL PROCESS

#### General

The Burt Word Reading Test is, as its title suggests, a test of individual ability to recognise and name on sight, single words. The Burt Test is intended for use with children, to give their teachers and others with a professional interest, an indication of the extent of their individual word recognition skills.

Within the Burt Test the only clues to recognition are within each word itself. Since word recognition is central to the major study reported in this thesis an examination of related research findings is essential. In this way a basis can be provided for understanding how word recognition is carried out, even though these research findings are still far from conclusive.

Several important points need to be kept in mind. As Williams(1970) points out, there is or may be, a marked difference between what a subject can do in a research study of factors in word recognition, and what he actually does in the ordinary reading situation. It must also be noted that no distinction is generally made between what children do as learner readers and what more competent child readers or highly skilled readers do, in reading.

The studies to be referred to are only those considered to have direct relevance to the present study.

#### Word Recognition Theories

Interest in the perception or recognition of single words is suggested by Gibson and Levin (1975) to stem from

"the classic experiments of Cattell in 1885 and 1886." (p.189).

Williams (1970) states:

"whatever one's ultimate definition or criterion of 'reading' may be, word recognition must clearly be included as one of the primary and major component skills." (p.38).

Smith (1971) feels that there are three traditional theories of word recognition. He specifies a whole-word theory, a letter-by-letter theory, and a letter cluster theory. He further believes that

"each of these theories contains a kernel of truth about reading ..." (p.123)

but holds that an alternative view which he terms a feature-analytic theory, would overcome apparent weaknesses in the traditional theories without being incompatible with evidence in their favour.

Briefly, the whole-word viewpoint maintains that words are recognised as units. This view stems from the work of Cattell who demonstrated that in a single tachistoscopic presentation, four or five random letters could be reported. A similar number of random words could also be reported. (Gibson and Levin, op.cit; Smith, op.cit.) Cattell also demonstrated that words could be identified without any of their component letters being clearly discriminable and that words could be identified as fast as letters. (Smith, op.cit.)

As Smith suggests, it is logical to conclude that if a word can be identified just as easily as a letter, it must be just as much a unit as a letter. It follows from Cattell's findings that a word is recognizable as a whole rather than as a sum of its parts - letters.

The letter-by-letter theory, in rebuttal, poses a question - If words are recognized 'as wholes,' how are the wholes recognized? Failure to accept that the whole-word theory cannot account for a skilled reader's ability to recognize many thousands of words at sight, is unrealistic. It would be to suggest that such a reader remembered every word, but this seems unrealistic because it does not provide for transfer of learning to new situations and would be likely to prevent a reader from becoming highly skilled. Smith suggests that a compelling argument which supports the letter-by-letter theory is that readers are sensitive to the predicability of letter sequences. This is usually referred to as intraword redundancy and will be considered further, later on in this discussion.

Between these first two traditional theories is the letter cluster view which holds that the recognition of at least some words is facilitated by the reader's knowledge of the way certain groups of letters tend to go together. One example would be - 'ough' as in 'enough' and 'tough'.

The feature-analytic theory, as Smith terms it, attempts to explain how the many factors of word recognition which research studies have discovered, may be used to facilitate recognition in a systematic way. Many writers cited by Gibson and Levin (Bower, 1967; Fillenbaum, 1969; Gibson, 1971; Katz and Fodor, 1963; Perfetti, 1972) have referred to a word as a 'complex of features' or:

"a complex representation of five classes of information: graphic, phonological, orthographic, semantic, and syntactic." (Gibson and Levin, op.cit. p.194).

The 'complex of features' notion fits well with the feature-analytic theory since the existence of a 'complex' gives a logical reason for an analysis of the features.

Although Williams (op.cit.) concludes that:

"The strategies that a reader actually utilizes in word recognition are far from explicitly delineated at the moment," (p.38),

a consideration of some of the 'complex of features' is indicated.

Among the research methods used to learn more about factors in word perception, tachistoscopic techniques, variations in brightness or contrast between figure and ground, reducing distance, focus, and embedded words in lists or embedded letters in words, have been employed to establish recognition thresholds.

The term, graphic features, includes type font, word shape, position of letters in words, and features of individual letters. Tinker (1965) showed that different type styles did not appear to play a very great role in legibility although certain type sizes appeared marginally more suitable. Gibson and Levin (op.cit.) summarise research on this aspect by saying:

"Apparently, for young children who are reading slowly with a great deal of attention to the details of the text, physical features of the textual display are only peripherally important." (p.169).

Research into the significance of word shape, such as studies by Edelman (1963) and Smith (1969) (cited by Gibson and Levin), has generally rejected the idea that global form or contour of words is a basis for their recognition. Gibson and Levin (op.cit.) state emphatically that not only is

"overall word shape not a good enough differentiator /but that/ children (and adults) do not use it." (p.197).

Spache and Spache (1973) believe that children spontaneously discriminate among words by similarities and differences such as, unusual length, shape, base words, compound words, initial letters or sounds, and internal details. Their inclusion of word shape as a discriminating feature suggests that the research is as yet inconclusive on this point. It may be for instance, that there have been insufficient studies of children's use of word shape in analysing word features.

Gibson and Levin cite studies by Broerse and Zwann, 1966; Bruner and O'Dowd, 1958; Horowitz, White and Atwood, 1968; Marchbanks and Levin, 1965; Nelson, Peebles and Pancotto, 1970; and Oleron and Dansett, 1963; to support their contention that the principal graphic cues to word recognition appear to be the beginnings and endings of words. The foregoing studies consistently demonstrated that initial letters have the greatest significance, followed by final letters and then medial letters. New Zealand early reading practices as emphasised by teachers, which aim to direct children's attention towards the initial letter of a word and hope that a letter-sound association will develop, would appear to be endorsed by these findings.

It has been suggested (Marchbanks and Levin, 1965) that the reason for the reliable findings reported in the preceding paragraph, is the effect of the white space (or other colour presumably, should the paper not be white) which precedes and follows a word. This effect is true even for very young

readers. With adult readers there are additional reasons for the phenomenon.

The beginning of a word provides more information towards its recognition than either the end or the middle. Once the beginning has furnished information, the remainder is more predictable since intraword redundancy, or the predictability of letter order, is greater than contextual redundancy. There are many more possible combinations of words than there are combinations of letters within a word. (Garner, 1962, cited by Gibson and Levin, *op.cit.*).

The ends of words give information about gender, number, and quite frequently the part of speech, while inflections are also informative since they consist of letter clusters, say Gibson and Levin.

Gibson, Pick, Osser and Hammond (1962) demonstrated that phonological and orthographic regularity, that is to say the predictability of letter sounds and letter order, were effective in facilitating recognition of units of word size whether they were real words or pronounceable nonsense words. First grade American children (generally 6 year olds) were involved in a study designed to determine the possibility that word recognition took place through internally mediated sounding of the words. This appears similar to the New Zealand infant teaching emphasis which hopes that emergent readers will learn to make letter-sound relationships for initial consonants internally, before their attention is drawn to the relationship through specific teaching. Gibson et.al. concluded that the consonant-vowel-consonant pattern of the three letter real and pronounceable nonsense words used in the study, was familiar to even first grade children even though they had had no instruction.

It was also concluded by Gibson and Levin that children acquire the ability to discriminate structure in strings of letters that involve quite complex conditional rules, and without explicit teaching, since studies showed such teaching to be rare.

Rubenstein, Lewis, and Rubenstein (1961), in a study reported by Gibson and Levin (*op.cit.*), named as 'phonemic

encoding' a process in which words could be identified, when seen but not heard. The study, which used adults, hypothesized that in such a process a

"search through the internal lexicon is carried out in the phonemic code."

(in Gibson and Levin  
op.cit., pp.205-206)

The similarities between this process and aspects of Bruner's theory of perception, discussed later in this chapter, will be readily apparent.

Meaning, as a factor in word recognition, was first specified by Cattell who suggested that meaningfulness was what made it possible to read whole words as units. This was how he explained the results of his studies. Gibson and Levin believe that meaning of a word, as a factor in word recognition, has become confused by awareness of the existence of other factors such as intraword redundancy and familiarity. Research into aspects of meaning and meaningfulness is itself complex. Summarised, it appears that it has been conclusively demonstrated that when words are meaningful to the reader the threshold for perception is lowered and speed of recognition is increased. Among studies which have demonstrated some aspects of this factor are those by Gibson, Bishop, Schiff and Smith, 1964; Kristofferson, 1957; Johnson and Zara, 1964; Riegel and Riegel, 1961; Spreen, Borkowski, and Benton, 1967; Paivio and O'Neill, 1970. All of these studies are reported by Gibson and Levin (op.cit.). Gibson and Levin conclude that the real effectiveness of meaning comes from the context of a sentence, and thus is an aspect not directly relevant to this discussion.

Another aspect of word recognition is that of imagery. Recently van der Veur (1975) demonstrated that some words could be learnt more quickly than others, and that learnability of words is predicted most strongly by the imagery of the words. Van der Veur produced a list of one thousand frequently used words which had been rated for imagery by adult readers. Many of these words were taught to young children whose ability to remember them was then tested.

From the results obtained van der Veur concluded that her findings could have considerable value in the teaching of reading because the words ranked most highly for imagery by adults proved to be significantly related to the children's ability to learn them. Unfortunately van der Veur has made no effort to relate imagery to the kinds of features involved. It is apparent that the children who participated in the study learnt to recognise the words using their own methods of analysing the features of the words, since their naming for the learner was the only form of assistance given.

Spache and Spache (1973) and Smith (1971) are in substantial agreement about the ways in which children learn to recognise words. Spache and Spache advise readers of their text on reading, to take time to observe the spontaneous efforts to identify words which are made every day by children in an average primary school classroom. Although they specify an American classroom, this author is confident an observer would see similar activities in New Zealand classrooms.

Smith (op.cit., p.146) says:

"It is a sobering thought that just about everything a child learns about word recognition is never explicitly taught. Among the many positive aspects of reading instruction—providing motivation, direction, answers, feedback—we cannot include provision of the rules by which the immediate identification of words is accomplished. We leave that part of learning to the child himself."

The matter of word recognition could be left at this point except that there has thus far been no consideration of the process by which a child may identify unknown or even known words. For an engaging explanation it is necessary to turn to the work of Jerome Bruner.

#### Bruner's Theory of Perceptual Readiness as it may apply to Word Recognition

Some measure of the way in which the feature-analytic theory may be operated by individual readers in the process of word recognition is contained in the Brunerian concept of 'perceptual readiness' which takes its name from Bruner's treatise, "On Perceptual Readiness" (1973).

Bruner advanced the view that perceptual readiness was the condition in which the human organism was ready to deal with stimulus inputs and to process them for the purpose of categorising them. In the case of word recognition the author believes Bruner's process could be somewhat akin to the process by which the reader analyses the features of a word as proposed by Smith. Bruner hypothesized the perceptual process as a series of decisions and sees the process of perception as a categorisation.

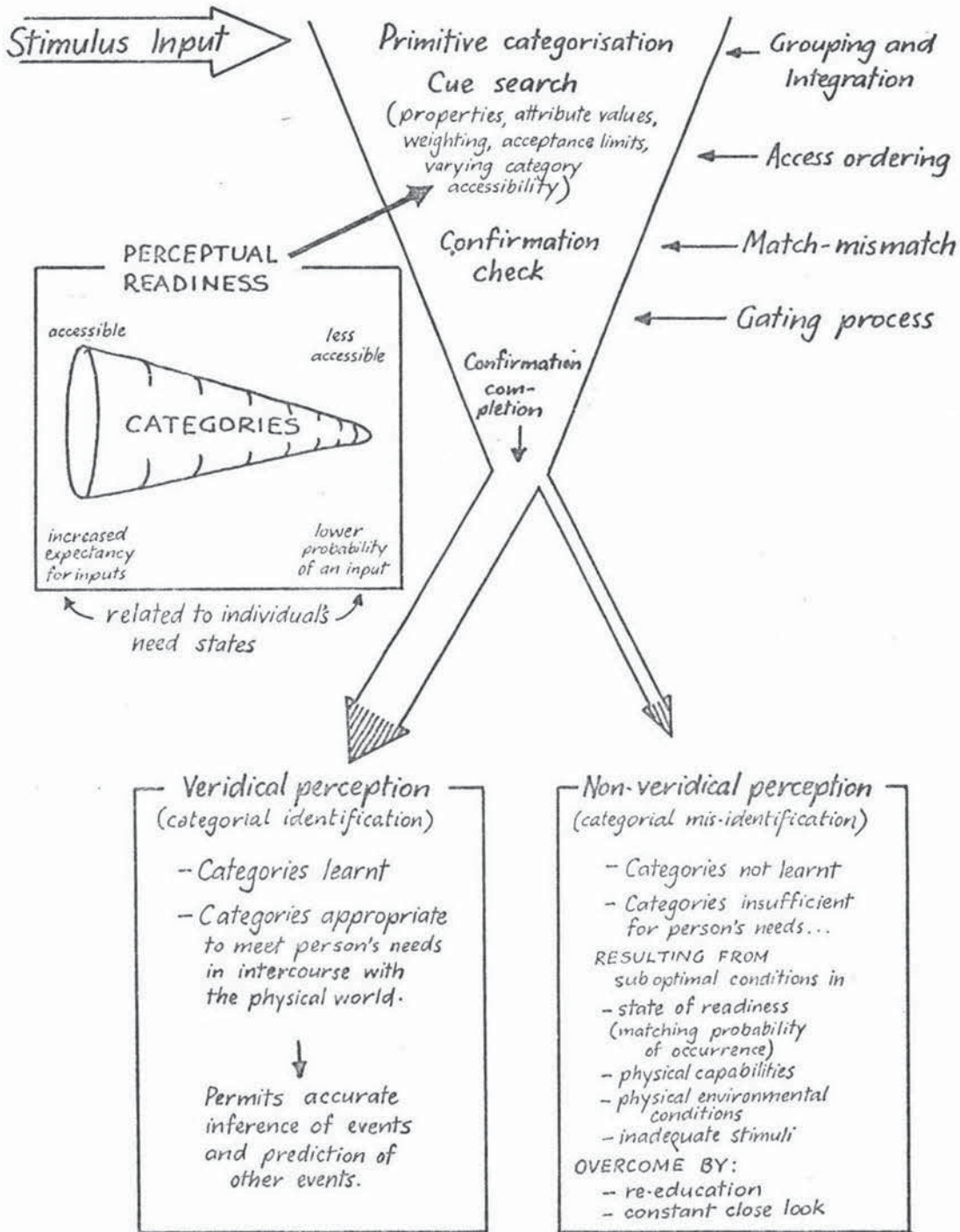
Reduced to a simplistic level Bruner's theory says that categorisation depends upon the individual having categories to meet the input of stimuli, and upon those categories being accessible. Bruner suggests that the relative accessibility of categories will depend upon the expectancies of the individual with regard to the likelihood of a particular stimulus being encountered. Within the reading process, word recognition of known words will be likely to be a function of the frequency with which a word has previously been met and read, as indicated in the work of Solomon and Postman (1952), reported by Gibson and Levin (op.cit.).

In word recognition it is likely that a child for example, becomes increasingly able to use categories in the perceptual process to permit word identification. This is if one presumes that growing knowledge of word recognition skills affords the reader more categories to which he may refer in attempting to identify and read words which are not immediately recognised. As Bruner explains it, where an input—here, a word—cannot be recognised almost instantly, a cue search is undertaken for known features of the word. This cue search is similar to the 'trial and check' process suggested by Woodworth (1947) and cited by Bruner in support of such a cue search. The 'complex features' previously discussed, together with Smith's feature-analytic theory, seem synonymous with, or closely related to, cue search.

Veridicality of perception, that is to say the accuracy with which stimulus inputs are categorised appropriately, depends upon the individual's knowledge of category systems. As Figure 1.1\* shows, if the categories have not been learnt

\*Figure 1 was developed by the author in order to visually present interrelated aspects of Bruner's theory of perceptual readiness.

PERCEPTION ~ a decision process - after Bruner



veridical perception, which equates to word identification, is not possible.

Access ordering in Bruner's theory is similar to the selection of the features of a word which contribute to its recognition, and the match-mismatch process to the method by which the inputs are gradually placed into narrower categories. The gating process filters out unwanted stimuli or features of a word which may not contribute anything to its identification.

The ability of the individual to carry out the perceptual process is acknowledged by Bruner to depend upon learning. It is thus limited by the extent of an individual's knowledge of categories. As has been stated by Smith and by Spache and Spache, much of what a child knows of word recognition is acquired by spontaneous effort, but as some of the research studies discussed earlier have found, there are certain features of words which can certainly be utilized to advantage, and which should perhaps be taught. Doubtless the continuing research effort will identify other features which should similarly be taught. For the present, where word recognition is concerned, a good deal would seem to rest with the ability of each individual child, to acquire knowledge of a growing range of categories, which is to say features of words.

## CHAPTER TWO

## WORD RECOGNITION TESTS: A BRIEF HISTORY OF SOME ASPECTS OF THEIR DEVELOPMENT AND USAGE, AND OF RECENT STUDIES TO RESTANDARDIZE THE BURT WORD READING TEST

General

Word recognition tests have been reported in use in the English-speaking countries of the British Isles, Canada, the United States, Australia and New Zealand. No accounts, or references to accounts of the use of word recognition tests in countries other than those named above, were located by this author.

Origin and Initial Use

Vernon, in his 1938 account of "The Standardisation of a Graded Word Reading Test" describes Burt's "Graded Word Reading Test" published in 1923 as

"one of the simplest and most useful of educational attainment tests ..." (p.9).

It also appears to have been the first word recognition test.

Burt himself had little to say about the origins or development of his "Handbook of Tests - For Use in Schools" (1923). He is content to note in the general instructions which precede the tests that:

"Of all the reading tests the graded vocabulary has the widest range. It is suitable for almost any child who has learnt to read; and, being both quick to administer and most suggestive in its applications, forms by far the best point at which to begin general testing." (p.ix)

Burt also reported (1947, p.271) that the words in his test

"were eventually selected as words which are read by approximately one half - between 40 per cent and 60 per cent - of the age group specified."

Vernon (1938) notes that:

"at first sight the Burt Test appears too short and simple to be reliable or valid." (p.9)

Vernon suggests that criticisms are ill-founded for the test had a very high coefficient of reliability. In reference to validity Vernon states (p.10) that he:

"discovered some time ago correlations of + .7 to + .8 between reading quotients and Burt - Stanford-Binet I.Qs,"

a discovery which a footnote records, he subsequently reported in the British Journal of Educational Psychology in 1937. It seems natural that Vernon should be impressed by such figures, as attainment testing in the pre-Second World War years was still in its relative infancy.

Vernon also expressed the opinion that the test was proven to be sound, in experiments with large numbers, and that because it was useful as an individual test for use by both teacher and psychologist, it possessed additional value. As a means of establishing initial rapport with a child, and in gauging the basic starting point in a subsequent Stanford-Binet test, Vernon also found the Burt Test useful. To add to the already noted advantages, he found he could make a preliminary diagnosis of a child's disability from its main types of errors. Unfortunately these types of errors are not elucidated. Vernon speculated that because the test correlated

"so well with measures of intelligence, it could be expected to agree even more highly with measures of other types of reading ability." (p.10)

### Developments

Although Vernon found Burt's Graded Word Reading Test so useful, valid and reliable, he was moved by the fact that Burt had standardised the test some twenty years earlier on London children, to attempt a restandardisation and an alternative version of the test, which would better reflect what he felt to be the more efficient Scottish teaching methods.

Vernon's restandardisation and rearrangement, completed in 1938, has not been rearranged since that time up until the last few years. At the time of the restandardisation in 1938, Vernon also produced his Graded Word Reading Test which he intended to cover the age range 5 years to adult. The Graded Word Reading Test does not appear to have come into popular usage

among teachers, and others such as psychologists, as no mention of its use been found.

In 1946 Schonell also produced a Graded Word Reading Test of words which were

"selected, after careful preliminary trials and testing ... from a much larger body of words." (1961, p.135).

This test has also been widely used but perhaps because of its higher initial starting level, is not so frequently used in New Zealand.

Shearer and Apps (1975) note that the Burt Test as rearranged by Vernon, and the Schonell Graded Word Reading Test continued to be widely used by teachers. Their views are supported by the Bullock Report (1975) which found that the Burt Test was used in one third of all primary schools and fifteen per cent of secondary schools in England. As is shown in the report of a preliminary study of the incidence in the Palmerston North area (see Chapter Three) it is much more widely used in that area than in England.

In the manual for the 1974 revision of the Burt Test, the Scottish Council for Educational Research states that:

"Evidence produced by many years of research has shown that criticisms sometimes made of the test have little weight." (p.1)

Shearer and Apps (op.cit.) suggest that users of both the Burt and Schonell Tests

"are well aware of the tests' shortcomings and of their failure to take account of a wide range of intermediate and higher order reading skills" (p.67)

and note that as measures of one important aspect of reading ability the tests have value because they are quick to administer, and reliable.

Fieldhouse (1952) produced an Oral Word Reading Test

"for use only with New Zealand children whose mother tongue is English ... it is not intended for use with other children such as Maoris, Chinese, Indians, and European immigrants." (p.2).

Perhaps because it excludes the racial groups noted above, together with its brevity - it comprises only 50 words - and its limited intended usage for children aged 7 to 11 years, it has never seemed to have gained wide and lasting acceptance.

#### USAGE

In the day-to-day practice of teaching, teachers persevere with the use of techniques and tests which they have found helpful and convenient. As Shearer and Apps (op.cit.) report, they are reluctant to abandon tests which they have found useful and for which they have built up their own fund of expectations and standards. It is the experience of the author from many administrations of the Burt Test that one acquires a good deal more than the mere score and equivalent Burt Reading Age.

Vernon alluded to the value of the test in enabling him to make

"a preliminary diagnosis of a child's disability"

and teachers in New Zealand have been actively encouraged by Education Department Reading Advisers to pay attention to possible clues to a child's difficulties which may be available from his method of attacking unfamiliar words or the nature of incorrect responses on the Burt Test. Teachers are cautioned by the same advisers to confirm such clues from the child's efforts in prose reading such as an informal prose test.

The English Bullock Committee found that about 30% of English primary schools used the Burt Test but only about 15% of secondary schools.

If the findings of the preliminary investigation reported in Chapter Three are indicative of the extent of use of the Burt in New Zealand, a considerably higher percentage of New Zealand primary schools may use the test in some way. It is felt likely, in the absence of information to the contrary, that greatest use would be made of the Burt in the lower standard classes where such use may reflect the greater difficulty which teachers experience in accurately assessing the instructional levels of children at the younger age levels.

#### Recent Studies Of The Burt Test

Although Shearer and Apps (1975), Andrews (1967), Linfoot

(1967) all report findings concerning the Schonell Graded Word Reading Test it is proposed to deal only with studies involving the Burt (Rearranged) Word Reading Test.

Four restandardisations or standardisations have been reported since 1970. As Andrews (1967) notes in some comments on the use of standardised word reading tests:

"Standardised tests should be restandardised from time to time, in order to take account of changes in school population, teaching method and emphasis in the curriculum." (p.176)

Andrews goes on to note the necessity of preserving a valid gradation of difficulty because it is basic to the accuracy of a test. His comments made especially in respect of Schonell's test are equally applicable to the Burt Test.

Vernon, was moved by the dissatisfaction of local psychologists with the existing norms of the Burt Test, to complete a restandardisation in the city of Calgary, in the Canadian province of Alberta. He is most particular to point out that the norms produced to form the restandardisation cannot be considered as suitable for use outside of Calgary, or even to the province of Alberta, let alone Canada.

The norms produced by Vernon were based on a sample of only 240 children—30 children per grade, 20 in junior high and 10 in senior high—and after some experimentation he finally used the median age of children obtaining any given score as the basis of his new reading ages. Vernon notes that the scores produced

"are considerably more lenient than those currently used by Calgary psychologists," (p.76, 1973)

but his reference to old norms is somewhat confusing as it is not clear to which norms he refers. Specifically he states that under the 'old norms' a score of 25 gained a Reading Age of 6 years but that on the new ones for Calgary it was equivalent to a Reading Age of 7.2 years.

Broadley and Broadley (1975) was a replication of Vernon's restandardisation and conducted in a rural county with a total school population of about 1500 pupils. The results of this study were similar to those of Vernon's except that the rural children were slower to begin reading and did not match the

children in Vernon's sample till about seven and a half years of age. This study used a sample of only 85 boys and 85 girls; 17 comprised the largest one year age range.

The study by Shearer and Apps (1975), by contrast with the previous two, was a large one, involving about 2,000 children from each of three socio-economic categories. Carried out in the County of Cheshire, all but a very small amount of testing was carried out by the head teachers of the schools involved. Significant changes in both the norms and difficulty order of the test words was reported with a mean shift of position of 4.3 places. Since only children up to eleven years were involved Shearer and Apps felt that the word order of the more difficult words may have been affected by the inclusion of older children in the sample.

A significant aspect of the Shearer and Apps study is their decision to limit the publishing of norms to 11 years and under. Acknowledging that the restandardisation process involving children of secondary age is a more complex process, they question the relevance of word recognition skills to the assessment of developing reading skills at such a level.

This question has relevance to all the studies since if word recognition is of greater importance for the younger age groups then the publishing of norms for the older groups may not be warranted.

A similar decision was taken by the Scottish Council for Research in Education in their restandardisation which produced the 1974 Revision of the Burt Test. In publishing norms for children only up to 12 years they have covered only the range of children in each of their seven primary levels.

The Scottish study, also a large one, involved about 2,200 children with testing being completed by the staff and students of the Colleges of Education. As with the other three studies reported here, some considerable changes in the order of difficulty of some of the words were noted. The size of the shift in order was from 0 to 28 places with 23 words, or about one fifth of the test total, shifting 8 places or more in order of difficulty.

The words which changed most in difficulty in the main are

the words also noted by Vernon and by Shearer and Apps as those altering most, though some local variations are apparent.

Andrews' (1967) concern that standardised tests should be restandardised from time to time is borne out by the considerable shifts in word difficulty noted in the foregoing studies. Those using the tests need to be reminded too of the validity and usefulness of those tests which have enduring value. This brief survey of other studies would seem to indicate that after 57 years of use the Burt Word Reading Test still has something of value to offer educators in widely spread parts of the British Commonwealth at least.

## CHAPTER THREE

## PRELIMINARY INVESTIGATIONS

Rationale

Following the author's decision to investigate whether a norming study of the Burt Test would be a suitable project, members of the staff of the New Zealand Council for Educational Research were approached for advice. It was expected that their collectively wide experience in the production of the Progressive Achievement Tests (1969) which initially probed reading attainments, coupled with their oversight, as test agents, of sales of Burt Test, would place them in the best position to gauge the extent of continuing use of the Burt Test by New Zealand teachers. The author wished to complete a useful study which might bring benefits to class room teachers.

Sales of the Burt Test over several years were limited and the New Zealand Council for Educational Research officials believed that use of the test was also limited. In addition they indicated that it was unlikely that any use was made of the Burt Test at the Intermediate School level. Because this seemed contrary to the experiences of the author as an Organiser (Special Classes) and his colleagues in the Palmerston North Office of the Psychological Service, it was decided to obtain more concrete evidence.

Survey of Use

Approval was obtained from the Wanganui Education Board to circularize all state primary and intermediate schools within a 15 mile radius of Palmerston North. The 15 mile figure was an arbitrary decision but designed to include a number of small rural schools, those in the larger centres of Feilding and Ashhurst, in addition to the urban schools of Palmerston North.

A list of 45 schools was compiled and a questionnaire (see Appendix I) developed. This questionnaire was directed only to the principals of the schools involved.

Aims of the Questionnaire

The primary aim of the questionnaire was: to establish the

extent of the use being made of the Burt Test.

The questionnaire also sought to establish the following points:

- a) the range of classes in which the Burt Test was used within each school;
- b) the type of form used;
- c) the reasons for which the test was used;
- d) the way in which the results were used, and
- e) opinions as to how research concerning the test could be helpful to schools.

#### Results of The Survey

36 schools, representing 80% of those to whom the questionnaire was sent, subsequently replied. Only two large urban area schools did not reply, the remaining non-respondents being smaller rural schools.

All schools indicated familiarity with the Burt Test and 33 schools (94%) said that it was used within their school. Only 2 schools (6%) said they did not use the test. One of these schools was a smaller (Grade V B) urban school, the other a small rural school.

TABLE 3.1

School Principals' Reports of Purposes For Which The Burt Test Was Used. (See Appendix 1 Question 8)

	<u>Responses</u>	<u>%</u>
A. For Formal Evaluation	14	40.0
B. Not for Formal Evaluation	18	51.4
C. No Indication (A or B)	3	8.6
	<u>N = 35</u>	
Other Purposes than Formal Evaluation	24	68.6

40% of the respondent schools stated that the Burt Test was used within their school for formal evaluative purposes. (See Table 3.1).

51% of the schools reported that they did not use the Burt Test for formal evaluative purposes, the remaining 9% giving no

indication.

Table 3.2 indicates that overall, in slightly more than 50% of most classes, the Burt Test was used.

TABLE 3.2  
Use of Burt Test By Classes As Indicated By School  
Principals

Schools Using In	Responses	% of Schools	No. of Schools
Upper Primers	15	46.8	32
Standard One	19	59.4	32
Standard Two	17	53.1	32
Standard Three	17	53.1	32
Standard Four	16	50.0	32
Form One	11	55.0	20*
Form Two	8	40.0	20

(\* Includes rural full primary schools)

Most schools (89%) indicated they used a copy of the standardised form of the Burt Test for testing while 60% also reported that a typewritten copy was used. (See Table 3.3).

TABLE 3.3  
Type of Burt Test Form In Use In Schools As Indicated By  
School Principals

	Responses	%
A. Using standardised form	31	88.6
B. Not using standardised form	3	8.6
No response A or B	1	2.8
C. Using typewritten copy	21	60.0
D. Not using typewritten copy	9	25.7
No response C or D	5	14.3

Approximately two-thirds of the schools (69%) reported that they used the Burt Test for purposes other than for formal

evaluation, primarily for assessing the instructional reading level of pupils. 37% replied that they believed the Burt Test's greatest value was when used for purposes other than formal evaluation or when it was used for assessing instructional levels. (See Table 3.1).

### Discussion of Results

Unfortunately this survey, conducted during November 1975, would have coincided with end of year school surveys, the preparation of pupils' reports, and a great many other administrative matters which principals may well have considered had greater priority than completing the survey. The staff at the New Zealand Council for Educational Research subsequently considered that the 80% response rate was very satisfactory.

The fact that an overwhelming majority of the respondent schools indicated the Burt Test was used by them suggested ample justification for a research exercise to establish normative data.

It was surprising to establish that such a large proportion (40%) used the Burt Test for formal evaluative purposes. The question which elicited this response was designed to indicate that formal evaluation implied use for the mid or end of year surveys of children's progress completed in all schools in accordance with the requirements of the Department of Education. The results of the surveys are recorded by teachers in the Register of Progress and Achievement (an official record of pupils' progress), which all teachers in primary and intermediate schools are required to maintain. The finding itself is surprising because the Burt Test has never been standardised or normed for use in New Zealand and thus there is no basis for relying upon the results obtained. Few teachers, in the experience of the writer or of his colleagues in the Department of Education's Psychological Service, have access to any set of administration instructions.

The data appearing in Table 3.2 must be interpreted cautiously. In the first instance each school's principal was asked to complete the questionnaire and while principals can be expected to have a good overview of the functioning of their schools it would be unrealistic to expect them to know precisely

for which purpose each and every teacher used the Burt Test, and how often they used it.

Secondly, the percentages of Form One and Two classes using the Burt Test are likely to be unreliable both for the previously stated reason and because the figures were not obtained from one large urban intermediate school. In addition there was no means of ascertaining from the questionnaire responses, which rural schools had or did not have Form One and Two pupils on their rolls.

Thirdly, in schools in which there are more than one class at any one class level, the true proportion of the classes at that level using the Burt Test is masked.

Although 89% of the schools indicated they used a copy of the standardised test form, (Table 3.3) 60% reported a typed copy being used. These figures suggest confusion either concerning what constitutes a standardised form or what the term 'standardised' implies. In any case the use of typewritten forms may not permit accurate results to be obtained. The possibility exists that typewritten forms are even used for the formal evaluative purposes. Such a use would represent a further factor which might call into question the validity of any scores so obtained.

TABLE 3.4  
Greatest Value of Burt Test As Reported By School  
Principals

	<u>Responses</u>	<u>%</u>
A Formal Evaluation	3	8.6
B Assessing Instructional Levels	16	45.7
Both A and B	12	34.3
No responses A or B	4	11.4
	<u>N = 35</u>	

While 40% of the schools indicated they used the Burt Test for formal evaluative purposes it is clear that the majority use the test to gauge pupils' instructional reading levels and

believe this represents the test's greatest value. (Table 3.4). While 46% believe assessing instructional levels is the greatest value only 9% believe this is true for formal evaluation. Just over a third believe that the Burt's greatest value is that it can be used for both purposes.

It is likely that because of the absence of normative data - and many principals commented upon this absence - because of the paucity of standardised administration instructions and because of the substantial number of typewritten forms of the test in use, that principals and teachers have not been able to make as much use of the test as is possible. The comments written by principals on the questionnaire indicate a reluctance to place too great (in some cases any) reliance upon a test, for which there has existed no normative data for New Zealand, but yet continues to be used because of the absence of alternatives.

#### Other Uses To Which The Burt Test Is Put

Although both the indications of use (Table 3.4) and the general comments included on the questionnaires by principals reveal that Burt Test results are used on their own by teachers and schools for grouping for instructional purposes, in most instances the principals indicated that Burt Test results are appraised in conjunction with some other form of assessment.

The principals often commented that Burt results were used as a backup to results obtained on the Progressive Achievement Tests (New Zealand Council for Educational Research, 1969) administered by schools to pupils from Standard One to Form Four each March. One principal said that he and his staff used the Burt Test as a further check on other results when they

"surprise us, e.g. were unexpectedly high or low."

A further frequently reported use was for checking word recognition skills or as part of the process of diagnosing reading difficulties. Several principals said that the Burt Test was useful as an indicator of the extent of a child's knowledge of basic sight words, while one principal identified specifically the first thirty words as an indicator of the extent of a child's basic sight vocabulary.

Several replies indicated that when children arrived at the

school part way through a year usually not accompanied by any indication of the level of current working, the Burt Test was administered

"as a quick guide for putting [them] into the correct reading level"

and noting,

"this is of course not a final decision."

Another comment indicated the use of the Burt in conjunction with a reading inventory, presumably a reference to an informal reading inventory as it is most commonly known.

Other schools reported that they use the Burt Test as an aid to selecting possible candidates for remedial reading and for later checking their progress. The use of the test both in February or March and later in November as an indication of progress over a school year was also reported.

One comment was to the effect that a child's performance showed his attitude to a difficult task. Although there is no research known to the writer which would validate such a use, the notion is one which may warrant further consideration. It is at least indicative of the thoughtful use to which the Burt Test may sometimes be put, or again the lack of alternative instruments to do what teachers want to do.

Among the uses reported were those which revealed possible misconceptions held by the writers. One principal indicated use of the Burt Test to indicate potential. The method by which this was to be gauged was not made clear. Another principal indicated that he used the test when individual children were ready to go up a level. Since the only reference to 'levels' in relation to reading, known to the writer, appears in the Manual for the Progressive Achievement Tests (New Zealand Council for Educational Research 1969, pp.10-11) and is unrelated to the use apparently implied, the principal's purpose is unclear.

#### How Might Research Be Useful?

As was to be expected from the questionnaire, comments regarding ways in which research on the Burt Test could be useful to the principals and their staffs, brought forth a variety of responses. The most common of these was a suggestion

that local or New Zealand norms were desirable possibly accompanied by a rearrangement of the order of the words since they did not appear appropriate to local children.

Other suggestions were that research might show how results gained from administration of the Burt Test might be related to instructional levels. One comment in particular epitomized this view -

"To allay doubts that you can accurately ascertain children's real progress in reading through the Burt."

Others indicate a desire for results they could apply with greater confidence.

Correlations with other means of assessing children's reading progress were also requested. Specifically mentioned were correlations with the Progressive Achievement Tests, the Schonell Word Reading Test, and the New Zealand Council for Educational Research Oral Word Reading Test (Fieldhouse).

Also suggested were indications as to the test's relevance to country children, the need for a revision of the administration instructions - because of wide variations in application and scoring the writer had observed in various schools - and general guidance to teachers as to its best use in schools.

Perhaps the overall attitude to the Burt Test and any research relating to it is best summed up by the desire of one principal to know

"if the time spent on using this test is worthwhile."

## CHAPTER FOUR

THE RESEARCH EXERCISE: AIMS, DEVELOPMENT OF THE  
RESEARCH FORMAT, RESEARCH DESIGN, PROCEDURES AND  
TECHNIQUES USED TO OBTAIN THE DATA, TRAINING OF  
TESTERSQuestions Raised

The following questions were raised as a basis for the research exercise:

- 1 Does the present format of the Burt (Rearranged) Word Reading Test sample the reading behaviour of New Zealand children in such a reliable and valid way that reading age levels obtained for the Burt correlate highly with reading levels obtained by other test instruments such as the Progressive Achievement Tests (New Zealand Council for Educational Research 1969)?
- 2 Are there any indications that rearrangement of the order of the test words is desirable due to changes in their degree of difficulty under current conditions?
- 3 Does it appear desirable that some words should be replaced in order to better reflect the frequency of usage of children's vocabulary at this time?
- 4 Does it appear that an entirely new test might yield more accurate assessments of children's reading levels?

Aims of the Research Exercise

From the initial questions raised the following aims were formulated:

- i) To obtain data from which normative scores could be computed, for the Burt (Rearranged) Word Reading Test.
- ii) From the information obtained in (i) above to reorder the words comprising the Burt Test should the data obtained indicate that the order as per Vernon (1938) Rearrangement was not in order of difficulty for local children.
- iii) To obtain the raw scores for each child to be tested in (i) above, for the Progressive Achievement Tests (New Zealand

Council for Educational Research 1969) in Reading Comprehension and Vocabulary (Form B) administered in March 1976, for the purpose of correlating this information with that obtained in (ii) on the previous page. In addition the following secondary aims were identified:

iv) To find what differences, if any, existed between the scores obtained on the Burt Test by

rural and urban children  
male and females  
age groups.

As the writer was unable to find any evidence that any normative data had ever been obtained for a New Zealand sample it was an additional objective that the projected research should meet any requirements which would enable it to be acceptable as a first step towards an eventual New Zealand standardisation of the Burt Test, should the results show this to be desirable.

#### Development of the Research Format

To ensure that the research exercise would be acceptable as outlined above, the staff of the New Zealand Council for Educational Research were kept informed throughout the planning stages and their advice sought on a number of matters.

Following initial correspondence with Dr Elley, the Assistant Director of New Zealand Council for Educational Research, and the completion of the preliminary survey outlined in Chapter Six, the writer was able to have an extensive conference with staff members of the New Zealand Council for Educational Research who were and are concerned with test development. This conference reviewed in detail the requirements regarding sample nature, size and selection, and the nature of the data required in order to obtain correlations between the Burt Test and the Progressive Achievement Tests of Reading Comprehension and Vocabulary.

Prior to the conference at New Zealand Council for Education Research, negotiations were conducted with the Practical Training Department at Palmerston North Teachers' College with a view to involving as testers for the research exercise, third year students who would be on their major six

week posting which would take place at the beginning of Term Two 1976.

The College authorities agreed that all students should complete the testing as a college requirement. When the first discussions were held it was expected that some 280 students would be involved.

Dr Elley and his colleagues at New Zealand Council for Educational Research agreed with the writer's proposal that the research exercise aim for a sample of 100 children per half year age group, and that since the preliminary survey (Chapter Three) had indicated widespread use of the Burt Test up to and including Form Two pupils, the age range to be covered should be from 6 years to 13 years and over.

It was agreed that the urban-rural distribution of the sample should match the proportion in the general population as indicated in the census data for the 1971 census.

The choice of schools it was recognised, would be beyond control since their involvement would of necessity depend upon the schools to which the third year students were posted. It was expected that this mode of school selection would likely be sufficient to constitute a randomized sample.

In order to ensure that the selection of the pupils would be of a random nature it was agreed that every third child on a class attendance register would be selected regardless of age or ability level. Such a method of selection would also ensure approximately even numbers of males and females being selected since the registers have separate groupings for boys and girls.

### Research Design

#### 1 Sample

The nature of the sample of schools in which subjects were selected depended upon those chosen as schools to which third year students at Palmerston North Teachers' College would be posted for their major posting, which was to commence on the first day of the second school term.

It was recognised that a substantial number of students were likely to be posted to infant classes in which few pupils would be above six years of age. The Practical Training

Department of the Teachers' College agreed to make available a posting list which set out the names of students and the school and class level to which they were being posted. From this list it was to be the writer's task to determine the approximate distribution by classes of the students and to then redirect the students posted to classes where pupils' ages were below the minimum age required for the sample, to carry out their testing in other classes.

Because such requirements were to depend upon the good offices of the schools and teachers concerned it was expected that some students would experience difficulties in meeting the requirement to complete the testing. Initially, therefore, the College authorities agreed that each student would be asked to test 12 pupils for the research exercise. They would also be asked to test a further 2 pupils who would be tested first, as practice subjects, but selected after the College student had first chosen the required subjects according to Sample Procedure criteria to be provided. (See Appendix 2).

## 2 Sample Selection Criteria

Each College student was instructed to adhere strictly to the stated procedure.

The first child to be selected was the pupil whose surname was first in alphabetical order after the student's own surname. This was intended to ensure a further element of randomness of selection. Having selected the first child, the student was then to select every third pupil for the sample, returning to the beginning of the alphabetical order where necessary, until the required number - 12 children - was obtained.

Sampling procedure instructions directed students to try to select the same number of boys as girls except where there was a marked disparity in the ratio of boys to girls in the class concerned. A procedure for continuing the selection where the class was of limited size was also set out (after Appendix 2). In addition, provision was also made for an alternative child to be selected, should a child at first selected subsequently become unavailable.

### 3 Anonymity

When approval to undertake the research exercise was sought from the Joint Committee on Research in Schools and the Wanganui Education Board, it was very properly pointed out by them that pupils' names should not be used.

As no decision had been made as to the possibility of randomized reliability checks on testers it was necessary to provide some basis for subsequent identification of subjects should this prove necessary. It was decided that anonymity could be preserved but yet some identification obtained if the christian or first name of each subject, together with the initial of their surname, was recorded.

Such a procedure had the added advantage of permitting a visual check that the Sampling Procedure criteria appeared to have been followed.

### 4 Individual Subject Details

In addition to the subject's christian or first name and surname, initial provision was made for the collection of other details considered essential to later statistical analysis.

Provision was made on a Test Recording Sheet (see Appendix 3) for recording the following details:

date of birth  
 date of testing  
 age  
 class  
 school  
 Progressive Achievement Test raw scores  
 for Reading Comprehension and  
 Vocabulary (Form B)  
 Progressive Achievement Test percentile  
 ranks for Reading Comprehension and  
 Vocabulary (Form B)

### 5 Recording Sheet

With a potential number of subjects exceeding 3,000 it was recognised that statistical analysis would present a major undertaking. Enquiries were therefore made regarding computer analysis of the data.

Staff at the Computer Unit at Massey University were asked

for their comments about a proposed recording sheet (similar to that in Appendix 3) and its suitability in permitting direct punching on to computer cards. No negative comments were received and the recording sheet as shown in Appendix 3 was confirmed as that to be used in the research exercise.

#### 6 Analysis of Data

At the same time as the suitability of the recording sheet was being considered, ways of analysing the data to be collected, were also examined. It was found that the data would be best processed on the Burroughs B6700 computer at the Massey Computer Unit with statistical analysis being completed under the Statistical Package for the Social Sciences (SPSS), (Massey University Computer Unit, undated). In order that such a procedure could be carried out it would first be necessary to have the data transferred to punched cards.

#### 7 Test Form

The form of the Burt Word Reading Test rearranged by Vernon (1938) and commonly known in the Palmerston North local area as either the Burt (Rearranged) Word Reading Test or the Burt-Vernon Word Reading Test was to be used to test all subjects. (See Appendix 8).

#### Training of Testers

As a major part of the third year students' course immediately preceding the end of the first term 1976, was given over to aspects of reading and in particular the assessment of reading achievement, together with diagnostic techniques related to remedial reading, it proved easy for the writer to conduct training sessions for the students, as prospective testers, within the framework of the course.

Two training sessions were held for two separate groups of students. Each session consisted of a one hour lecture type period followed by a further hour during which the students took part in seminar groups which usually developed the subject matter covered by the lecturer.

The students were informed using the advance organiser technique of presentation by Ausubel, in De Cecco, 1968) that at the end of the session they should:

- i) have some appreciation of the need for individual assessment of instructional needs in reading and how the Burt Test might be used as part of such an assessment
- ii) know why they had been asked to use the Burt Test to test a number of children during their forthcoming posting
- iii) know, how to go about gathering the necessary data and, about administering the Burt Test.

In the lecture sessions the writer gave a brief background to the Burt Test dealing with a little of its historical background and some of its more common uses - the assessment of reading levels and the diagnosis of word attack skill weaknesses. Brief mention was also made of other forms of reading assessment commonly employed by teachers, in order to show that a number of test instruments were available for teacher use depending upon what they wished to learn about a particular pupil.

The particular way in which the Burt Test was used as part of the process of determining a pupil's instructional reading level was explained, as was the hope that the research exercise results might give added support to the use of the Burt Test in that way. The limitations of the Burt Test, as far as the absence of norms and inappropriate order of the words, was explained as part of the rationale for the research exercise. It was the author's hope that the students might appreciate that the exercise should produce results which would lead teachers being able to use the test with increased confidence. By expressing these matters in this way it was hoped to increase student commitment to the exercise.

By means of an overhead projector transparency depicting a fictitious class roll the method of sample selection was illustrated.

The students were given practice in computing the age of pupils using the method to be applied in completing the Test Recording Sheet, since it had been the writer's experience, while employed by the Psychological Service, that this computation was often completed wrongly. In addition, this particular method in

which the year of birth and year of test are written on the left was likely to be difficult for those not familiar with such computations as completed in aspects of psychological assessment.

A further overhead projector transparency had been prepared showing a representation of the Test Recording Sheet. By means of two overlays this was used to demonstrate how the data should be recorded in the upper section, and how a pupil's responses, during administration of the test, should be recorded.

A reproduction of the Burt Test, also an overhead projector transparency, was also shown, in order to demonstrate the procedure by which the starting point for each subject was to be located.

While a full outline of the Administration Procedures (see Appendix 4) was made available to all students during the lecture theatre presentation, the following format was also presented by means of an overhead projector transparency (see Table 4.1) in order to emphasize a number of points.

The need to follow the same procedure with each pupil was emphasized and in this regard explanation of the meaning of the term 'standardised' was included. It was recommended to the students that they read the Administration Procedures (Appendix 4) more than once, in order to thoroughly familiarize themselves with the methods to be employed.

The methods<sup>for</sup>/determining the correctness or otherwise of the responses were dealt with in detail together with the question of correct pronunciations.

Students were instructed upon entering the school to which they were posted, to check with the Principal that they might have his permission to carry out the testing, and also to negotiate with their associate classroom teacher and obtain permission from them as well.

Where possible students were asked to select their sample and complete their two practice administrations of the Burt Test during their first two days on section. The testing which was to form the official part of the research exercise was to be delayed until after the first College Day.

TABLE 4.1

Lecture Summary For Testers' Training Session  
As Presented By Overhead Projector Transparency

---

## TESTING PROCEDURE

- Establish rapport
- Explain the task
- Find a starting point  
if over 9 years
- Give no help
- DO encourage
- Record either
  - TICK
  - WRONG RESPONSE
  - PARTIAL RESPONSE
- Keep Record Sheet from View
- Continue till TEN consecutive misses  
THEN ask child to look ahead

## WHEN TESTING COMPLETED

- RETURN
    - Recording Sheets (12)
    - Tester's Sheet
- in stamped addressed envelope.
-

Efforts were made to impress upon the students that the whole success of the research exercise, depended upon, getting the principal's approval and cooperation; in getting their associate teacher's approval of, and assistance with, the testing; maintaining accuracy in obtaining the data requested; and both accuracy and legibility in recording pupil responses.

### Seminar Session

Following the lecture theatre presentation the materials required for testing were distributed. Each student was given the following:

- a copy of the Burt Test form
- 15 Test Recording Sheets
- a Tester's Sheet (see Appendix 5)
- a sheet detailing the Sampling Procedure
- a letter from the writer (see Appendix 6)
- a stamped, addressed envelope for returning the Test Recording Sheets and Tester's Sheet

During the seminar session the writer was available to answer questions. It was also explained at this time that the writer would be available on the first "College Day" of the posting, in order to discuss any difficulties experienced by the students, or worries they might have in relation to the research exercise. (It was usual for students to return to the College on Wednesdays in order to maintain contact with their tutors and advisers).

### Exceptions to the Sample

As pointed out previously under "Research Design" as likely to be necessary, analysis of the classes to which the College students were posted was carried out. As a result, those students who had been posted to first year infant classes or to classes in which most pupils' ages did not come within the sample range, were redirected as follows:

- those students whose surnames began with letters A to P were to seek to test children in Standard One and Two classes
- those students whose surnames began with letters Q to Z were asked to test children in Standard Three classes

Some additional imbalances of numbers seemed likely in the youngest age group, i.e. 6 years to 6 years 5 months, and also at the Form One level. Accordingly students posted to primer classes in which there were a mixture of 5 and 6 year olds were asked to seek to test children just a little older. Those students posted to composite Form One and Two classes in Intermediate Schools were asked to try to test only Form One classes.

#### Time of Testing

The dates on which testing was carried out recorded on the Test Recording Sheets show that most students completed their part of the exercise during the first two weeks of their posting, i.e. between 27 May and 7 June. A smaller number completed the testing in the later part of their posting.

#### Collection of Completed Recording Sheets

Testers were instructed at their training session to return the completed Recording Sheets as soon as possible following testing, along with the Tester's Sheet. A stamped addressed envelope was provided for the return of this material but the last batches were not received until some weeks after the completion of the six weeks school posting of the students.

It proved impossible to accurately assess the number of students who completed the exercise. A number did not enclose a Tester's Sheet and some recording sheets arrived in larger batches representing the work of a number of students. Many recording sheets - some 500 to 600 - were not completed in sufficient detail to permit use and were discarded.

On receipt, the recording sheets were separated into rural and urban groups. They were then individually checked for the presence of necessary data, and age computations examined carefully for errors. The ways in which correct responses had been recorded were also checked closely to ensure that misunderstandings would be unlikely to occur once the sheets were sent for encoding prior to computer analysis.

#### Encoding the Data for Computer Analysis

The basic data for each subject was then converted to a common basis to permit computer analysis. Each recording sheet

was also assigned a subject number, but only for identification purposes in the event of encoded computer cards getting out of order or errors being found during verification.

A band across the upper part of the Recording Sheet enabled the subject number, the subject's sex, age and school class, rural or urban school classification, and raw scores on the Progressive Achievement Tests in Reading Comprehension and Vocabulary, to be recorded as converted from a descriptive or numerical form to an all numerical format.

The computer punch card operators were instructed to take note of correct responses to the Burt Test as indicated by ticks. Verification following initial punching was also requested and after the writer's receipt of the completed cards they were further checked visually. During this final checking the only errors found were those of faulty registration of the punched data. These were replaced with corrected cards.

It is assumed that so far as was humanly possible erroneous information had been eliminated prior to computer analysis.

## CHAPTER 5

THE SAMPLE: SCHOOLS AND PUPILS INVOLVED, AND  
URBAN-RURAL DEFINITIONSchools Involved in the Study

There are 147 schools in the Wanganui Education Board District. Data for the research project was obtained from pupils in 50 of these. In addition several schools in the Wellington Education Board District in the Levin area also came into the sample by reason of the College students involved as testers, being posted to classes in those schools. An arbitrary decision was made not to exclude these schools in order to maintain adequate numbers of pupils throughout the sample.

Table 5.1 shows a breakdown of the total number of schools in the Wanganui Education Board District. Each grade of school is listed along with the total number of schools of that grade in operation in Term One of the 1976 school year. The number of schools of each grade has further been expressed as a percentage for each grade of school involved in the sample and is included as evidence that a satisfactory coverage was made.

Examination of Table 5.1 shows that with the exception of Grade II, III and IV schools, the proportion of schools within the sample resembles in general, the distribution of schools within the education board area and thus that this may be considered representative.

Although only a small proportion of the total number of Grade II, III and IV schools was represented in the sample, the 25 Grade II schools in the Wanganui Board district had a total roll of only 362 pupils as at February 1976,\* the 39 Grade III schools had 1,396 pupils at the same time and the Grade IV schools a further 1,102 pupils. The 2,860 pupils in these grades of school represented only 12.24% of the 23,362 pupils in all grades of school in the Wanganui Education Board district at that time.

\*These figures were obtained from a breakdown of staffing and school roll numbers obtained from the District Senior Inspector of Schools, Wanganui Education Board.

TABLE 5.1

Grades And Numbers of Schools in the Wanganui  
Education Board District compared with Schools  
in the Research Sample

Schools in Board District			Schools in Sample		Schools in Sample
Grade of School	N	as % of total schools	N	as % of total sample	as % of all schools of each grade
II	25	17.01	3	6.0	12
III	39	26.53	6	12.0	15.38
IV A	16	10.9	2	4.0	12.5
IV B	6	4.08	3	6.0	50.0
IV C	5	3.4	-	-	-
V A	5	3.4	4	8.0	80.0
V B	5	3.4	3	6.0	60.0
V C	4	2.72	1	2.0	25.0
V D	4	2.72	2	4.0	50.0
VI A	6	4.08	4	8.0	66.66
VI B	8	5.44	4	8.0	50.0
VI C	5	3.4	5	10.0	100.0
VI D	1	0.78	1	2.0	100.0
VII A	5	3.4	4	8.0	80.0
VII B	4	2.72	3	6.0	75.0
VII C	1	0.68	-	-	-
VII F	5	3.4	4	8.0	80.00
VII G	1	0.68	1	2.0	100.0
VII H	2	1.36	-	-	-
	<u>147</u>	<u>100.00</u>	<u>50</u>	<u>100</u>	

In view of the fact that the population of any one of these schools (maximum roll 60 for Grade III schools, including children under 6 who were not included in the study sample) would have made it difficult for a student tester to select a truly random sample of pupils for testing, it is not considered that the small proportion of these schools included in the sample is likely to have influenced greatly, the overall nature of the sample. In this instance, precise data regarding the classification of pupils in non-sample schools was not available.

TABLE 5.2  
Urban/Rural Distribution of Schools in the Sample  
by Grade

	Urban	Rural	Total
II		3	3
III		6	6
IV A		2	2
IV B		3	3
V A		4	4
V B	3		3
V C		1	1
V D		2	2
VI A	2	2	4
VI B	4		4
VI C	3	2	5
VI D	1		1
VII A	4		4
VII B	3		3
VII F	4		4
VII G	1		1
	<u>25</u>	<u>25</u>	<u>50</u>

A breakdown of schools according to urban-rural status (see Table 5.2) has been included to give some idea of the type

of school from which children in the sample came. For further research it would be an advantage to include grade of school as a variable among the information collected for each subject, as a means of revealing the class levels and grades of school from which subjects come. This information, together with subject age, would permit additional controls over the nature of the sample, beyond those that were possible in the present study.

#### Pupils in the Sample

An attempt was made to determine in what way the research sample should be distributed, according to rural-urban distribution, before the study was begun.

The population statistics for the counties, urban areas and statistical divisions enumerated by the Department of Statistics in figures produced following the 1971 Census, were examined in order to determine what ratio of urban to rural children should be involved.

This exercise was complicated by the fact that the boundaries of the Wanganui Education Board district do not closely coincide with the statistical divisions set out by the Department of Statistics. As a result the figures used to calculate the ratio of urban to rural children required in the study sample could only be estimated on the basis of the figures extracted. Despite these difficulties it is believed that the resultant ratio is an accurate indication of the actual situation.

The Department of Statistics population figures from the 1971 Census (see Table 5.3) were taken by age groups from one to eight years since these were considered most likely to comprise the groups of children from which the study sample would be taken, given that it was undertaken in mid-1976, approximately five years after the Census, and that children aged 6-13 years would comprise the age groups from which the sample would be taken.

TABLE 5.3

Distribution of Population Aged 1-8 Years for  
the Palmerston North Statistical Division as  
Compiled During the 1971 Census

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Palmerston North Statistical Division

Ages	1	2	3	4	5	6	7	8	
Male	773	835	764	789	785	897	932	911	
Female	751	836	772	744	782	833	794	908	
Total	1524	1671	1536	1561	1567	1730	1726	1819	13,134

Palmerston North Urban Area

Ages	1	2	3	4	5	6	7	8	
Male	523	549	523	535	547	605	625	631	
Female	505	574	516	496	527	555	550	605	
Total	1028	1123	1039	1031	1074	1160	1175	1236	8,866

(extracted from 1971 Census of Population and Dwellings  
Supplement No.6)

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When the total population aged 1-8 years of the Palmerston North Urban Area is compared with that of the Palmerston North Statistical Division which comprises both urban and rural figures, a ratio of about 2 to 1, urban to rural, is obtained.

So as to be sure that the urban-rural ratio for the Palmerston North Statistical Division held good for the wider area likely to be covered during the research study, the population figures for all counties approximating the Wanganui Education Board District were examined. The statistics are shown in Table 5.4. They are shown in three age groups, i.e. 0-4 years, 5-9 years, 10-14 years as these are the groupings used by the Department of Statistics. The total population of children aged 0-14 in the counties and urban areas, 50,294, was then compared with the total found in Table 5.5, which comprises the urban population numbers for the same age groups, which was 29,386. Once again a ratio of close to 2 to 1 was obtained.

TABLE 5.4

Distribution of Population by Sex and Age Groups  
0-14 years in Counties in the Wanganui Education  
Board District

County		0-4	5-9	10-14
Waimarino	Male	320	272	280
	Female	304	318	279
	Total	624	590	559
Patea	Male	391	399	360
	Female	390	373	332
	Total	781	772	692
Waitotara	Male	1691	2007	2371
	Female	1680	1978	2143
	Total	3371	3985	4514
Wanganui	Male	197	192	181
	Female	188	178	141
	Total	385	370	322
Rangitikei (part)	Male	1350	1458	1243
	Female	1278	1442	1328
	Total	2628	2900	2571
Kiwitea	Male	143	131	88
	Female	116	132	82
	Total	259	263	170
Pohangina	Male	48	59	40
	Female	79	71	40
	Total	127	130	80
Oroua	Male	821	870	962
	Female	735	859	803
	Total	1556	1729	1765
Manawatu	Male	485	501	531
	Female	456	491	468
	Total	941	992	999
Kairanga	Male	2772	2990	2905
	Female	2675	2851	2716
	Total	5447	5841	5621
Age Group Total		15,419	17,572	17,303
All Groups				50,295

(Extracted from 1971 Census of Population and Dwellings.  
Supplement No.6)

TABLE 5.5

Distribution of Population 0-14 years, by Age Groups  
in Urban Areas within the Wanganui Education Board  
District

Area	0-4	5-9	10-14	
Feilding	999	1082	1174	
Wanganui City	3086	3634	4193	
Palmerston North City	4845	5268	5105	
	8930	9984	10,472	29,386

(Extracted from 1971 Census of Population and Dwellings  
 Supplement No.6)

Urban-Rural Definition

An arbitrary decision was taken to determine that those children attending schools in the Wanganui and Palmerston North city areas and Feilding and Levin boroughs would be classified as urban for the purposes of the research exercise. The usual Department of Statistics classifications of Urban Area, City, Borough, Independent Town District, County, and Country Town were felt to be too precise for the purposes of this study.

Added weight is given to this decision when the nature of school rolls is considered. In a number of areas, especially where intermediate schools are concerned in urban areas, an unknown number of pupils is transported daily to attend these schools. There are also instances, especially in the Feilding area where both primary and intermediate pupils are transported to Feilding schools from well beyond the borough boundaries.

The author presumes that there may be less difference between the characteristics of the rural and urban populations of the sample than is usually expected. While this point is speculative and no New Zealand studies are known which have investigated this aspect, it is suggested that television, the greater use of educational trips and visits, and the increased mobility of the population at large, may have reduced some of

the differences which may at one time have indicated that rural and urban populations be ascribed somewhat different sets of characteristics. The results of this study set out in the next chapters, tends to support the notion of little difference between urban and rural children. For the foregoing reasons it is felt that a ratio of 2 to 1 in favour of urban groups was adequate for this research study.

#### The Actual Research Sample

Although provision was made for a random selection of the actual sample as set out in Chapter Four subsequent events caused changes which will be explained.

In the beginning it was felt that the sample would depend upon the schools and classes to which the third-year College students who were to act as testers, were posted. Initially it was expected that 264 College students would be involved. This number was obtained from a roll of third-year students supplied by the Palmerston North Teachers' College.

Provision was made for checking the actual number of student testers who made returns of the Recording Sheets (Appendix 3) through the use of the Tester's Sheet (Appendix 5), however only 135 of these sheets were returned. In addition there were instances in which two and more students combined to return bundles of Recording Sheets. By a process of deduction based upon all the Recording Sheets returned, it was finally concluded that approximately 180 of the total 264 College students completed the testing and returned their batch of Recording Sheets.

Each batch of Recording Sheets was inspected upon receipt for an indication that the sampling procedure set out (see Appendix 2) had been adhered to. This checking was carried out by an inspection of the surname initial of each pupil tested, which was included on each Recording Sheet, and by ascertaining that the proportion of boys and girls was similar within each batch. No indications were found that the appropriate sampling procedure had not been applied by the College students in selecting pupils for testing.

From statistical analysis of the Recording Sheets, using the Burroughs 6700 computer and the Statistical Package for the

Social Sciences, the age and sex distributions of the research sample set out in Table 5.6 were found. The aim for a representative sample of 100 children per half year age group as set out in Chapter Four was achieved and bettered in 9 out of 15 age groups. It was within 10 of the achievement in a further three groups. Only in the 6 to 6 year 5 month, and 13 years and over groups, where only 42 and 55 pupils respectively formed part of the sample, was the number less adequate than was hoped for.

TABLE 5.6

Distribution of the Study Sample by Age Group, Sex and Urban-Rural Categories

Age	Boys	Girls	Total	Urban	Rural
6-6.5	23	19	42	30	12
6.6-6.11	43	50	93	57	36
7-7.5	73	72	145	107	38
7.6-7.11	80	72	152	111*	40*
8-8.5	63	65	128	91	37
8.6-8.11	58	47	105	71	34
9-9.5	67	79	146	109	37
9.6-9.11	96	86	182	132	50
10-10.5	65	55	120	98	22
10.6-10.11	71	75	146	94	52
11-11.5	48	45	83	63	30
11.6-11.11	59	39	98	51	47
12-12.5	55	55	110	59	51
12.6-12.11	49	33	82	46	36
13 and over	27	28	55	28	27
	<u>877</u>	<u>820</u>	<u>1697</u>	<u>1147*</u>	<u>549*</u>

(\*one case was recorded as missing data by the computer analysis)

While the overall urban-rural distribution as in Table 5.7 conforms to the desired ratio an inspection of the age group rural-urban numbers in Table 5.6 shows that there is some variation from this pattern. The most noticeable places where this occurs

are at the higher age groups, 11 years and above, which correspond to the intermediate school class levels, and as explained previously these categories would be likely to be ones affected by the transport of rural pupils to urban intermediates.

TABLE 5.7

Distribution of Study Sample by Urban and Rural categories and expressed as Percentages

Group	N	Percentage
Urban	1147	67.6
Rural	549	32.4
Total	1696	100.0

An analysis was also made of the pupil numbers in the sample by school class as shown in Table 5.8.

TABLE 5.8

Distribution of Study Sample by School Class

Primers	Std 1	Std 2	Std 3	Std 4	Form 1	Form 2	Total
164	306	219	328	283	193	204	1697

## CHAPTER SIX

RESULTS OF THE STUDY: NORMATIVE DATA, SCORES  
OBTAINED, URBAN-RURAL AND SEX DIFFERENCES IN  
SCORES AND SUGGESTED WORD ORDER CHANGESData Processing

For computer analysis the following variables were available:

sex  
age  
school class  
urban/rural  
Burt responses correct for each word  
P.A.T. Reading Comprehension - Raw Score  
P.A.T. Vocabulary - Raw Score

Results of the analysis concerning the nature of the sample have been reported in Chapter Five.

Normative Data

The principal objective of this study was to obtain norms for the Burt Test which would be applicable in the first instance to the area in which the study was carried out.

A summary of this data is shown in Table 6.1, while for ease of comparison the  $1 SE_m$  ranges for males, females and all pupils are shown in Table 6.2.

Scores in Ranges

The author decided that to quote Burt Test scores in a range related to each group would overcome an apparent tendency of teachers and others administering the test to place reliance upon small increases in total words known, (sometimes only one or two words). This practice ascribes a false precision to the scores. It also seemed more appropriate to relate a range of scores to an age group because this more nearly approximates the way in which reading levels are usually quoted on Informal Reading Inventories (New Zealand Department of Education, undated) and in the Progressive Achievement Tests.

TABLE 6.1  
Distribution of Mean Raw Scores for the Burt Test  
by Age Group and Sex and expressed as a Range within  
one Standard Error of Measurement

Age Group		Mean	Sd	SEm	Rounded SEm	Range withi- in SEm
6-6.5	Male	20.957	11.683	2.436	2	19-23
	Female	29.158	11.553	2.650	3	26-32
	Total	24.667	12.203	1.883	2	23-27
6.6-6.11	Male	24.698	14.126	2.157	2	23-27
	Female	28.700	12.941	1.830	2	27-31
	Total	26.849	13.586	1.409	1	25-28
7-7.5	Male	32.055	16.822	1.969	2	30-34
	Female	34.458	10.876	1.280	1	33-36
	Total	33.248	14.187	1.178	1	32-34
7.6-7.11	Male	36.238	15.218	1.701	2	35-28
	Female	40.833	11.743	1.384	1	39-42
	Total	38.414	13.831	1.122	1	37-40
8-8.5	Male	34.492	15.493	1.952	2	33-36
	Female	42.123	15.707	1.948	2	40-44
	Total	38.367	16.005	1.415	1	37-40
8.6-8.11	Male	42.328	19.914	2.615	3	40-45
	Female	50.894	17.072	2.490	2	48-53
	Total	46.162	19.094	1.863	2	44-48
9-9.5	Male	54.045	21.045	2.571	3	51-57
	Female	56.747	19.025	2.141	2	55-59
	Total	55.507	19.953	1.651	2	54-57
9.6-9.11	Male	54.438	20.854	2.128	2	52-57
	Female	56.547	18.915	2.095	2	54-59
	Total	55.434	19.935	1.478	1	54-57
10-10.5	Male	67.200	21.925	2.720	3	64-70
	Female	65.818	19.608	2.644	3	63-68
	Total	66.567	20.820	1.901	2	65-68

TABLE 6.1 cont'd

Age Group		Mean	Sd	SEm	Rounded	Range with- in SEm
10.6-10.11	Male	60.915	24.903	2.955	3	58-64
	Female	68.933	18.591	2.147	2	67-71
	Total	65.034	22.180	1.836	2	63-67
11-11.5	Male	71.250	22.636	3.267	3	68-75
	Female	72.956	19.868	2.962	3	70-76
	Total	72.075	21.244	2.203	2	70-74
11.6-11.11	Male	69.763	24.398	3.176	3	67-73
	Female	78.051	19.391	3.105	3	75-81
	Total	73.061	22.800	2.303	2	71-75
12-12.5	Male	76.309	23.333	3.146	3	73-79
	Female	80.091	19.006	2.563	3	78-73
	Total	78.200	21.267	2.028	2	76-80
12.6-12.11	Male	80.204	20.103	2.872	3	77-83
	Female	89.303	13.216	2.300	2	87-92
	Total	83.866	18.128	2.001	2	82-86
13+	Male	82.778	21.232	4.086	4	79-87
	Female	80.821	21.399	4.044	4	77-85
	Total	81.782	21.142	2.851	3	79-85

On the Progressive Achievement Tests (1969) teachers are cautioned against placing too great a reliance on a single test score.

For the mean scores produced for each sex in each age group, standard errors calculated, range from 1.122 to 4.086. In order to calculate ranges of scores for each age group, the standard error to three decimal places was added to and subtracted from the mean scores also to three decimal places. The resulting maximum and minimum figures were then rounded to give the ranges as shown in Table 6.1.

TABLE 6.2  
Burt Test scores quoted in Ranges of one Standard  
Error of Measurement and listed for ready comparison  
by Age Groups

	Males	Females	All
6 - 6.5	19-23	27-32	23-27
6.6 - 6.11	23-27	27-31	25-28
7 - 7.5	30-34	33-36	32-34
7.6 - 7.11	35-38	39-42	37-40
8 - 8.5	33-36	40-44	37-40
8.6 - 8.11	40-45	48-53	44-48
9 - 9.5	51-57	55-59	54-57
9.6 - 9.11	52-57	54-59	54-57
10 - 10.5	64-70	63-68	65-68
10.6 - 10.11	58-64	67-71	63-67
11 - 11.5	68-75	70-76	70-74
11.6 - 11.11	67-73	75-81	71-75
12 - 12.5	73-79	78-83	76-80
12.6 - 12.11	77-83	87-92	82-96
13+	79-87	77-85	79-85

#### Urban-Rural Differences

Overall, there are few differences in performance between rural and urban children.

The major differences in mean age group scores between urban and rural groups occur at the 6 year to 6 year 5 month level and levels above 11 year 6 months (see Table 6.3). The deficit at the younger level may be in part attributable to the limited number of rural children in the sample at this level, i.e. only 12 (see Table 5.6). If a similar difference was obtained with larger samples, further investigation of contributing factors would be warranted. A major factor may be the different organisational structure in a small rural schools, with composite classes and the constraints such organisation could place on teaching methods. Additional factors may include pre-school education, and teacher experience.

TABLE 6.3

Comparison of Mean Scores on the Burt Test gained  
by Rural and Urban children and expressed by Age  
Groups

Age Group	Urban	Rural	Rural Difference
6 - 6.5	26.200	20.833	- 5.367
6.6 - 6.11	26.877	26.806	- 0.071
7 - 7.5	33.533	32.447	- 1.086
7.6 - 7.11	37.874	39.975	+ 2.101
8 - 8.5	38.121	38.973	+ 0.852
8.6 - 8.11	45.549	47.441	+ 1.892
9 - 9.5	56.321	53.108	+ 3.213
9.6 - 9.11	55.386	55.560	+ 0.174
10 - 10.5	67.041	64.455	- 2.586
10.6 - 10.11	63.617	67.596	+ 3.979
11 - 11.5	71.746	72.767	+ 1.021
11.6 - 11.11	75.549	70.362	+ 5.187
12 - 12.5	81.898	73.922	- 7.976
12.6 - 12.11	86.848	80.056	- 6.792
13+	83.821	79.667	- 4.154

Regardless of these factors it is apparent that with a sample size of only 12, a representative group of pupils aged 6 years to 6 years 5 months could not have been obtained from the twenty five rural schools from which results were obtained.

Amongst the older children where there is an appreciable difference in mean scores among the upper four age groups, (refer Table 6.3) the likely reasons are less obvious but may reflect a different orientation to reading and more limited access to library books for example.

By contrast with the differences between urban and rural mean scores shown in Table 6.3, the comparison of the percentages of all urban and rural pupils who correctly recognised the test words, set out in Table 6.4, presents a somewhat different picture. For only very few words does the urban

TABLE 6.4

Comparison of Mean Scores obtained in the present study with scores for the same ages as computed by the original Burt formula.

to 99.7/99.8	is 99.2/99.1	he 96.2/97.8	of 96.8/96.5	up 99.6/99.5
for 98.9/98.2	an 92.2/93.4	of 90.1/92.3	his 94.1/94.4	or 89.7/91.1
sun 97.4/96.5	went 95.8/94.7	just 91.1/91.4	big 98.1/98.0	my 96.3/97.1
that 94.2/93.3	girl 97.3/97.3	day 96.1/96.7	pot 88.6/90.3	one 98.4/98.5
boys 93.6/94.9	no 86.3/88.5	water 91.3/91.1	some 94.9/94.4	told 89.5/89.3
wet 89.2/89.4	things 88.9/90.5	sad 85.3/86.3	carry 77.9/81.6	now 85.9/86.0
nurse 75.9/79.6	quickly 80.5/81.6	love 91.2/90.7	scramble 65.7/68.5	village 78.8/82.3
shelves 59.9/61.6	return 73.7/75.6	terror 59.6/60.8	known 62.3/66.5	journey 63.6/67.4
beware 77.4/80.1	twisted 63.8/67.4	luncheon 66.2/69.2	explorer 52.9/57.2	obtain 46.6/53.4
forge 55.5/60.3	steadiness 49.0/51.0	projecting 57.4/60.1	serious 50.7/54.5	commenced 39.5/43.0
scarcely 35.7/37.7	dominate 33.7/38.6	labourers 34.5/39.5	fringe 40.1/42.4	nourishment 40.7/44.8
belief 51.9/56.1	trudging 36.4/38.8	exhausted 34.4/38.4	formulate 37.3/41.5	overwhelmed 46.1/48.5
universal 41.0/41.0	circumstances 35.9/40.6	urge 30.7/33.5	destiny 33.0/35.5	glycerine 15.4/19.5
motionless 35.1/40.1	events 48.3/49.9	reputation 28.4/31.0	perambulating 16.8/20.8	melodrama 25.7/29.0
apprehend 28.1/31.7	ultimate 25.8/30.4	humanity 22.4/24.0	contemptuous 18.7/22.8	atmosphere 29.0/32.2
perpetual 17.4/21.7	theory 33.0/36.4	excessively 20.9/24.6	emergency 42.7/44.6	philosopher 18.7/21.5
autobiography 23.7/24.0	economy 27.8/29.3	binocular 23.7/27.0	fatigue 7.3/8.7	exorbitant 14.5/14.8
champagne 15.0/15.3	melancholy 8.6/10.4	physician 12.3/15.5	efficiency 14.5/18.2	influential 14.7/16.4
atrocious 13.7/12.9	terminology 19.4/22.6	mercenary 18.5/20.2	renown 17.4/17.3	refrigerator 38.7/42.8
encyclopaedia 32.8/35.9	constitutionally 11.2/10.7	unique 15.3/17.9	contagion 10.0/11.8	palpable 8.8/10.4
hypocritical 12.5/16.0	falacious 5.8/7.5	phlegmatic 7.1/8.4	microscopical 14.6/19.1	eccentricity 8.5/10.4
subtlety 1.6/1.1	alienate 5.8/5.3	ingratiating 3.1/3.3	paignancy 5.1/6.2	phthisis 3.9/4.2

percentage exceed that of the rural percentage even slightly, and for no words does the difference in favour of the urban group exceed 1 per cent. By contrast the rural percentage exceeds the urban percentage by 2 per cent or more for 52 of the 110 test words. This difference is most prevalent beyond the first 30 words of the test.

There are no indications of the reason for this phenomenon. Overall the results shown in Tables 6.3 and 6.4 point to the desirability of a more extensive review of urban-rural differences in reading attainment, at least in the Manawatu area.

TABLE 6.5  
Percentages of Correct Responses for each Burt Test  
word for Rural and Urban Groups

	By Original Formula	Mean in present study	Difference
6 - 6.5	23	24	+1
6.6 - 6.11	28	26	-2
7 - 7.5	33	33	0
7.6 - 7.11	38	38	0
8 - 8.5	43	38	-5
8.6 - 8.11	48	46	-2
9 - 9.5	53	55	+2
9.6 - 9.11	58	55	-3
10 - 10.5	63	66	+6
10.6 - 10.11	68	65	-3
11 - 11.5	73	72	-1
11.6 - 11.11	78	73	-5
12 - 12.5	83	78	-5
12.6 - 12.11	88	83	-5
13+	90+	81	-9

(The scores for the original formula were selected by choosing the median age within each age group in the present study, i.e. 6 years to 6 years 5 months has a rounded median age of 6 years 3 months and that for 6 years 6 months to 6 years 11 months is 6 years 9 months).

An examination of Table 6.5 reveals that overall, the age level scores on the Burt Test for the present study differ little from the scores which teachers would compute using the original Burt formula, of 4 years plus the raw score of total words, divided by 10 to give a Reading Age (Burt, 1948, p.x).

#### Methods of Establishing a New Word Order

A summary of the responses obtained is set out in Table 6.6. In order to greatly simplify reference to the words of the Burt Test, a replica of the relevant section of the Recording Sheet has been used with the total correct responses inserted in the appropriate places.

It is clear from an inspection of the totals that a number of words are markedly out of order of difficulty, but this is a crude measure of difficulty order since the responses of all age groups are combined.

The 1974 revision of the Burt Word Reading Test which was carried out by the Scottish Council for Research in Education, also found that

"it was easy to demonstrate that the order of difficulty of some of the words had changed over the years." (p.12)

The Council reports that deciding the criterion for determining the new order was far less straight forward. The manual for the 1974 Revision states that

"the relative difficulty of the words depended on the ages of the children reading." (p.12)

Eventually the Council decided to order the words according to their apparent difficulty for the group of children

"for whom they were mainly relevant." (p.12).

However this reason for re-ordering the words is imprecise since 'mainly relevant' is not defined and the problem is not satisfactorily resolved by the explanation that the first thirteen words were ordered based on the performance of Primary One pupils from Scottish schools included in the revision sample, or that words 14-19 were ordered by considering the performance of Primary Two children.

TABLE 6.6

Total frequency of Correct Responses for each word of the Burt Test in the present study.

to	1692	is	1683	he	1641	at	1641	up	1689
for	1674	an	1572	of	1542	his	1598	or	1530
sun	1648	went	1620	just	1548	big	1664	my	1638
that	1594	girl	1651	day	1634	put	1513	one	1671
boys	1596	no	1477	water	1548	some	1608	told	1517
wet	1514	things	1518	sad	1453	carry	1343	now	1458
nurse	1308	quickly	1372	love	1545	scramble	1130	village	1357
shelves	1025	return	1260	terror	1018	known	1081	journey	1099
beware	1329	twisted	1102	luncheon	1140	explorer	921	obtain	827
forgue	968	steadiness	842	projecting	988	serious	880	commenced	689
scarcely	616	domineer	599	labourers	613	fringe	693	nourishment	713
belief	903	trudging	630	exhausted	606	formulate	656	overwhelmed	795
universal	695	circumstances	635	urge	536	destiny	574	glycerine	284
motionless	623	events	828	reputation	496	perambulating	307	melodrama	454
apprehend	501	ultimate	463	humanity	387	contemptuous	340	atmosphere	510
perpetual	319	theory	578	excessively	375	emergency	735	philosopher	333
autobiography	404	economy	480	binocular	420	fatigue	132	exorbitant	247
champagne	256	melancholy	156	physician	226	efficiency	266	influential	259
atrocious	228	terminology	346	mercenary	323	renown	295	refrigerator	679
encyclopaedia	573	constitutionally	187	unique	273	contagion	180	palpable	158
hypocritical	231	fallacious	107	phlegmatic	127	microscopical	272	eccentricity	155
subtlety	24	alienate	96	ingratiating	53	poignancy	93	phthisis	68

Reference to Vernon's (1938) report of his restandardisation of Burt's test is hardly more helpful, since he was introducing many new words for consideration, in an effort to reproduce Burt's original format in which each group of ten words constituted a one year increment of progress in word recognition. Vernon details a process by which he determined the age level for each word, at which 50 per cent of the pupils in his sample correctly read it.

Shearer and Apps (1975), reporting a study of the Burt (Vernon rearrangement) conducted in the Cheshire County of England in 1971, note merely that reordering appeared desirable but that they had been unable to obtain permission from the publishers to proceed.

Other studies by Vernon (1973) and Broadley and Broadley (1975) cannot be used as reference points because of methodological differences in their studies, but the changes in order of difficulty of the Burt Test words in these studies appears to have been based on total responses correct.

Two methods were used in the present study to obtain revised orders. In the first instance the total frequency of correct responses for each word was used to produce the revised order set out in Table 6.7. In Table 6.8 the words were ordered after the percentage of correct responses for each word for each age group was examined. For the easier words, i.e. the first 15 words, percentages of correct responses ranged upwards from 71 per cent for 'some' to 100 per cent for 'to' in the 6 year to 6 year 5 month group. From the first fifteen words onwards the order was decided by the point at which about 50 to 60 per cent of the responses were correct at the lowest age group. In many cases it was necessary to make arbitrary decisions since the percentage of correct responses was sometimes lower at a higher age group. To illustrate this point 46.1 per cent of the 6 year 6 month to 7 year 11 month age group knew 'scramble' but only 41.4 per cent of the 8 year to 8 year 5 month group knew the same word.

Further inspection of the array of percentages correct for each age group showed that for many words there appeared to be a "threshold" or point at which there was a sudden marked

TABLE 6.7

A suggested New Order of Word Difficulty for the Burt Test based on the total frequency of correct responses obtained in the present study, including the number of places each word would change in position.

to	0	is	+3	he	-1	of	+2	up	+15
for	+8	an	+10	of	+3	his	-6	or	-6
sun	+4	went	+6	just	-1	big	+10	my	-6
that	+5	girl	-1	day	-11	pot	-6	one	+6
boys	+12	of	-14	water	-13	some	+3	told	0
wet	0	things	-8	sad	-6	carry	+1	now	-2
nurse	+1	quickly	+3	love	-6	scramble	+7	village	-4
shelves	+1	return	+6	terror	-6	known	+3	journey	0
beware	-2	twisted	-6	luncheon	-5	explorer	+4	obtain	+1
tongue	-2	steadiness	+9	projecting	+1	serious	-2	commenced	+17
explorer	-2	belief	+9	serious	+1	steadiness	-2	events	+17
scarcely	-6	domineer	+8	labourers	+26	fringe	+1	nourishment	+6
belief	-2	trudging	-7	exhausted	+37	formulate	0	circumstances	+2
universal	-6	circumstances	+4	urge	-12	labourers	-11	glycerine	-7
motionless	-14	events	+10	reputation	-6	perambulating	+27	melodrama	-7
domineer	-14	theory	+10	destiny	-6	encyclopaedia	+27	urge	-7
apprehend	+4	ultimate	-1	humanity	-5	contemptuous	+8	atmosphere	-3
atmosphere	+4	apprehend	-1	reputation	-5	economy	+8	ultimate	-3
perpetual	-6	theory	+6	excessively	+3	humanity	-6	philosopher	-2
melodrama	-6	binocular	+6	autobiography	+3	humanity	-6	excessively	-2
autobiography	+10	economy	-8	binocular	-3	fatigue	+9	exorbitant	-9
terminology	+10	contemptuous	-8	philosopher	-3	mercenary	+9	perceptual	-9
champagne	-17	melancholy	+7	physician	-23	efficiency	+9	influential	+14
perambulating	-17	renown	+7	glycerine	-23	unique	+9	microscopical	+14
atrocious	-2	terminology	-2	mercenary	-7	renown	-9	refrigerator	+6
efficiency	-2	influential	-2	champagne	-7	exorbitant	-9	hypocritical	+6
encyclopaedia	-5	constitutionally	-9	unique	-1	contagion	0	palpable	0
atrocious	-5	physician	-9	constitutionally	-1	contagion	0	palpable	0
hypocritical	-14	fallacious	+3	phlegmatic	-19	microscopical	-1	eccentricity	-3
melancholy	-14	eccentricity	+3	fatigue	-19	phlegmatic	-1	fallacious	-3
subtlety	+1	alienate	+2	ingratiating	+2	poignancy	-1	phthisis	-4
alienate	+1	poignancy	+2	phthisis	+2	ingratiating	-1	subtlety	-4

TABLE 6.8

An Alternative Order of Word Difficulty for the Burt Test generated by the present study, including the number of places each word would change in position.

to	0	is	+3	he	-1	at	+2	up	+15
for	+8	an	-4	of	+3	his	+8	or	-6
big		he		sun		girl		at	
sun	+4	went	+6	just	-1	big	+10	my	-6
my		day		went		some		his	
that	+5	girl	-1	day	-11	pot	+4	one	-7
boys		that		an		water		just	
boys	+12	no	-14	water	+3	some	-14	told	+2
love		of		wet		or		things	
wet	-1	things	-8	sod	-6	carry	-1	now	0
told		pot		no		sad		now	
nurse	+1	quickly	+3	love	-4	scramble	+7	village	-4
quickly		village		carry		beware		nurse	
shelves	+1	return	+6	terror	-4	known	+3	journey	0
return		luncheon		scramble		twisted		journey	
beware	-2	twisted	-6	luncheon	-5	explorer	+4	obtain	+1
known		shelves		terror		projecting		tongue	
tongue	-2	steadiness	+9	projecting	+1	serious	-2	commenced	+17
explorer		belief		serious		steadiness		events	
scarcely	-6	domineer	+8	labourers	+26	fringe	+1	nourishment	+6
obtain		overwhelmed		emergency		nourishment		universal	
belief	-2	trudging	-7	exhausted	+37	formulate	0	overwhelmed	+2
fringe		commenced		refrigerator		formulate		circumstances	
universal	+5	circumstances	-5	urge	-12	astiny	-11	glycerine	-7
motionless		trudging		scarcely		labourers		exhausted	
motionless	-14	events	+10	reputation	-6	perambulating	+27	melodrama	-7
domineer		theory		destiny		encyclopaedia		urge	
apprehend	+4	ultimate	-1	humanity	-5	contemptuous	+8	atmosphere	-3
atmosphere		apprehend		reputation		economy		ultimate	
perpetual	-6	theory	+6	excessively	+3	emergency	-6	philosopher	-2
melodrama		binocular		autobiography		humanity		excessively	
autobiography	+10	economy	-8	binocular	-3	fatigue	+9	exorbitant	-20
terminology		contemptuous		philosopher		mercenary		glycerine	
champagne	+12	melancholy	+17	physician	-12	efficiency	0	influential	0
unique		microscopical		perpetual		efficiency		influential	
atrocious	-22	terminology	+2	mercenary	-5	renown	-8	refrigerator	-10
perambulating		renown		physician		champagne		exorbitant	
encyclopaedia	+5	constitutionally	-6	unique	-1	contagion	0	palpable	0
hypocritical		atrocious		constitutionally		contagion		palpable	
hypocritical	-14	fallacious	+3	phlegmatic	-19	microscopical	-1	eccentricity	-3
melancholy		eccentricity		fatigue		phlegmatic		fallacious	
subtlety	+1	alienate	+2	ingratiating	+2	poignancy	-1	phthisis	-4
alienate		poignancy		phthisis		ingratiating		subtlety	

increase in the percentage of an age group responding correctly to a particular word. For 'scramble' for example, the 8 year 6 months to 8 year 11 months age group were 61.9 per cent correct. This represents a 15.8 per cent increase from the next youngest group noted above.

Once these two revisions of the word order were completed (Tables 6.7 and 6.8) a comparison of the extent of the changes in word order as compared with Vernon's (1938) rearrangement, was made. No substantial differences were found, and the order of words in Table 6.8 varied only in few instances from that of Table 6.7. The method of arriving at Table 6.8, based on the percentages of age groups giving correct responses, seems more likely to match the actual test performance of children, because the order of the more difficult words should be related to the performance of those children within whose recognition vocabulary the words are likely to be, and amongst whom they are likely to discriminate best.

No attempt was made to group the words in the way Burt or Vernon chose groups of ten words to relate to the performance of a particular age level, since it was apparent from the mean scores obtained for all age groups (see Table 6.1) that groups of words of a particular and consistent size could not be found from the results of this study. Further, as Vernon (1938) in his restandardization tested the discriminative nature of many new words, he was able to reject words which did not discriminate well, i.e. at or about the 50 per cent level (Anastasi, 1968, p.164), in order to get groupings of ten.

#### A Suggested New Order of Words Arranged According to Difficulty

It is considered that the order of words in Table 6.8 is the order which would be most suitable for use in any future attempt to produce New Zealand norms or complete a New Zealand restandardisation.

The average movement of words based on the revised order suggested in Table 6.8 is 6.3 places. This compares with an average shift of 4 places reported by Shearer and Apps (1975) in whose study the range of shift of position was from 0 to 28 places. In the present study the range was from 0 to 37 places.

The Scottish Council for Research in Education (1976) reported that in their revision of the Burt, a shift in position of 8 places was equivalent to  $9\frac{1}{2}$  months of reading age and that of 25 places was  $2\frac{1}{2}$  years. Similar means of assessing the value of shifts found in the present study have not been assessed because of the unevenness of the increase in means by age groups.

TABLE 6.9

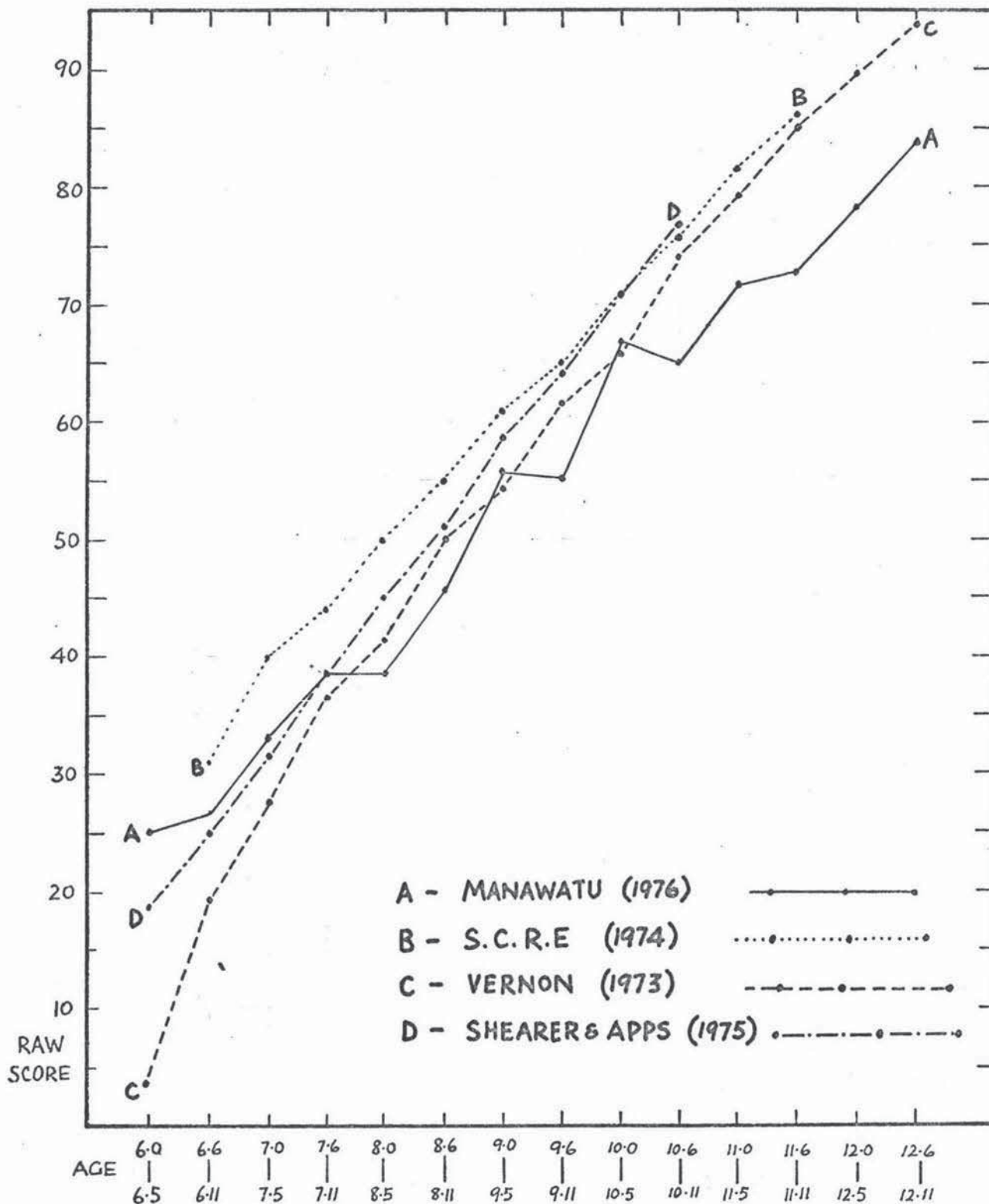
Shifts in Word Order as per Table 6.8 for those words whose indicated shift is seven places or more

Upward Movement (Easier)		Downward Movement (Harder)	
refrigerator	+ 37	perambulating	- 22
encyclopaedia	+ 27	glycerine	- 20
emergency	+ 26	fatigue	- 19
events	+ 17	melancholy	- 14
microscopical	+ 17	or	- 14
one	+ 15	domineer	- 14
love	+ 12	of	- 14
unique	+ 12	scarcely	- 12
some	+ 10	perpetual	- 12
theory	+ 10	an	- 11
terminology	+ 10	labourers	- 11
belief	+ 9	exorbitant	- 10
mercenary	+ 9	pot	- 8
big	+ 8	contemptuous	- 8
girl	+ 8	champagne	- 8
overwhelmed	+ 8	just	- 7
economy	+ 8	commenced	- 7
beware	+ 7	exhausted	- 7
		urge	- 7

Table 6.9 lists the words which made the greatest shifts of position together with extent of the shift upwards or downwards. By comparison with the first thirty words of the

TABLE 6.10

A Graph Depicting The Burt Test Scores Gained by Children in Four Recent Studies.



NOTE: The Study A scores are the mean score for each age group. For the other studies (B, C and D) the score for the age which is equivalent to the median age of the Study A age groups was taken.

revised order resulting from the Scottish study (1976) the order in Table 6.8 shows variations of from 0-12 places and a mean variation of 3.2 places.

This brief comparison is enough to suggest that the order of words from the Scottish study may not be applicable to New Zealand children. It further suggests that with very young children a similar situation to that which gave rise to concern about the difficulty order of the version of the test currently in use, applies to the revised form of the Burt Test published following the Scottish study.

#### A Comparison of Age Group Mean Scores in Present Study With Those Obtained in Other Studies

The graph in Table 6.10 compares the levels of performance of children in the present study with studies conducted by Broadley and Broadley (County of Newell, 1974), Vernon (Calgary, 1973), Shearer and Apps (Cheshire, 1975) and the Scottish Council for Research in Education (Scotland, 1976).

While the scores obtained in the present study, in general match those of other studies quite closely up to about 9 years of age, there is a noticeable and steady falling behind of local scores from that point on.

The Scottish study did not report scores below 6 years 4 months, at which point they are almost identical with the overall local scores; the County of Newell study scores begin from 6 years 7 months; and those of the Cheshire study do not go above 11 years.

## CHAPTER SEVEN

## CORRELATIONAL RESULTS: COMPARISONS OF BURT TEST SCORES WITH SCORES ON THE PROGRESSIVE ACHIEVEMENT TESTS OF READING COMPREHENSION AND VOCABULARY, WITH SOME IMPLICATIONS FOR TEACHERS

Correlations Obtained in the Study and their Significance

The third major objective of the research study was the gathering of raw scores for the Progressive Achievement Tests (New Zealand Council for Educational Research 1969) of Reading Comprehension and Vocabulary for as many pupils as possible, in order to calculate correlations with Burt Test scores.

In many cases it was not possible to collect the P.A.T. raw scores as the test papers had not been retained. In other cases the magnitude of the task of converting dozens of percentile rank scores, also collected, into raw scores was not considered to be warranted at this stage.

Pupils of most schools classified Standard Two to Form Four, sit the Progressive Achievement Tests of Reading Comprehension and Vocabulary about the first week of March in every year. Pupils taking the Progressive Achievement Tests begin at a point in the tests determined by their school classification. In order to obtain correlations therefore, the pupils were grouped by school class. The Pearson Product-Moment Method as used in the SPSS programme, was used to produce the correlations shown in Tables 7.1 to 7.6.

All correlations were significant at the 0.001 level. In all instances correlations for Burt scores with P.A.T. Vocabulary were higher than for Burt scores with P.A.T. Reading Comprehension.

For the correlation between all pupils for whom P.A.T. Reading Comprehension scores were available and their Burt scores a correlation of 0.69 was obtained. For Burt scores and P.A.T. Vocabulary a correlation of 0.83 was obtained. (see Table 7.1).

TABLE 7.1

Correlations for All Pupils for Burt Test scores with P.A.T. scores for Reading Comprehension and Vocabulary (Form B)

Scores Correlated	Correlation	N	P
Burt/P.A.T. Reading Comp.	0.6915	995	0.001
Burt/P.A.T. Vocabulary	0.8305	992	0.001

TABLE 7.2

Correlations for Burt Test scores with P.A.T. scores for Reading Comprehension and Vocabulary (Form B), by School Class

Class	P.A.T.Comp	N	P	P.A.T.Vocab	N	P
Std 2	0.7154	170	0.001	0.7935	168	0.001
Std 3	0.7106	272	0.001	0.7883	272	0.001
Std 4	0.7057	255	0.001	0.8306	253	0.001
Form 1	0.6869	137	0.001	0.7604	137	0.001
Form 2	0.5440	159	0.001	0.6995	160	0.001

TABLE 7.3

Correlations for Burt Test scores with P.A.T. scores for Reading Comprehension and Vocabulary (Form B) by Sex

Sex	P.A.T.Comp	N	P	P.A.T.Vocab	N	P
Boys	0.6992	502	0.001	0.8380	503	0.001
Girls	0.6788	493	0.001	0.8200	489	0.001

TABLE 7.4

Correlations for Burt Test scores with P.A.T. scores  
for Reading Comprehension and Vocabulary (Form B) by  
School Class and Sex

Class	Sex	P.A.T.Comp	N	P	P.A.T.Vocab	N	P
Std 2	Boys	0.6785	80	0.001	0.7751	79	0.001
	Girls	0.7235	90	0.001	0.7931	89	0.001
Std 3	Boys	0.6470	132	0.001	0.7563	133	0.001
	Girls	0.7678	140	0.001	0.8216	139	0.001
Std 4	Boys	0.7043	130	0.001	0.8674	130	0.001
	Girls	0.7107	125	0.001	0.7634	123	0.001
Form 1	Boys	0.6550	75	0.001	0.7453	76	0.001
	Girls	0.7272	62	0.001	0.7773	61	0.001
Form 2	Boys	0.5948	84	0.001	0.7281	84	0.001
	Girls	0.4644	75	0.001	0.6646	76	0.001

The correlations in Table 7.4 compare favourably with a correlation between the Burt Test and P.A.T. Reading Comprehension (Form B) of .76. This correlation was obtained for a sample of only 33 Standard Two children

TABLE 7.5

Correlations for Burt Test scores with P.A.T. scores  
for Reading Comprehension and Vocabulary (Form B) for  
All Pupils by Urban and Rural Groups

Group	P.A.T.Comp	N	P	P.A.T.Vocab	N	P
URBAN Pupils	0.6996	662	0.001	0.8360	657	0.001
RURAL Pupils	0.6803	333	0.001	0.8195	335	0.001

TABLE 7.6  
Correlations for Burt Test scores with P.A.T. scores  
for Reading Comprehension and Vocabulary (Form B) by  
Urban and Rural Groups and School Class

Class	Group	P.A.T.Comp	N	P	P.A.T.Vocab	N	P
Std 2	Urban	0.7313	129	0.001	0.8109	126	0.001
	Rural	0.5040	41	0.001	0.7073	42	0.001
Std 3	Urban	0.7271	200	0.001	0.7839	200	0.001
	Rural	0.5664	72	0.001	0.8032	72	0.001
Std 4	Urban	0.7282	196	0.001	0.8471	195	0.001
	Rural	0.6064	59	0.001	0.7618	58	0.001
Form 1	Urban	0.6609	51	0.001	0.7709	50	0.001
	Rural	0.7059	86	0.001	0.7610	87	0.001
Form 2	Urban	0.5512	86	0.001	0.7186	86	0.001
	Rural	0.5228	73	0.001	0.6764	74	0.001

#### Some Implications for Teachers

The preliminary study conducted to establish the incidence of use of the Burt Test (see Chapter Three) indicated that teachers often used Burt Test results as a means of finding a child's instructional reading level.

The Teacher's Manual for the Progressive Achievement Tests N.Z.C.E.R. 1969) states (p.12) that the tests of Reading Comprehension and Vocabulary give level scores which

"provide a useful guide to the teacher who is interested in placing the child's achievement on a developmental scale."

These level scores are age level related and the Manual provides teachers with the necessary information to gauge the appropriate age level.

The Burt Test scores obtained in this study for which similar age levels are stated (see Chapter Six), have been shown in Tables 7.1 to 7.7 to correlate at significant levels for all groups and categories, with the P.A.T. scores. As a result teachers would be justified in placing some reliance upon the Burt scores they obtain, as an indication of a child's

instructional reading level, but with certain cautions.

Teachers need to beware of placing too great a reliance upon the single score from the Burt but should look for additional indicators of the child's instructional reading level. Given the particular age group range for which a score on the Burt in this study has been shown to be related, the best check is likely to be to have the pupil read from an Informal Prose Inventory. Such a method has been recommended both by the New Zealand Department of Education (1972) and by the same department's Curriculum Division in an undated booklet prepared for teachers and entitled "An Informal Prose Test." This booklet states that the Progressive Achievement Tests (N.Z.C.E.R. 1969)

"help to broadly determine present reading levels but do not adequately assess individual children's ability to understand what is read, use of spoken language or ability to attack strange words." (p.1)

A similar criticism could be levelled at the Burt Test taken alone except for the fact that it may give some indication of a child's ability to attack unknown words. The Burt Test samples a small but important aspect of reading behaviour, therefore it is sensible for teachers to use it as a quick and easy means of establishing a child's instructional level where no other recent data is available, and prior to administering an informal prose test.

Teachers, at least in the area in which the norms in this study were developed, should be confident that a Burt Test score they can obtain from a pupil at any time of the year, will provide an accurate indication of a child's instructional reading level.

Since correlations between the Burt Test and Progressive Achievement Tests are highly significant any marked discrepancies in performance by individual children on these tests should point to the desirability of further investigation.

## CHAPTER EIGHT

## CONCLUSIONS, AND SUGGESTIONS FOR FURTHER RESEARCH

Conclusions in Respect of Questions Raised as a Basis for the Research Exercise

- Prior to the commencement of the research exercise several questions were posed that the exercise might help to resolve. (Chapter Four). Conclusions reached were:
- i) It appears that the Burt Test does sample the reading behaviour of children in the Manawatu in a valid way. The significant correlations obtained constitute the basis for this statement. No effort was made during the present study to determine reliability since the difficulty order of the Burt Test words was shown to be inappropriate.
  - ii) There were very strong indications that a rearrangement of the word order is desirable, the mean shift in word difficulty order being apparently higher than that recorded for other recent studies. The suggested alternative word order (Table 6.8) would be best tried in a pilot study prior to an exercise to complete a New Zealand standardisation in order <sup>that</sup> such a standardisation be based on a word order it was not intended to alter further.
  - iii) The words in Vernon's 1938 rearrangement of the Burt Test which is commonly used in schools in the Manawatu area, appear to discriminate extremely well among the children tested. Although no attempt was made to determine the range of individual scores within each age group the total frequency figures obtained for the final ten words (refer Table 6.6) suggest that even the better readers in the oldest age groups may have been extended in reading them.
  - iv) On the basis of the results obtained there is no indication that an entirely new test would yield more accurate assessments of children's reading levels. Since the original question failed to specify a word reading test of word recognition skill the implications are broader than was intended. The conclusion however remains the same since such satisfactory correlations were obtained between Burt Test

scores and those of the Progressive Achievement Tests. It is anticipated that if an endeavour to produce a New Zealand standardisation for the Burt Test proceeds, and if similar data is gathered, even higher correlations might be obtained if the standardisation was completed on a previously revised word order.

### Suggestions for Further Research

#### A New Zealand Standardisation of the Burt Test.

##### i) Importance of such a Standardisation.

It is essential to have a standardised word reading test. Whatever the Progressive Achievement Tests of the New Zealand Council for Educational Research (1969) or other reading tests tell teachers about New Zealand children's reading, it is a fact that word recognition is still a primary and major component skill (Williams, 1970) and that without adequate word recognition skill a child's reading will be inadequate. It is for this reason that teachers must have access to a test which can objectively check how a child's word recognition skills are developing.

The quickness with which a Burt Test may be administered, together with its apparently enduring popularity, dictate that a New Zealand standardisation should be completed at an early date, in order to provide teachers with New Zealand norms. Such a project should have high priority. In addition any standardisation of the Burt Test must be regularly restandardised in order to maintain teacher confidence.

##### ii) Standardisation Procedure in a New Zealand Restandardisation.

In recent overseas studies a revised word difficulty order and new norms were produced in one research exercise. The author believes that such methodology is open to question, a view which was endorsed by staff members of the New Zealand Council for Educational Research when the author first

approached the Council's staff for advice.

Where marked changes in word difficulty occur---marked changes have been present in all recent overseas studies---this factor may be expected to exert a marked influence on the norms obtained. The inappropriate difficulty order of the words may deter some children from continuing their best efforts when they meet difficulties too early.

B     An Investigation of Urban-Rural Differences as they Influence Standardised Test Scores.

As the situation at present exists in New Zealand it is expected that differences will exist between urban and rural groups. It appears to be traditional to break up samples into urban-rural categories without adequate knowledge of the variables which operate in New Zealand conditions.

A discussion in Chapter Six postulated that in respect of the present Burt Test study, school organisation may have contributed to the youngest rural children gaining lower scores than their urban counterparts. A further discussion in Chapter Five suggested that urban-rural differences may have declined to the point where they were unlikely to be exerting a significant influence. The similarities of children's experiences, and especially the nature of their exposures to the media, may be the key to reduced urban-rural differences, if indeed there has been a reduction.

C     Consideration of the Ways in Which Learning - Especially in Reading and Specifically in Word Recognition - Differs Between Urban and Rural Groups of Children.

It is suggested that insufficient is known about differences in the form that teaching/learning takes in rural and urban schools. This is especially true in the small rural schools in which one teacher may have to teach a number of distinct class levels.

D     Research to Examine the Methods by which Teachers Establish the Instructional Reading Level of Individual Children.

During the course of the present study it came to notice that some teachers used the Burt Test to establish a child's instructional reading level. The Department of Education was reported, in two instances (in Chapter Six) as advising teachers to follow a Burt Test with an informal prose test to establish the instructional reading level.

The author believes that the practice of teachers of relying upon a Burt Test alone to establish an instructional reading level is most unwise, and that some hard evidence of the methods used to establish instructional levels is urgently needed. Such evidence would be extremely helpful in supporting efforts to ensure that the most appropriate methods were used. It has been the author's experience, and that of colleagues in the Department of Education Psychological Service, that individuals are often not assigned to appropriate instructional levels, with one result, that referral to the Psychological Service may later become necessary.

E     An Examination of the Methods Used by Schools to Determine Reading Achievements During the Mandatory Half Yearly Surveys.

All State primary and intermediate schools are required by Department of Education regulation to carry out mid-year and end-of-year surveys of pupils' progress and achievements and report to parents. The process is an internal procedure whereby schools are meant to review the work of children as facilitated by the teachers.

The preliminary investigation reported in Chapter Three that some school principals used the Burt Test during the half yearly surveys as a check on achievement. Since the Burt Test assesses skill in word recognition of single words it appears to be singularly inappropriate and inadequate for such a purpose. The author feels that a research study which examined the methods by which schools determine reading

achievements would produce hard evidence of current practices and lead to a discussion of the assessment methods which were the most desirable. At this point no suggestion is being made as to the most desirable.

BURT RECOGNITION TEST QUESTIONNAIRE

SCHOOL: \_\_\_\_\_

GRADE:

(Please tick the appropriate boxes).

1. Are you familiar with the Burt Word Recognition Test? YES  NO
2. Is the Burt Word Recognition Test used in your school? YES  NO
3. Is it used as part of the school's formal evaluation programme? (e.g. to gauge reading attainment at mid or end-of-year). YES  NO
4. If it is used, for what class or classes?

Upper Primers	<input type="checkbox"/>		S4	<input type="checkbox"/>
S1	<input type="checkbox"/>		F1	<input type="checkbox"/>
S2	<input type="checkbox"/>		F2	<input type="checkbox"/>
S3	<input type="checkbox"/>			

5. Do you use a copy of the standardised form? YES  NO
6. Do you use a typewritten form of the test? YES  NO
7. If the Burt Test is not used for formal evaluation is it used for any other purposes, by one or more teachers to assess instructional level? YES  NO
8. What do you consider the Burt Test's greatest value in your school?
  - a) FORMAL EVALUATION
  - b) ASSESSMENT OF INSTRUCTIONAL LEVELS
  - c) Both a) and b) of EQUAL VALUE
  - d) OTHER VALUE (please specify)

9. Are there any other purposes or occasions on which it is used?

10. In what way(s) could research on the Burt Test be useful to you and your staff?

\_\_\_\_\_ PRINCIPAL

BURT WORD READING TEST STANDARDISATIONSAMPLING PROCEDURE

In order to choose the children to test please adhere to the following procedure STRICTLY.

1. In the class to which you are posted, select as follows:  
The first child should be the individual whose surname is first after your own in alphabetical order. Having selected the first pupil you should now select every third pupil for the sample, returning to the beginning of the alphabetical order, where necessary to obtain the required number - ie. 12 children.
2. Try to select the same number of boys as girls except where there is a marked disparity in the ratio of boys to girls in the class concerned.
3. Where necessary if every third pupil has been selected before you obtain the required number of subjects; begin from the first selected pupil, choose the very next child and then every third child until you have a sufficient number.
4. Select the children for your sample before you select your practice subjects.
5. If you have been posted to a class in which there are either few or no children who have reached six years of age, in consultation with the principal of the school and with the cooperation of the class teacher, arrange to test children from a class to which no student teacher has been posted. Use the same method for determining your subjects as outlined in steps 1-4 above.
6. If, having selected the children to test, it is not subsequently possible to test one of them, select the child next in alphabetical order, after the child who is unavailable.

E M Eggers

**BURT** REARRANGED  
WORD READING TEST  
MANAWATU STANDARDIZATION  
June 1976

BOY GIRL RURAL URBAN

DATE OF TEST	YEAR	MONTH	DAY
DATE OF BIRTH			
AGE			

Name: ..... FIRST ..... SURNAME INITIAL ..... Class: .....  
School: ..... P.A.T. RDG. COMP. P.A.T. VOCAB.

RAW SCORE	<input type="checkbox"/>	P.R.	<input type="checkbox"/>
RAW SCORE	<input type="checkbox"/>	P.R.	<input type="checkbox"/>

SUBJECT NO.	CARD	SEX	URBAN/RURAL	AGE	P.A.T. COMP.	P.A.T. VOCAB	CLASS
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
1 - 4	5	6	7	8 - 9	10 - 11	12 - 13	14 - 15
to	is	he	at	up			
for	an	of	his	or			
sun	went	just	big	my			
that	girl	day	pot	one			
boys	no	water	some	fold			
wet	things	sad	carry	now			
nurse	quickly	love	scramble	village			
shelves	return	terror	known	journey			
beware	twisted	luncheon	explorer	obtain			
tongue	steadiness	projecting	serious	commenced			
scarcely	domineer	labourers	fringe	nourishment			
belief	trudging	exhausted	formulate	overwhelmed			
universal	circumstances	urge	destiny	glycerine			
12 motionless	events	reputation	perambulating	melodrama			
apprehend	ultimate	humanity	contemptuous	atmosphere			
perpetual	theory	excessively	emergency	philosopher			
autobiography	economy	binocular	fatigue	exorbitant			
champagne	melancholy	physician	efficiency	influential			
atrocious	terminology	mercenary	renown	refrigerator			
encyclopaedia	constitutionally	unique	contagion	palpable			
hypocritical	fallacious	phlegmatic	microscopical	eccentricity			
subtlety	alienate	ingratiating	poignancy	phthisis			

BURT WORD READING TEST  
(Vernon Rearrangement)

ADMINISTRATION PROCEDURES

A. Surroundings

Testing should preferably be carried out in a place which is relatively quiet and free from distraction.

B. Co-operation

Try to ensure that the child is at ease through engaging him in conversation prior to testing. The word "test" need not be mentioned, in fact it should be avoided, nor any suggestion made regarding its difficulty. The child should be encouraged throughout, and his efforts praised - words such as "fine", "good effort" are appropriate.

A suitable introduction, once the child is at ease, might be -  
"I want to see how well you can read these words to me."

C. Procedure

THESE INSTRUCTIONS SHOULD BE ADHERED TO STRICTLY.

1. No coaching or prompting of any kind should be given prior to, or during, testing. The child should be allowed to read at his own speed, and by his own method, and no help or suggestions should be given.

Should the child read too quickly for his responses to be recorded, he may be asked, preferably at the end of a line to slow down. He might also be asked to "read that line again", if you are unable to keep up in recording.

2. The child's original responses should be accepted, but spontaneous corrections should be allowed.

3. The child should not be told whether his responses are correct or not - if he asks, only general encouragement should be given, ie. "you're doing just fine."

4. The tester's record sheet should be kept out of sight, and the recording of responses should be inaudible. The child might change his mind and produce the correct pronunciation if he felt his first attempt was wrong - if the tester audibly echoed the response, or the sight of a wrong response or series of them was gained. (A clipboard would be suitable for concealing the Recording Sheet).

5. If necessary, the child should be encouraged to guess, particularly if he seems nervous or lacking in confidence, or reluctant to attempt words of which he is not completely sure. But the child must only be asked to repeat a response if it was genuinely unclear. This should only be done by asking the child to "read that line again please", when the end of a line has been reached. In this way the child gets no cue as to a possible error.

## 2.

6. Only recognized pronunciations should be accepted. Some variations in accent may be present, especially if the child is not of local heritage, and these should be allowed for in deciding on the correctness or otherwise of responses. (The Oxford Dictionary is the accepted source of standard pronunciations).

If a word is pronounced fragmentarily it must then be pronounced as a whole without prompting.

7. No variations from the words as they appear on the test sheet - for example, plurals or past participles - should be accepted.

8. Children aged less than nine years, or known to be poor readers, should begin at the first word. Older children should be asked to read the first word of each line until they make an error. They should then be taken back to the first word in the pair of lines preceding the error, and if they read correctly all ten words in this pair of lines, they should be credited with success on all earlier words. If any error was made in this pair of lines, they should be asked to read the preceding pair, and so on until a pair was read without error, and then be credited with the earlier words.

9. Testing should be continued until ten consecutive words are failed (or no response given), and the child should then be encouraged to look ahead beyond this point, and should be credited for any additional words read correctly.

#### D. RECORDING

1. (a) Keep the record sheet covered from the view of the pupil being tested.
- (b) Record a tick for every correct response.
- (c) Write each incorrect response and where beginning sounds or consonant blends are audible without the remainder of a word, these should also be recorded. (Later examination may provide indications of skills shown).
- (d) If the response does not bear resemblance to any known word, spell it phonetically. It is not necessary to use a formal phonetic method. (A capital letter for a long vowel sound is useful, e.g. 'rate' is 'rAt').

2. Other information required is as follows:

- (a) Child's name
- (b) Class
- (c) Sex
- (d) Age - note that if the small grid is filled in and the date of birth is subtracted from the date of testing, an age in years and months is obtained. Disregard any odd days over.

#### E. COMPUTATION OF READING LEVEL

- (a) Divide the total of words known by 10.
- (b) Add 4.
- (c) Adjust any decimal fraction to fit into a 12 month year pattern if desired. e.g. 6.9 yrs becomes 6yrs 11mths.

3.

NOTE: It is probably better to think of a reading level in say a 6 month range as otherwise a false precision is given to the test result.

E M Eggers  
Psychological Service  
1977

BURT TEST STANDARDISATIONTESTERS SHEET

STUDENT: \_\_\_\_\_ SCHOOL: \_\_\_\_\_

Please feel free to comment or not do so about any of the following.  
DO return this sheet with Name and School entered.

- 1) Was it necessary to depart from the Instructions for selecting the sample or Administration of the test?
  
- 2) Did you experience any particular difficulties?
  
- 3) Does your Associate make use of the Burt Test? For what purposes? (Comment ONLY with your Associate's approval).
  
- 4) Any other comments?

E M Eggers

Dear Student

BURT WORD READING TEST STANDARDISATION

I know very well as an ex-Associate teacher that you have a great deal to do for your major Third Year posting.

I am delighted to have you working with me on this project, and I am confident that together we will achieve something worthwhile as a contribution to teachers and teaching in the near future. Hopefully this contribution may be for all New Zealand teachers who wish to make use of what results we may get.

You will be amongst those who will receive the benefits from this project. Your enthusiasm and I hope conviction that this venture is worthwhile will help ensure its success. Please feel free to approach me in order to discuss any problems or worries you may have in connection with this project.

I can be contacted during the day at:

Psychological Service  
164 Broadway Avenue  
Palmerston North                      Phone 83-026

or if need be at home:

5 Ellesmere Crescent  
Palmerston North                      Phone 82-826

During the time you are involved with the testing for this project, and other data gathering, you may be made aware of the views of your Associate regarding the usefulness of this test and ways it may be used or could in future be used once it is standardised. Comments you may care to include when you return the Recording Sheets would be most appreciated.

At this stage I cannot foresee when the results of this project will be available but the findings will be published and made freely available to all teachers and interested persons.

Thank you for your help and co-operation. Without it this project could not have been successfully carried out on such a scale.

Sincerely

*Edwin M Eggers*

Edwin M Eggers

c/- Psychological Service  
Box 1154  
PALMERSTON NORTH

The Principal

Dear Sir/Madam

During the major third year posting of students from Palmerston North Teachers' College, in the second term, they will be assisting me to complete a standardisation of the Burt (Rearranged) Word Reading Test.

One or more students having been posted to your school, I write to ask if you will assist them in every way possible to complete something which I believe to be extremely worthwhile and potentially valuable to all teachers, and of course children. From the reactions I have received as the results of correspondence with Dr Warwick Elley and Mr Colin Cowie of NZCER, I believe they share this view.

In order that you should be completely in the picture here are some additional details which may be both informative and of interest.

The teaching of reading and especially the selection of instructional reading materials at appropriate levels of difficulty, have been major interests which I have developed in the last few years, and are interests which have heightened since I moved to my present position as an Organiser of Special Classes with the Psychological Service.

It has been apparent that many teachers have at some stage used a Burt Reading Age as a guide to instructional level so one aim of the standardisation will be to attempt to evaluate the validity of such a practice.

Since it is believed by others that a Burt Reading Age is but a start to finding an instructional level; and that an informal reading inventory incorporating material previously assessed for instructional level by using a readability formula such as the Elley Noun Count is the next step; it is hoped to consider this aspect also by collecting results of testing done this year in PAT Reading Comprehension and Vocabulary, and correlating them.

The level of difficulty of the PAT Reading Comprehension passages was originally assessed using the Elley Noun Count so an attempt to show a high correlation between the Burt and the PAT Reading Comprehension, if successful, may lead to teachers being able to rely on Burt results in beginning to establish instructional levels.

A major difficulty with PAT results has been that they are of greatest value only around the time of testing, since the progress of individual pupils may be rapid beyond this point especially if subsequent teaching is linked to the results. For the Burt Test this problem does not exist since, because the Reading Age produced is an indication of the typical performance of children of any given age, test performance may be age level related at any time of the year.

2.

YOUR STUDENT/S TASK

... The student/s posted to your school will have been instructed in the administration of the Burt Word Reading Test and the "Administration Instructions" (a sample of which accompany this letter) were the basis of that instruction. In case any of you are familiar with the original form of the administration procedure, I should mention that some changes have been made in order to make the testing easier and to lead to a simple but more useful method of recording responses. This in turn should make the statistical processes to which the results will be subject, less time-consuming.

Each student is to locate two or three pupils on whom to carry out practice administrations of the test. It is hoped that these will be completed in the first two days of the posting in order that, where necessary, any difficulties can be discussed on the first Wednesday when students return for College Day.

Where a student is unable to get sufficient pupils to test (at least 12 are required and, two or three pupils for practice testing) from the class to which they are posted, I hope it will be possible for them to arrange with you to carry out testing on pupils from another class. This will be especially true where a student is posted to a primer class with few children who have reached six years of age. Such students will have been asked to see if they can arrange to test pupils at a particular class level in order to balance as evenly as possible the range and numbers of pupils who are being tested.

Students have been given full instructions for selecting the pupils for testing and asked to adhere strictly to the procedure set down.

Finally, this project has been approved by Joint Committee on Research in Schools and the District Senior Inspectors of Schools in all Board areas concerned, ie. Wanganui, Wellington, Hawkes Bay. I hope you will give permission for the student/s to complete this section of the project within your school.

Thank you for your support.

*E M Eggers*

E M Eggers

enc.

to is he at up

for an of his or

sun went just big my

that girl day pot one

boys no water some told

wet things sad carry now

nurse quickly love scramble village

shelves return terror known journey

beware twisted luncheon explorer obtain  
tongue steadiness projecting serious commencedscarcely domineer labourers fringe nourishment  
belief trudging exhausted formulate overwhelmeduniversal circumstances urge destiny glycerine  
motionless events reputation perambulating melodramaapprehend ultimate humanity contemptuous atmosphere  
perpetual theory excessively emergency philosopherautobiography economy binocular fatigue exorbitant  
champagne melancholy physician efficiency influentialatrocious terminology mercenary renown refrigerator  
encyclopædia constitutionally unique contagion palpablehypocritical fallacious phlegmatic microscopical eccentricity  
subtlety alienate ingratiating poignancy phthisis

## THE BURT (REARRANGED) WORD READING TEST

NAME \_\_\_\_\_

SCORE \_\_\_\_\_

SCHOOL \_\_\_\_\_

READING AGE \_\_\_\_\_

DATE OF TEST \_\_\_\_\_ AGE \_\_\_\_\_

MENTAL AGE \_\_\_\_\_  
(IF KNOWN)

DATE OF BIRTH \_\_\_\_\_

EXAMINER'S INITIALS \_\_\_\_\_

to is up he at  
for my sun one of

big some his or an  
went boys that girl water

just day wet pot things  
no told love now sad

nurse carry quickly village scramble  
journey terror return twisted shelves

beware explorer known projecting tongue  
serious domineer obtain belief luncheon

emergency events steadiness nourishment fringe  
formulate scarcely universal commenced overwhelmed

circumstances destiny urge labourers exhausted  
trudging refrigerator melodrama encyclopaedia apprehend

motionless ultimate atmosphere reputation binocular  
economy theory humanity philosopher contemptuous

autobiography excessively champagne terminology perambulating  
efficiency unique perpetual mercenary glycerine

influential atrocious fatigue exorbitant physician  
microscopical contagion renown hypocritical fallacious

phlegmatic melancholy palpable eccentricity constitutionally  
alienate phthisis poignancy ingratiating subtlety

## THE BURT WORD READING TEST (1974 REVISION)

NAME \_\_\_\_\_

SCORE \_\_\_\_\_

SCHOOL \_\_\_\_\_

READING AGE \_\_\_\_\_

DATE OF TEST \_\_\_\_\_ AGE \_\_\_\_\_

MENTAL AGE \_\_\_\_\_  
(IF KNOWN)

DATE OF BIRTH \_\_\_\_\_

EXAMINER'S INITIALS \_\_\_\_\_

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