

A STUDY OF THE RELATIONSHIPS BETWEEN STYLES OF TEACHING  
AND PUPIL PERFORMANCE IN TASMANIAN PRIMARY SCHOOLS

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

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## ABSTRACT

This study focuses on two basic questions: To what extent can styles of teaching be compared? How do teaching styles relate to the performance of pupils in the primary classroom?

The first question originated in a continuing debate about the respective merits of 'traditional' and 'open' education. The debate was stimulated by publication of the Bennett (1976) study, but was made persistently more difficult by the problem of defining 'openness'.

That difficulty was approached in this study by development of a conceptual basis upon which operational definitions, incorporating elements of traditional and open teaching style, were determined. These elements, in addition to those refined from the research instrument of Bennett, formed the basis of a Teacher Questionnaire.

For the purpose of analysis the Questionnaire items were classified in a set of ten features of teaching style, representing teaching behaviour and teacher attitude categories (after the Giaconia and Hedges (1982) model of 'open education' features).

From the responses of a State-wide sample of teachers, composite scores for the ten features were calculated. High canonical correlations between the factor scores of the two major categories led to a search for an underlying dimension of teaching style. This was achieved by use of the maximum likelihood method of common factor analysis. Reasonable interpretation of the data justified the grouping of teachers according to their low (traditional), neutral, and high (open) factor scores along a single teaching style continuum.

To find out how the differing teaching styles related to pupil performance, a sample of teachers was selected, together with their pupils from whom data on five performance tests had been gathered (tests in general ability, mathematics and language).

Analysis was based on a division of pupils in relation to the teaching style groupings of their teachers. Multivariate analysis of covariance revealed significant differences between the pupil groups. Canonical variate analysis enabled the patterns of these differences to be observed.

The analysis showed statistically significant differences between the pupil groups (i.e. traditional, neutral, open) in respect of the dependent (performance) variables, after adjustment for differences among pupils in general ability. Each pair of groups was distinct.

The strongest separation between the traditional and open groups is provided by performance in mathematics. No clear pattern in this respect emerges for the language performance variables, which work rather to separate the neutral groups from the traditional and open. Nevertheless the groups clearly differ in respect to these variables also.

The evidence from the study answered the two research questions. Teachers can be classified as employing traditional and open (or neutral) styles of teaching. These differing styles are directly related to variation in pupil performance.



Implications of the results are then discussed. Given that the performance areas included in the study are regarded as basic to the progress of primary school children, the results emphasise the particular consequence of varying forms of methodology employed in teaching these areas.

The results are further discussed in comparison with the Bennett (1976) study.

Then some suggestions are made for further research, specifically in regard to the teaching style methodologies applied to the teaching of basic areas, and use of the teaching style features classification as an aid to the analysis of teaching.

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## CHAPTER 1

### INTRODUCTION TO THE STUDY

#### 1.1 The Problem and Need for the Study

Do styles of teaching that are more 'Open' bring about better results in children's school work than do more 'Traditional' styles? This has been one of the basic issues of a serious debate which has occupied education for two decades in Australia. Neither is it a dead issue. Teachers in schools, and students preparing for teaching, still tend to define their teaching as more 'Open' or more 'Traditional' in style. Schools continue to describe their 'curricula' in similar contrasting terms. In consequence the issue has appeared to heighten the natural concern of parents as to the kind of teaching their children receive and the effects upon children's performance at school. Such debate upon the respective merits of 'Open' and 'Traditional' methods of education prompted the present study. The intention is to examine the relationships between styles of teaching and pupil performance, focussing the research upon Government Primary Schools. Let us note just some of the reasons as to how and why the debate developed in Australia.

In the late 1960's Government Departments of education in this country became strongly committed to building new so-called "Open plan" primary schools. Literally hundreds of these schools were built in the next decade. In Tasmania evidence for this existed in reports of a "Primary School Design Survey" (1973) prepared by the Research Branch of the Tasmanian Education Department. This included data from schools

between 1968 and 1974 (anticipatory) showing the extent of the variety of architectural developments in the direction of 'Open plan'.

However, there was little evidence either from overseas or in Australia to assist education departments in evaluating the new concept.

The most obvious fact about research into aspects of 'Open' Education in Australia was the paucity of such research. The adoption of notions of 'Openness' and practices of 'Open plan' was rapid and lacking in empirical evaluation. Of course this assertion over-simplifies the case. Some evaluations did exist. However, their merit was dubious. They were often narrowly defined, particular in focus, and therefore offered no applicable conclusions of a general kind. This narrowness of definition was mainly due to the variegation of features which characterised 'Openness'. In addition, as King (1974) argued, there was a widely held assumption that 'Open' education meant innovative practices, and this meant extraordinary variations upon this assumed definition. Also part of the momentum for the adoption of 'Open plan' in Australia was a powerful volume of literature, mainly from overseas, which extolled its virtues, and quickly gathered a following from the increasing numbers of young teachers who were coming into teacher training straight from high schools.

During the 1970's a lack of general agreement about the merit of 'Open' education persisted. This was partly due to the problem of defining 'Open' education. It was also due to a conservative reaction against what was regarded as 'Open' education in practice. A continued

lack of substantial evaluative research did not help. Confusion arose from an assumption that 'Open' planning was to be equated with 'Open' educational practice. However, as Angus et al. (1975) put it, "in Australia, the number of open-plan schools (was) hardly a satisfactory index of a school system's commitment to open education" (p.1). Characteristics of school design and quality of instruction were shown to be distinct. Also since 'Openness' could not be simply defined, the notion of rigidly comparing 'Open' and 'Traditional' education was increasingly regarded as suspect. Some educators began to favour instead the view that 'Open' and 'Traditional' should be seen along a continuum of educational practice and not in polarised terms (Giles, 1976; Tronc, 1977; Skilbeck, 1977). Educational researchers began to argue that the use of the concepts 'Open' and 'Traditional' were no longer useful to educational theorists, researchers, or practitioners (Smith, 1979).

The so called 'Open' plan could be seen as part of a general movement for change in Australian education. However, by the mid 1970's there was a strong community feeling that educational innovation had not produced the expected improvement either in teaching or in pupils' performance (McDonald, 1978). 'Open' education was one of the innovations which appeared no longer to be a promising direction to take.

Conservative reaction to educational change was predictable in the Australian context. Yet the most severe reaction appeared to be against the change from 'Traditional' to 'Open' educational practice (Connell, 1978; McDonald, 1978). The attack on 'Progressive' education

in Britain, by a publication entitled 'Black Paper, 1975' (Cox and Boyson, 1975), was paralleled in Australia by the Australian Council for Educational Standards (1973, 1974), whose journal tended to equate 'good' with 'Traditional' and explicitly equated 'Progressive' or 'Open' with 'bad' (Johnson, 1976). However, such reactions were often an appeal to nostalgia, or a cry for 'back to basics', and presented little or no evidence to confirm such claims (Skilbeck, 1976). Nor did the claim that the comparison of 'Open' and 'Traditional' education was obsolete gain universal support.

The debate continued in a confused fashion until the release of the publication entitled *Teaching Styles and Pupil Progress*. This was the report of a study directed by Bennett (1976) and carried out in the north west of England. Its major conclusion was that more 'Formal', or 'Traditional', styles of teaching were directly related to higher performances of pupils. The report stimulated fresh argument, in Australia as well as overseas, concerning the relative merits of 'Open' ('Informal') and 'Traditional' ('Formal') education.

However, adequate evaluation of this question was still not available for Australian schools. Because a number of issues were contentious, it seemed logical, in order to resolve some of the questions raised, to follow the Bennett study, focussing the research upon primary schools in Tasmania. Of the Australian research into 'Open' education the most notable, at the time of the present study, was the 'National Study of Open Area Schools' (1979). However, this was mainly concerned with the variable of school design. A specific aspect of the problem was the question as to how far 'Open' and

'Traditional' teaching could be compared. The Bennett study was criticised for appearing to make a subjective judgement as to what constituted 'Openness' of teaching style (e.g. Selleck, 1976). The Final Report of the National Study of Open Area Schools (1979) had also questioned the legitimacy of attempts to define a variable like 'Openness' of teaching style (p. 48).

Therefore the present study had two main objectives. One was to investigate the extent to which 'Open' and 'Traditional' styles of teaching practice could be compared. The second was to find out how these styles related to the performance of pupils.



## CHAPTER 2

### THE IDEOLOGICAL BASIS OF 'OPEN' EDUCATION

Descriptions of 'Open' education in Australia sometimes alluded to the ideologies underlying it. However, the significance of ideology as a fundamental basis for educational reform appears to be under-emphasised. For example, in 1976 the leading papers of a conference of the Primary Principals Association in Tasmania were published under the sub-title "The Impact of Open Education". The report stated:

"Open Education came to Tasmania in 1970 when two (open) primary schools ... were established" (p.24)

It also carried a series of case studies describing the changes from 'Traditional' to 'Open' education in Tasmania in the 1970's. Yet there was no apparent concern with the ideological roots of this change.

It was clear that by 1976 Tasmania was preoccupied, as were other States, with adopting 'Open' education. However, the change was being achieved mainly in terms of commitment to the building of 'Open plan' primary schools. The point is important to the outlook of the present study. The development of 'Open' education in Australia was not simply a series of basically utilitarian responses to harsh or inappropriate organisational circumstances. Nor was it a mere symptom of a certain faddishness for which modern education has been criticised. 'Open' education in Australia represented a reform ideology whose origins were in ideas contemporaneous with the period of World War I. This ideological character of 'Open' education referred to basic values, such as the emphasis upon the child's individual development, to which 'Open' educators expressed their commitment.

An understanding of the ideological nature of 'Open' education in fact helps to explain some of the difficulties associated with research into its practice, including:

- . attempts to define 'Open' education, in view of wide-ranging interpretations of the concept.
- . assumptions that methodological changes occurred naturally and in concert with the new ideologies of education.
- . attempts to justify or explain 'Open' education on the basis of wide ranging practices.

These points of difficulty can be illustrated via an historical survey of the development of 'Open' education. An historical viewpoint also helps to emphasise that 'Open' education may not simply be dismissed as a current fad. It is a phenomenon whose origins can be traced to another movement, known as 'Progressive' education, rising to prominence in the early part of this century.

## 2.1 'Progressive' Origins of 'Open' Practice

'Progressive' education arose out a period of general social reform in the late nineteenth and early twentieth century, which was international in scope but focussed upon Western Europe. It was there that the figures of Rousseau, Pestalozzi, Froebel, and Herbart exerted their lasting influence upon educational thought and development (Stewart, 1972). Western Europe also was the theatre of the First World War. The decade following the Armistice witnessed an atmosphere of revolutionary enthusiasm. It was probably a natural popular tendency

of the people to work towards a better life in Europe. The emergence of a strong public sentiment that hope for a new order in Europe would rest in the young, was also natural and predictable. There was a profound sense in which education was looked upon as the means not only for social reform, but for a new social order in Europe (Demiashkevich, 1923; Pinkevitch, 1929).

Thus the characteristics of 'Progressive' educational reform included a new sense of the freedom of the individual, a new emphasis upon the self initiation of children's learning, with a fresh desire for learning to take place in a cooperative environment. Hence the child-centredness of education in schools was a predominant concern of the period (Washburne, 1923).

In Australian schools the authoritarian, lock-step and teacher dominated classroom climate was also being questioned then. The matter was taken as a national theme in 1918 at the second biennial conference of the Australian Directors of Education. The notion of individualising of instruction was given prominence there. Such new flexibility was introduced by adoption of the Dalton Plan. In fact the earliest Australian evidence of experiment in the Dalton Plan in State Schools comes from Tasmania (Rowntree, 1923). It began in Hobart in the Elizabeth Street School in 1922 under the direction of Frances Rowntree. The significance of the experiment lay partly in its elaboration in the 1930's to incorporate class grouping of children according to ability. Australia's further involvement in the reform of education was exemplified in its formal representation at world conferences of the New Education Fellowship prior to World War II.

## 2.2 Relationship Between 'Open' and 'Progressive' Education

'Open' education, like 'Progressivism', was publicly endorsed as an ideology after a World War. Following the deep wounds to human freedom of World War II, the post war years were marked by a universal declaration of 'Openness' as "one of the supreme declared social values of our time." (Lynch 1975, p. 448). Democratisation literally swept the western world after the war. It was exemplified in the rising new nations as self determination, and in the old states as a fundamental reappraisal, within an atmosphere of a crisis of political institutions.

"Such a process of re-appraisal includes the opening up of issues concerning not only the structures of society, both political and economic, but also the value and epistemological systems associated with these. Stemming from this opening up of issues, educationists, theorists and practitioners at all levels, have been faced by the need to fashion a more 'open' education." (Lynch, 1975; p. 448)

Western nations looked at new structures of knowledge within society, new social relationships within schools, and consequently new pedagogies as the means to this educational 'Openness'. A new and complex social environment was developing after World War II in which 'Open' education gained credence. Hence the basic differences between 'Open' and 'Progressive' education originated in the altered conditions of the society in which they were each fostered. In principle, though, the major educational ideologies for such reform were consistent with those of the 'Progressive' era.

It should be noted that the term 'Progressive' refers to the educational reforms of the era between the late nineteenth century and

the conclusion of World War II. 'Open' education refers to the educational changes after World War II. In Australia the extension of "Open planned" schools was coincident with a revival of interest in 'Progressive' educational methods (Angus et al., 1975) and the terms 'Open' and 'Progressive' were often used interchangeably. This was also the case in Britain as indicated by Bennett's (1976) use of the term in listing characteristics of 'Progressive' and 'Traditional' teachers. (There of course 'Informal' would have been used more generally to indicate 'Openness'). See the Introduction to the Study. However, literature promoting the 'Informal' or 'Progressive' approach generally became subsumed under the heading of 'Open' education, partly acknowledging the distinctness of the terms. This distinctness is maintained in the present study.

### 2.3 Consistency of 'Open' With 'Progressive' Beliefs and Innovations

Some parallels existed between educational beliefs and innovations of the 1970's in Australia and those of the years just prior to and after the 1914-1918 War (Mandelson, 1977).

Concern for the national welfare through the educational development of individuals was a central ideology of 'Progressive' reform. The same concern was exhibited in 'Open' education. They were not merely reflexive or faddish attempts at change. They were part of a continuous ideal. However, they could be only partially understood without recognition of the zealous spirit they breathed.

The characteristics of educational reform in Britain after World War II also exemplify the ideological consistency between 'Progressive' and 'Open' ('Informal') education.

In 1967, in Britain, a Report was published for the Central Advisory Council for Education in England. It was called the "Plowden Report", after its Chairman, Lady Plowden, J.P. It comprised a collective statement of 'Open' developments already existing in practice, as a projection for improvements. Three major "value domains" underlay the Plowden Report (Lynch, 1975). These were: an emphasis on Individual Development; equality of educational opportunity; the notion of efficiency.

### 2.31 Emphasis on Individual Development

The first ideology implied the adaptation of teacher methods to suit individual pupil needs. At least part of this ideology was attributable to the 'Progressives'. For instance John Dewey was particularly acknowledged in the Report. Associated with this emphasis upon 'individuality' was the development of Teachers Centres, of which 550 had been established in England by 1974. These centres provided the stimulation for teachers to work at providing the resources and organisational ideas, as well as the high level of motivation required, for the new approach to the individual child. A few such centres were already established by the time of the Report.

### 2.32 Equality of Educational Opportunity

This major ideology of 'Open' education was not so explicit in 'Progressivism'. 'Progressive' educational initiatives were often directed at particular social class groups of the school population. However, from the 1950's in Britain, as in other western countries after

World War II, public opinion shifted from an elitist to an egalitarian ideology as a basis for reform.

Nevertheless, the methodological accompaniments to this ideology reflected the principles of child-centredness and flexibility in curriculum employed by the 'Progressives'. Under this 'equality' principle notions of streaming according to psychological definitions of ability were no longer acceptable. Instead Family Grouping became a popular feature of Primary and then Middle Schools. The Middle Schools were envisaged in the Plowden Report as transitional between Primary and Secondary school (8 or 9 years to 13 years). They were intended to be "comprehensive in intake, egalitarian in philosophy, integrating in organisation." (Lynch, 1975; p. 455)

### 2.33 The Notion of Efficiency

Lynch (1975) argued that sections of the Report dealing with the economics of building provision, maintenance and staffing in relation to the sizes of the new Middle schools, appeared to be "strongly pursuant" of economic efficiency. There were even allegations that the Plowden Committee had drawn up the proposals to assist local authorities to come to economic terms with increasing pressures for comprehensive reorganization. These pressures were being exerted by the Central Government and by the swelling ranks of egalitarian and child centred lobbies (Lynch, 1975; p. 456). The principle of efficiency was clear in the approach of the 'Progressives' to the practical application of their reform ideologies. However, the extremely rapid changes into various new patterns of classroom

organisation prevented the development of any single and orthodox ideology of the Middle School. In addition, it became difficult to explain and justify 'Informal-ness' in terms of these transformations. Nevertheless, though the context and the associated characteristics were different, the efficiency ideology in practice expressed a quality consistent in both 'Progressive' and 'Open' education.

The example of Britain illustrated a further characteristic of both 'Progressive' and 'Open' (or 'Informal') education. In Britain, though the three value domains were employed to give legitimacy to 'Open' education, the translation of these ideologies into practice required rapid organisational change. The development of the Middle Schools was a case in point.

These placed heavy demands on staff to provide integration and specialisation. Often the methods were employed in hastily adapted existing buildings. Also teachers experienced difficulties in attempting to apply the 'Open' ideologies in practice. Tensions existed, for example, between the dictum of individualisation and required grouping procedures, and between 'child centred' and subject centred teaching. Teachers were required in the 'informal' mode to cope with an ideology of teaching and learning which was in conflict with the notions of status and authoritative identity implicit to the school systems. The tensions between 'informal' teaching style and 'subject' specialisation attested to this.



## 2.4 Ideologies of 'Open' Education - A Wide Range of Interpretation

'Openness' as a reform ideology in education was capable of a wide range of interpretations and practices. Developments in the United States exemplified this. There was a range of responses by significant individuals to the social conditions existing there during the 1950's and 1960's. This period in the United States witnessed significant societal currents of change which were reflected in the schools. The discord of racial discrimination, levels of poverty, the upsurge of drug addiction, were all reflected in violent social reactions, some of which the schools themselves experienced. In addition the nation was torn by the events of the Vietnam war.

The schools in America were criticised continually for failing to meet the social as well as the academic needs of children.

Within the climate of criticism and unrest a number of individuals rose as important figures supportive of educational change. Among these were teachers such as Holt (1964), Postman (1969), Kohl (1970), Kozol (1972); journalists such as Featherstone (1968), Reich (1971), Silberman (1973); psychologists such as Bruner (1966) and Carl Rogers (1969); and professional and academic educators such as Goodman (1964), Weber (1968) and Goodlad (1970). All of these committed their views to books and journals. Some of them were responsible for the direction of organisational attempts to foster change - such as the Elementary Science Study of Newton Massachusetts; the National Association of Independent Schools, Boston; the Education Development Centre, in Massachusetts, where Bruner's curriculum ideas had a focus; and the Institute of Cuernavaca, Mexico, directed by Ivan Illich.

Change towards 'Open' education was also directed and supported from outside the educational system. The revolutionary ideas of Illich, boldly stated in his *Deschooling Society* (1971), constituted the most radical expression of this change.

Other characteristics in the American frame of reference were summarised in the writings of Rathbone (1971) in a statement entitled *The Implicit Rationale of Open Education*, and by Barth (1971) *Assumptions about Children's Learning*. These included ideas such as the individualisation of 'knowledge' and of learning, the centrality of the child's experience, the primacy of the social objectives of Schooling in terms of individual development, and the role of teaching as a "lateral" rather than a "vertical" interchange between teacher and pupil.

Their assumptions about learning included the independent and exploratory definition of the child's motivation to learn, the notion of children's competence to make significant decisions concerning their learning, the necessity for wide ranging pupil choice in learning, the natural inclination of children to cooperate in mutually relevant learning, the appropriateness of recognising 'stages' and 'styles' of intellectual development in individual terms, the high priority of the child's affective development, and the necessity to place the measuring of a child's learning performance in perspective (which in fact meant a diminished priority to testing and grading).

Clearly these factors expressed interpretations of 'Open' ideology that envisaged modifications to current methods and practices. In general they were at different points along a continuum from those of the radical reformers.

A further indication of such a range of interpretations of 'Open' education was implied by inhibitions to its development. For instance, Leese (1973) and Vincent Rogers (1975) maintained that the American teacher was not accorded the autonomy given to the British. Vulnerability to community pressure was one reason for the apparent reluctance of the American teacher to change to an 'Open' style of teaching. Silberman (1973) was more specific. He charged that the failure of attempts at curriculum reform in American education in the 1950's and 1960's was due to the fact that

"its leaders tried to impose change from outside and above, without regard for what teachers and principals thought or felt." (p. xv)

Nevertheless the characteristics of 'Openness' in educational terms were similar and were similarly derived from the 'Progressive' principles which had entered and influenced modern American education as they did the British (Spodek, 1970).

The practices which became part of 'the Open education' scene in the U.S.A. included such organisational and pedagogic strategies as Family Grouping, with its consequent non grading and grouping procedures; the Integrated Day, which in general terms meant a range of learning activities operating at any one time, thus spanning the time and task schedule and being individually motivated; and Cooperative Team Teaching, where the 'Open' emphasis was upon increasing options for learning to both teachers and pupils, as distinct from the rationale of Team Teaching for 'Traditional' classrooms, which was efficiency for the purpose of instruction (Stephens, 1974).

Exploration of the ideological character of 'Open' education, including the difficulties implicit to its beliefs and innovations, is one of two essential phases to reviewing this phenomenon. The second is to examine the research into its practices, necessarily focussing upon aspects pertinent to the present study.

## CHAPTER 3

### REVIEW OF RESEARCH: 'PROGRESSIVE' TO 'OPEN' CONTEXTS

A Review of Evaluative studies appropriate to questions of the relative merits of 'Open' and 'Traditional' classrooms, properly includes research dating back to the 'Progressive' era. There are two specific reasons for this. Firstly, as the introductory survey indicated, there were consistencies of ideology and practice between 'Progressive' and 'Open' schools, in Britain, in the United States and in Australia. Secondly, as Horwitz (1979) pointed out, the appearance of 'Progressive' schools and classrooms after World War I was coincident with the "burgeoning development" of the tests and measurements field. Hence a large number of studies were undertaken quantitatively to assess the impact of 'Progressive' Schooling upon children. Though 'Open' education, initially at least, was generally confirmed by reference to its ideologies, this was not the case with practices of the Progressive era.

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#### 3.1 Research of the 'Progressive' Era

In the earliest research into teacher and pupil behaviour - from about 1900 to 1930 - researchers concentrated on discussing characteristics of 'good' teachers. Some early data were gained from questions put to pupils. A second approach was to gather the opinion of so-called educational experts. The third approach was the use of rating scales, and by 1930 Barr and Emans had located 209 instruments, rating 'instruction', 'classroom management' and 'professional attitude'. However there was no consensus about the areas to be rated.

None of these early studies apparently included any measure of the effects of the teachers on pupils.

Appropos the present study, a notable research project called the 'Activity Program', (cited by Horwitz, 1979) was reported in a series of articles in the *Journal of Experimental Education*, 1939 and 1941. The project was an evaluation of the 'activity' programme in New York City public elementary schools. 'Activity', that is 'progressive', school children scored slightly lower than the control group in reading and arithmetic achievement, tests of knowledge of current affairs, 'progressive' social beliefs, and personal and social adjustment. In observational studies the 'Activity' school group showed more evidence of initiative, experimentation, criticism and appraisal of one another's work, cooperation, and leadership, than did the control pupils. Ratings of classroom conduct and discipline for the two groups were similar.

Another early example focussing on pupil achievement was the comparison of the 'Progressive' 'schools', as an experimental group, with the 'Traditional' in the so-called Eight Year Study of the U.S.A. This was conducted by the American Progressive Education Association between 1933 and 1939. Though that research concentrated in the secondary school and 'college' groups, later studies were to extend to the elementary (primary) grades.

In this series of studies three types of experiments were conducted. One was a comparison of 'Traditional' and 'Progressive' groups using national test norms. Another compared the performance of pupils in the same school before and after the adoption of

'Progressive' curriculum changes. The third compared 'Progressive' classes with those of presumably similar characteristics in 'Traditional' schools (Hopkins and Mendenhall, 1934; Proctor, 1933; Jersild, 1941; are quoted examples).

The findings of this wide ranging experimental research was summarised by Wallen and Travers (1963) as follows:

"In the early grades, students in the progressive curriculum tend to perform somewhat below expectation in reading and arithmetic but overcome their inferiority by sixth grade; they tend to be average or somewhat superior throughout their school years in achievement areas involving language usage; when moving up to junior high school, they suffer no handicap in dealing with a more traditional curriculum; when compared to tests designed to measure work skills, organising ability, ability to interpret information, and civic beliefs, they score higher but often not significantly so; they tend to be better informed on current affairs, and they tend to be rated higher by school teachers and independent observers on such dimensions as initiative, work spirit and critical thinking. In summary, the findings indicate no important differences in terms of subject matter mastery and a superiority of the progressive students in terms of the characteristics which the progressive school seeks to develop." (pp. 473, 474)

A criticism levelled at both the Eight Year Study and the results of the extended studies (Wallen and Travers, 1963, p. 474) was that the "experimental" students conceivably differed initially from the 'Traditional' with respect to variables related to achievement, such that the experimental variable was possibly confounded with other variables.

Horwitz (1979) quoted Baker et al., (1941) in which the Progressive Education Association's Informal Committee on Evaluation of Newer Practices in Education was reported as stating,

"In general the evidence shows convincingly that the new methods do not result in a loss of academic efficiency in the usual school subjects, and that where any measures have been applied, there is a definite gain in terms of initiative, skill in dealing with problems, knowledge of contemporary and world affairs, and social participation." (Baker et al., 1941, pp. 52-53)

Following this early research there appears to have been a dormant period lasting until the early 1960's. Again, it is noticeable that none of this research appeared to conclude specifically that effects of teacher behaviour or style might be a significant variable worth further investigation. Bennett (1976) quoted Marsh and Wilder (1954) who, having reviewed the research from the period 1900-1952, concluded that

"No single, specific, observable teacher act has been found whose frequency or percentage of occurrence has invariably correlated with student achievement."  
(1954, p. 44)

### 3.2 Research at the Beginnings of 'Open' Education - the 1950's and 1960's

In the 1950's and 1960's evaluative studies were undertaken which related to the effectiveness of teachers and their influence upon pupil learning. However, reviews of many of these studies indicated that the research was generally inconclusive.

Medley and Mitzel (1963) reviewed all the available studies in which the effectiveness of teachers was rated by supervisors or administrators. They compared these ratings to "any reasonable objective measure of pupil growth". The summary indicated a consistent finding of no relation between these ratings of effectiveness and measures of change in pupils.



Anderson (1959) reviewed thirty two studies. Eleven reported superior learning in learner-centred classes, eight in teacher-centred classes, and thirteen showed no difference. Thus the findings were inconclusive. Gage (1963) also concluded that change in pupils seemed largely unaffected by style of teaching. However, the research up to this period appeared to have suffered from subjectivity, which seemed characteristic of that rating scale procedure (Bennett, 1976, 14).

The longitudinal studies of Gardner (1942, 1950, 1966) in Britain, and Minuchin et al. (1969) in the United States are significant for this period. These studies, in addition to their long-term nature, were important for the comprehensiveness of their attempts to evaluate the effects of 'Open' or 'Informal' and traditional teaching methods.

Gardner's research was particularly important for the fact that her studies covered a period of three decades. The methodological and statistical flaws in these studies are obvious by comparison with current standards of rigour. Nevertheless they were of sufficient breadth and substance to warrant attention by subsequent researchers.

The results showed little difference between 'Open' ('Informal') and 'Traditional' schools on measures of academic achievement, but favoured 'Open' schools on a number of other variables. In fact some of these were skills usually assumed to be the expert province of 'Traditional' teaching. They included listening and remembering, "neatness, care, and skill." Other variables favouring 'Informal' methods were descriptive and expressive writing, free drawing and painting, ingenuity and inventiveness, and range and depth of out-of-school interests. The single area in which the more 'Traditional' schools showed superiority was arithmetic.

Both the Gardner (1942, 1950, 1966) studies and the research of Minuchin et al. (1969) were important contributions to our understanding of the effects of varying schools and teaching methods upon children. Though neither was flawless in its methodology their results were notably consistent.

The Minuchin et al. (1969) research was based on data collected in fourth-grade classrooms in four New York City schools between 1956 and 1958. It was carried out by researchers from the Bank Street College of Education and their aim was to assess the impact on the fourth grade (nine year old) pupils of schools varying from very 'Traditional' to very 'Open' ('Modern'). Its methodology and application were defective in that since the innovations of the 'Progressive' era had dwindled, the sample of 'Progressive' or 'Informal' teaching was represented by a fairly exclusive private school. Nevertheless the study was marked by comprehensiveness of systematic detailed descriptions of classroom environments, attention to the factors of parental values and child rearing practices, and the range of cognitive and personality variables investigated.

In terms of group tests of academic achievement, individual problem-solving tasks, and tests of imaginative thinking, there was generally no significant difference between the 'Informal' ('Open') and 'Traditional' schools. However, children of the 'Informal' classrooms tended to have more differentiated self-concepts, describing themselves in less rigid and more subtle and thoughtful ways. In addition they expressed less conventional, or more 'open', conceptions of their social sex roles, and more positive attitudes toward school.

### 3.3 Later Research: the 1970's

#### 3.31 General Review

Attempts to summarise research into the relative merits of 'Open' and 'Traditional' classrooms can appear non judgmental in the sense that all the studies appear ultimately to be of equal value. However the truth is to the contrary; the clearest characteristic of such studies are that they are numerous and of variable quality.

Hörwitz (1979) reviewed a total of 363 studies which he grouped according to their foci upon nine particular outcome variables. The following table summarises this review.

TABLE 1

#### HORWITZ (1979) REVIEW OF 363 STUDIES - OVERVIEW OF RESULTS

Variable and Number of Studies	Results (Percent of Studies)			
	Open Better	Traditional Better	Mixed Results	No Significant Differences
Academic Achievement (102)	14%	12%	28%	46%
Self Concept (61)	25%	3%	25%	47%
Attitude toward School (57)	40%	4%	25%	32%
Creativity (33)	36%	0%	30%	33%
Independence & Conformity (23)	78%	4%	9%	9%
Curiosity (14)	43%	0%	36%	21%
Anxiety & Adjustment (39)	26%	13%	31%	31%
Locus of Control (24)	25%	4%	17%	54%
Cooperation (9)	67%	0%	11%	22%
(Overall average)	(39%)	(4%)	(24%)	(33%)

(p.80)

The table emphasises the high proportion of studies in which there have been mixed results or where no significant difference was found between the 'Open' and the 'Traditional' classrooms. It suggests that the examination of those trends, especially in terms of pupil achievement and pupil attitudes, is warranted. Moreover, this review, as do those of Anderson (1959), Medley and Mitzel (1963), indicates that a meta-analysis approach to such research findings, particularly in terms of the more common outcome variables, would be appropriate and useful. As Horwitz (1979) says, the method suggested by Glass (1976) might be worth following.

In light of his review Horwitz (1979) wrote,

"The overall impression from this research is that, compared to traditional education, the open classroom sometimes has measurable advantages for children and that it sometimes appears to make no measurable difference, but that it rarely appears to produce evidence of measurable harm. Even this general impression must be qualified, however, because of the inconsistencies in defining open classroom and other variations among the research studies, including age level of subjects, numbers of years' exposure to open education, and type of evaluation instruments utilized.

Before the question of how open classroom teaching affects children can be more fully answered, much additional research will have to be undertaken." (p. 80)

He goes on to suggest with Perrone, (in Macroff, 1975), that where there is likely to be some notice taken of such research, perhaps evaluation can serve to counter the "back-to-basics" movement by "assisting people to understand what open education is about" (p. 83).

Whether or not educators respond to research, does not deny its value. In such a complex area continued research may lead to the more appropriate alternatives.

Some of the classroom research undertaken in the early 1970's did not focus directly upon 'Open' and 'Traditional' variables but have contributed to our understanding of such comparisons.

### 3.32 Teacher Directness/Indirectness and Pupil Growth

An example was the work of Flanders (1970) with his category descriptions used in the analysis of teacher-pupil interactions. (Flanders Interaction Analysis Category: FIAC). These were a measure of the 'indirectness' of teacher influence. The results indicated that such influence (i.e. the teacher who accepts pupils 'feelings', 'praises and encourages', 'uses pupils' ideas') was directly related to 'pupil gain' or 'pupil growth'. Soar (1972), in studies using the Flanders system noted a consistency of results in terms of positive relationships between indirect teacher behaviour and various measures of pupil achievement.

However, he also referred to a number of other studies. In these the positive relationships between teacher behaviour and pupil achievement were too low to be significant. The same studies showed a significant scattering of negative correlations.

Soar also attempted to resolve discrepancies in his own findings (1966: 298, 299), by hypothesising non-linear relations between indirect teacher behaviour and three measures of pupil growth

(vocabulary, reading comprehension, and creativity). His sample was fifty seven teachers of grades three to six in four schools, whose classrooms were "unusually indirect" in climate.

He found that the more complex or abstract the pupil gain measure, the more indirect the teacher behaviour associated with pupil growth. There was also the suggestion of an upper limit to the degree of indirectness supportive of a particular kind of pupil growth, beyond which less rather than more pupil growth occurred.

In a study by Tisher (1970) teacher "indirectness" was found to be associated with greater achievement of pupils with "low achievement orientation (only)". Dunkin and Biddle (1974) in referring to these "careful, thoughtful" studies observed that such findings suggest that the relationship between "indirectness" and pupil learning may not be a simple one. They observed that the studies were field surveys rather than experimental. In the experimental studies which they reviewed, the majority of findings for such "process-product" variables did not show a relationship between teacher-"indirectness" and the achievement of "average" pupils. They hypothesised that factors such as the level of intelligence of the pupils and the differential "quality" of teaching in different schools might account for the contradiction between the field surveys and the experiments. Also the matter of causation needed possibly to be viewed as from pupil to teacher as well as from teacher to pupil, where teacher "directness" or "indirectness" was concerned. (pp. 118, 119).

Nuthall (1970) expressed reserve similar to that of Soar (1972) and Dunkin and Biddle (1974) about studies attempting to relate pupil

achievement to measures of the affective climate of classrooms. Firstly, observation procedures resulting in a single measure such as degree of teacher "indirectness" were probably too gross in their approach ever to show clear relationships with any measures of pupil growth. Secondly, in so far as these observational procedures did measure a valid dimension of classroom behaviour it was not one which was likely to be related in a simple linear fashion to pupil achievement.

### 3.33 Verification of 'Open' Education from Polemic and 'Experimental' Projects

In Australia 'Open' education has been identified with the growing adoption of a voluminous range of ideas and practices, generally from overseas. However, these ideas mostly preceded evaluative research activity of a kind that could give clear direction to educational authorities and schools. Instead there was an assumed verification of 'Open' practices by polemic and very limited 'experimental' projects. On the other hand increasing reference to learning theory and developmental psychology helped to persuade 'Open' educators of the need for further evaluation.

By the 1970's such polemical reports were both numerous and reflective of a wide range of evaluative competence. They gave credence to the move toward 'Openness'.

The polemic extolled the virtues of "Open" education giving advice as to its application for teachers. However, there was little attempt to define the term except by such simple alternatives as "Open

... in the sense of not being closed." Nor was evaluative evidence presented as a basis for the assertions about "Open" practice.

Examples of the 'experimental' investigations were those of Muir (1973), Roseth and Winkler (1973), both in N.S.W., and McD. Mitchell (1973) in South Australia. The disadvantages of such research attempts echoed much of the reported research reviewed in North America (Lukasevich, 1976). There was little consistency in the research designs used to assess 'Open' practices. There was also a lack of control over the variables involved. Thus doubt existed as to whether the outcomes being tested could be related with certainty to 'Openness'. Small or inappropriate sampling prevented the results from being generalisable.

In some Australian cases the investigations were designed to assist State Education Departments in making future policy recommendations (e.g. McD. Mitchell, 1973). However, such research provided no internally consistent empirical evidence to justify policy-making decision for a system of education. What it did do was to justify the need for increased competent evaluation on a broad scale.

### 3.34 'Open Education Research and Psychological Theory

Insights from educational psychology significantly influenced the adoption of 'Open' education in Australia. A specific concern was the change in views of the child as learner. Rickett (1975) in her research quotes Getzels, (1974), who drew a parallel between changes in school design and the changes in the development of learning theory.



"The vision of the learner as an empty organism was transformed into a vision of the learner as an active organism. Learning was conceived of not only as a connective process but as a dynamic cognitive and affective process as well." (Getzels, 1974, p. 532)

"The learner is not only a problem-solving and stimulus-reducing organism but also a problem-finding and stimulus-seeking organism." (Getzels, 1974, p. 536)

However, understandings of developmental psychology did not simply serve the purposes of those who sought to verify 'Open' education. Rather they formed grounds for support to the claims that evaluative evidence was required for such verification. Angus (1973) was prominent in respect to this claim. Collis (1975 (a), 1975 (b)) over a number of years had investigated the stage theory of intellectual development based on the work of J. Piaget. Collis proposed a "developmental model" whereby curriculum could be planned according to the analysis of learning tasks. These would be rationally determined by appropriate levels of children's cognitive functioning. He argued that this "model" provided a logical reason for the adoption of learning practices based on a "Progressive" ideology (1978, p. 22). It would be preferable, he said, to the hitherto intuitive reasons for such adoption. In fact Collis endorsed the 'Progressive' education defined by Kohlberg and Mayer (1972). They had argued that only a 'Progressivism'

"with its cognitive-developmental psychology, its interactional epistemology, and its philosophically examined ethics provides an adequate basis for our understanding of the education process". (p. 449)

## CHAPTER 4

## RESEARCH VARIABLES PERTINENT TO THE PRESENT STUDY

4.1 Comparison of 'Expository' and 'Discovery' Methods

Another approach to teaching, related to 'Open' education but probably derived from a psychological field of enquiry, was discovery-learning. Its child-centred methodology and its emphasis on high motivation for pupils, were a distinct alternative to the expository methods of traditional teaching. Discovery learning and expository teaching incorporated characteristics which were assumed to represent various methodological accompaniments of 'Open' and 'Traditional' education respectively and for this reason are relevant to the review at this point.

Wilson et al. (1972) compared pupils of two 'Open' schools, which emphasised the discovery learning approach, with pupils of two 'Traditional' schools. The aim was to compare measured attitudes of pupils toward school, teacher, self, learning, and "school last year". Pupils were also compared on measures of "productive thinking" (or "creativity") and curiosity.

It was found that pupils in the "Open" schools had more positive attitudes to school and to themselves, and scored higher on "productive thinking" measures, than did pupils in the 'Traditional' schools. No significant differences appeared in curiosity measures and there were "fewer" differences in the other concepts. The researchers stated that it was difficult to translate the claimed advantages of the 'Open' school into operational terms. Also they conceded that there were "many

important" variables confounded in the school. The 'Open' schools were non-graded in addition to employing discovery teaching methods, and, particularly, used an explicit program of self-development and self-discipline for the pupils. Also the principals and staff of the 'Open' schools were described as 'atypical teachers'. Clearly there were problems of comparison in this research. A significant one was the lack of comparison of 'traditional' teaching methods with 'discovery' methods of the 'Open' schools.

Olander and Robertson (1973) studied the methodology of 'Open' education in terms of a comparison between 'expository' and 'discovery' teaching methods of mathematics in the fourth grade. One hundred and eighty four pupils in seven classes were in the 'expository' group, and one hundred and ninety pupils in the 'discovery'. The same text book was used but the teachers using the 'discovery' method obviously departed from the text book as the prime source of teaching ideas. Pupils in the discovery group were found to score higher on 'concepts' whereas the 'expository' pupils scored higher on arithmetic 'computation' and 'applications'. Pupil attitudes to mathematics improved significantly in the discovery group.

The analysis of this study was extended and results indicated that pupils whose initial scores on computation and application were low did better with an 'expository' treatment. The results were reversed for arithmetic 'concepts'.

The question raised here, of course, is whether such results were in fact caused simply by the teaching method, or whether a confounding of variables existed in that limited design. Perhaps Leith's comment (1972) is apt:

"It is not that the different methods are interchangeable - rather that each is successful and unsuccessful with different kinds of pupils". (p.25)

Cronbach and Snow (1969) reiterated the claim that the student's personality does affect his response to the classroom and that this ought to be researched further.

#### 4.2 Personality Factors of Pupils in 'Open' and 'Traditional' Classrooms

Farrall and Thaller (1976) compared the personality traits of boys and girls of varying experience in 'Open' and 'Traditional' classrooms. The subjects consisted of thirty girls and thirty boys, ages 8-10, who had been in 'multi age' 'Open education' classrooms for at least two years. These were compared with sixty eight girls and seventy boys who had been in 'Traditional' self-contained classrooms and had "no experience with open education". The 'Open' and 'Traditional' classrooms were located in different school buildings but both school programs drew children of similar socio economic background. Personality traits were measured through the Childrens' Personality Questionnaire which has fourteen scales measuring separate personality traits. The results of the study showed that boys as well as girls seemed "more capable of coping" with their environment in the 'Open' than in the 'Traditional' classroom, the results appearing more positive for girls than for boys.

One question raised by this study was the degree to which pupils might vary according to their personality traits in their preference for 'Open' or 'Traditional' classrooms. In the 'Open-classroom' school



used in the study the inception of the programme resulted in a definite shift in the school population. As the programme progressed a number of children transferred to 'traditional' schools, and a number from 'traditional' schools to the 'open' school. These transfers suggested that certain children did not like the 'Open' classroom and other children experienced similar feelings towards the 'traditional' classroom. (p.448). The results of the comparison were inconclusive.

Arlin (1976) investigated the relationship between pupil attitudes and combinations of the factors of sex, grade, and 'Open' education. About 2,000 pupils - equal numbers of boys and girls from grades 1 to 8 inclusive - were selected from the classrooms of eighty teachers in a semi-rural country school system of the United States. 'Open' teachers were distinguished from 'Traditional' teachers and identified by means of a Principal and Supervisor rating form. The study concluded that pupils in 'Open' classrooms did not perceive themselves as having more classroom freedom, or more favourable attitudes towards teachers, than pupils in 'Traditional' classrooms. Pupils in 'Open' classrooms however exhibited less favourable attitudes towards arithmetic and language arts (reading) than pupils in 'Traditional' classrooms. Notably the attitudes of pupils in both the 'Open' and 'Traditional' classrooms here became significantly less positive with increase in age, though girls were slightly more favourable in attitude than boys.

Research of this kind raised questions of general concern to the present study. One was the problem of accurately defining and differentiating between 'Open' and 'Traditional' classrooms. Another

was the difficulty of showing with certainty a causal relationship between independent and dependent variables - for instance between classroom type or grade level and the attitudes of children observed.

Nevertheless such studies, despite their limitations, did indicate that pupil preferences or attitudes could vary according to differing ('Open' and 'Traditional') classrooms. Conceivably those attitudes could be related to variation in aspects of pupil performance.

NOTE: 1. Personality factors in respect of both pupils and teachers, as indicated by previous research, appear to be significantly related to the major variables of this study. However, ensuring the gathering of sufficient data on pupil personality proved difficult for reasons explained in the later section on design (7.332). Also the analysis indicated that more data was required for the results to be valid and not due to chance. (See Appendix A for this analysis).

2. By comparison, references to variables of pupil and teacher background are not given as great an emphasis in respect of the major questions for the present study. The focus is rather on aspects of teacher and pupil behaviours. However analysis incorporating these variables in relation to pupil performance was done and is also included in Appendix A.

#### 4.3 'Open' Classrooms and Academic Achievement

Horwitz (1979) states that of all the variables which have been investigated in the evaluation of 'Open classrooms' academic

achievement has received the most attention. However of the 102 studies reviewed by him the results were quite mixed - 14 favoured 'Open schools', 12 favoured 'traditional schools', 29 showed mixed results and 47 revealed no significant differences. This review points out that whilst the results do not reflect the superiority of 'Open' or 'Traditional' teaching methods, neither do they reveal an inferiority of the more informal approach of 'Open' teaching. Furthermore, though it is certainly true that academic achievement is not the complete measure of children's learning and development in school, the existing research suggests that the 'Open' classroom is not a hindrance to this attainment.

The conclusions of this review would suggest that to cite mere uncomparing examples of studies of 'Open' classrooms focussing on academic achievement is futile. However the following examples are given for their differing emphases. The first discusses results in relation to four grade levels; the second provides some indication of differences in achievement factors between boys and girls; the third presents an analysis of longitudinal effects on achievement.

Hill (1973) compared the academic achievement of intermediate level (i.e. grades 3 to 6) students in an 'Open concept' school with that of students in a 'Traditional' ('conventional') school. Pupils were given standardised tests in language and arithmetic (including arithmetic 'computation', 'application', and 'concepts'). It was hypothesised that the raw score test results would show no significant differences among students of the 'Open' and 'conventional' 'concept' schools in the subtest areas, according to the four grade levels.

The study did not reveal a consistent pattern in the pupils' academic achievement, but did show that the 'open' school pupils "appeared to be more effective" in arithmetic. However, this greater 'effectiveness' was revealed for grades 4 and 5 but not for grades 3 and 6. However, considering the claim of 'Bennett (1976) that in general teaching 'styles' do not vary with the age of pupils taught the results here are intriguing. They raise at least the question as to why there were different results for those grades studies.

Reiss and Dyhdalo (1975) tested two hypotheses - that 'open-space' environments promote persistence on difficult tasks and that persistence and achievement are more positively correlated in 'open-space' than in 'traditional' ('conventional') classes. Pupil samples were drawn from three 'open' and three 'traditional' schools. The achievement test was confined to reading and persistence was measured via the mean length of time pupils spent in working on a series of puzzles.

The first hypothesis was confirmed. It was found that pupils in 'open-space' classes were reliably more persistent than were pupils in the 'traditional' classes. It was noted that the effect was greater for boys than for girls.

Results relating to the second hypothesis also showed differences for boys and girls. This hypothesis predicted that persistence and achievement would be more positively correlated in 'open-space' classes. The results further suggested that non-persistent boys "learned less" in open-space than in 'traditional' classes.



The consistency of results longitudinally appears significant, yet questions remaining for the study are how much those results reflect the type of programme or the nature of the learning environment or both. The studies referred to next, attempted fairly directly to relate aspects of these variables to particular pupil characteristics.

#### 4.4 Classroom "Structure" and Pupil Characteristics

Smith (1977) reported a study of the relationship between *classroom "structure"* and some affective pupil characteristics. His preference for 'structure' rather than 'Open education', as a broad term, was explained in a later paper (Smith, 1979). He considered 'structure' to be directly observable and related to pupil outcomes (p. 1). Also he implied that a conceptual definition of 'structure' had a theoretical basis which 'Open education' did not (p. 12). The term 'structure' was derived from Grimes and Allinsmith (1961), defined as

"structure in teaching (which) involves the availability of cues within the whole that give certainty of meaning, definiteness of form, or clearly understood expectations" (Grimes and Allinsmith, 1961, p. 300)

It was conceived as a multi-faceted feature of the total classroom environment (Smith 1979, p. 1). Smith operationally defined 'structure' by a combination of four teacher and pupil characteristics. These were the amount of teacher talk to the whole class as opposed to small groups and individuals, the number of simultaneous activities, amount of pupil movement, and amount of teacher movement. However, he gave no justification for choosing those characteristics in

preference to others. The use of 'structure' as an alternative to 'Open education' did not establish a greater potential for valid and generalisable results. Structure implied mainly the "provisioning for learning" dimension as in the Walberg and Thomas (1972) observation rating scale, and as such was more likely to be a sub-set of 'Openness' rather than equivalent to it.

#### 4.5 'Locus of Control' and Pupils' Academic Success

'Locus of Control' research referred to the assessment of children's beliefs that they, rather than forces outside their control, were responsible for their intellectual successes and failures. The Smith (1977) study employed 'locus of control', self esteem, and level of anxiety as the affective pupil characteristics for comparing classes of high and low degrees of structure. The earlier phase of this study (1976) found a relationship between 'structure' and self esteem, but no relationship with locus of control. In the second phase Smith (1977) reported that in repeated testing with children who had been in 'Open education' programs longer, a negative relation was found between 'Openness' of structure and locus of control orientation.

Peterson (1977) examined the Smith (1976, 1977) studies and also those of Wylie (1975), and White and Howard (1970). He then hypothesised that the development of independence in the direction of learning activities ought to be related to more internal locus of control orientations. He also expected that 'Open education' programs which adopted these practices ought to have pupils with more internal locus of control orientations than those programs not incorporating such practices. His results suggested that

"not only do open schools not develop more internal orientations but they appear to do just the opposite."  
(Peterson, 1977, p. 6)

Peterson's surprising results might, as he suggested, be attributed to the "fuzziness of open education" (p. 6). However, they raised other questions pertinent to the present study. The first concerned sample bias. In the Peterson study the children in the 'Traditional' schools were considered a representative sample. The children in 'Open' schools were a 'self-selected' sample. The implicit assumption was that 'Open' education programs somehow attracted less internally oriented children or selectively retained them. Secondly, 'Traditional' schools apparently reinforced the belief in children that they alone were responsible for their intellectual success or failure. The third question related to the presumed nature of locus of control processes per se. Peterson (1977) quoted Solomon and Oberlander (1974) in this respect. They suggested that for children to develop internal orientations toward academic outcomes they must have experienced consistent and accurate feedback for their performances. Peterson argued that in the 'Traditional' school, feedback was more likely to come from the teacher. In the 'Open' classroom feedback could come just as much from peers, and be less generally 'correct'.

The research of Smith (1976, 1977) and Peterson (1977) raised a number of relevant questions for 'Open' educational practice. In essence their results suggested at least two lines of enquiry which contributed to the development of the present study. One was the respective contributions made by the teacher and by characteristics

of the pupil toward pupil performance. The other was the nature of the relationship of teacher behaviour to pupil progress in 'academic' terms. In respect of the 'locus of control' variable, in the second year's (1977) analyses, pupils in the more highly structured classrooms tended to attribute their intellectual-academic successes and failures to their own efforts rather than to forces outside their control.

#### 4.6 Teaching Style and Pupil Behaviour

Reference has already been made to studies in which teacher directness and indirectness were related to pupil growth or achievement, for example the studies of Flanders (1970). Townsend (1971) employed a modified form of the Flanders' interaction analysis model to investigate the effects of different learning environments, in terms of 'teaching style', pupil achievement, and pupil attitudes. Teaching style included factors of direct/indirect teacher 'influence', teacher-pupil talk, and classroom groupings of pupils were selected from second and sixth grades of an 'open-space' a 'self-contained' and a 'departmentalised' school. Teachers were selected because 'their' children had previously been given a standardised achievement test. Any growth in achievement could then be related to 'teaching style' of teachers for the three types of schools. Neither were there significant differences between the schools in terms of pupil attitudes toward teachers. The 'Open-space' school showed no greater academic growth of pupils than was shown for the other two schools. Logically no variation in academic achievement could be attributed to differences in teaching style.

The researcher asserted that the results were not generalisable, partly due to the small teacher sample. However, there did appear room for broadening the range of variables by which to characterise 'teaching style'.

Good and Brophy (1974) presented a careful assessment of data on differential teacher behaviour and the effects upon student achievement. Their review showed clearly that teachers held different attitudes towards students as a result of their expectations. Their (1970) study showed that although only minor differences existed in the frequency of teachers' contacts with students of differing achievement levels, there were "important" variations in the quality of these contacts.

The review cited the study of Silberman (1969) to indicate some of the evidence which suggests that differential teacher attitudes are associated with differential teacher behaviour. Both of these elements therefore would seem appropriate to a concept of teaching style.

One of the earliest Australian attempts to focus on 'Openness' as an assumed function of teaching style was the unpublished thesis of Pickett (1975). Specifically the study investigated the relationship between 'Openness' of teaching style and independence of behaviour in children at year 1. Teaching style was defined in terms of characteristics of the teacher's attitudes to learning and to the child as learner, after Flurry (1973). Independence of behaviour was categorised in terms of external locus of control characteristics. These included the child's ability to care for himself, to care for property, and to handle certain tasks. In the study of ten classrooms

the results showed a positive relationship between 'Open teaching style' and independent behaviour.

This research, though small in scale, raised points which were beneficial to early design questions for the present study. Given the operational definitions applied in Rickett's study, one would have expected that highly indirect 'Open teaching style' would foster such independent pupil behaviour. However, a further question was raised apropos children of the higher as distinct from the lower primary years. The question in this instance was whether the fostering of this behaviour by such 'teaching style' would also be related to improved pupil achievement. Given Peterson's (1977) caution about problems of ambiguity in the use of locus of control dimensions (p. 2), the isolation of independence as a variable appeared too narrow an approach. One wondered what the contribution might be of other pupil factors in mediating children's responses to teaching styles.

## CHAPTER 5

### THREE MAJOR STUDIES PROMPTING AUSTRALIAN RESEARCH

#### 5.1 The Study of King (1974)

In the latter half of the 1970's educators sought to understand more closely the implications of adopting 'Open' education in Australia. One medium for this understanding was a descriptive analysis of educational crisis; another was conceptual analysis; a third was empirical research. The study of R.C. King (1974a) suggested some of these developments. His research made an important contribution to the analytical and empirical investigation of 'open' education here in Australia.

#### 5.11 'Open' Education as Response to Educational Crisis

King described 'Openness' as a characteristic response to a series of crises in education, precipitated by a number of social pressures. Indeed there was pressure on curriculum designers from community sources, including teachers, to use the school more as a vehicle for change in society than for simple reflection of such change. Other pressures such as changing social attitudes and the expansion of knowledge were cited as challenges to the traditional methods of education.

The 'crises' for which 'Open' education was regarded as a response were explained from the Victorian scene (p. 2ff). However, some aspects were generalisable to other States, certainly those with densely populated cities. They included student alienation,

characterised after Seeman (1959) as powerlessness, normlessness, meaninglessness, isolation, and self-estrangement. King stated that these were all reflected in case studies of students filed over a period of ten years by the Psychology and Guidance Branch of the Victorian Education Department.

Another 'crisis' was educational failure, due to the heavy reliance which the school systems placed on annual external examinations. This tended to fix certain notions held by teachers and others in the community. These notions concerned assessment, the intelligence of children within the school population, expository teaching, class sizes and homogeneous ability grouping of students. The crisis was implicit to the task of teaching. Increasing teacher autonomy was not coincident with a new mental set by teachers or teacher 'training' which could produce advantages to students implied by such freedom.

Student action was a third 'crisis' advanced by King's analysis. Matters of discipline and regimentation in schools were highly visible issues of the late 1960's. Educational authorities were therefore regarded as likely to restrain changes to traditional organisation in case such 'undesirable behaviour' in students might be aggravated thereby. To these crises 'Open' education was perceived by educators as a vehicle for alternative organisational structures.



### 5.12 'Open' Education Subjected to Conceptual Analysis

King (1974a) advanced five levels of human behaviour, as distinct from behaviour of a system, as a conceptual basis for understanding 'Openness'. These levels were, the politico-social system, organisation, the group, personality, and the individual's perceptions. He asserted that the period of this innovation began in the early 1960's, and was related to the fourth and fifth conceptual levels, that is, aspects of individual personality, and perceptions of the surrounding world, or attitudes and beliefs, after Allport (1960), Osgood and Tannenbaum (1955) et al. In other words changes in curriculum towards "Openness" could be viewed within contexts of personality and attitudes and beliefs. Also, King argued that the conceptual levels could well be used as contexts for analysing research done. From 1970-71 on, the conceptual levels of "Openness" incorporated politico-social and organisational factors (after Burns and Stalker, 1961; Popper, 1962; et al.). The writings of Kohl (1969), Goodman (1970-71), Silberman (1970), Postman and Weingartner (1971), and particularly Illich (1971) became the accepted authorities for changing educational ideas.

However, a problem in this kind of analysis was not explained. The use of levels of behaviour to describe the global concept 'Open', did not also account for the interplay of its characteristics. Such explanation was likely to be crucial to understanding the concept over time.

Hill (in Nyberg, ed., 1975) provided a classification which attempted to account for the multidimensionality of 'Open' education.

The range of interpretations he gave, was threefold. The first was 'Procedural Openness', which concerned the greater flexibility of school time, space and patterns of pupil grouping. It left intact traditional constraints regarding attendance and consensus of cultural objectives for curriculum. Secondly, "Normative openness" challenged the right of a teacher to be anything more than a facilitator, responsive to the expressed ideas of the learner. Thirdly, there was 'Revolutionary openness'. Proponents of this type were Illich and Freire, e.g., for whom 'open' schools were intrinsically subversive of the value system of an 'oppressive society'.

As Johnston (1979) noted, the policies of Australian education with regard to 'Open' education have belonged to the 'Procedural' end of the continuum (p. 185).

#### 5.13 'Open' Education Subjected to Empirical Analysis

There were two basic questions in this research of King (1974). One asked what were the effects of 'Open' education on student attitudes and performance. The second was based on the given nature of 'Open' education in the context of Victorian State High Schools. It asked what modifying influences on these effects were likely to arise from organisational constraints and problems in 'innovation' (p. 9). The research design was based on a quasi-experimental methodology for testing differences and relative changes over time in the groups of students chosen as subjects. The subjects were 577 children from first year co-educational classes of 10 'Open' and 10 'Traditional' schools.

'Open' and 'Traditional' groups were determined in four stages involving rater assessments and student-based indexes. The primary assumption here was that characteristics of 'Open' and 'Traditional' lay on a continuum and were not discrete categories. Therefore in order to isolate extreme ends of the continuum a five point definition of 'Open' education was constructed (p. 102). This was derived from ideas expressed by Hannan et al (1970) in a Victorian teacher journal, from interviews, and from the ideas of J.R. McLeod who was prominent in the development of 'Open' education in Victoria (King, 1974a, 18).

Two education department psychologists and two curriculum specialists were asked to nominate those schools which "housed" the best examples of 'Open' and 'Traditional' education. Schools were chosen according to whether their environments stimulated 'most' or 'least' of the five characteristics of 'Openness'. The author notes the similarity of the definition with that of Walberg and Thomas (1972). These choices were submitted to the school Principals as a basis for final selection of the sample. An Organisation Stringency Index and a 'Things Teachers Say' Test were then administered to students in the sample schools. These were designed to plumb relevant aspects of organisational climate and provide student perception of teacher behaviour.

The next stage included the use of four criterion methods to assess relevant aspects of student attitudes and behaviour. These measures were the 'Scale of Student Attitudes to High Schools', the 'Consequences Task' (a Torrance test of creative thinking), the 'Collaborative Behaviour Profile' and the 'Preferred Activities Index'.

(based on the Stern subscales of Change/Sameness, Autonomy/Supplication, and Understanding). They were designed to give evidence as to areas of possible difference in student outcomes from 'Open' and 'Traditional' groups.

Differences in attitudes to high school were found between the two groups. However, significance was accounted for by the increasing negativism of the 'Traditional' groups, whilst the 'Open' groups remained 'stable'. 'Open' groups were found to be significantly more interactive and collaborative in work-associated tasks than were 'Traditional' groups. The teachers' endeavours to create environments for collaborative and independent behaviour could have accounted for this significance. With respect to performance on creative tasks, the 'Open' groups were found to be "significantly worse" than the 'Traditional' groups at the first testing session. This was after six weeks into the school year. By the end of the year, the difference was no longer significant. The degree of student experience in an 'Open' classroom was obviously related to that result. Finally, the 'Open' and 'Traditional' groups were found not to differ significantly in preference for activities involving 'change/sameness', 'autonomy or dependence', or for 'intellectualised' activities.

In the summary of results, King stated an interesting proposition:

"When a comparison of significantly and non-significantly different effects is made, certain aspects of cognitive structure and collaborative behaviour are relatively volatile areas in which environmental influence can produce quite rapid change; whereas preference for certain activities, being related more to personality structure developed to a stable level over a long period of time, are not so volatile or readily changeable." (p. 296)

Using "aspects of cognitive structure and collaborative behaviour" as postulates for pupil outcomes, questions of the particular influences of teacher behaviours seemed worth further investigation. To describe the teacher behaviours, or teaching style which contribute to varying pupil outcomes seemed an appropriate objective for study. Also, given such stability of 'personality structure', the contribution of pupil personality to variation in cognitive performance measures, in addition to 'preferences', was worth finding out. These questions could be appropriate to upper levels of primary classrooms, the kind of population from which King's sample was derived and towards which the present study was directed.

A major intention of the King Study was to determine the effects of 'Open' education in a climate of questioning about the negative effects of schooling on student attitudes. The climate for the present study is characterised by concern for the improvement in cognitive outcomes of students. Teachers are being required to satisfy community demands for improved educational performance. To this end teaching methods in primary schools as well as high schools, are under scrutiny. The teacher is also recognised as a final interpreter of the external and environmental influences upon the classroom. Hence research into 'Open' educational practice appropriately would require evaluation of the styles of teaching employed and their effect on pupil performance as an important focus. Analysis of two major studies in this regard follows.

## 5.2 A National Study of Open Area Schools (1979)

Pressure increased on Departments of Education for evaluative evidence regarding 'Open' education. However, the evaluation and research in the area varied widely in their competence to support or deny the 'Open plan' school. The first relatively large scale evaluation began in 1970 when the Education Department of Western Australia initiated an analysis of teacher behaviour in the 'Open plan' schools. The study was prompted by the Department's commitment to 'Open plan' in the design of primary schools. As in South Australia large scale building programs were being scheduled without serious on-going evaluation, a situation being repeated in other state school systems.

The project, entitled 'A National Study of Open Area Schools' published its findings at the end of 1979, having been preceded by a series of progress publications - Technical Reports 1 to 5. An overview of the project was presented by the Executive Officer to a conference of the Australian Association for Research in Education in November, 1978. It was an examination of some of the methodological issues relating to this kind of evaluative research.

The stated aim of the project was to compare schools on the 'Open area' and conventional design in terms of teaching practices and pupil outcomes (p. 35). Answers were sought to two "seemingly straightforward" questions. First, did teachers operate differently in 'Open area' schools? Second, were students in 'Open area' schools achieving as well as their counterparts in conventional design schools (Angus, 1979, p. 8).

Data were collected from 120 primary schools of different design types and from a random sample of 18 year five pupils from within each school selected. Schools were drawn from all the States and territories (A.C.T. and N.T.) of the Commonwealth. Twice during 1974 the pupils were tested on a number of outcome measures: mathematical computation, reading comprehension, written expression, attitude to school, and self esteem. Information was also collected regarding various aspects of the teacher, pupil and school background. From this data it was possible to examine the relationships between the design of schools and teaching practices, design of schools and pupil outcomes, and between teaching practices and pupil outcomes.

#### 5.21 Findings

Findings of the national study included the following:

There was more 'Open' and 'cooperative' teaching in 'Open area' schools than in conventional design schools.

'Open' teaching practices were not related positively or negatively to any of the pupil outcomes measured.

There was a persistent trend in the cognitive outcomes, reading, mathematics, written expression, in favour of conventional design schools.

From the point of view of the present study, the latter two findings are important. Elaboration and comment are restricted to those concerns.

It must be noted that the researchers admitted the limitations of their approach in that all the reasons for the differences between the comparison groups would not have emerged.

Angus, in a later published statement (1979) suggested that the differences in pupil outcomes might have been the effect of something other than school design or teaching practice. The most reasonable possibility might have been those potentially powerful factors most difficult to operationally define and measure, notably the process of diffusion and adoption of the 'Open concept' (p. 11).

The reasonableness of this was partly confirmed from consideration that an obvious limitation of a study, whose independent variable was school design, would have been the short term power of its results. Many changes have taken place in terms of the expansion and the modification of 'Open area' schools. This applied even during the lifetime of the national study. The Report acknowledged the views of Cronbach on the matter of "short term empiricism" (1975, p. 122-123). The project of course was limited in terms of its sample, having been constrained by the number of 'Open area' schools available from each State. Significantly the State with the greatest population (N.S.W.) was one of the least represented. Obviously it was not possible in 1974 to sample all the States equally. However, there were other aspects to the problem. In determining results the school was employed as the unit of analysis. Data were aggregated to product mean scores for the selected teachers and pupils within each school. This being so, as the Report agrees, it would have been much more difficult to



detect teacher effects where it was not possible to associate each pupil with a particular teacher.

One of the more striking results in this connection was that 451 (or 35%) of teachers in 'Open area' schools compared with 561 (or 56%) of teachers in 'Conventional' schools claimed to be fully familiar with the rationale for the effective use of their school building (p. 101).

The manner in which adoption of 'Open area' classrooms was promoted, and inhibited, probably explains the apparent lack of teacher development in this direction. As the Report noted, the adoption was essentially a "top-down operation" and most Education Departments failed to discriminate between functions of schools designed according to 'Open area' and 'Conventional' design principles (p. 101).

There were three expressed limitations to the findings of the national project.

- (i) The methodology appeared not to have been adequately sensitive to teacher and pupil interaction, particularly in terms of pupil outcomes.
- (ii) There was a discrepancy between 'Open area' and 'Conventional' teachers in the degree of their familiarity with rationale for effective use of school building.
- (iii) There was a short term power in the results due to change over time related to the key variable of 'Open area design'.

Hence further investigation of specified teacher and pupil interactions was warranted.

The careful control which characterised the research in this project is acknowledged. That the researchers were at pains to emphasise the tentativeness of their conclusions reflected the integrity of the project. The present study was therefore encouraged in its focus upon the teacher variable in relation to pupil outcomes.

#### 5.22 Implications for Tasmanian Schools

Tasmanian Government Schools contributed to the sample for the Australian Open Area Schools Project. However, no substantial research into the 'Open' concept had been produced in Tasmania beyond that contribution.

Sixteen Tasmanian schools were included in the national sample. The sampling matrix of all schools were classified according to a four-way stratification of school design. In Tasmania eight schools were classified as 'conventional', six as 'two teacher space', and two as 'three or more teacher spaces', (later called 'multi-space'). (The classification 'Mixed' was not relevant to Tasmania). The results of the national study were of course aggregated, and have been discussed in the earlier sections.

For Tasmanian education the immediate impact of the Report of the national study, (1979), appeared to be a disappointment. Tasmania

had already decided against expansion of the 'Open space' design, partly due to the natural limitations of its small population.

Also the public statement of the Minister for Education was, if predictably, negative and critical. No doubt this reaction was attributable to a major finding of the study, viz. a persistent trend in the cognitive outcomes in favour of 'Conventional' schools. However, such responses obscured other important findings of the national study, viz.,

- . The conclusion that school building design warranted more serious attention than had hitherto been the case in formal education. (p. 112)
- . That the study in any case did not provide a blanket criticism of the 'open area' school design. (p. 110)

Of particular interest to the present study, and for the Tasmanian context, was the finding that systematic differences in pupil achievement (and pupil attitude) were observed between 'Open' and 'Conventional' design schools. However, in no case was it possible to relate these differences to 'Openness' of teaching practices (p. 98). The Report noted that this latter finding was contrary to the result of the Bennett study (1976). The national study conceded an alternative explanation to its finding in relation to teaching practices. It was that the methodology of the national study, whose primary purpose was to investigate school building design, may have been insufficiently sensitive to detect teacher-pupil relationships in terms of pupil outcomes (pp. 98, 99). On this basis, and also for reasons already indicated, a State-wide study in Tasmanian schools appeared potentially useful.

In addition the release in 1978 of a significant educational report, commissioned by the Tasmanian Government, further reinforced the need for such a study. The Report of the 'Tend' Committee (Tasmanian Education: Next Decade) stated its preference for 'Open' education, regarding it as "commensurate" with "high" educational attainment (p.42).

### 5.3 The Study of Bennett (1976)

Of questions Bennett aimed to answer, this study is concerned primarily with the following: do teaching styles have a differential effect on the academic progress of pupils?

Twelve styles of teaching were distinguished, ranging from 'Informal' ('Open') to 'Formal' ('Traditional'). The typology was developed from an analysis of a Teacher Questionnaire which asked teachers to describe their behaviour in relation to their teaching 'methods'. From this typology 37 teachers were chosen representing 7 of the 12 styles. These seven types were then collapsed into three general styles, 'Informal', 'Mixed', and 'Formal'.

The 950 pupils of the 37 teachers were given a range of tests - in reading, mathematics, English and creative writing - at the beginning and end of their fourth grade, the teachers having been selected prior to the end of the previous year.

Bennett reported that the 'Formal' and 'Mixed' classes made significantly better progress than the 'Informal' in reading. In mathematics there was an even more striking difference in favour of

the 'Formal', as also in English. There was little evidence, he concluded, to suggest that pupils in 'Informal' classrooms did better in creative writing, and only partial support for the belief that an 'Informal' style of teaching depressed performances in English grammar. Pupils in 'Formal' and 'Mixed' classes performed better in punctuation, though spelling performance appeared to reflect sex differences rather than teaching style. Pupils in 'Formal' classes engaged in 'work activities' more frequently than those in 'Informal' classrooms, where there was more social interaction and talking.

The results came at a time of great public and institutional interest in the performance of schools. This was exemplified in Britain, where the study was conducted, and where it was heralded as an implicit judgement upon the effectiveness of the implementation of the Plowden Report recommendations.

In Australia the Bennett study was regarded by a member of the Technical Committee of the Australian Open Area Schools Project as having "some remarkable parallels" with the Australian Project. It was also called "essential" reading for administrators and teachers (Dodson, p. 32).

### 5.31 Critique

Criticism was inevitable, especially since the Bennett study had thrown substantial doubt on the effectiveness of 'Open' educational practices. This 'evidence' was acclaimed by educators round the world, particularly those who opposed or doubted the value of 'Open' education. Some of those criticisms have been referred to specifically

only insofar as they provided relevant procedural indicators for the present study.

#### 5.311 The Research Instrument

A major instrument employed in the research was *The Teacher Questionnaire*, responses to which provided data for developing the clusters of Teaching Styles. The Questionnaire was based on dimensions of a dichotomous nature, (mainly simple 'yes' and 'no' answers). (Bennett 1976, p. 165ff). This method was criticised for its inexactness, since cases within either part of the dichotomy could vary greatly (e.g. Powell, 1976). Therefore questions of the reliability of items were obviously relevant to the design of the Teacher Questionnaire for the present study.

#### 5.312 Clusters (Typology) of Teaching Styles

These formed the critical basis for developing linkages to pupil factors. They were criticised for having been selected ultimately on the basis of "the subjective opinion of the author" (e.g. Selleck, 1976). On the face of it, such criticism could have raised serious doubt as to the validity of the Typology of Teaching Styles. However, it is also necessary to acknowledge that Bennett sought evidence for the validity of the Typology from three sources. They were: ratings by research staff; ratings by local authority advisers; and descriptions of the school day by pupils. Thus despite any descriptive problems related to the 'Traditional' - 'Open' continuum, it appeared an adequate basis for examination of classroom reality, in terms of Teaching Style and effects on pupils.

### 5.313 Pupil Characteristics

Bennett sought to explain the relationships between types of pupils and their "progress". He found that "Teaching Styles" had a more powerful effect on progress than did pupil personality, arguing that most pupils in any case showed "better progress" under "formal" teaching. However, he had also stated that Teacher Attitudes ("Aims and Opinions"), being closely related to classroom practice, might be mediated by such factors as the characteristics of pupils. Thus, whether Teacher Attitudes might affect pupil progress, in terms of their relationship to pupil personality characteristics, posed an intriguing question.

### 5.32 Application of the Study in Tasmania

As indicated previously, publication of the Bennett study (1976) appeared prior to the final report of the Australian Open Area Schools Project. The findings of both studies were equivocal and controversial in terms of the key variables of teaching practices and pupil outcomes. Partial replication of the Bennett research was the approach chosen for the present study mainly because of its particular focus on those key variables. In addition Tasmania presented an ideal context for this approach due to its involvement in the national study, and also for the completeness of its sample. The schools included could represent a total State system and a cross section of primary schools in terms of geographical location and social character.

#### 5.4 Summary

Hitherto Australian studies have attempted to validate or impartially objectify the claims of 'Open' education. However, the research has been of widely varying quality. In addition the weaknesses of overseas research often have not been adequately rectified. The sampling has continued to be too limited. The operational definitions of 'Openness' have mitigated against any valid generalising of results. Crucial variables in terms of 'structure', pupil behaviour, 'teacher influence', etc. have either been too narrowly defined or isolated from other variables similarly essential to a unitary study. Nevertheless some issues have consistently arisen out of the research in the field over the period from the 'Progressive' era until the 1970's. The major ones, which this study will take up, include the questions of appropriately defining styles of Teaching, the relationship of such styles to the performance of pupils, and the significance of the factors of teacher attitude to that performance.

The present study did not presume to be more successful in resolving the significant questions. However, it did consider that further research into the interactive processes of teaching behaviours and pupil learning was both warranted and worthwhile. To this end the study of Bennett (1976) appeared to be an appropriate basis for proceeding, particularly since criticisms of that study had enlivened controversy in regard to the effectiveness of 'Open' teaching practices. The following statement generally represented the position, and the expectation, of the present study,



"An ... optimistic conclusion is that we still need to conduct large scale evaluation research on teaching behaviour and pupil learning; that teachers do differ in approach or 'style' and that pupils, other teachers, researchers and laymen are aware of such differences; that provided it includes appropriate other variables, such research will yield important implications for teacher selection, training and placement. Certainly, we do know that in large-scale studies using general achievement as criterion and the class as the unit of analysis, home back-ground factors and their confounding with school factors are likely to account for two-thirds or more of the criterion variance. But the remaining one-third or less still warrants the attention of researchers." (Baumgart, 1977, p. 119)

To this point two steps have been taken. One was to describe the nature of the problem for study, that is within the general context of 'Open' education. The second was to review the literature in the area. This has confirmed that 'openness' of teaching style, and its effects upon pupil performance remain significant variables for evaluative research.

However the problem of defining 'Open' education, and 'Open' teaching specifically, has been long standing. This problem, as a context for defining the terms used in the present study, is now dealt with.

## CHAPTER 6

### DEFINITION OF TERMS

#### 6.1 The Problem of Defining 'Openness'

The introductory historical survey showed that 'Progressive' and 'Open' educational practices were generally confirmed by reference to the ideologies underlying them. A wide range of interpretations of 'Open' education was also made possible by the emergent nature of such ideologies.

The review of the research literature has also shown that one of the most important problems for research into 'Open' education has been the 'lingering ambiguity' surrounding the definition of the 'Open' classroom. Predictably, as Katz (1971) observed,

"A way of thinking is difficult to operationalize. The available data imply (but do not verify) that there are reliable relationships between ways of thinking, assumptions about learning, classroom events, and educational outcomes." (p. 3)

Myers and Myers (1973) went further in asserting that,

"Emerging ideologies are difficult to implement because they cannot be defined operationally" (p. 110)

Nevertheless, to paraphrase a point made by Kerlinger, (1973) 'Open' education is a phenomenon to which meaning has been assigned by attempts to describe and specify the activities represented by it. Thus operational definitions have been employed in this and related research. However, one of the difficulties for research has been the confusion of terminology in relation to such activities. In particular

it was common - in Australia as well as overseas - for the terms 'Open education' and 'Open plan' (or 'Open space') to be used equivalently. Angus et al. (1979) reported the studies of Ward and Barcher (1975); Wright (1975); and Bell, Zipursky and Switzer (1976) as examples of this confounding.

#### 6.11 Conceptual Difference Between the Terms 'Open Education' and 'Open Plan'

The Fourth Technical Report of the Australian Open Area Schools Project, pointed out an essential discrimination to be made between these terms (Angus, Evans, Parkin, 1975).

In the first place it was noted that the term 'Open Plan' was a general descriptor relating to certain design features which were a departure from the traditional school building.

Hence it was inaccurate to equate 'Open' education with 'Open Plan'. It was also probably misleading to research 'Open' education in terms of a focus on classroom design features. For example, Dodson (1976), a Tasmanian member of the Australian Open Area Schools Project, summarised the "architecture of openness" as it developed in Tasmania over a period of about five yeears. He described twelve "major differences" which had evolved in school and classroom design, and concluded

"It can be seen ... that there is no such school as the open plan school. Given a basic design principle, architects have been able to produce a large number of permutations". (p.6)

## 6.12 'Open Plan': Research Findings

Research findings from other countries have supported the view that 'Open plan' appears unreliable as a research variable.

Gill (1977) attended to this question in a thorough study of classroom groups from three New Zealand Schools. A descriptive comparison between the two architectural types of schools was supported by an experimental study of behaviours within selected classrooms in which the physical environment was methodically manipulated. Gill stated:

"From the outset the question was asked whether the architectural change from 'conventional' schools to 'open plan' schools necessarily resulted in changes in the things teachers and pupils do in the two school types. The answer from the empirical evidence in this study would appear to be in the negative... What occurs within the walls of an educational environment reflects not the physical environment but the characteristics of those within it." (p. 14)

The relationship between "the physical environment" and "the characteristics of those within it" was specifically referred to by Allen (1976). After reporting three Canadian studies he concluded that they showed,

"a strong indication that self contained classrooms may be better suited to open programs than open areas" (p. 1)

More serious doubt was cast on the reliability of research employing the 'Open Plan' as an independent variable by the summary of relevant research provided by Lukasevich (1978). This was an extremely comprehensive review of sixty North American studies,

published between 1969 and 1976 inclusive. Lukasevich stated that findings on the effects of 'Open space classroom' ('Open space' being characterised, in the studies reviewed, as change in architecture),

"continue to be inconclusive and contradictory. For about one half of the studies no significant differences are reported for the groups compared. Depending on the variables being examined, about one quarter of reported studies show significant differences in favour of 'open space' students; one quarter in favour of 'students in self-contained classrooms.'" (p. 14)

The review further stated that a number of limitations were evident in the studies. Often terms were loosely defined, and in some cases did not describe actual practices. There was little consistency in the research designs used for assessment, and perhaps most significantly of all, there was often a lack of control over all variables such that there was no certainty that the architectural "facility" type was the only independent variable affecting the dependent variables under study.

This report strongly criticised research employing architectural design as the major independent variable. Clearly such procedure has confounded other variables under study.

The above research evidence together with a substantial inference from results of the National Study of Open Area Schools (1979) was regarded as adequate reason not to employ school design as the major variable in the present study. Earlier discussion of the National Study (5.21) indicated that its methodology, which employed school design as the independent variable, may not have been sufficiently sensitive to teacher-pupil interaction in terms of pupil outcomes.

The discrimination in terminology as illustrated by the confusion between 'Open education' and 'Open plan' raised a further point. Research into 'Open education' needed to specify clearly what was meant by the 'Openness' being investigated. The next section attempts to prepare the groundwork for this specification.

## 6.2 Distinction between Constitutive and Operational Definitions of Terms

Explanation of the terms used in the present study imply a distinction between the constitutive, or conceptual, and operational definitions of those terms. Kerlinger (1965) had argued that a scientific term has a constitutive or conceptual meaning and not only an operational definition. He later elaborated the point thus,

"Words or constructs can be defined in two general ways. First we can define a word by using other words which is what a dictionary usually does ... such definitions use other concepts or conceptual expressions in lieu of the expression being defined. Second we can define a word by telling what actions or behaviours it expresses or implies." (Kerlinger, 1973, 30)

In deference to scientific usage Kerlinger further advanced Margenau's (1950) distinction between constitutive and operational definitions.

"A constitutive definition defines a construct with other constructs. For instance we can define 'weight' by saying it is the 'heaviness' of objects ... Torgensen borrowing from Margenau says that all constructs in order to be scientifically useful must possess constitutive meaning. This means that they must be capable of being used in theories. An operational definition assigns meaning to a construct or a variable by specifying the activities or 'operations' necessary to measure it..." (Kerlinger, 1973, 30-31)

Such distinctions have been maintained in order to clarify the basis for operational definitions in the present study.

#### 6.21 Constitutive Definition of 'Open'

Roseth (1977) suggested that educators have adopted one of three alternatives in attempting to provide a "theoretical conceptualisation to open education". She presented those alternatives in the form of models, viz., the "learning assumption" model, that is, the listing of assumptions, concerning the way children learn, which underlie the philosophy of 'Open' education; the "learning practices model", that is, the listing of practices regarded as typical of 'Open' teaching, and the "dimensional model", that is, the description of one or more educational dimensions characterising 'Open' education.

##### 6.211 'Learning Assumption Model'

Perhaps the most influential would be examples of the "*learning assumption*" model. This model was exemplified in the writing of Barth and Rathbone. Barth (1969, 1972) has been widely quoted on the assumptions underlying 'Open' education. However he has also warned against possible contradictions in their expression. Nevertheless he himself produced a statement amounting to a definition:

"What is open education? Why does this term best represent the foregoing assumptions. Open education is a way of thinking about children, about learning, and about knowledge. It is characterized by openness: doors are ajar, and children come and go; classrooms are open, and children bring objects of interest in and take objects of interest out; space is fluid, not preempted by desks and chairs organized in rows or in any permanent way; a variety of spaces are filled with a variety of materials; children move openly from place to place,

"Within the open education classroom, surely other organizational elements exist; and it would certainly be possible, and even useful, to analyse them. Yet perhaps more important at this juncture is recognizing the interlocking, integrated nature of those features already specified; for, clearly, none exists as a distinctly independent entity, but rather each operates in collaboration with the other toward a set of common goals. Their common characteristics derive from a commonly held core of belief - an integral and unifying philosophy of what schools are for and what learning is like. Any attempt to describe these features separately must rightfully end with a reminder of this underlying unity." (p. 536)

However, he did not define that underlying unity.

Nyquist (1971) argued for two basic 'principles' for 'Open' education related to learning assumptions. He stated:

"Respect for and trust in the child are perhaps the most basic principles. It is assumed that all children are motivated to learn and will learn if the emphasis is on learning, and not on teaching; on thinking and not on memorising; on freedom and responsibility, rather than on conformity and following instructions." (p. 9)

This was at least an attempt to find a unifying principle. A problem is that he did not state whether 'respect' and 'trust' are synonymous. He therefore conceived of 'Openness' as having possibly more than one meaning. Also the words 'respect' and 'trust' are value terms, not principles. What Nyquist had to do to define 'Openness' in education was to provide principles that showed clearly how they applied to education as a total process.

An important definitional issue was raised by Resnick (1972) who viewed 'Open' education macrocosmically. She said,



"...it becomes clear that the heart of the open education challenge lies in the vision of an open society rather than in the organization of an informal classroom, or even a 'school without walls'. An open society requires open access to knowledge for all individuals at any stage of life. It also requires extensive degrees of self determination with respect to what is learned, when it is learned, and how." (p. 1)

"By using learner control as the defining criterion, I have tried to free the conception of open education from any particular set of current educational practices and to focus attention on a central social concern: increasing the degree of control the individual exercises over the shape of his own life." (p. 22)

The ideological position expressed here would probably be endorsed by those who would be described as 'Open' educators. Resnick focussed on a single and central conceptual notion. She proceeded to elaborate this on the basis of an assumption about the learner's control 'over his own life'. However, she needed to bring this assumption into the arena of educational practice and show how it could be operationalised, if the idea were to be interpreted by research.

#### 6.212 'Learning Practices Model'

Under the heading of the "*learning practices model*", Westbury (1973, pp. 109, 115) and Stephens (1974, p. 27) provided examples. However they did not actually define 'Openness'. Rather they attempted to describe it. Westbury's (1973) statement was an attempt to interpret the classroom, whether 'Open' or 'Traditional'. His analysis was based on the assumption that in order "to understand what teachers do, we have to look to the context that is the classroom, to the tasks, structures and resources that define that social setting" (p. 109). Westbury was actually pursuing the implications of other assumptions

about 'Open' education by writers such as Barth (1969) and Rathbone (1971) and trying to work them towards concrete issues of "tasks, structures and resources" etc.

In doing so he saw the work of Zoltan Dienes, in primary mathematics, as being "the *real* literature of Open education" (p. 115). Westbury's point appears to be that despite the ideological basis for 'Open' classrooms, their pedagogical questions can only be answered via "devices" ... "to facilitate materials - induced instruction" which become "the primary instruments of explicit routine instruction in these ('Open') classrooms". After a lengthy discussion on the relevance of Dienes' prescriptions for achieving 'Open' educational objectives, Westbury is in fact fairly pessimistic as to whether areas other than mathematics have been sufficiently developed to provide such pedagogical answers "in practice". In a sense Westbury, as Barth (1969) before him, has presented a form of operational definition for 'Open' practices, but has not shown how such characteristics applied together to form 'Openness' or how any one was characteristic. There was a lack of constitutive meaning in the sense that the construct 'Open' has simply been described or explained by the practices attributed to it.

#### 6.213 'Dimensional Model'

The third model of Roseth was the '*dimensional model*'. She asserted that this was an improvement over the other two models since it took account of the extent to which assumptions about (and presumably practices in) children's learning that were 'Open' differed from those adhered to in conventional ('formal', 'traditional') learning. The

first examples are the uni-dimensional models. One of these (Franks et al. 1974) views theories of motivation as distinguishing 'Open' and 'Traditional' education. 'Traditional' learning theory regards all behaviour as extrinsically motivated, whilst 'Open' education sees learning as intrinsically motivated. Another model (Johnson and Johnson, 1974) is based on "goal structures" underlying classroom activities. Accordingly 'Traditional' classrooms are generally characterised by competitive goal structures, whilst 'Open' education is characterised by cooperative goal structures. Roseth however argued that uni-dimensional models were simplistic in the sense that they did not, as multi-dimensional models did, view the goals and practices of various educational systems as "consisting of a number of interdependent characteristics".

The *two dimensional model* was advanced by Bussis and Chittenden (1970) who viewed classroom environments along two dimensions according to the contribution made by teachers and by children to decision making. 'Traditional' education was characterised by a high degree of teachers' contribution (and a low degree of children's contribution) to decision making. 'Open' education was characterised by high degrees of both teachers' and children's contributions. This model was the product of the Educational Development Corporation, one of the most prestigious research organisations which were at work attempting to 'define' 'Open' education in America in the late 1960's and early 1970's.

The Bussis and Chittenden model related to an important aspect of the classroom dynamic viz., decision making. The characteristics

of this aspect were, however, described rather than explained. No conceptual definition of 'Openness' was contributed by such analysis. The authors may not have intended this to be so; the point at issue is the legitimacy of using such a model as definitive.

Gibbons (1970) described a *three dimensional model* of "educational practices". The three dimensions related to mode of instructional grouping (whole class vs. individual), pattern of decision making (teacher vs. pupil directed), and mode of instruction ('confrontation' vs. teaching aids). 'Open' education was described as being midway on the three dimensions.

The critical point about the Gibbons model was that it set out on an analysis of the notion of individualisation. He was proposing individualisation as a property of several of the same aspects of the school program - including grouping, decision making, and mode of instruction. As such, the analysis, and the three dimensional model which advanced a "definition" of 'Open education', more accurately yielded a conceptual definition of 'individualisation' rather than 'Openness'.

As a final example, the *four dimensional model* of "openness in classroom activities" by Linder and Purdom (1975) went some way towards relating interdependent characteristics of a classroom. The four dimensions were, "openness of assignment", that is, who decides on the learning activity; "openness of management", or the teacher's role; "openness of process", or the learner's role; and "openness of product", the degree to which outcomes are specified in advance. There

was a twofold weakness in the example however. On the one hand the authors appeared to regard 'Openness' as an innovation to be 'established' by teachers. 'Openness' was then defined in terms of the four aspects of the model. Teachers were expected to accept these as assumptions and somehow interrelate the classroom characteristics which they implied as 'levels' and 'aspects' (or 'Openness'). The article, though it suggested that a definition of 'Openness' was implicit to the model, did not also show how 'Openness' was conceptualised via this set of classroom activity characteristics.

The three alternative "models" of Roseth (1977) presented above were relatively advanced attempts to explain 'Open' education conceptually. However, she finally dismissed them as an "academic exercise only in that they have little value to teachers" (p. 4). She then proceeded to offer a further alternative, an "operational" definition. This was derived from a composite of what she called the "multidimensional" models of 'Open' and 'Traditionality'. The three aspects of 'past definitions' which, according to Roseth, contributed to the "multidimensional" model were "space layout", "organisational strategies" and "teaching methods". Roseth claimed that "Openness" and "Traditionality" were relative concepts and that *in any classroom* "Open education practices" can exist alongside "traditional practices". In order to define such relative concepts "precisely" she argued that "comparative" research employing *experimental and control classes* was the appropriate procedure. This enabled her to arrive at an "operational definition" of "Openness" which incorporated "Open" organisational strategies, teaching methods etc., and one of "Traditionality" incorporating "Traditional" organisational

strategies, teaching methods, etc. However, this procedure does not show how such a "definition" may apply "within any classroom" as well as between classrooms, which were somehow "proven" to be 'Open' or 'Traditional'. In other words the "definition" does not unequivocally assign meaning to the constructs "Open" and "Traditional" by the "operations" chosen to measure it. The characteristics implied by the classroom activities would need to satisfy criteria by which they could be judged as validly defining 'Open' or 'Traditional' for purposes of research. There was no clear evidence as to whether the characteristics of the classroom dimensions chosen were the correct and sufficient ones. Nor was the relationship between those dimensions explained in terms of that deduction.

The long and detailed discussion above has been presented because it serves to establish some important points regarding "definitions" of 'Open' education, as bases for researching its activities. Firstly it describes attempts to give conceptual (or constitutive) unity to the term 'open', providing thereby a useful basis for operational definitions to be employed in research. Secondly it indicates some obvious confusion as to the distinctions to be drawn between the constitutive and operational forms of such definitions. Thirdly it shows clearly that concern for children and their learning were fundamental principles implied by those definitions. Fourthly it implies the significance of teachers, as initiators of and monitors of opportunities for children to learn. Fifthly it points to the persistent ideologies underlying all such definitions.

Perhaps above all the previous discussion reveals that the strivings for a constitutive definition of 'Openness' in the sense of reaching its essence have failed in fact. This has partly been because what might be accepted as characteristics of this phenomenon are capable of differing interpretations by different people. Conceivably Thomas Arnold, hardly to be defined as 'Progressive' or 'Open', would nevertheless regard "respect for and trust in the child" as legitimate to his view of teaching and learning, in the same way as Nyquist does in his 'basic principles' of 'Open' education.

It would seem that some characteristics of a constitutive definition of 'Openness' could well be fitted into a constitutive definition of 'Traditionality' depending on how such characteristics were to be interpreted. Perhaps the important point here is that the interpretation is clarified when the concept is operationalised. Though there is a distinction to be recognised between constitutive and operational definitions they are in one sense inextricably linked in purposes of research.

It is now appropriate for the present study that a constitutive definition of 'open' be arrived at as a proper basis for an operational definition of the term.

## 6.22 Constitutive Definition of 'Open' in the Present Study

Beck (1975) produced a definition of 'Openness' in which he deferred partly to Nyquist's (1971) two "basic principles" of "respect for and trust in the child". Beck used a series of value terms or synonyms which, he argued, collectively represented a "synthesis" of

'Openness'. This, he said, formed a "reliable" basis for an instrument to measure it. The definition of 'Openness' was incorporated in the statement: "...the extent to which pupils are regarded as persons who learn rather than organisms to be trained." (1975 (a), p. 68)

This definition implicitly acknowledges the significance of the teacher as well as the child, in particular the teacher's attitude ('Openness' is ...."the extent to which pupils are regarded..."). In addition to the teacher, of course, other educational influences on the child might be implied in the statement. However in the classroom context the teacher would obviously be the final interpreter and arguably the most authoritative of those influences.

Thus a constitutive definition of 'Open' would appear to warrant the addition of a specification of teacher attitude or expectation as a significant element, along with teacher practices or behaviours. Indeed evidence from the literature has indicated that such teacher attitude has been fundamental to the concept of 'Open' education, as signified by teaching practices. (The later section on an Operational Definition elaborates on this point). Thus a reasonable constitutive definition of 'Open', as a basis for operationally defining the concept for classroom research, would incorporate the key elements of teacher attitude towards pupils, teacher provision for learning (specified in teaching behaviours), together with the notion of pupils as learners. Such a definition might be stated as follows:

*Open education is characterised by the Teacher whose teaching, and whose provisions for the classroom, regard pupils as persons who are active and responsible initiators of their own learning.*



This definition would be an appropriate one on which to base the operationalising of 'Openness', having taken account of the theoretical concepts in the literature, of descriptions employed in the Bennett (1976) study, and those of other wide ranging research.

#### 6.23 Operational Definition of 'Open' in the Present Study

In the study of Bennett (1976), 'Open' education was operationalised in terms of 'teaching styles', that is teaching behaviours in the classroom. In fact Bennett had claimed that operationalising the global terms 'Open' and 'Traditional' into behavioural elements was only partly justified from the "theoretical literature" (p. 37). He gave this as the reason for his additional reliance on teacher interviews. Nevertheless, there was little doubt that this operationalising leant heavily on the literature as he reviewed it. The review of the literature in the present study substantiated the position that 'Openness' in education could be operationally defined in terms of teaching behaviours in the classroom. Such behaviours could have included elements such as teacher talk, types and degree of incentives, "control" of pupil talk, manipulation of programming, subject emphases, and allowance for pupil freedom and initiative in learning.

However, as also indicated from the literature, and as Bennett's (1976) study revealed, modes of teaching children were firmly rooted in the attitudes of Teachers toward educational issues and to various classroom methods and practices. The findings of Aston et al. (1975) were advanced in support of such a contention. Hence the term Teaching

Style incorporated teacher attitudes as well as teaching behaviours. Both in Bennett's research and in the present study, teacher attitudes are defined as teachers' "opinions" about education, including expectations about aims and issues in education, and methods used.

The term attitude will be used to emphasise the distinction from the teachers' classroom practices, but also the link between those practices and the teacher as a person who initiates them.

The following sections give details of the operational definitions for both the Teaching Behaviour and Teacher Attitude components.

#### 6.231 Operational Definition of 'Open' Teaching Style - Teaching Behaviour Component

Bennett's categorising of components of Teaching Behaviours acknowledged the work of Walberg and Thomas (1971), who had searched the traditional literature, and particularly had reviewed the writings of Barth (1969) Bussis and Chittenden (1970) and Rathbone (1971). Walberg and Thomas isolated eight themes of 'Open' teaching style (see Listing in Appendix B). These themes were probably adapted from the ten themes of Bussis and Chittenden (Cochran et al., 1976). Bennett did not consider that a questionnaire adapted from these themes was satisfactory from a "structural" viewpoint. Nevertheless, not only the Teaching Behaviours as per the Bennett questionnaire items, but also the characteristics of the Teaching Style typology, were directly related to the Walberg and Thomas themes (Bennett, 1976, p. 45-47).

These characteristics, together with appropriate additions for the present study, are listed in Appendix C. Those additions or modifications to the Bennett definition (as expressed in the teacher questionnaire) were made for the purpose of greater objectivity. They also provided for a more appropriate means whereby the characteristics of teaching represented by the Tasmanian sample might adequately be determined. It was considered that such characterisations justified the selection of items from a Teacher Questionnaire to form the Teaching Behaviour component of Teaching Style.

On the basis of the above assessment, then, an *'Open' Teaching Style* would generally reflect the following Teaching Behaviours:

- \* a high degree of pupil choice in learning
- \* a high degree of pupil oriented investigation, including activities out of school in normal time
- \* a low degree of control over pupil talk and movement
- \* a low degree of Teacher talk
- \* a low degree of discipline of pupils
- \* a low degree of assessment of pupil work in terms of competitive testing
- \* a high range of resources for independent pupil work
- \* a high degree of integrated subject activity
- \* a high degree of cooperative/team teaching

In searching for a means of a logically, theoretically founded grouping of teaching behaviours, implied by the above listing, the set of 'features' of 'Open' education employed in the research of Giaconia and Hedges (1982) provided an appropriate basis in evidence. That

research, whose purpose was the comparison of larger and smaller effect studies of such features on pupil outcomes, employed the following groupings: the role of the child in learning, diagnostic evaluation, manipulation of materials, individualised instruction, grouping of pupils, use of space, and employment of team teaching.

These features were based, "partly on the general categories proposed by Traub, Weiss, Fisher, and Musella (1972), partly on the categories described by Walberg and Thomas (1972), and largely on general impressions gathered in the course of reading the 153 studies reviewed in the meta analysis by Hedges, Giaconia, and Gage" (p.592).

Such grouping of behaviours also provided for a reasonable and justifiable selection from the items of the Bennett (1976) Teacher Questionnaire. Note that the features were consistent with items of the Bennett (1976) classification (cf. Bennett (1976: 38) and Giaconia and Hedges (1982: 593,4)). Clearly the features above specify 'Openness' of teaching. However the items, according to the degree to which teacher behaviour would adhere to them, would provide a means of measuring the 'Openness' - and by contrast the 'Traditional-ness' - of teaching. Also the grouping would accord with the principle of the constitutive definition of 'Open' teaching style given earlier, wherein the respective roles and contributions of both Teacher and Pupil in learning are the focus of significance.

By this means the teaching behaviour items would comprise a number of research variables (37), which are listed in Table 2.

TABLE 2  
 SHOWING QUESTIONNAIRE ITEMS IDENTIFYING TEACHING BEHAVIOURS GROUPED  
 ACCORDING TO FEATURES WHICH OPERATIONALLY DEFINE TEACHING STYLE  
 (Teaching Behaviour Component)

Feature	List of Variables
1.	<u>Role of the Child in Learning</u> Pupil movement Pupil talk Freedom to leave classroom Use of timetable Use of textbooks Homework Curriculum emphasis Emphasis - aspects of number Emphasis - aspects of language Pupils working cooperatively and individually on work chosen by the teacher and the pupil respectively Discipline
2.	<u>Diagnostic Evaluation</u> Use of rote learning (tables) Marking grading of pupil work Correction of spelling Use of incentives Weekly test - arithmetic Weekly test - spelling Testing in reading - fluency Testing in reading - comprehension Term testing

Table 2 (Cont.)

Feature	List of Variables
3.	<u>Manipulation of Materials</u> Use of class library Resources for independent work Pupils able to leave room for class Work Use of reference materials
4.	<u>Individualising of Instruction</u> Size of class Method for pupil reading Extent of teacher talk to whole class Extent of teacher talk to individuals/group
5.	<u>Grouping of Pupils</u> Grouping by grading Grouping by ability
6.	<u>Use of Space</u> Pupil choice of seating Form of seating - static by day Form of seating - static by term
7.	<u>Cooperative Team Teaching</u> Extent of team teaching

TABLE 3  
 SHOWING QUESTIONNAIRE ITEMS IDENTIFYING TEACHER (ATTITUDE) AND  
 GROUPED ACCORDING TO FEATURES WHICH OPERATIONALLY DEFINE TEACHING STYLE  
 (Teacher Attitude Component)

Feature	List of Variables
8.	<u>Teaching Aims</u> Pupils' preparedness for secondary work Pupils' understanding of the world they live in Acquisition of basic skills Development of pupils' creative abilities Encouragement of self-expression Helping pupils cooperate Acceptance of normal standards of behaviour Pupils' enjoyment of school Promotion of high level of academic attainment
9.	<u>Educational Issues</u> Pupil maturity in study Pupil security in terms of being directed in study Creativity - its educational status Discipline Streaming Teacher image of being 'liked' by class Assessment of pupil group work Incentives Keeping order in the classroom Knowing the home background of pupils

Table 3 (Cont.)

Feature	List of Variables
10.	<u>'Traditional' Methods of Teaching</u>
	Do these ... Create discipline problems Fail to bring out best in 'bright' pupils Make heavy demands on teachers Encourage self-discipline in pupils Teach basic skills, concepts effectively Encourage day-dreaming Leave pupils unsure of what to do Provide balance between teacher directed and individual work Allow individuals to develop full potential Teach pupils to think individually
11.	<u>'Open' Methods of Teaching</u>
	Items as for Feature 10



### 6.232 Teaching Style - Teacher Attitude Component

From literature reviewed in the present study it was clear that Teacher Attitude was directly related to Teaching Behaviours, and indeed that there was a correlation between attitudinal characteristics of Teachers and the 'growth' of pupils (Flanders, 1970; Ashton, 1975). Also, as Bennett found, "...opinions about teaching methods are firmly held (by Teachers) and ... in general opinions relate strongly to classroom practice." (1976, p. 78)

Thus attitudinal factors of Teaching Style employed in the study were designed to reflect such relationships.

Generally, an 'Open' Teacher Attitude, operationally defined, would be characterised by expectations such as the following:

- \* low degree of grading pupils by ability
- \* low level of reliance on extrinsic motivation
- \* low estimation of and reliance on Teacher control or 'order' in the classroom
- \* low expectation of discipline problems from 'Open' teaching
- \* high esteem of pupil learning - in terms of their maturity of choice and persistence in tasks
- \* high expectation for the strengthening of pupils' learning security
- \* high expectation for the development of individual pupil potential

- \* high expectation for the strengthening of pupils' intellectual individuality and autonomy

Bennett (1976) grouped these components according to questionnaire items under the headings of teaching aims and teacher opinions, with specific reference to pupils' learning and to teacher attitude towards methods of teaching. Such grouping could reasonably be identified as 'features' of a Teacher Attitude component of teaching style. The features (comprising 39 research variables) are listed in Table 3. It is to be noted that it is the *degree* to which the teacher Behaviour or Attitude might be measured as 'high' or 'low' on these features which would enable their classification as 'Open' in style to be determined.

#### 6.24 Definition of 'Traditional'

Constitutive and operational definitions of 'Traditional' education have been determined generally by virtue of contrasts with 'Openness'. More correctly 'Open' has been referred to generally as an antonym of 'Traditional'. The inference has been that 'Traditional' education has meant among other things an emphasis on large groups of pupils in all-purpose self-contained classrooms, with pupils confined to rows of single desks, and learning experiences directed by the Teacher. 'Openness' has contrasted with this in terms of a new environmental flexibility, including Team-Teaching approaches, which have emphasised the individuality of pupils.

Frazier (1972), writing about the development of 'Open' education in the United States, categorised such behaviours in terms

of differences between 'Traditional' and 'Open' schools. The categories were explained under the general headings 'Authoritarian' and 'Non-Authoritarian' respectively. (Table 4)

The differentiations between 'authoritarian' and 'non authoritarian' schools incorporated elements of values held by those schools and their teachers. They also gave, particularly for the 'authoritarian' group, some specification of the activities or operations implied by those values. In addition there was some attempt to interrelate the elements by the categories used.

Bennett (1976) similarly listed the characteristics of 'Traditional' teachers (which equated with those of the 'authoritarian' type categorised by Frazier). On the basis of a theoretical review of alternative conceptions of the learning process, and from close observations of teacher behaviours in schools, he was able further to discriminate between the characteristics of 'Traditional' and 'Open' teachers. These differentiating elements are listed in Table 5.

Whether or not the contrastive mode of comparison between 'Open' and 'Traditional' teaching in fact adequately discriminates between those features is a question not fully addressed here. It is one which may warrant further research. However, this mode certainly has applied in research in both the United States and Britain, as indicated by the examples given in Frazier (1972) and Bennett (1976). The question is made more difficult in the Australian context due to the lack of officially published statements which might describe departures from 'traditional' concepts of teaching. However the contrastive approach

TABLE 4

"EXHIBIT 1. (CATEGORISATION OF BEHAVIOURAL) DIFFERENCES BETWEEN  
AUTHORITARIAN AND NONAUTHORITARIAN SCHOOLS (REPRESENTATIVE LANGUAGE)"

	Authoritarian Schools		Nonauthoritarian Schools	
1 Attributes and qualities	arbitrary identical irrelevant oppressive orderly	preplanned rigid single silent specified	democratic diverse episodic exciting free	intense meaningful natural spontaneous unique
2 Artifacts aspects	boundaries curriculum discipline grades routines	standards structure tests textbooks walls	choice community exploration interests involvement	issues options participation possibilities self-evaluation
3 Actions	control cover establish follow get through	impose lay out spell out suppress tell	change develop experiment help enable	reorganize share stimulate trust uncover

(Frazier, 1972, 2)

TABLE 5  
 "CHARACTERISTICS OF PROGRESSIVE AND TRADITIONAL TEACHERS"

Progressive	Traditional
1 Integrated subject matter	1 Separate subject matter
2 Teacher as guide to educational experiences	2 Teacher as distributor of knowledge
3 Active pupil role	3 Passive pupil role
4 Pupils participate in curriculum planning	4 Pupils have no say in curriculum planning
5 Learning predominantly by discovery techniques	5 Accent on memory, practice and rote
6 External rewards and punishments not necessary, i.e. intrinsic motivation	6 External rewards used, e.g. grades, i.e. extrinsic motivation
7 Not too concerned with conventional academic standards	7 Concerned with academic standards
8 Little testing	8 Regular testing
9 Accent on cooperative group work	9 Accent on competition
10 Teaching not confined to classroom base	10 Teaching confined to classroom base
11 Accent on creative expression	11 Little emphasis on creative expression

(Bennett, 1976, p. 38)

was considered appropriate in the present study, particularly by virtue of the fact that it is consistent with the Bennett (1976) study on this point.

As indicated previously Bennett used the above contrasting characteristics of teachers as a basis for operationally defining six areas of teaching behaviour, viz., classroom management and organisation, teacher control and sanctions, 'curriculum' content and planning, instructional strategies, motivational techniques, and assessment procedures. These were further categorised under the headings; 'teacher class and classroom, teaching method, and opinions about education'.

So in operationally defining a 'Traditional' teaching style, the various items of those categories could be incorporated as follows:

In terms of the *Teaching Behaviour* dimension, a 'Traditional' teaching style could be defined as incorporating, for example,

- a high degree of teacher control over pupil talk and movement;
- a low degree of integrated subject matter;
- a high degree of testing and marking of pupils' work;
- a low range of resource provision for independent pupil work.

In terms of the *Teacher Attitude* dimension a 'Traditional' style could reflect, for example,

- a low estimation of the maturity of pupil choice in learning;
- a low expectation for the strengthening of pupils' intellectual individuality and autonomy;

a high level of reliance on extrinsic motivation

a high estimation of and reliance upon Teacher Control or 'order' in the classroom.

Note again that these items, in a contrasting sense, are consistent with the features employed to define 'Open' teaching style. Again it is the *degree* to which the teaching behaviour or teacher attitude might be measured as 'high' or 'low' on these features which would enable their classification as 'Traditional' to be determined.

'Open' and 'Traditional' teaching styles have now been defined operationally. Their detail also provides a sufficient basis for the development of instruments whereby data can be gathered. The next chapter describes the procedure for this task, and the following chapter the nature of the instruments to be employed.

### 6.3 Summary

In finding an appropriate definition of 'Openness', as a basis for proceeding to gather data, there were two difficulties to overcome. First it was necessary to distinguish between 'Open' education and 'Open' plan design, the latter proving to be unreliable as a research variable. Second the distinction between constitutive (or conceptual) and operational uses of the term 'Open' needed to be realised. Recognition of the fact that a scientific term used in research had a constitutive meaning as well as an operational definition was essential to this study. Such distinction, together with an examination of previous definitions of 'Openness', indicated that the significance of the teacher - the teacher's attitude as well as the

teacher's provision for children's learning - was essential for determining an appropriate operational definition. On this basis it was possible to provide a constitutive definition for the purpose of operationalising 'Openness'. The definition arrived at was as follows:

*Open education is characterised by the teacher whose teaching, and whose provisions for the classroom, regard children as persons who are active and responsible initiators of their own learning.*

In the process of operationalising 'Openness' account was taken of Bennett's (1976) approach, in defining the term according to elements of teaching style. In addition, advantage was taken of the classifications of 'Open' teaching according to certain 'features' described in the meta analysis research of Giaconia and Hedges (1982). These features enabled a logical grouping to be applied to the items extrapolated from the Bennett categories of teaching style. The features incorporated items of teacher behaviour under the headings; role of the child in learning, diagnostic evaluation, manipulation of materials, individualising of instruction, grouping of pupils, use of space, team teaching. It is noted that whilst the emphasis was on 'Openness' it was necessary, by contrast, also to define 'Traditional' teaching style. Part of the aim of this study is to see whether teachers vary as to their adherence to 'Open' or 'Traditional' teaching. Operationalising of 'Traditional' teaching was arrived at in the same fashion as for the contrastive term 'Open'. The definitions now form an appropriate basis for design procedure.



## CHAPTER 7

### THE RESEARCH DESIGN; DATA COLLECTION PLAN, AND DESCRIPTION OF SAMPLE

#### 7.1 Background to Formation of the Research Design

The starting point in creating the research design was the study of Bennett (1976).

Bennett's aim, as previously shown, was to investigate the effects of various teaching styles on the cognitive and emotional growth of pupils. Basic to this approach was the necessity to show that a 'typology' of 'Open' and 'Traditional' teaching styles could be established, and that these various styles related causally to pupil outcomes. Though published reviews of the Bennett study had raised some serious doubt about the methodology upon which it was based (Selleck, 1976; Powell, 1976) nevertheless the study had exerted a long term influence on the attitudes of Tasmanian teachers towards comparisons between 'Open' and 'Traditional' teaching practices.

The present study was designed to give evidence as to certain teacher-pupil relationships which existed in the Tasmanian context. This evidence would constitute information not previously available to teachers and school authorities in Tasmania. The significance within the present study of organisational and activity structures as a context for the behaviours measured, was presumed to be of particular interest.

## 7.2 Development of the Research Design and Data Collection Plan

Development of the design, and of the plan for data collection, was concentrated into three lines of approach. A simple model of the research design is presented in Figure 1.

7.21 Teachers. The following steps were required. To

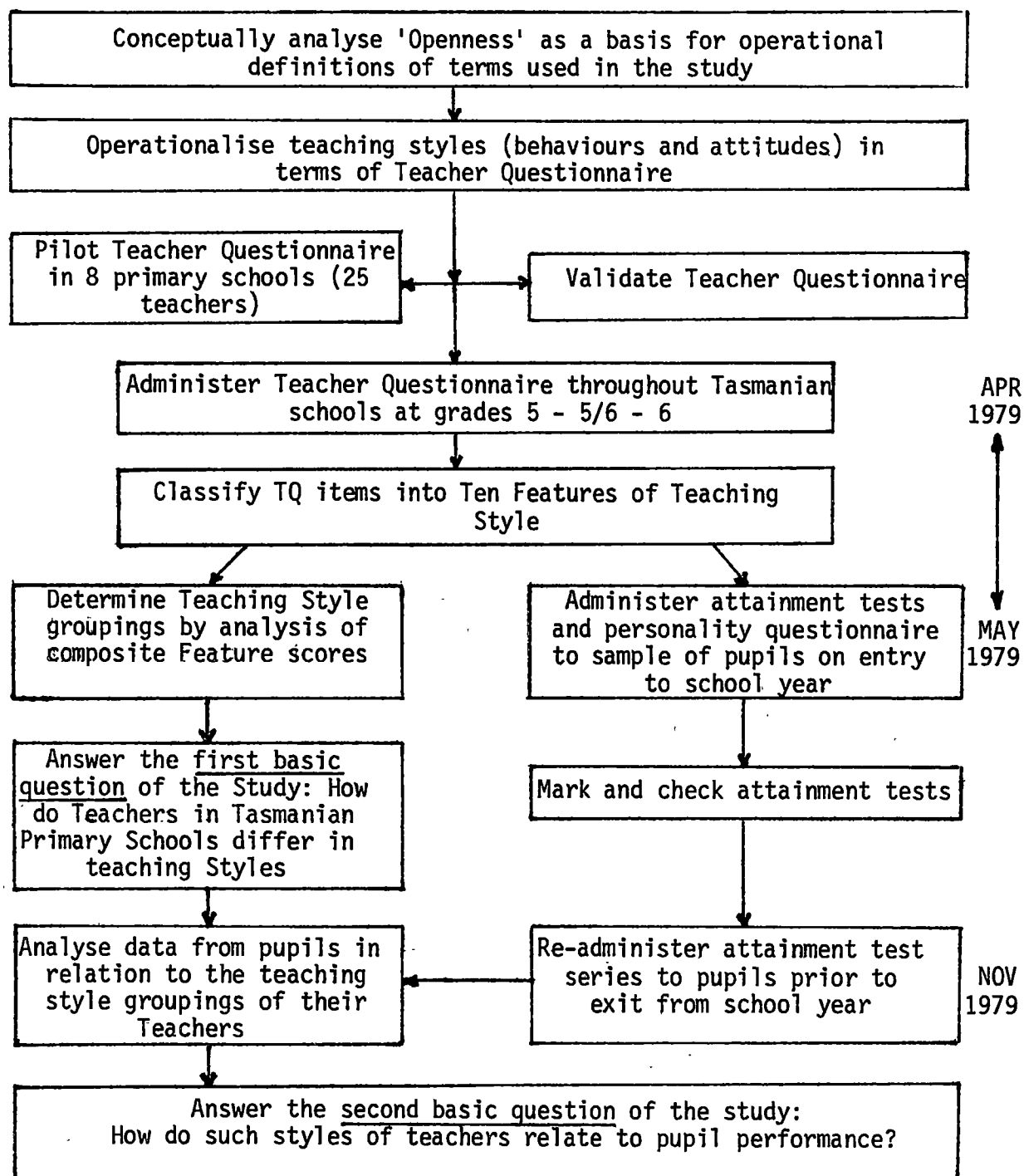
- . Conceptually analyse 'Openness' as a basis for determining operational definitions of Teaching style (Teaching Behaviours and Teacher Attitude).
- . Operationalise teaching styles in terms of their translation into items of a Teacher Questionnaire.
- . Pilot the Teacher Questionnaire in a selected sample of schools.
- . Validate the Teacher Questionnaire using classroom observation, interviews and descriptive essays, independently rated.
- . Administer the Teacher Questionnaire throughout Tasmanian schools at all grades 5, 5/6, and 6 levels. Circulate the Teachers not responding in the first round, in order to sample as large and representative a population of teachers and schools as possible.
- . Gather data from teachers concerning the extent to which items on instruments for the test series reflected detail of subject areas covered by pupils during normal classroom work throughout the year.

### 7.22 Pupils - Performance

- . Select the classroom sample of pupils by a stratified regional sampling of all schools in which teachers responded to the Teacher Questionnaire.

FIGURE 1

## SIMPLE MODEL OF THE RESEARCH DESIGN FOR THE PRESENT STUDY



- . Assess the performance of all those pupils by use of a range of attainment tests, including standardised tests of general ability.

### 7.23 Pupils - Personality

- . In each of the three State school regions select half the number of schools and administer the children's personality questionnaire (C.P.Q.).

## 7.3 Description of Sample

### 7.31 Significance of the Sample for the Present Study

Some of the reasons for selection of the sample for this study apply to the fact that the sample incorporated teachers and pupils from natural settings of intact classrooms.

Keeves and Lewis (1983) argue that, compared with experimental situations, in the main intact classrooms in real situations are required in order to "allow the learning conditions to co-vary as they do in the natural setting." (p.275).

Also, apart from reasons of economy and simplified data collection, the natural classroom setting enables a detection of particular effects between variables involving the pupil, classroom characteristics, and teaching behaviours.

The sample was chosen firstly according to parameters of the design (the Bennett research having been in the upper grades of primary schools). For the present study it therefore consisted of all the teachers, for grades 5 and 6, and a selection of the whole pupil groups

belonging to those teachers, in Tasmanian primary schools. In terms of the magnitude and expense of data collection it was not considered feasible to include all the pupils of all teachers (see Table 6, Appendix D for numbers involved).

There were other reasons for the above selection, which were related to the location of the sample. Tasmania was an ideal source because of its comprehensiveness as a total State primary school system. It thus included a cross section of rural and urban schools and a mix of socio-economic strata of school population.

Another fact relevant to the choice of sample was the involvement of 16 Tasmanian primary schools in the National Study of Open Area Schools (1975-79). It seemed appropriate to take the opportunity of substantially enlarging that sample in the same general research area.

The choice of Tasmanian primary schools related also to the professional position of the author. This involved supervision of student teachers in primary schools across the State over a number of academic years. In addition the author was from time to time engaged as a consultant to the Research Branch of the Education Department in its primary and infant schools. These factors meant a fairly continuous acquaintance with the system of schools chosen for research.

### 7.32 Sampling Method

The method chosen was stratified sampling, on the basis of the three regions of the State school system. In each of these regions

the population could be divided according to strata such as locality of school, sex of teacher, class size, and grade level of pupils (see Table 7, Appendix D). In particular the population could be divided proportionately by locality - in terms of inner city, sub-urban, and rural categories - Tasmania having a high proportion of rural schools relative to other States of Australia. There are also a number of schools situated on the outer edges of the cities and larger towns in Tasmania - such as Launceston and Burnie - whose pupil groups comprised residents of both town and surrounding country districts. The term sub-urban reasonably divided these from the inner urban and rural sectors.

Together with stratification, teachers and classes of pupils were selected randomly by use of the random numbering table of Murdoch and Barnes (1970). The selection of every fourth teacher subject provided for a final sample of schools from which both teacher and pupil data could be collected.

Matching the sample to the universe by the above process permitted a greater validity of inference than that of a random sampling procedure alone (Travers, 1969). The stratified sampling method was therefore considered to be most appropriate for the present study.

The use of this sampling procedure was also partly justified because the administration of education in Tasmania is conducted precisely in terms of the three regions referred to, thus providing a useful basis for stratification. The sampling method produced a regionally balanced and Statewide spread of schools (see distribution maps: Figures 2,3).





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[illegible]

### ● Schools in Final Data Analysis Sample



Another factor relevant to the choice of method was that the final sample of schools reflected the spread of organisational description provided by the schools for the Tasmanian "Directory of Schools" (1980). These descriptions could be categorised "Open", "Traditional", or "Mixed", and in fact the sample distribution accorded with these categories (Table 8, Appendix D).

### 7.33 Population Groups Comprising the Sample

A statistical table summarising the population distribution of groups in the sample - teachers, schools, pupils, grade levels - is presented in Table 6, Appendix D. A further summary - of characteristics particularly referring to the final sample of schools - is given in Table 9, Appendix D.

#### 7.331 Teachers:

Teachers from 138 of the total 172 schools responded to the first round of data gathering. This represented 78.5% of the total. (Of course the schools varied in the ratio of numbers of staff members to grade levels included). The high rate of response could have been due partly to the fact that principals in the majority of primary schools in the State were already acquainted with the study. The author briefly introduced the study at a primary principals conference held three months prior to the initial contact with schools. Nevertheless, despite the high rate of teacher response in the first round non responding schools were surveyed again. This was to determine the reasons for the lack of response, as well as to increase the sample.

34 schools responded in the further survey. Of these 20 were considered inappropriate in terms of smallness of numbers (some had no grade 5 or 6 in the year of data gathering), or because of the special nature of the school population (e.g. the Hagley Farm School serves a visiting school population from various State primary schools). Six schools indicated their interest but inability to join in the study for administrative reasons. Seven additional schools thus returned data in the second round of requests. This meant a response of 145 schools or 84.3% of the total possible. However, data for this latter seven schools were too late to be included in the final analysis. Only one school declined to participate because of the perceived nature of the study. The principal expressed doubt as to the possible use to be made of the results. Ultimately the stratified sample for analysis included a total of 253 teachers.

#### 7.332 Pupils:

The pupil sample was derived from a stratified sampling of all responding schools (i.e. 145 schools out of a total of 172). Random selection from the total school number was achieved from a choice of numerals, representing the schools, which had been ordered according to a random table (Murdoch and Barnes 1970, pp.30-32). This method yielded 30 schools or 20.69% of the total. The grade levels from which the pupils (and teachers) were drawn were evenly spread. There were 9 at grade 5, 11 at grade 5/6, and 10 at grade 6. Over a period of testing obviously the data sets for some individual pupils would not be completed, due to absences, etc. Therefore the final sample included 28 schools and 574 pupils.

For the personality testing greater than half the total number of pupils in the regional sample were included (that is, 16 classes, and 358 pupils). These again were randomly selected. There were two reasons for the reduced sample. Firstly the author decided to administer this test personally to all children in the sample. It was considered that items of this test, as compared with those of the attainment measures, were likely to require more advice on interpretation. It seemed appropriate for the author to ensure that such possible advice was consistent in this sense. Also since the attainment or performance testing had required travel on different occasions to all responding schools in the three regions, the sampling gained for the personality data was considered to be a reasonable limit. Secondly research budgeting did not reasonably allow for the purchase of more instrument materials, since these were expensive and had to be purchased from out of the State. However, the sample for this testing did represent 8.7% of all schools and 62.7% of the final data analysis sample of pupils.

#### 7.333 Grade Levels:

The employment of a composite grade 5/6 in the study was considered appropriate for the following reasons. In the relatively large number of suburban and rural schools the grade 5 and 6 pupils often were not divided. In some instances the 5/6 composite represented all the pupils at those levels even when the total would justify the employment of two teachers by "country" standards. The "Directory of Schools" (1980) indicated that grade 5/6 schools of the sample for analysis were also represented in all three types of organisational description, viz. 'Open', 'Traditional', and 'Mixed'.

## CHAPTER 8

### THE RESEARCH INSTRUMENTS

Instruments for the present study were designed to gather data from two main sources:

- all teachers at grades 5, 5/6 and 6 levels throughout the total State School population.
- all pupils of those grade levels who comprised the stratified sample of all schools by regions.

#### 8.1 Teacher Questionnaire (TQ) (Appendix E) - Formation

This instrument was constructed partly on the basis of the Teacher Questionnaire of Bennett (1976, p.164). Analytical detail of that instrument was given previously in relation to the operational definition of 'teaching style' (3.231). The elements of this variable were incorporated into the Questionnaire form. In order to present evidence for the validity of the instrument used in the present study, it <sup>(it)</sup> proposed firstly to report Bennett's validation of his Questionnaire. Then modifications considered appropriate for the present study will be described. Finally the procedures adopted in validating the present instrument will be stated.

#### 8.11 Validation of Bennett (1976) Teacher Questionnaire

Bennett sought evidence of validity of the typology of teaching styles from three sources (p.48). These were ratings by research staff, ratings by local education authority advisors, and descriptions of the

school day by pupils. The teachers from whom the evidence was derived were those (37) whose responses "most closely matched" the central profile of seven of the twelve clusters of teaching styles. The clusters refer to the groups of twelve teacher types or styles derived from a cluster analysis of responses to a teacher questionnaire. According to Bennett's clustering, that seven represented 'Formal', 'Mixed', and 'Informal' teaching styles or types.

Research staff spent two days in each of the classrooms during the course of data collection. Immediately afterwards they wrote a description of each classroom based on items in the questionnaire and in the cluster analysis. Bennett stated that the reports "related closely" to the cluster descriptions of teacher styles. The second source of evidence was the local education authority (L.E.A.) advisers. All primary school advisers were previously acquainted with the questionnaire analysis and cluster descriptions and also the teachers involved were known to them. The advisers visited the teachers and reported on them in terms of the questionnaire and clusters of styles. Bennett stated that an analysis of those reports indicated an 80% agreement between their ratings and the cluster description. The third source of evidence was gained from content analysis of an essay written by pupils of the 37 teachers involved. The topic for the essay was "What I did at School Yesterday". Nine classrooms of pupils were analysed. Two assistants were given the essays from the same class and were asked to write independent descriptions of the classroom. Bennett reported that the two descriptions were "virtually identical", indicating a "very high interjudge agreement" (p.49).

Bennett appeared to argue that the extent to which his "description of classroom reality" was adequate depended upon validation of the classification of teachers in the clusters. However in the present study reliability of the teacher questionnaire was of concern and depended initially upon careful modification of the instrument employed by Bennett.

#### 8.12 Modification to the Bennett Teacher Questionnaire

It was stated previously that modification of the Bennett teacher questionnaire was reasonable in view of the subjective method by which the items had been produced. Another reason for modification was the crudity of the items themselves. As Powell (1976) has argued, agreement on a simple dichotomy for each variable was "unexact" since cases within either part of the dichotomy could vary greatly. Also the items in the questionnaire were ambiguous in their application. As he also observed, the use of the teacher questionnaire was defensible because it enabled the gathering of responses from a large and representative sample of teachers. However, this method also implied an exactness in the instrument used.

Thus the first principle employed for modifying the Bennett teacher questionnaire was the reduction of ambiguity; for instance, in terms of the item concerning provision of materials ("storage materials in Bennett, p.165). This needed to indicate the possible purpose of such storage. So the item was modified to request information as to the extent that materials were available for independent work by pupils. Under this principle a total of 17

modifications were made in preparation for piloting the instrument for the present study.

A second principle was that all of the original questionnaire items in the Bennett instrument were retained. Generally the modification implied expansion from the dichotomies of those items and addition of some items. For instance, in the Bennett questionnaire an item concerning pupil movement in the classroom only allowed for a dichotomous response - pupils could move "whenever they wished" or "only during certain curricular activities" (p.166). This item was expanded to allow for a wider, more realistic range of possibility in response, from "no movement allowed" to "movement only in free/open times", to "practical subjects" to "movement whenever (pupils) wished". A summary list of modifications to the Bennett Questionnaire is presented in Table 10, Appendix F.

Completion of the Teacher Questionnaire, in terms of any further modifications to be made, awaited a piloting of the instrument.

### 8.13 Pilot Instrument; Establishing Reliability of the T.Q.

The teacher questionnaire for the present study was piloted at the end of the school year prior to the first year of data gathering. A total of 25 teachers representing eight schools were asked to respond (see Table 11, Appendix F). Teachers were asked not only to give precise answers to all questions but also to elaborate on their answers and to make suggestions for modification. Some of the teachers were interviewed after their questionnaires were received in order to clarify the responses which appeared potentially useful for revising the instrument.

On the basis of this piloting an additional 23 modifications were made. Thus a total of 40 modifications were applied to the Bennett instrument for the sake of reducing its ambiguity. These covered items in each of the three major sections of that questionnaire. This process of the two stages of revision established an internal consistency or homogeneity of items in the questionnaire, giving evidence of its reliability.

Computation of a parallel form (split-half) estimate of reliability yielded a coefficient of .67.

#### 8.14 Validation of Teacher Questionnaire used in the Present Study

It was noted that Bennett sought evidence for validation of the typology of teaching styles. The typology had been extracted from a cluster analysis of teacher responses to items of the questionnaire. The present study sought to improve the method of validation for the following reasons:

- . It was considered essential to validate the questionnaire instrument itself as well as validating the resultant typological analysis of responses.
- . The comparison of the questionnaire with observational data lacked rigour (Powell 1976). The mere comparison of written descriptions of selected classrooms with the teachers' questionnaire responses was considered an inexact procedure.



#### 8.141 Validation Procedure - Verification of Questionnaire Items

In this study 15 observers spent a minimum of two day visits in the classrooms of 19 of the responding teachers. A summary of the procedure is given in Table 12, Appendix F. Seventeen of the teachers were randomly selected from participating schools in the South region of the State. The other two were visited by the present author in the Northern region. The classrooms in the South were located in schools where the observers, who were final year students, were also engaged in four weeks of practice teaching.

There were three objectives of the visits:

- . First the observers checked 60 previously selected items out of the 70 incorporated in the questionnaire.
- . Second the teachers and some pupils were interviewed by indirect reference to the items where appropriate. The items potentially requiring elaboration of response were discussed in the preparation sessions.
- . Third the classroom records were checked for additional information where necessary (e.g. timetabling, use of materials, etc.).

Preparation for the observations was completed a few weeks prior to the classroom visits and consisted of the following procedure. After a general briefing to the observers collectively, the researcher met a group of five for a session of one and a half hours. Some of this first group, having completed their initial preparation, also attended the initial sessions of the further two groups of five. This assisted further clarification both of procedure and questions of interpretation.

The tasks in this session included discussion, checking, and confirmation of the 60 questionnaire items to be verified. (These 60 items mainly referred to questions on classroom organisation and teaching methods, parts I and II of the questionnaire, see Teacher Questionnaire, Appendix E. Teacher background items were referred to but did not require extended discussion).

Clarity of the meaning of items, and precision as to how verification of individual items would be determined, were the key elements of the first preparation sessions. The observers were provided with checklists in a form different from the questionnaire, though the items were worded precisely as in that instrument.

Each item was carefully examined for meaning and the criteria for verification were explained, discussed, and agreed upon. Verification meant that the characteristics of "classroom organisation" or "teaching methods" as per the questionnaire item were confirmed as accurately represented. For instance, to the question "Do your pupils generally decide for themselves where they sit in the classroom", the answer by the teacher would be 'Yes' or 'No'. The observer would effectively verify this by observation and, if necessary, pupil interview. As the sessions proceeded the trainees made notes for later reference. It is to be noted that the assistants were not required to judge the degree of 'Openness' in the classrooms. Their task was to record information via the questionnaire items which, by comparison with the Teachers' responses, would show the extent of validity of the instrument. The team of 15 observers was brought together for a final session mainly to ensure that all tasks had been

satisfactorily completed. Verification was carried out by the researcher and two other independent assistants, that is, persons who had not otherwise been involved.

The ratings of agreement between teacher responses and observations ranged from an agreement of 64.4% to 81.8% of items. The average agreement of the observers' checks with the original teacher responses was 72.7%. Thus the questionnaire for the present study was considered valid as an instrument for recording a measure of classroom reality (see Validation Data Summary, Table 13 in Appendix F). (In addition to the observational visits the assistants wrote descriptive essays on the classrooms following their return. These were read by other assistants who had not made observations, and comparison was made with the questionnaire checks. In no case had the assistant any access to information concerning the original questionnaire responses by the teachers. There was high agreement of the essay ratings with the descriptive items of the questionnaire responses (Table 14, Appendix F). However, since this comparison was mainly evoked in discussion sessions the agreement, though high, was considered merely supportive to the more precise checking by the observers.)

An additional validation measure was achieved by a Pearson correlation between 'Behaviour' and 'Attitude' classifications of the questionnaire item responses for all Teachers. The correlation coefficient was .61.

The completed list of items for the Teacher Questionnaire, in terms of the groupings according to features defining Teaching Behaviour and Teacher Attitude, is given in Table 15, Appendix F.

## 8.2 Pupil Tests - Standardised Cognitive Series

Pupil data were obtained from three sources - firstly the administration of a series of tests of attainment, secondly via a children's personality questionnaire (C.P.Q.), and thirdly from teachers' official records. Information from these records included pupils' calendar ages and reading ages, and parental (or guardian) occupations.

The attainment tests were:

- . The Tasmanian Tests of Mathematical Understanding A-H and B-H Combined
- . The Tasmanian Test for Reading Comprehension -H
- . The Tasmanian Word Knowledge Test - Form q
- . The Tasmanian Junior Test of General Ability -H.H. (Parts I and II, non-verbal and verbal respectively).

These were a standardised series of tests designed for use in State primary school conditions, and contained provision for conversion of raw scores to age and grade norms. More importantly they were a reliable and valid group of tests.

### 8.21 Test Reliability

Estimates of reliability for this group of tests were obtained and verified at the Regional Guidance Branch of the Education Department of Tasmania. They were provided by Mr. Jan Locher, Acting Supervisor, whose office handled all formation and distribution of tests for Tasmanian schools. The estimates were made throughout the

State in 1976 and 1977. In the case of Mathematics, Reading, and Word Knowledge, test reliability was in the form of coefficients from Kuder-Richardson, K-R 20, item analysis, estimates (Mehrens and Lehmann, 1973). For Mathematics the Kuder-Richardson estimate, K-R 20, yielded a test reliability of .73. A reliability measure was also achieved via the test-retest data, the tests having been given in April/May and November of the School year. A canonical correlation between the test retest scores was .90.

#### 8.22 The Tasmanian Test of Mathematical Understanding - A-H and B-H Combined (Appendix G)

This comprised a graded test of general mathematical understanding as distinct from tests which specified particular computational skills. It thus sampled a wide range of mathematical abilities. The two parts, signified by the letters A-H and B-H, indicated the distinction between grades 4 and 5/6 respectively. Both parts were administered in order to ensure an adequate assessment of the lower score range, and also to reinforce pupil confidence. There were 26 items in part A-H and 40 in B-H. The test was of 30 minutes duration, but additional time was allowed at the discretion of the teacher.

#### 8.23 Tasmanian Test for Reading Comprehension -H (Appendix H)

This test was appropriate to the required age and grade range tested. The test comprised a series of extracts to be read by the pupil. For each extract a set of questions were to be answered. There were

14 extracts and a total of 90 questions, and 30 minutes were allowed for response. The test sampled a range of five reading abilities - reading for facts, retention of key ideas, comprehension of various sequences, comprehension of points of view, and vocabulary. Reasonable alternative answers to the questions were acceptable and no penalty was imposed on the score total for mistakes in spelling, grammar, or for omission of some questions.

The Kuder-Richardson estimate, K-R 20, yielded a test reliability of .67.

#### 8.24 Tasmanian Word Knowledge Test - Form Q (Appendix I)

The development of a pupil's vocabulary of meaning has been regarded as significantly related to the development of reading skill (Dallmann, 1976). Thus a deficiency in such vocabulary could set limits on competence and progress in various types of reading. It was partly on these grounds that the testing of Reading skill was extended to the area of Word Knowledge. Also since the other tests of the series had incorporated two dimensions to the measure of competence, or performance, this test constituted a second dimension for Reading. Once again the standardised test used in the primary schools by the State Education Department was administered. The test was a series of single words, ordered according to grade level, alongside each of which was an array of five alternative words. Pupils were asked to identify the correct synonym from among those alternatives. Seven minutes were allowed for identification of up to 50 words, this being the optimum set for grade 6.

The Kuder Richardson estimate, K-R 20, yielded a test reliability of .83.

8.25 Tasmanian Junior Test of General Ability - H.H. (Parts I and II) (Part I = Non Verbal, Part II = Verbal) (Appendix J)

This was a test of general intellectual ability appropriate in terms of grade and age levels required in the present study. It was distinct from the Mathematics, Reading and Word Knowledge tests whose purpose was to gain data related to the specific achievement of pupils.

For middle school (primary) age children, tests of intellectual ability such as the one administered here have been shown to be accurate in predicting later "mental" ability (Weiner and Elkind 1972). Hence the term "intellectual potential" has also been used in regard to these tests in the present study.

Of course the question of what constitutes general intellectual ability and how it might be properly measured, has been one of considerable debate over a long period. Smart and Smart (1978) argued that perhaps the major principle to be observed in contemporary classroom research employing tests of intellectual ability must be their consideration in relation to other significant factors (p.86). In other words a more comprehensive view of intelligence and its measurement would aid the improvement of educational performance.

In the present study such lines of argument were acknowledged. Results of general ability tests were examined in relation to other

background factors in terms of their contribution to variation in pupil performance. Those factors included the cognitive tests already noted. In addition aspects of pupil personality were taken into account. For the Junior Test of General Ability, the reliability estimates were computed by the Guidance Branch in conjunction with the Research Branch of the Education Department. In this case a Horst Modification coefficient was also calculated.

The Kuder Richardson estimate, K-R 20, yielded a test reliability of .86.

The Horst Modification estimate yielded a test reliability of .88.

### 8.3 Performance Test Validity

A measure of external validity was achieved by a correlation between subject scores on tests of general ability and those via the attainment tests - of mathematics understanding, reading comprehension, and word knowledge. These tests have been described in previous section. The canonical correlation between the scores was 0.84, indicating a high measure of validity for the attainment tests.

Another test for validity involved establishing that the items of the attainment tests reflected subject matter familiar to the pupils during the particular testing period.

During November teachers were asked to indicate the extent to which items in each of the attainment tests were directly related to subject matter covered during the class year. Of the 28 teachers, 22



stated that the majority of the items for each test were based on material familiar to their class. No clear information was provided from the remainder. For Mathematics the rate of agreement ranged from 70.0% to 100%. For Reading Comprehension the range was 80.0% to 100%. Responses in terms of the test of Word Knowledge could not be clearly determined. Most teachers simply indicated that the list of words constituting the test would be 'covered' during the school year. However, the response information as a whole supported the assumption that the instruments were testing what was being taught, thereby providing evidence of their validity.

#### 8.4 Summary

The last two chapters have clarified the research design and the procedure for gathering data. The nature of the sample and the instruments to be employed, and the verification of those instruments in terms of reliability and validity measures, have been explained.

The next sections describe the stages followed for the statistical analysis of the data. The results are interpreted at each stage.

## CHAPTER 9

### ANALYSIS FOR DIMENSIONS OF TEACHING STYLE

#### 9.1 Teaching Style Features

Categories of Teaching Style were derived from analysis of response items of the Teacher Questionnaire. Two categories - Teaching Behaviour and Teacher Attitude - were formed by a grouping of Questionnaire items into features which altogether would make up the Teaching style set.

Theoretical justification for the use of such features, as a basis for analysis, was provided in 6.231.

The features themselves are presented here in tabular form which includes variable numbers for the items (Tables 26 and 27). Fuller detail of the items is given in the Questionnaire itself, (Appendix E).

Note that in preparation for analysis the fifth and sixth features of the Giaconia and Hedges (1982) model were combined. The grouping of items of the Teacher Questionnaire (such as 'seating and grouping') more closely equated to these features in combination. Also one item (TQ3, grouping of pupils by ability) was taken from the original feature 5 and given to number 1. This item related more appropriately to the pupil's role in learning (Feature 1) considering the total context.

TABLE 26  
 QUESTIONNAIRE ITEMS IDENTIFYING TEACHER BEHAVIOURS GROUPED ACCORDING  
 TO FEATURES WHICH OPERATIONALLY DEFINE TEACHING STYLE  
 (TEACHING BEHAVIOUR COMPONENT)

Feature	Teacher Questionnaire Item No.	Variable No.
<b>1. <u>Role of the Child in Learning</u>    Part 2</b>		
Pupil grouping by ability	3	28
Pupil movement	6	32
Pupil talk	7	33
Freedom to leave classroom	8	34
Use of timetable	11	38
Use of textbooks	13	40
Homework	16	44
Pupils working cooperatively and individually on work chosen by the teacher and the pupil respectively	17	47-48 49-50
Curriculum emphasis	18	51
Emphasis - aspects of number	19	52
Emphasis - aspects of language	20	53
Discipline	27	62
<b>2. <u>Diagnostic Evaluation</u></b>		
Use of rote learning (tables)	14	41
Marking grading of pupil work	21	54
Correction of spelling	22	55
Use of incentives	23	56
Weekly test - arithmetic	24	57
Weekly test - spelling	25(a)	58
Testing in reading - fluency	25(b)	59
Testing in reading - comprehension	"	60
Term testing	26	61

\* Combination of these variables indicates that the items were collapsed in order more accurately to weight the individual as against the group aspect of classroom 'work'. See the Questionnaire (Appendix E) and explanation in 9.11 for further detail.

Feature	Teacher Questionnaire Item No.	Variable No.
3. <u>Manipulation of Materials</u>	Part 1	
Use of class library	11	21
Resources for independent work	11	22
Pupils able to leave room for class work	Part 2 10	36
Use of reference materials	15	43
4. <u>Individualising of Instruction</u>		
Size of class	Part 1 6	12,13
Method for pupil reading	Part 2 14(b)	42
Extent of teacher talk to whole class	17.1(a)	45-46
Extent of teacher talk to individuals/group	(b)	
5. <u>Use of Space in Grouping of Pupils</u>		
Grouping by grading	Part 1 8(ii)	17
Pupil choice of seating	Part 1 1	26
Form of seating - static by day	4	29
Form of seating - static by term	5	31
6. <u>Cooperative Team Teaching</u>		
Extent of team teaching	7(ii)	15
No. of variables = 37		

TABLE 27  
(TEACHER ATTITUDE COMPONENT)

Feature	Teacher Questionnaire Item No.	Variable No.
<b>7. <u>Teaching Aims</u>                      Part 3</b>		
Pupils' preparedness for secondary work	A	85
Pupils' understanding of the world they live in	B	86
Acquisition of basic skills	C	87
Development of pupils' creative abilities	D	88
Encouragement of self-expression	E	89
Helping pupils cooperate	F	90
Acceptance of normal standards of behaviour	G	91
Pupils' enjoyment of school	H	92
Promotion of high level of academic attainment	I	93
<b>8. <u>Educational Issues</u></b>		
Pupil maturity in study	A	94
Pupil security in terms of being directed in study	B	95
Creativity - its educational status	C	96
Discipline	D	97
Streaming	E	98
Teacher image of being 'liked' by class	F	99
Assessment of pupil group work	G	100
Incentives	H	101
Keeping order in the classroom	I	102
Knowing the home background of pupils	J	103

Feature	Teacher Questionnaire Item No.	Variable No.
<b>9. <u>'Traditional' Methods of Teaching</u></b>		
Do these ...		
Create discipline problems	(i)	104
Fail to bring out best in 'bright' pupils	(ii)	105
Make heavy demands on teachers	(iii)	106
Encourage self-discipline in pupils	(iv)	107
Teach basic skills, concepts effectively	(v)	108
Encourage day-dreaming	(vi)	109
Leave pupils unsure of what to do	(vii)	110
Provide balance between teacher directed and individual work	(viii)	111
Allow individuals to develop full potential	(ix)	112
Teach pupils to think individually	(x)	113
<b>10. <u>'Open' Methods of Teaching</u></b>		
Items as for Feature 9		114-123
No. of variables = 39		

### 9.11 Scoring of Features

Scores were obtained on the Teacher Questionnaire items for each feature of teaching style, providing for a set of [10] feature scores for all of the 253 teachers in the sample.

Since the variables for each feature of teaching style were multi-scaled, it was necessary to devise a means of scoring appropriate to all response items. This was done by applying a weighting of numerical value to each response variable. This weighting indicated

whether the response represented a traditional, neutral, or open characteristic of behaviour (or Attitude) for the respective item. Each variable was scored in this manner, enabling a total score to be determined on all 10 features for each of the 253 teachers in the sample. The procedure would perhaps be clarified by the use of an example.

Variable 32, of feature no. 1, was chosen because it was an instance wherein more than a dichotomous response was possible. It thereby presented a more complicated scoring task than was the case for most items in the teacher behaviour grouping. Variable 32 related to the extent of movement of pupils in the classroom. The pattern of response and scoring was as follows.

If the response were at [1] on the scale, that is 'no movement allowed', the weighting given was a numerical value of -1, representing a traditional teaching behaviour in relation to this item. If the response were at [4] on the scale, that is, pupils moved "whenever they wish(ed)", the weighting was a value of 1, representing an open behaviour. If the response were at [2] or [3], that is, movement allowed only at special times, the value assigned was 0, representing a neutral behaviour in respect of this item. The value of 9 was given for a missing response.

Note that the application of weighting was not merely arbitrary. In light of the theoretical descriptions of the terms previously presented, fair judgment could be made as to whether a response was likely to be 'traditional', 'open', or 'neutral' in connotation. Also the responses at the open and traditional 'ends' of the scale represented an interpretation of general tendency, not simply an

extreme of behaviour. In the case of variable 32 the phrasing of the question "usually allow pupils ..." provides for this kind of interpretation.

Two qualifications were necessary in the method of assigning values to responses in the Questionnaire. One applied to variables 45-50 which related to the amount of time given to cooperative and individual work of pupils - in terms of teacher talk to pupils. These variables belonged to features 1 and 4 respectively. Responses required a percentage allocation of total time given to those activities. Response allocations of 5% or more were assigned an appropriate numerical value in the same way as before where they represented traditional or other behaviour, whilst allocations of less than 5% were regarded as neutral in this respect. A frequency distribution of the 11 variables of feature 1 (which includes variables 47 to 50 in the group referred to here) is shown in Figure 4. The relative normality of the distribution indicates that the mode of scoring for this group of variables was consistent in effect with that for the majority of variables (see Frequencies of Teacher Factor Scores for all Features, Appendix N).

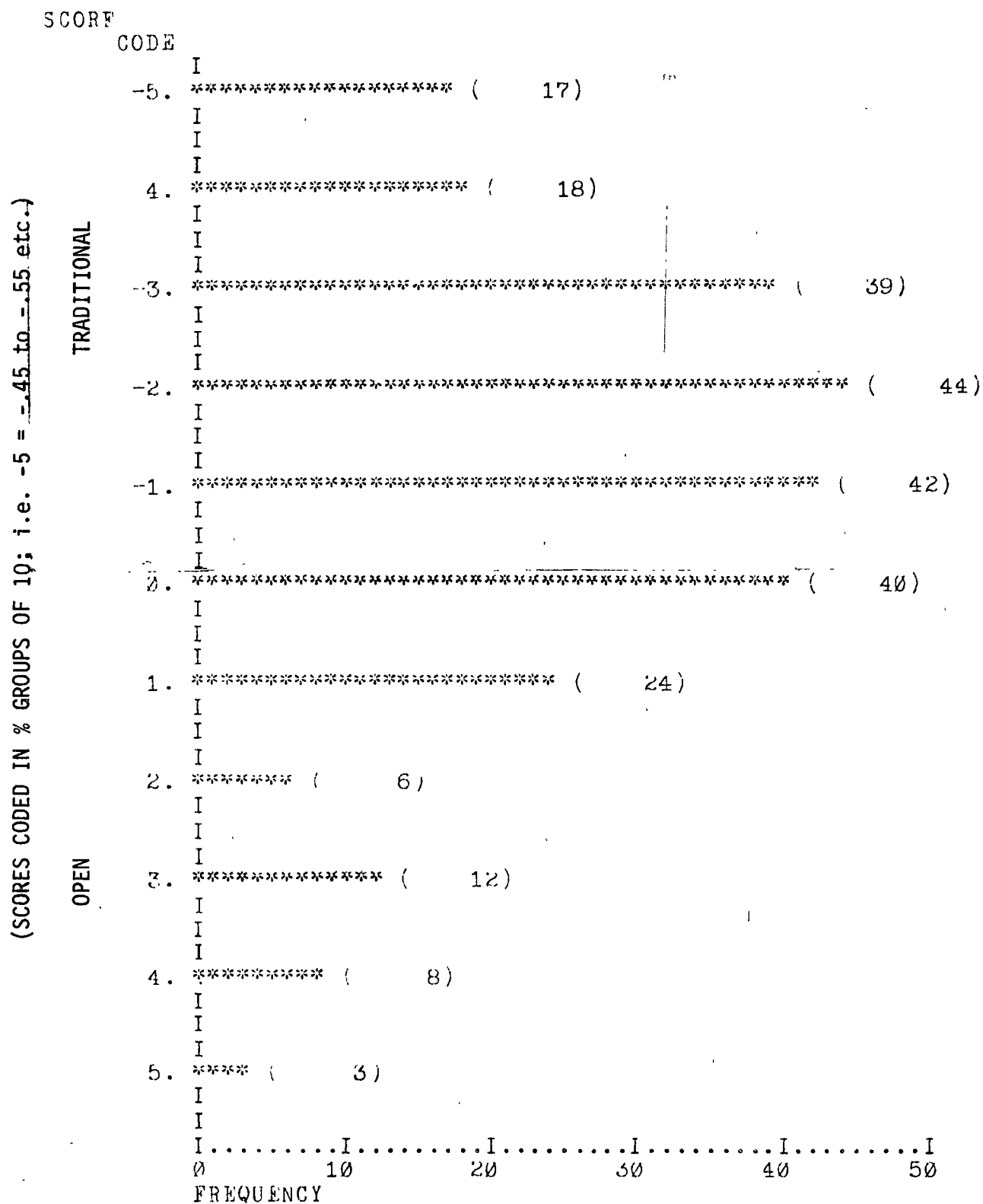
The second qualification concerned variables of the teacher Attitude dimension, that is, of features numbered 7 to 10. Scoring of these variables was done by assigning a numerical value to each response variable, as for most cases. However, for these variables the values were assigned specifically according to the strength of agreement with the item statement. The distance positively or negatively from the midpoint of the scale indicated a traditional or



FIGURE 4  
 FREQUENCY DISTRIBUTION OF RESPONSE SCORES  
 FOR FEATURE 1 OF TEACHING STYLE (TEACHING BEHAVIOUR)

N = 253

FEATURE 1 : ROLE OF CHILD IN LEARNING



open response respectively, a neutral response occurring at the midpoint. The values were averaged to achieve a score for the feature, and a frequency distribution of scores is given in Appendix N for the four features of the personality dimension.

The 10 features of teaching style represented composite scores on 76 variables (37 for teacher behaviour, and 39 for teacher attitude). The scores were calculated for the sample of 253 teachers. Calculation of these feature scores was achieved by subtracting the number of traditional responses from the number of open responses and dividing by the number of cases, the scores being given as a percentage. That is

$$F_{(1...10)} = \frac{O-T}{N} \times 100$$

where F is the feature score, O the Open response total, T the traditional response and N the number of items responded to (so accounting for missing cases). A negative feature score would indicate a traditional character to this style. A listing of Feature Scores for the Teacher Sample is given in Appendix O.

## 9.2 Relationship Between Teaching Behaviour and Teacher Attitude

For the total sample of 253 Teachers the basic statistics for each feature are presented in Table 28.

TABLE 28

N = 253

Variable		Mean	Standard Deviation
Teaching Style	1 (Teaching Behaviour)	1.13	2.29
	2	3.95	3.68
	3	3.84	3.65
	4	0.55	4.50
	5	0.98	5.14
	6	1.33	2.85
	7 (Teacher Attitude)	5.94	3.24
	8	19.95	4.26
	9	3.59	6.02
	10	0.11	5.40

The correlation coefficients are given in Table 29, Appendix Q.

A canonical correlation analysis was performed to explore the relationship between the set of behaviour scores and the set of attitude scores.

The approach implies an analysis of two sets of variables. Two linear composites are formed, one for the first set of variables  $X_j$  and one for the second set of variables  $Y_j$ . The correlation between these two composites is the canonical correlation and like multiple R will be the maximum correlation possible given the particular sets of variables.

The canonical correlation statistics are shown in Table 30.

TABLE 30  
 FEATURE SCORES 1-6 (TEACHING BEHAVIOUR)  
 WITH FEATURE SCORES 7-10 (TEACHER ATTITUDE)

Number	Eigen Value	Canonical Correlation	Wilks Lambda	Chi-Square	df	Significance
1	.37	.61	.60	127.49	24	.00

Coefficients, and correlations of each variable with the canonical variate, for the canonical variables (Canvar) are listed in Table 31, Appendix Q.

### 9.21 Interpretation

There was a single high canonical correlation between the feature scores of Teaching Behaviour and those of Teacher Attitude.

This means that only one trait would have to be controlled in order to eliminate all linear relationships between the two sets of scores. In other words, the teaching behaviour and teacher attitude measures have only one significant dimension in common.

### 9.3 Dimensions of Teaching Style

In order to explore the dimensionality underlying the ten variables, the technique of common factor analysis was employed. This has the advantage of reducing the number of variables to more manageable proportions. Also the factors so derived could acquire meaning because of the structural properties which might exist within the set of

relationships revealed. In this sense structure means a "departure from randomness" (Ferguson, 1981).

The technique has the ability to separate common factor variance (shared with other variables) from the variance unique to a variable. The basic mathematical model for common factor analysis has been clearly explained by Ransley (1981) as follows.

Suppose  $n$  variables (tests) are measured on  $N$  persons. If  $k$  fundamental underlying sources of variation (or factors) are operating in the observed data, then the fundamental equation of the ordinary factor analytic model can be written in the form

$$\underline{y} - E\{\underline{y}\} = H\underline{x} + U\underline{e} \quad \text{Equation 1}$$

where  $\underline{y}$  is a random vector of  $n$  components (test scores)

$\underline{x}$  is a random vector of  $k$  components (the common factor scores)

$\underline{e}$  is a random vector of  $n$  components (the unique factor scores).

$H$  is a fixed  $n \times k$  matrix of factor loadings (coefficients).

$U$  is a fixed  $n \times n$  matrix of the unique factor coefficients, and is a diagonal matrix with elements greater than zero.

In the orthogonal model it is further assumed that  $\underline{x}$  and  $\underline{e}$  are independent and

$$E\{\underline{x} \underline{x}'\} = I_k; E\{\underline{e} \underline{e}'\} = I_n; E\{\underline{x} \underline{e}'\} = 0;$$

$$E\{\underline{x}\} = 0; E\{\underline{e}\} = 0.$$

If  $C$  is the population covariance matrix; that is,

$C = E\{(\underline{y} - E(\underline{y}))(\underline{y} - E(\underline{y}))'\}$ , then it can be shown that

$$C = H H' + U^2 \quad \text{Equation 2}$$

$U^2$  is a diagonal matrix whose  $n$  diagonal elements are the unique variances or uniqueness ( $u_j^2, j=1, \dots, n$ ). The test scores may be expressed in standardised form so that  $C$  represents the population correlation matrix.

In cases where the factors are not orthogonal, the equation becomes

$$C = H S H' + U^2 \quad \text{Equation 3}$$

here  $S$  is the  $k \times k$  symmetric matrix of correlations between the factors. The resulting factors are said to be oblique.

The maximum likelihood method for common factor analysis is generally regarded as the "best" procedure (Timm, 1975), for estimation of the parameters in the factor model, under the multivariate normal assumptions. Ransley (1981) again has explained the procedure in careful contextual detail (pp.85-91).

The maximum likelihood method assumes that  $k$ , the number of common factors is known in advance. Lawley (1940, 1943) was the first to develop a test of how well the model fits the data; in effect this tests the hypothesis that  $k$  is a given number. The test employs the general likelihood ratio technique for testing statistical hypotheses; with a large sample the obtained test criterion has an approximate chi-square distribution with degrees of freedom,  $1/2[(n-k)^2 - (n+k)]$ .

The hypotheses that there are  $1, 2, \dots, k$  common factors form a nested sequence, in which more factors give a better fit. In exploratory work Jöreskog (1967) suggests a step by step procedure in which the number of factors is taken as the smallest number which will account for  $C_1$ . This proceeds by choosing some level of significance (e.g.,  $\alpha = .05$ ). One then takes the smallest value of  $k$  which yields a nonsignificant value of the test criterion.

The solution employed was that provided by the International Mathematical and Statistical Libraries (IMSL) statistical subroutines (1979).

#### 9.4 Teaching Behaviour Dimension

For the total sample of 253 Teachers the basic statistics for the six features of teaching behaviour are given in Table 28.

The results for the test of the hypothesis that  $k = 1$  are shown in Table 32.

TABLE 32

Hypothesis	Obtained Chi-square	Degrees of Freedom df	Achieved Alpha
$K = 1$	10.50	9	.3117

The maximum likelihood solution yielded at the most one factor to account for the obtained shared variance. The correlation matrix and residual matrix are shown in Table 33, Appendix Q.

The factor matrix along with the unique variances are given in Table 34.

TABLE 34

	Variable	Factor 1	Unique Variance
Teaching Behaviour Feature	1	.54	.71
	2	.39	.85
	3	.22	.95
	4	.33	.89
	5	.61	.63
	6	-.16	.97

#### 9.41 Interpretation

The factor matrix (Table 34) shows that a dimensionality exists for the Teaching Behaviour variables. Thus teachers may be grouped according to negative (traditional) and positive (open) factor scores in terms of this separate dimension of teaching style.

#### 9.5 Teacher Attitude Dimension

The basic statistics for the four features of teacher personality were given in Table 28. Applying the maximum likelihood test of the hypothesis that  $K = 1$  gave the results shown in Table 35.



TABLE 35

Hypothesis	Obtained Chi-square	Degrees of Freedom df	Achieved Alpha
K = 1	2.25	2	.3262

The correlation matrix and residual matrix are given in Table 36, Appendix Q.

The factor matrix along with the unique variances are shown in Table 37.

TABLE 37

	Variable	Factor 1	Unique Variance
Teacher	7	.46	.79
Attitude	8	.63	.61
Feature	9	.65	.58
	10	.75	.43

#### 9.51 Interpretation

The maximum likelihood solution yielded at most one factor to account for the variability in the data.

Teachers can be grouped according to low (traditional) and high (open) factor scores in terms of this separate dimension.

### 9.6 Teaching Style (Incorporating Both Major Categories)

For the total sample of teachers the basis statistics for each feature of teaching style are presented in Table 28.

The hypothesis that  $K = 1$  was tested according to the procedure described in 9.3. The results are shown in Table 38.

TABLE 38

Hypothesis	Obtained Chi-square	Degrees of Freedom df	Achieved Alpha
$K = 1$	38.43	35	0.3167

Applying the maximum likelihood criterion one common factor is indicated as that which accounts for the obtained correlation matrix. The correlation matrix and residual matrix are shown in Table 39, Appendix Q.

The factor matrix along with the unique variances or uniqueness (as  $u_j^2$  in the procedure for analysis (9.3)) are shown in Table 40.

TABLE 40

Variable	Factor 1	Unique Variance
Feature 1	.49	.76
2	.39	.85
3	.22	.95
4	.37	.86
5	.55	.70
6	-.14	.98
7	.50	.75
8	.57	.67
9	.69	.52
10	.71	.50

#### 9.61 Interpretation

Intercorrelations between variables (teaching style feature scores) 1 to 10 are relatively low indicating that the features are largely independent of one another. This applies mainly to the first six features of the category Teaching Behaviour. Intercorrelations for feature variables 7-10, Teacher Attitude, are high indicating a high proportion of common variance.

The data presented in the Factor matrices (Tables 34, 37 and 40) show that there is at most one dimension underlying the 10 features. The factor is largely determined by features 7 to 10 (Teacher Attitude). Nevertheless, though the uniquenesses are generally high, there is a common variance shared by the features which gives grounds for acceptance of the dimensionality of Teaching Style.

This result is consistent with the finding from the earlier canonical correlation analysis.

A reasonable interpretation of the data is that teachers may be grouped according to the position of their low (traditional) and high (open) factor scores along a single teaching style continuum based on the common component among the 10 features.

Note:

A problem occurred with the particular installation of the IMSL subroutine programme, causing uncertainty as to its accuracy for generating the factor scores.

In order to obtain estimates of factor scores it was decided also to employ the Principal Factor Analysis method (PA2).

The factor matrix is given in Table 41.

TABLE 41  
FACTOR MATRIX WITH (5) ITERATIONS

Variable	Factor 1	Communality	Eigen Value
Feature 1	.49	.24	2.46
2	.41	.17	
3	.22	.05	
4	.37	.14	
5	.56	.31	
6	-.14	.02	
7	.51	.26	
8	.56	.31	
9	.69	.48	
10	.70	.49	

The result is almost identical to that with the Maximum Likelihood solution. It seemed a reasonable procedure in the circumstances to use the option with PA2 to obtain estimates of factor scores.

## CHAPTER 10

## ANALYSIS FOR TEACHING STYLE AND PUPIL PERFORMANCE

10.1 Analysis for Determining Differences Between Pupil Groups

This next stage of the analysis required the selection of 28 teachers from the original sample (253) together with their pupils (N=574) from whom performance data had been gathered. Feature scores for each of the 10 Teaching Style variables (new variables) were then given to the children from the corresponding teachers.

The approach to the analysis was based on a division of the pupils into groups in relation to their teachers, who were high on the factor scores (representing open styles of teaching, N=9) and low on the factor scores (representing traditional styles of teaching, N=9). This division, though somewhat arbitrary, allowed for a reasonable representation of a neutral group (N=10) between the high and low boundaries of the teaching style continuum. The factor scores are listed accordingly in Table 42 (Appendix O). Pupil performance data is listed in Appendix P.

The object of the analysis was to determine whether statistically significant differences existed between the pupil groups, based on the individual pupils' scores on the set of performance tests (dependent variables). In addition, adjustment on the dependent variables was required to take into account possible differences between the groups on general ability measures.

These requirements led to the use of a multivariate analysis of covariance (MANCOVA) procedure.

The technique has the advantage of providing a test of differences between the five groups for the dependent variables taken simultaneously. It tests for differences among the three groups for the vectors of mean.

The tests (general ability 1, general ability 2 - or GA1 and GA2; mathematics, word knowledge, reading comprehension) are taken as the dependent variables. The performance variables GA1, and GA2 were used as covariates.

The above approach to the analysis implies the attempt to employ the teacher and pupil variables in such a way as to account for possible relationships between pre-test and treatment. As Keeves and Lewis (1983) argue, where complete randomisation of sample is not possible it is necessary to ensure that appropriate methodology of analysis is applied in respect of those relationships.

Further analysis with regard to measures of individual pupil improvement in the performance areas was not proceeded with, for two reasons.

Firstly, high canonical correlations between the May and November performance test scores indicated lack of significant change (see Table 62, Appendix Q).

Secondly, there was insufficient evidence for an assumption of equitability among the pupils in terms of variability in the 'style'

of classroom and teaching experienced by them in the previous school year. Obviously a number of variables which could influence pupil behaviour in transition from one grade to the next could not easily be controlled.

#### 10.11 Results

A summary of the analysis of covariance is shown in Table 43.

TABLE 43  
ANALYSIS OF COVARIANCE - SUMMARY

Source of Variation	df	Multivariate F
Constant	1	
Between groups	2	-6.57 (df6, 1134) $P < 0.0001$
Within groups	569	

For the whole pupil sample basic statistics for the ten feature (score) and five performance (test) variables are given in Table 44.

TABLE 44

N = 574

	Variable	Mean	Standard Deviation
Teaching Style Feature	SCORE1	-1.5767	2.3750
	SCORE2	-3.7648	4.2560
	SCORE3	3.8240	3.9701
	SCORE4	2.3136	4.8380
	SCORE5	1.0592	4.4404
	SCORE6	0.2648	0.4416
	SCORE7	6.4477	3.3084
	SCORE8	-19.9669	4.3459
	SCORE9	-3.8780	5.2474
	SCORE10	-1.2962	6.4952
Pupil Performance	PERF1	12.5819	3.7523
	PERF2	18.8206	6.8278
	PERF3	34.5592	10.6454
	PERF4	26.1585	10.9502
	PERF5	39.9164	14.5359
1CANCORR/INDIV/MAY/TESTS			

Correlation coefficients for the teacher feature scores and pupil performance tests are shown in Table 45, Appendix Q.

Coefficients for the canonical variables are given in Table 46, Appendix Q.

### 10.12 Interpretation

The analysis indicates that there are differences between the pupil groups (i.e. Traditional, Neutral, Open groupings) in respect of the dependent (performance) variables taken simultaneously.

No clear patterns of the differences between groups are obvious from observations of the group means, shown in Table 47.



TABLE 47  
TABLE OF MEANS

N = 574

Pupil Group	N	Observed Cell Means Variables				
		1	2	3	4	5
Traditional	(178)	12.44	18.20	35.60	25.80	40.39
Neutral	(174)	12.55	18.45	34.83	26.32	38.47
Open	(222)	12.72	19.61	33.52	26.32	40.68

Pupil Group	N	O.C. Standard Deviation Variables				
		1	2	3	4	5
Traditional	(178)	4.00	7.00	10.11	10.86	14.65
Neutral	(174)	4.04	7.05	11.35	11.69	15.00
Open	(222)	3.29	6.46	10.45	10.46	14.05

## 10.2 Analysis for Patterns of Difference in Pupil Performance

Further clarification of the above analysis required the use of canonical variate analysis. For this procedure the performance variables 1 and 2 (general ability (GA)1, general ability (GA)2) are again used as covariates.

The purpose of the analysis is to establish:

- one, if the patterns of responses to the three tests differ between the groups - after adjustment has been made for the differences in general ability levels between groups;

- two, if there is evidence of such difference, which pairs of groups differ;
- three, whether the neutral group can be seen as intermediate between the traditional and open plan groups; and
- four, the manner in which each of the three tests employed is involved in establishing the separation between the groups.

The statistics approach is simply designed to seek evidence for a difference in the set of average responses to the three tests employed. If two or more groups differ in mean performance in any one or more of the tests used, then the groups are said to show differences. It is presumed that three tests were employed because of their collective properties in measuring performance of students and that any one test alone would provide an inadequate basis for the comparison of groups. Hence it is appropriate to employ a statistical approach which utilises the collective set of responses independently. Given that the technique should also adjust responses to remove effects of different levels of general ability in students, a suitable method for initial comparison of groups is "Multivariate analysis of covariance". This technique seeks to establish whether the variation in response between students in different groups tends to be larger than variation in response between students in the same group, thereby implying evidence of group differences. It is multivariate in nature in that it makes allowance for correlations between the scores in different tests. Having established that at least two of the groups show evidence of differences in mean test score in at least one of the tests, it is then useful to establish which pairs of groups show evidence of difference. With minor amendments which are designed to improve

efficiency this basically involves repeatedly applying the multivariate analysis of covariance technique for each pair of groups. (The idea being that if only two groups are involved and there is evidence of group differences, then we know exactly which groups differ.) Computationally, it is not necessary to perform a whole series of analyses to achieve this end. It is possible to obtain the information in a single analysis and traditionally the presentation of the results of this analysis is in the form of a table of "Mahalanobis distances".\* From the user's point of view, Mahalanobis distances can be viewed as measures of the separation of the pair of groups. Two groups identical in mean response for every variable will have a distance of zero between them. As they exhibit greater and greater separation in any one variable, so the distance between them will grow.

Computation of the measures of Mahalanobis distances is based on the formula

$$S^2 = \left(\frac{1}{n_i} + \frac{1}{n_j}\right) \left(\frac{d}{d+1-p}\right) p F_{p, d+1-p}$$

by which two groups,  $i$  and  $j$ , are declared significantly different if the squared distance between them,  $D^2$ , exceeds the computed value for  $S^2$ , where

$n_i$  and  $n_j$  are the sample sizes of the groups;

$d$  is the residual degrees of freedom;

$p$  is the number of variables;

$F_{p, d+1-p}$  is the tabulated value of  $F$  for the chosen level of significance.

---

\* Named in honour of the statistician who initially proposed the method.

For this study,  $n_1 = 178$ ,  $n_2 = 174$ ,  $n_3 = 222$ ;

$$d = 574 - 3 = 571$$

$$p = 5$$

$$F = 2.23 \text{ (5\% level)}, 3.06 \text{ (1\% level)}.$$

The value of the Mahalanobis distance is that it takes into account duplicated information which results from correlations between response variables. For example, if two variables are perfectly correlated, their contribution to the separation between the groups, as registered by the Mahalanobis distance, would not be diminished by the exclusion of one variable since no information is lost. A statistical test is available which judges whether the size of the Mahalanobis distance is sufficiently large to provide evidence that the observed separation between the groups is not merely sampling variation but is a real effect.

Since differences in patterns between groups may take varied forms, it is useful to examine and portray the relative manners in which groups differ. This can be achieved by a technique known as "canonical variate analysis". This technique is valuable when it can provide a pictorial representation of the relative positions of the groups, as in the current study. Additionally the technique provides an indication of the extent and manner in which each of the response variables contributes to the separation of the groups.

## 10.21 Results

Basic statistical summaries from analysis of each variate separately are given in table 48. Note that means are provided after adjustment for any differences in general ability between students.

TABLE 48  
SUMMARY STATISTICS FROM UNIVARIATE ANALYSES  
TABLES OF MEANS

	Traditional	Neutral	Open
GA1	12.44	12.55	12.72
GA2	18.20	18.45	19.61
Maths*	36.23	35.17	32.74
Wordk*	26.55	26.76	25.37
Read*	41.41	39.05	39.40

\* adjusted for differences in GA1 and GA2

### RESULTS FROM ANALYSIS OF COVARIANCE

	F-value	Residual mean square (adjusted)
Maths	13.4	47.77
Wordk	2.2	50.50
Read	3.7	77.85

A summary of the application of multivariate analysis of variance and canonical variate analysis are given in table 49.

TABLE 49  
RESULTS FROM MULTIVARIATE ANALYSES  
RESULTS FROM MULTIVARIATE ANALYSIS OF COVARIANCE

---

Test for differences in patterns of mean responses from the three tests:

$$\text{Wilks' } \Lambda = 0.9339 \quad (p < 0.01)$$

Therefore there is evidence to reject the assumption that all groups have the same set of mean responses.

---

RESULTS FROM CANONICAL VARIATE ANALYSIS

---

	Canonical Variable	
	1	2
Latent root	0.0499	0.0198
Percentage of variation explained	72	28
Loadings*(standardised loadings)		
- Maths	0.141 (0.97)	-0.0025(-0.02)
- Wordk	0.049 (0.34)	0.126 (0.89)
- Read	-0.028(-0.24)	-0.138(-1.22)

(standardised loadings are formed from loadings by multiplying by standard deviations (i.e. squareroots of residual mean squares - from table 48)

---

---

**Canonical variate means**

- Maths	0.21	-0.16
- Wordk	0.14	0.19
- Read	-0.28	-0.02

**Mahalanobis distances**

Traditional	0.00			Difference for significance	
Neutral	0.36	0.00		- at 5% level	0.28
Open	0.51	0.47	0.00	- at 1% level	0.41
	Trad	Neut	Open		

---

\* Canonical variates are related to response variables as follows:

Canonical variable 1,  $C_1 = -0.2106 + 0.141 \text{ Maths} + 0.049 \text{ Wordk}$   
 $- 0.028 \text{ Read}$

Canonical variable 2,  $C_2 = 0.0975 - 0.0025 \text{ Maths} + 0.126 \text{ Wordk}$   
 $- 0.138 \text{ Read}$

A pictorial representation of the findings of canonical variate analysis are provided in figure 6.

**Note:**

As Keeves and Lewis (1983) point out the appropriate level and units of analysis can only be adequately resolved after due consideration of factors of design and also the research questions being investigated.

The analysis in this study firstly considers the primary sampling of teachers and then accordingly, the logical grouping of pupils.

Employment of the individual pupil as the unit of analysis is appropriate since individual test scores form the basis for analysis of the collective responses of pupils. As is indicated above part of the object of the second stage of analysis is to determine whether

FIGURE 6

POSITIONING OF TEACHING STYLE (PUPIL) GROUPS BASED ON CANONICAL VARIATE ANALYSIS

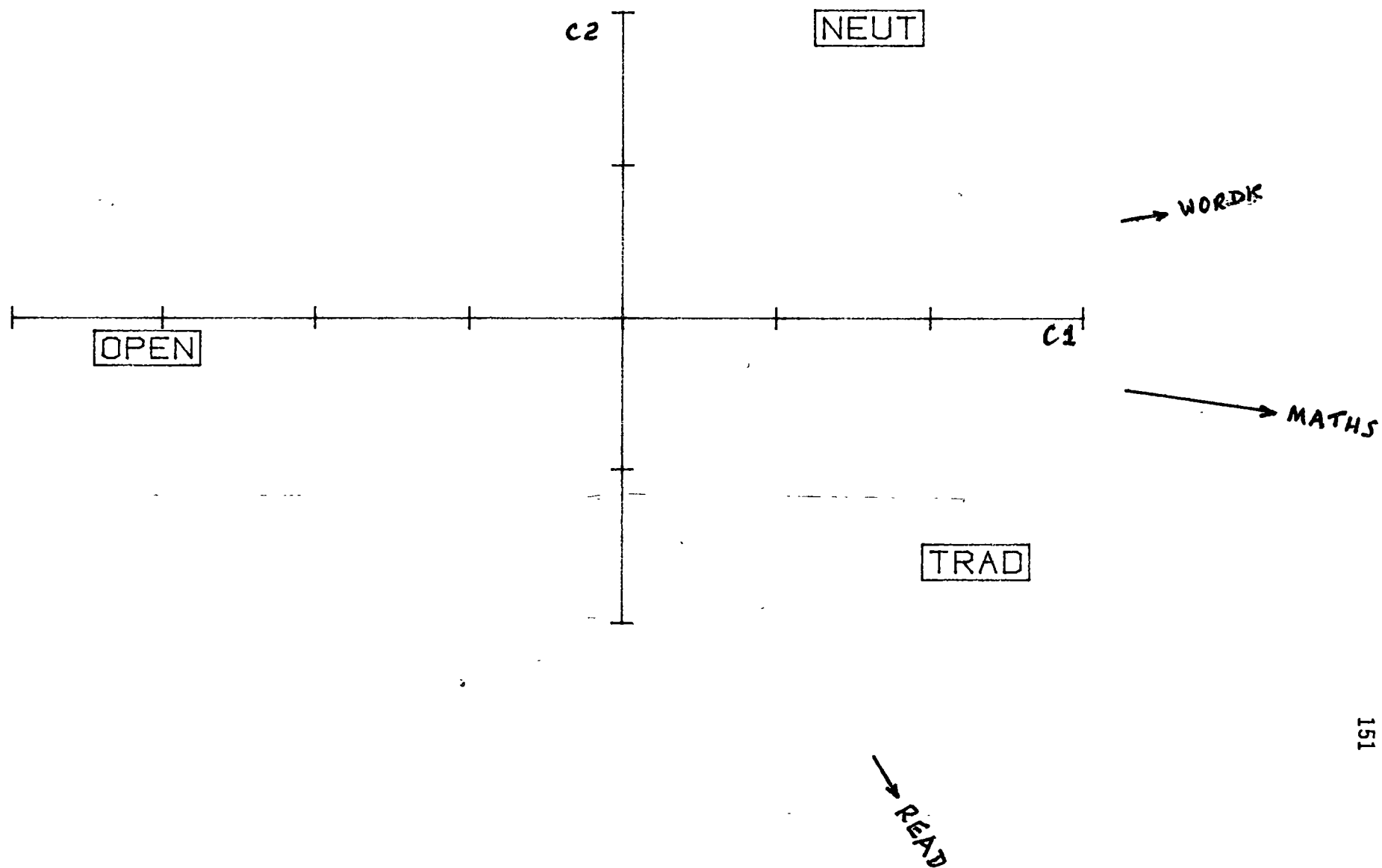




FIGURE 6  
POSITIONING OF TEACHING STYLE (PUPIL) GROUPS BASED ON CANONICAL VARIATE  
ANALYSIS

Notes:

- (i) The positions of the groups are defined by the canonical variate means given in table 49.
- (ii) A guide to the contributions of the three test variables in the separation of the groups is displayed as follows: an approximation of the direction of increasing score on each test is shown by the direction of the corresponding arrow; an indication of the relative importance of each test variable is indicated by the length of the arrow (with the lengths being proportional to the magnitudes of the F-values deriving from the univariate analyses of covariance - see table 48).

variation in responses between pupils in different groups is larger than variation in responses between pupils of the same group, adjustment having been made for the differences in general ability of pupils.

#### 10.22 Interpretation

The results establish that there are statistically significant differences between groups at the .05 and .01 levels and each pair of groups is distinct. It can be seen from figure 5 that the neutral group is not an intermediate group between the traditional and open groups. Whereas the results of the Maths test provide the strongest separation of the traditional and open groups, performances in "wordk" (word knowledge) and "read" (reading comprehension) jointly work to separate the neutral group from the other two groups.

In other words the greatest magnitude of separation between traditional and open groupings applies to the 'maths' performance variable, in the direction of traditional. The separations between traditional and open groupings for word knowledge and reading, though still significant, are of considerably less magnitude than for maths. Since the neutral grouping does not lie in an intermediate position, the direction of separation for word knowledge and reading is decreasingly determined by the traditional, and increasingly by the neutral group.

## CHAPTER 11

## IMPLICATIONS OF THE STUDY AND FURTHER DEVELOPMENTS

11.1 Major Implications of the Study

The two main objectives of the study have been achieved. The research has shown (i) that teachers can be classified according to differences in their teaching styles, (ii) that styles of teaching have a significant impact on the classroom performance of pupils.

The first objective also concerned the question as to whether styles of teaching can be compared. The evidence presented in this study shows that teachers can be classified as employing traditional (or neutral) or open styles of teaching. Indeed the data indicates that teachers so categorise themselves whether deliberately or not.

Evidence for such categorisation was determined on the basis of a theoretical classification of features of teaching style. Hence comparisons of styles of teaching can be derived objectively and in some detail. An advantage of the method of categorisation is that the features of teaching style comprise aspects of both teaching behaviour and teacher attitude.

Analysis in the present study not only confirms the limited evidence (quoted by Bennett, 1976) suggesting a strong relationship between teachers' educational attitudes and their classroom practices. It also provides a sound basis for investigating the relationship of these teaching style categories to aspects of pupils' classroom performance.

The second objective of the study was to find out the ways in which differing teaching styles were related to pupil performance. The evidence here shows that variation in pupil classroom performance is directly related to differences in the styles of teaching employed in classrooms.

More formal teaching styles are significantly related to higher pupil performance in areas of mathematics. This was a particularly clear result for mathematics where performance in this area accounted for the strongest separation of traditional and open groupings of teaching style. The pattern of separation between the groups is not as clear for the language areas (reading comprehension and word knowledge). Separation in these latter cases is increasingly determined by the neutral group; nevertheless it is clear that the teaching style groups differ markedly in respect to these subject areas. Such results are particularly noteworthy because performance was tested in terms of content and methodology familiar to pupils over a long period of time.

Because mathematics is often regarded as a 'conservative' subject as compared to the language areas there may be a temptation to dismiss the findings as obvious; suggesting that 'traditional' is to be equated with 'conservative'. However the fact that for the language areas there was also a marked separation of groups, in the direction of the traditional, does not make such a facile interpretation viable. Pupils were given equal research treatments in relation to both areas and the results were implicit to the analysis of data and not to assumed peculiarities in the nature of the subjects. It must be remembered

also that the mathematics tests were comprehensive in their emphasis upon mathematical understanding rather than 'mechanical' and computational ability per se.

The point which needs to be stressed is that these subject areas are all regarded as basic to the progress of primary school children and the features of teaching style employed in teaching them are, according to the results of this study, of particular consequence.

### 11.2 The Study in Reference to the Bennett Research

Although Bennett's original results seem to be confirmed by this study,\* it was not the original aim of this study to examine the validity of those results. His study was taken simply as a reasonable starting point. The present study endeavoured to improve on Bennett's methodology in three important respects, in an attempt to obtain greater objectivity.

The first was in the expansion and further development of the Teacher Questionnaire instrument (as discussed in 8.12). The second was in the approach to analysing the T.Q. data. Bennett was ultimately required to rely on a very subjective classification of teachers into teaching style groupings. The theoretical and statistical approach in this study enabled a quite objective grouping to be achieved. Thirdly definition of the teaching style 'dimension' was made theoretically and logically more appropriate for relating to pupil aspects by incorporation of the teacher attitude category, which Bennett had not included there.

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\* He had found that pupils performed better under a 'formal' (traditional) style of teaching.

It is noted that in 1981 Bennett, having 're-analysed' his data appeared to withdraw the major conclusions of his 1976 study. The 're-analysis' did not confirm statistically significant differences between his teaching style groupings, and hence nullified conclusions as to their impact on pupil performance. Bennett appeared to have come to the view that the 'theory' of teaching underpinning 'formal' and 'informal' teaching styles had 'outlived its usefulness' in the light of 'more recent data and theory development'. In fact it was a view not confirmed by the results of this study, nor shared by other prominent researchers in the area (Horwitz, 1979; Giaconia and Hedges, 1982) who maintained that much additional research was still required.

### 11.3 Limitations of the Research Program

It is recognised that the major findings of the study are neither a gross endorsement of traditional teaching styles nor a complete negation of the possible effectiveness of open styles. The groupings of teachers, based on factor scores, produced a fairly equal representation of traditional, neutral, and open styles. Hence the results are not grounds for dismissing any one style as lacking future significance.

However, the research focussed on variables of teaching styles and pupil performance. Within these two broad aspects the research program displayed certain limitations which need to be teased out by further investigation.

There are three areas where the program of research has in-built limitations.

- (i) The ten features varied in their contribution to the common component of teaching style. From this reference point it could be productive to test systematically whether different configurations of features are causally related to variation in pupil performance. By this means it might be possible to determine a set of necessary and sufficient features of effective teaching style. This suggestion follows on the lines proposed by Giaconia and Hedges (1982) in terms of the program effects of 'open education features'.

In addition the results indicated the potential significance of varying methodological features of teaching style for pupil outcomes (as indicated by correlations between the features and pupil performance variables). Further investigation of this question could well begin in the the area of mathematics.

- (ii) Measures of pupil performance were confined to the basic subjects, typically regarded as indexes of school achievement. Further research could determine whether differing teaching styles would have various effects on pupil outcomes in the non-achievement, or creative, areas. It could also be useful to find out whether pupils who perform well in mathematics and language do so in contrast to their performance in creative subjects, in light of the evidence that teaching styles influence performance in the former significantly.

- (iii) The sample population chosen for study was the State primary school system in Tasmania. Valid generalisations from the findings are therefore restricted to this system, which might reflect characteristics different from those of other systems or other States. Neither do the results presume to bear necessarily upon the schools of countries whose research, in relation to the questions for this study, was reviewed. Further analysis with extended samples, at least in Australia, could be worthwhile.

#### 11.4 The Study as it Applies to Teacher Education

The results have implication for some aspects of teacher education.

With the evidence that experienced teachers may be classified according to the styles of teaching they employ, they may be assisted in analysing their teaching by use and adaptation of observational categories (features) of the teacher questionnaire. Such analysis is even more justified given the positive correlation shown between characteristics of teacher attitude and teaching behaviours.

Differing teaching style features are shown to have impact on pupil outcomes in basic areas of learning. Therefore the nature and possible implications of individual teachers' styles might usefully be examined in a systematic In-service study.

Previous research evidence that the form of classroom design is distinct from, and not necessarily correlated with, the type of



education obtaining there, lends weight to an argument for a renewed focus on specific features of classroom teaching. The results of this study imply that increased attention needs to be given to the influence of classroom behaviours and attitudinal characteristics of teachers, rather than functions and forms of classroom design, in teacher training as well as within the profession generally.

Students in several systems known to the author currently have opportunity to develop their practical skills mainly in two ways. Firstly they are, for periods of some weeks, each attached to one classroom and teacher who directs their experience and therefore presents to the student a model of teaching 'style'. The criteria for such development are therefore confined to one situation, though the teacher has been commended as supervisor through his/her experience and skill.

Secondly the student is assessed by the 'model' teacher according to several fixed categories of a report form. These categories (such as 'knowledge and understanding', 'preparation', 'teaching skill') being general in description, are interpreted according to 'the individual teacher's judgment. The performance of the student is then rated (from 'excellent' to 'most unsatisfactory') within each category.

The advantage of the set of teaching style features is that their constituent elements are reasonably interrelated. As such they could serve the student more usefully as a means of assessing his/her development and skills than the disparate criteria presently employed. Using the features to match with the example of effective teaching from

his/her supervisor (or 'model'), noting what emphases there were etc., could enable the student more readily to gain in perspective on what constitutes effective teaching. Such an approach would be particularly appropriate considering that the student is attached to seven or eight different teachers and classrooms, for long periods, during training.

The results in terms of pupil performance argue for a systematic examination of methodologies being applied to the 'teaching' of content, at least in the basic subject areas. The argument is reinforced by the apparent evidence that pupils of varying personality characteristics may respond differentially to the classroom behaviour of teachers. This point is especially applicable to the institutions which have the dual role of teacher training and research into teaching.

### 11.5 Implications for Further Research

#### Pupil Performance

One aspect of the findings with implications for further research concerns the tests in mathematics.

These tests were intentionally broadly based to give indications of pupils' general mathematical ability. It would be interesting and useful to determine the degree to which the pupil groups differ in separate tests of the more mechanical computations and the understanding of mathematical process respectively.

## Pupil Personality

Other interesting results suggesting further research related to the variables of pupil personality. A limited analysis indicates that classroom performance of pupils is not significantly influenced by aspects of their personality.

On the other hand this study shows that Teaching Style is likely to have a significant influence on pupil personality factors, though this influence is mainly attributable to aspects of teaching behaviour, rather than teacher attitude.

From another analysis (included in the Appendix) neither does it appear that factors of teachers' background (such as age, sex, type of training, type of previous teaching experience) are associated with personality characteristics of pupils.

Such results are intriguing and warrant additional research using larger samples.

## Teacher and Pupil Background

Further research also appears appropriate in the areas of teacher and pupil background as illustrated from analysis given in the Appendix.

There appears to be little influence of Teacher Background upon the performance of pupils. Neither do variables of Teaching Style correlate with those of Teacher Background.

It would seem that further research relating various features of Teaching Style with variables of Teacher Background (perhaps additional to sex, age, training, experience as employed here) would be useful. Attention might also be given to broader questions such as whether various selected background variables of (say) secondary school teachers are associated with differential classroom performance of their particular pupils.

Some analysis was completed in which five variables of pupil background (sex, age, grade, socio economic 'status', and personality) were correlated with the five performance variables of the study. From the results it does not appear that factors of pupil background are likely to be significantly associated with variation in their classroom performance. The samples were relatively small so further analysis with larger samples could prove illuminating.

Perhaps one striking feature of the above results, in relation to pupil personality and pupil and teacher backgrounds, is that they seem to focus more and more narrowly on questions of the influence of teaching styles, as described and measured in this study. There is much room for systematic research related to these major variables.

#### 11.6 Concluding Remarks

Teaching and learning in the primary schools in Tasmania, as well as elsewhere, have received increasing public attention for two decades. Such concern basically is due in part to the rapid social and educational change, and in part to the apparently decreasing effectiveness of schools generally in preparing children for later

working life. The publication of the Report of the Tasmanian Committee on Primary Education, in 1980, partly was a response to such concerns.

However, there has not been a great deal of available evidence from primary classroom research, except indirectly, to help sharpen the perspectives of teachers and administrators and provide clearer direction. Indeed this paucity of research coupled with the apparent liberating strength of 'Open' education made it possible for certain suppositions, or assumed 'truths', to build up over time, as to what is actually occurring in the schools.

For example, taking some recent public as well as professional comment into account, it might now be assumed that primary teaching and learning in Tasmania, as elsewhere, is characterised by a more 'Open' - or more modern approach. The evidence of this study contradicts this generalisation.

A simple comparison can be made between the categorised descriptions of schools, Open, neutral or traditional, as published in the Department of Education Directory (1980) (see reference in 7.32 and Table 8, Appendix D for details), and categorisation on the basis of this study's analysis, at about the same period. These are set out in Table 63, Appendix Q. Two important points emerge from the comparison. One is that there is evidence of a fair distribution of schools across all three categories; the schools have not moved as far to 'Openness' as might be assumed. Secondly the schools appear to be less 'Traditional' than is suggested in the published descriptions. This kind of evidence is pertinent considering a major finding of the study, that Traditional teaching is related to higher pupil achievement.

In light of much recommended school-community linkage, which has recently increased the incidence of teacher-parent interactions, it might easily be assumed that the ('open' or 'traditional') attitude of the teacher is likely now to be critical to the success of pupils in terms of their classroom performance. Thus the fairly common view that it is necessary to fit children with teachers according to such assumptions or expectations.

However the evidence indicates that variation in pupil performance is more likely to be attributable to the teaching behaviour aspects of teaching style rather than to those of teacher attitude. In addition factors of teacher background appear unlikely to have a significant effect on pupil performance. The results of this study caution against assumptions involving the influence of teachers' attitudes on pupils' classroom performance.

Finally the fairly strong public scrutiny of and debate upon education of recent years, has raised doubts as to the relative effectiveness of 'open' or 'traditional' teaching approaches. The evidence from this study again does not uphold a generalised point of view, that one approach is for all purposes necessarily better than the other. The results show that in important areas of mathematics the traditional teaching style is positively related to higher performance in pupils. But the study also concludes that for areas of language the results are not absolutely clear and although they point in a similar direction to mathematics, further research is required before much more than this can be stated.

The above points have been made in order to emphasise that classroom research serves the important function of correcting bias as well as providing new information. The major results of this study hopefully constitute not only a useful pool of data, but also a set of parameters by which judgments may be made about the contemporary situation as an aid to continued research. It is hoped that the present study may be useful to this end.

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## APPENDICES

## APPENDIX A

Additional analysis in relation to:

Teaching Style and Pupil Personality

Background Variables; Teachers and Pupils

Notes on Pupil Personality Instrument

## APPENDIX A

### TEACHING STYLE AND PUPIL PERSONALITY

As explained in the procedural chapter (7.332) the sample of teachers, whose pupils were given the children's personality questionnaire (CPQ) tests, was relatively small (N=16). This number of teachers is too small to warrant divisions into groups. However, some indication can be given as to the possible relationships between variables of teaching style and pupil personality by using canonical correlation techniques.

#### Teaching Behaviour / Teacher Attitude and Pupil Personality

The predictive relationship between the feature scores (of teaching behaviour and teacher attitude variables) with aspects of pupil personality was measured via a series of canonical correlations.

#### Analysis

For the selected pupil sample the basic statistics for the ten feature (scores) and the four personality (test) variables are given in Table 50.

TABLE 50

N = 358

VARIABLE	MEAN	STD DEV
SCORE1	-1.7458	2.1354
SCORE2	-2.7598	4.0595
SCORE3	2.8492	4.0804
SCORE4	2.6397	5.1205
SCORE5	0.8687	4.3492
SCORE6	0.2095	0.4075
SCORE7	6.9385	3.2525
SCORE8	-19.6453	5.0304
SCORE9	-3.1061	5.7497
SCORE10	-1.2737	7.5551
PERS1	44.2346	18.8592
PERS2	46.1453	20.1730
PERS3	48.5000	20.7433
PERS4	43.0475	18.5654
1CORR/SCORES/PUPIL/DATA		

Correlation coefficients for the teachers' feature scores and pupil personality tests are shown in Table 51 Appendix Q.

Canonical correlation statistics are given in Table 52.

TABLE 52

## CANONICAL CORRELATION STATISTICS - SUMMARY

VARIABLE	NUMBER	EIGENVALUE	CANONICAL CORRELATION	WILKS LAMBDA	CHI- SQUARE	D.F.	SIG.
*TBA/PPers	1	.31	.56	.61	172.43	40	.00
TB/PPers	1	.28	.53	.67	142.14	24	.00
TA/PPers	1	.05	.22	.93	25.63	16	.06

* TBP	Teacher Behaviour and Attitude	(Vars 1-10)
TB	Teaching Behaviour	(Vars 1-6)
TP	Teacher Attitude	(Vars 7-10)
P/Pers	Pupil Personality	(Vars 1-4 pupils)

Coefficients for the canonical variables are shown in Table 53, Appendix Q.

### Interpretation

Whilst the limited sample restricts valid generalisations some comparisons point to interesting factors which warrant further analysis with larger samples.

There is a relatively significant correlation between the teaching style and pupil personality categories.

However, comparison of the correlations between teaching behaviour and pupil personality with that of the correlations between teacher attitude and pupil personality, shows that effect on pupil personality may be largely attributable to teaching behaviour variables.

Taking the Bennett (1976) research as a theoretical guide it appears that his results are confirmed in the present study. He concluded that the 'formal' (traditional) teaching style fostered more positive affective growth, that is that anxious children, for instance, did better in traditional classes.

However, Biggs (1981), quoting Rosenshine's critique in support, argued that Bennett had confused factors of classroom 'structure' and teacher 'warmth'. He had not, in their view, made it

certain whether the anxious children did better in traditional classes because the classes were more 'structured' or because they were 'warmer', or both 'structured' and 'warm'.

Results of the present study indicate that factors of teaching behaviour, which generally imply the notion of 'structure', are more likely to be positively related to pupil personality than are factors of teacher attitude.

Further research in this area, employing larger samples, appears to be warranted.

#### NOTES ON EFFECT OF BACKGROUND VARIABLES OF TEACHERS AND PUPILS

##### Teacher Background with Pupil Behaviour Variables

It has been suggested (Dunkin and Biddle, 1974) that background variables of teachers might be associated with aspects of teaching style, and consequently with aspects of pupil behaviour. Therefore an analysis was made to explore such suggestions. In addition to dimensions of teaching style, the characteristics of teachers that can be examined for their influence on classroom events would include some demographic and formative experiences of teachers. Age and sex exemplify such factors, and the type of training and type of school (for the majority of a teacher's experience) could be added. It is possible that such 'presage' or background variables may either "leave a significant impact on teachers or cause continuing differential response to teachers in pupils" (Dunkin and Biddle, 1974, p.412).

The approach in this study was to find out if such background variables were significantly associated with the performance and personality characteristics of pupils.

### Analysis

For the whole teacher sample, basic statistics for the four variables of background are given in Table 54.

TABLE 54

N = 253

VARIABLES	MEAN	STD. DEV.
Sex	1.462	0.500
Age	1.928	0.985
Training Type	2.669	0.933
School Type	2.417	0.882

Correlation coefficients for Teacher Background Variables with Factor Scores for Teaching Style are given in Table 55, Appendix Q.

Coefficients for correlation of Feature Scores with Teacher Background variables are shown in Table 56, Appendix Q.

The coefficients for Teacher Background variables with Pupil Performance and Pupil Personality are presented in Tables 57 and 58 respectively, in Appendix Q.

### Interpretation

There is little evident correlation between the variables of Teaching Style and Teacher Background.

In addition the correlation coefficients of Teacher Background variables with Pupil Performance and Pupil Personality are extremely low.

From the results in this study it does not appear that factors of teacher background are either associated with teaching style or with the performance or personality characteristics of pupils.

### Pupil Background Variables and Pupil Performance

It is clear that part of the significant interactions for children in the classroom lies with influences which are beyond the pupil-teacher (or pupil-learning material) dyad (Ausubel and Robinson, 1969).

In this respect a number of background variables of pupils were selected to determine whether there was significant association between these variables and the performance of pupils. The background variables chosen were sex, age, grade, socio economic status and personality.

For purposes of analysis, variables sex, age and grade were scored by assigning a numerical value to category responses of the Teacher Questionnaire in relation to these variables. For socio economic status scoring was derived from the ANU 2 Scale (Broom et al, 1977), and for personality, scores on the C.P.Q. tests were employed.



### Analysis

A series of Pearson correlations were computed to associate the above background variables of pupils with their performance on the five test scores (data Appendix P).

For the selected pupil sample the basic statistics for the background and performance variables are given in Table 59.

TABLE 59

VARIABLE	CASES	MEAN	STD DEV
GRADE	358	5.3212	0.4852
AGE	358	1040.7402	70.5249
SEX	358	1.5223	0.5002
SOCIO	320	4.5531	1.2049
PERF1	358	12.4553	3.6945
PERF2	358	19.0587	7.1247
PERF3	358	34.6173	10.5359
PERF4	358	26.2318	11.4517
PERF5	358	40.1536	14.8241
PERS1	358	43.5950	19.3995
PERS2	358	45.6285	20.7680
PERS3	358	47.8464	21.3015
PERS4	358	42.4777	19.1320

Correlation coefficients of Pupil Background with Pupil Performance variables are shown in Tables 60 and 61, Appendix Q.

### Interpretation

Correlation coefficients of the five background variables of pupils with their performance on the five tests are generally low.

From the results in this study it does not appear that factors of pupils' background are likely to be significantly associated with variation in their classroom performance.

Of course the sample numbers are relatively small (consisting of 28, or 16, complete classroom groups) and perhaps further analysis with larger samples would prove enlightening.

Pupil Personality Data - Children's Personality Questionnaire (C.P.Q.)

Form A (1975 edition) (Appendix K)

Significance of Personality Tests in Education

The importance of adequate and convenient personality tests that could apply to children has been obvious in the clinical situation. However in the setting of the school there has been a growing recognition of the importance of pupil personality as a classroom variable.

Morrison and McIntyre (1969) in a British study found that teachers ranked pupil personality characteristics high among their concerns in the classroom. In Australia, Connell (1967) and Watts (1978), among others, drew attention to the relevance for teachers of understanding the personality of their pupils. Entwistle (1972) reviewed investigations into the links between pupil characteristics and achievement in school. He expressed doubts about the tendency to generalise from these links due to the number of external factors affecting such relationship. A more clearly specified proposition was that of Sells (1973). He indicated that classroom behaviours resulted from interactions of the total classroom environment with the personality of pupils. Bennett (1973) also argued that personality inventories needed to be clearly related to and meaningful for particular social situations. This was the substance of the hypothesis underlying his re-evaluation study (1973) on the Junior Eysenck Personality Inventory (J.E.P.I.). He concluded:

"Validity may be improved if inventories are developed which incorporate the assessment of both trait and situational elements... In the present context a start could be made by adapting a group of items from existing trait measures which could be answered with reference to a variety of specific situations e.g. the classroom, playground, and so on. In this way responses, situations and individual differences could be separately sampled, permitting the assessment of their relative



contribution to the attainment variance and their interaction." (p.138).

#### Reasons for Choice of the Children's Personality Questionnaire for the Present Study

The authors of The Children's Personality Questionnaire (C.P.Q.) (1975), Cattell and Porter, argue that the results of the present test provide the teacher with a precise quantitative evaluation of those aspects of pupils' personality which contribute to or detract from their performance and social adjustment in school, as well as certain psychological insights. The measures and concepts are considered equally relevant to classroom and child guidance purposes. The test also includes all of the more adequately research-demonstrated dimensions of personality from the general personality sphere (the test authors, Porter and Cattell, 1972; who also quote Cattell, 1957 (c)). Thus the dimensions, or 'source traits', are objectively determined and are potentially important in both clinical and educational terms.

By the addition of these dimensions to normally covered ability measures, the predictive accuracy of school achievement data obtained from other general (intellectual) ability tests may be increased. The C.P.Q. was therefore chosen for the present study because of its appropriateness to an assessment of the relative contribution which personality characteristics might make to variation in pupil attainments. Also it had the advantage of a format which was suitable for administration as an individual or group testing instrument (Porter and Cattell 1972, pp.5-8).

### Description of the C.P.Q. Test Instrument

The C.P.Q. yields an assessment of pupil personality by the measurement of 14 factorially independent dimensions (Cattell and Porter 1972, p.9). These dimension factors are identified by letters of the alphabet (A to Q<sub>4</sub>) similarly used in other equivalent tests. In addition to symbols the dimensions are given technical names consistent with the research literature, and also popular or common terms for ease of communication to "lay" persons (see Table 16, Appendix L). An important feature of the test is that it deals with psychologically meaningful and predictively significant traits having demonstrable functional unity (Cattell and Porter, p.6).

Two forms for the test (A and B) were available and form A was chosen for the present study. It was divided into parts 1 and 2, each part containing 70 items, 5 per factor. The particular items which defined each factor were listed in the C.P.Q. Tabular Supplement with Norms (1975, Institute for Personality and Ability Testing). Items were balanced so that an equal number of agreement and disagreement responses contributed to the scale score. Thus effects from an "acquiescent set" were eliminated. The items had a low level of "face validity" but at the same time retained their ability to measure accurately the trait in question (Cattell and Porter 1975, p.12).

### Scoring of the C.P.Q. Test

Raw scores for each individual were transformed to provide for an examination of the relative standings of an individual with a group or a group with the sample population. This transformation was accomplished by use of norm tables (C.P.Q. Tabular Supplement with Norms, 1975). Thus n-sten scores were derived, a sten being merely

a special case of a standard score and called such from a standard ten scale. (See description of the sten in Cattell and Porter (1972, p.18).

Sten score means indicated that on many primary factors there were differences for boys and girls, hence the norm tables provided for translating those scores separately or from one table. the C.P.Q. handbook (Cattell and Porter, 1975) provided a detailed discussion of the psychological meaning of the 14 primary factors (pp.23-25).

However, it was also possible to calculate scores on four other factors by combining scores on the primaries in specified ways. These scores were known as second order factors, or secondaries, because they were derived by factor-analysing the intercorrelations among the primary factor scores (see Table 17, Appendix L). These factors were recognised at the C.P.Q. levels, and also in other age level tests of the series, as extroversion, anxiety, tough pose, and independence. (Tough poiserefers to an activation level as indicated by such elements of response as degree of feeling or affect - see Cattell and Porter, 1972, p.39). Equations and procedure used for calculation of the secondary order factor scores, and a statement of the meaning applied to them, are given in Tables 18, 19; Appendix L.

#### C.P.Q. Test Reliability or Consistency

Reports of the reliability of the C.P.Q. test were presented by Cattell and Porter (1972) in terms of dependability (short term test retest correlations) and homogeneity (internal consistency) coefficients as tabled in Appendix L, (Tables 20, 21). Explanation of these measures was given in Cattell (1964, pp.1-22) and in the most recent manual (1972, p.13ff).



### Validity of the C.P.Q.

Evidence of validity for the C.P.Q. was presented in terms of three types of measures. The first related to concept or construct ("direct") validity (after Cronbach 1960; Cattell 1964), the coefficients for which are set out in Table 22, Appendix L. Cattell and Porter (1972) argued that the C.P.Q. was theoretically based, its scales being relevant to the hypothesised structure of personality. Validity therefore was represented in the "goodness" of the hypotheses and in the adequacy of the measures for each hypothesised construct (p.14).

The second type was called indirect or "circumstantial" evaluation. Direct concept validity asked how well the factor scale correlated with the "pure" factor it was supposed to measure. Indirect concept validity found how well the relationships between the factor scale and other variables matched the relationships between the pure factor and those other variables. Indirect validity coefficients for each of the scales are given in Table 23, Appendix L.

The third type of measure, concrete or criterion validity, was concerned with relationships between the C.P.Q. scales and observable criterion behaviours. In this respect the area of most interest to the present study was that of academic achievement. Using two sten equations, one for reading and one for arithmetic achievement, predicted scores from these equations were used to estimate achievement level of pupils in a particular grade. These measures were based upon data gathered in Cattell and Porter's own reported study (1972, pp.42, 43). "More powerful" predictions, derived by use of expectancy tables related to probable performance relative to current grade placement, were also reported and are given in Tables 24, 25; Appendix L.

## APPENDIX B

### Walberg and Thomas Themes Operationally Defining 'Open' Teaching Behaviours



## APPENDIX B

LISTING OF THE EIGHT 'THEMES' USED BY WALBERG AND THOMAS (1971) TO  
OPERATIONALLY DEFINE 'OPEN' TEACHING BEHAVIOURS

1. Provisioning for learning: range of materials supplied; freedom of pupil movement and talk; ability grouping; pupil choice of seating (twenty five items).
2. Humanness: materials developed by children; pupil abilities reflected in classroom environment; teacher care when dealing with conflicts (four items).
3. Diagnosis of learning events: regrouping of pupils on basis of test results; tests and assessment (four items).
4. Instruction: whether based on individual child; subject centred v. integration; lectures (five items).
5. Evaluation of diagnostic information: recording of cognitive and emotional development of pupils; teacher uses tests for comparative progress; evaluation as guide to instruction (five items).
6. Seeking opportunities for professional growth: teacher uses assistance of someone in supportive capacity; has helpful colleagues (two items).
7. Self-perception of teacher: teacher tries to keep all her pupils in sight (one item).
8. Assumptions about children and learning process: warm emotional climate; clear guidelines given to class; children involved in what they are doing; emphasis on achievement (four items).

(Cited in Bennett, 1976, pp.40,41)

## APPENDIX C

### Characteristics of Teaching Behaviours - Bennett Study and Additions, Present Study

## APPENDIX C

SHOWING CHARACTERISTICS OF TEACHING BEHAVIOURS EMPLOYED IN THE BENNETT  
(1976) STUDY TOGETHER WITH ADDITIONS FOR THE PRESENT STUDY

- \* degree of Teacher control over pupil talk and movement
- \* extent of pupil choice of seating
- \* whether pupils were grouped and seated according to ability
- \* degree to which pupils worked in groups on Teacher-set tasks
- \* extent of integrated or separate subject teaching
- \* extent of Teacher assessment of pupil learning - i.e. by testing and marking
- \* extent to which pupils taken out of school for activities during normal time
- \* extent of Teacher's use of discipline
- \* degree to which Teacher used incentives (extrinsic motivation)

For the present study the following additional Teaching Behaviours were incorporated.

- \* extent of Team teaching
- \* emphasis on flexibility - for pupil initiative in number and language (e.g. homework, pupil-provided resources)
- \* degree to which pupil seating was static (throughout the term, year); this was not strictly an additional variable of behaviour but specified more clearly when and how the pupil choice of seating applied; also pupil movement in terms of seating reflected an obvious element of pupil freedom

- \* teacher provision of resources and materials sponsoring independent pupil work

These additional factors were actually related to a further theme (the last theme reflected only a single item of the Walberg and Thomas questionnaire).

## APPENDIX D

### Descriptive Data Related to Sample Groups



TABLE 6

## STATISTICAL TABLE OF SAMPLE CHARACTERISTICS:

NUMBERS OF SCHOOLS, TEACHERS, PUPILS AT GRADES 5, 5/6, 6 LEVELS

	Original Totals at April 1979	Data Gathering Sample	Initial Data Analysis Sample
Schools	172	145 (84.3% total) for teacher Questionnaire	30 (20.69% of total sample) for pupil attainment tests 16 (11.03% of total sample) for personality Questionnaire
Teachers	448	253	253
Pupils	12,596 = 73 pupils per school at above grade levels, and 28 pupils per teacher	745 for pupil attainment tests	745 for pupil attainment tests
		454 for children's personality Questionnaire	454 for children's personality Questionnaire

TABLE 6 (Cont.).

## GIRLS/BOYS PER GRADE LEVEL

	Grade 5	Grade 5/6	Grade 6	Total
Girls	118	134	110	362
Boys	132	144	107	283
	250	278	217	745

= Pupil Sample  
Basis for  
Analysis

TABLE 7  
SHOWING SOME DESCRIPTIVE CHARACTERISTICS OF FINAL SAMPLE OF SCHOOLS

Name of School	No. Pupil Sample	Grade Level	Locality*	Sex of Teacher
1. Acton	25	5	SU	F
2. Bicheno	25	5/6	R	M
3. Bothwell	23	5/6	R	M
4. Burnie Central	27	6	U	M
5. Cygnet	21	5	R	F
6. Flagstaff	24	6	U	M
7. Glen Huon	8	5/6	R	M
8. Launceston West	29	5	U	F
9. Maydena	19	5/6	R	M
10. Moonah	20	6	U	M
11. Montagu Bay	19	6	SU	F
12. Moriarty	17	5	U	M
13. Mt. Stuart	20	5	U	M
14. Orford	12	5	R	M
15. Perth	18	5	SU	F
16. Punchbowl	22	5/6	U	M
17. Riana District Sub	18	6	SU	F
18. Ridgley	62	5/6	SU	F
19. Risdon Vale	17	6	U	M
20. St. Helens	32	5	R	F
21. South Georgetown	27	6	SU	F
22. South Queenstown	20	5	R	F
23. Strahan	15	5/6	R	M
24. Tullah	17	6	R	F
25. Warrane	22	5	U	M
26. Westbury	27	5/6	R	F
27. Westerway	10	5/6	R	M
28. Lenah Valley	22	5	U	M

\*SU = Sub-Urban (6)

U = Urban (9)

R = Rural (13)

Total 28



TABLE 8

SAMPLE OF SCHOOLS EMPLOYED IN PUPIL TESTING (FINAL ANALYSIS SAMPLE)  
 CATEGORISED ACCORDING TO 'OPEN', 'MIXED', TRADITIONAL' ORGANISATION

School	Case	Description of School "Organisation"		
		Number of School	'Open'	'Traditional'
1	23			*
2	30			*
3	55			*
4	68			*
5	83			*
6	109			*
7	111			*
8	112			*
9	114		*	
10	125			*
11	129			*
12	132		*	
13	141			*
14	148			*
15	151		*	
16	183			*
17	186			*
18	192		*	
19	196			*
20	202			*
21	209			*
22	225		*	
23	248		*	
24	249		*	
25	250		*	
26	251		*	
27	252			*
28	253			*

Tasmanian Directory of Schools (1980)

TABLE 9  
SHOWING DESCRIPTIVE CHARACTERISTICS OF SAMPLE FOR THE PRESENT STUDY

---

Sex of Teacher	F = 12 M = 16	
Size of Class (no. of pupils)	< 20 = 11 20-30 = 15 > 30 = 2	
Grade Level with number of classes	5 (=9) 5/6(=11) 6 (=8)	
Regional Locality	Urban = 9 Suburban = 6 Rural = 13	
Organisational Description of Schools		Open = 7 Mixed = 5 Traditional = 16

---

Note: Each category represents a total of 28 classes, the number employed in the final analysis of data.

## APPENDIX E

### The Teacher Questionnaire (TQ)

# ***Teacher Questionnaire***

**THE UNIVERSITY OF TASMANIA**

**FACULTY OF EDUCATION**

## **PRIMARY SCHOOLS RESEARCH PROJECT**

### **ABOUT THE QUESTIONNAIRE**

---

The way in which teachers arrange their classrooms, and methods of teaching adopted, naturally reflect factors such as the conditions under which the school operates, and the characteristics of the pupils. At present all too little is known about the way in which teachers adapt their methods to circumstances, and hence little advice can be passed on to students training to be teachers. In an attempt to obtain information which may be useful in this and other ways, this questionnaire has been devised. It is in three parts, reflecting the attempt to relate circumstances to teaching methods. Thus,

Part One asks for background information about the teacher, class and school.

Part Two is designed to cover various aspects of classroom and curriculum organization, and

Part Three asks for teachers' opinions on various educational topics.

Additional space is provided at the end of the questionnaire should you wish to elaborate on any of your answers.

For the work to be of any value, responses must be obtained from a wide cross-section of teachers. I hope you will feel that this project is sufficiently worthwhile to merit your support. It generally takes about three quarters of an hour to complete the questionnaire, and of course, replies are confidential. It is important in part two that you try to record as objectively as you can what actually happens in your classroom; inaccurate information could give misleading impressions to students in their 'training'.

---

### **INSTRUCTIONS FOR FILLING IN QUESTIONNAIRE**

Most of the items in this questionnaire ask you to choose ONE answer from a number of alternatives, by circling the appropriate RESPONSE CODE NUMBER. It is realized that this procedure occasionally involves oversimplification. Other items require a more specific response and you are asked to enter the appropriate figure in the blank box provided. It is important to answer all questions.

--	--	--

## PART 1 TEACHER, CLASS AND CLASSROOM

### PERSONAL DETAILS

1. Name (Optional) .....			
Name and address of school .....			
.....			
2. Sex	Female .....	Response Code Number	For Computer Use
	Male .....	1	
		2	5
3. Age	Under 30 yrs .....	1	
	30-39 yrs .....	2	
	40-49 yrs .....	3	
	50-59 yrs .....	4	
	Over 60 yrs .....	5	6
4. 'Training'.			
(i) Higher Education spent mainly at	University .....	1	
	College of Advanced Education .....	2	
	Teachers College .....	3	7
(ii) Formal Teacher 'training'			
a) Years of full-time pre-service 'training'	1 yr .....	1	
	2 yrs .....	2	
	3 yrs .....	3	
	4 yrs .....	4	8
b) Type of Teacher 'training'	None .....	1	
	Infant oriented .....	2	
	Primary .....	3	
	Secondary .....	4	9
(iii) Post Full-time 'training'	University .....	1	
	C.A.E. ....	2	
	C.C.E.T. ....	3	10
5. Teaching experience since graduation			
(i) Total years	In Tasmania .....		11-12
	Outside of Tasmania .....		13-14
(ii) Type of School for majority of experience:	Inner City .....	1	
	Suburban .....	2	
	Rural (District) .....	3	
	Rural (Small School) .....	4	15
(iii) Other experience you consider significant:	Inner City .....	1	
	Suburban .....	2	
	Rural (District) .....	3	
	Rural (Small School) .....	4	
	None other significant .....	0	16

**PRESENT CLASS AND CLASSROOM**

		Response Code Number	For Computer Use
6.	Number of pupils in class	Girls ..... Boys .....	17-18 19-20
7.	(i) Grade you are teaching	Grade 5 ..... Grade 5/6 ..... Grade 6 .....	1 2 3 21
	Cooperative		
	(ii) No. of hours per week you and your class are engaged in 'Team' Teaching? (That is, no. of hrs. you team teach with your class and another class and teacher.)		22-23
8.	(i) How many classes are there for your grade? .....		24
	(ii) Is your class Graded and Top Level .....	1	
	Is your class Graded and Middle Level .....	2	
	Is your class Graded and Lower Level .....	3	
	Is your class Ungraded but Grouped in conjunction with another class .....	4	
	Is your class Ungraded but Grouped within your class .....	5	
	Is your class None of these .....	0	25
	(iii) If applicable how was the grading/grouping worked out		
	.....		26
9.	Approximate area of classroom (in sq. metres) .....		27-29
10.	What type of desk is used in the class?	Single with separate seat ..... Double with separate seat(s) ..... Table style seating 3 or more together ..... Other (specify) .....	1 2 3 4 30
11.	Is there a small library, or store of books, in the classroom?	No ..... Yes .....	1 2 31
12.	Is there a supply of raw materials (e.g. paints, paper, wood, clay, scrap materials etc.) in the room or nearby such that children work independently in their use of such resources?	No ..... Yes .....	1 2 32
13.	Is the heating adequate in the classroom?	No ..... Yes .....	1 2 33
14.	Is the lighting adequate in the classroom?	No ..... Yes .....	1 2 34
			9 35

**PART 2 TEACHING METHODS ADOPTED****SEATING ARRANGEMENTS**

		Response Code Number	For Computer Use
1.	Do your pupils generally decide for themselves where they sit in the classroom?		
	No .....	1	
	Yes .....	2	1
2.	Are the seats mostly arranged so that pupils sit:		
	Separately .....	1	
	Separately and in pairs .....	2	
	In pairs .....	3	
	In pairs and in groups of seats .....	4	
	In groups .....	5	2
3.	Are pupils generally allocated to places or groups on the basis of their ability? (Pupils may of course change places or groups occasionally for special activities e.g. (reading).		
	No .....	1	
	Yes .....	2	3
4.	Do pupils stay in the same seats or groups for most of the day?		
	No .....	1	
	Yes .....	2	4
5.	Is seating generally static:		
	throughout the year		
	No .....	1	
	Yes .....	2	5
	for a term at a time		
	No .....	1	
	Yes .....	2	
	Other (specify) .....	3	6

**CLASSROOM ORGANISATION**

6.	Do you usually allow your pupils to move around the classroom?		
	No movement allowed .....	1	
	Only during free/open times .....	2	
	Only during practical subjects .....	3	
	Whenever they wish .....	4	7
7.	Do you usually allow your pupils to talk to one another?		
	No talk allowed .....	1	
	Only during free/open times .....	2	
	Only during appropriate subjects .....	3	
	Whenever they wish .....	4	8
8.	Do you expect your pupils to ask your permission before leaving the room?		
	No .....	1	
	Yes .....	2	10
9.	How many monitors do you appoint with responsibility for certain jobs at any one time?		11-12

## ORGANISING THE CURRICULUM

	Response Code Number	For Computer Use
10 (1) Do you regularly take pupils out of school as part of your normal teaching activities?		
No .....	1	
Yes .....	2	13
(2) Specify how often (i.e. approx. no. of times per year excluding phys.ed./sport)		14-15
11. Do you generally use a timetable for organising the week's work?		
No .....	1	
Yes .....	2	16
12. Do you use the Tasmanian Education Department's 'Curricula'?		
Not at all .....	1	
Less than half the time .....	2	
More than half the time .....	3	
Virtually all the time .....	4	17
13. For basic subjects, e.g. in Language, Mathematics, do you:		
not use textbooks .....	1	
use textbooks plus other material mostly self prepared .....	2	
use textbooks plus other material not self prepared .....	3	
use textbooks alone .....	4	18
14. (a) Do you require that your pupils know their multiplication tables off by heart?		
No .....	1	
Yes .....	2	19
(b) Do you regularly have your pupils read aloud? ('read aloud' means pupils reading in turn, not for the purpose of interpretation).		
No .....	1	
Yes — as rest of whole Class listens .....	2	
Yes — as rest of whole Group listens .....	3	
Yes — as Teacher only listens .....	4	20
15. Teaching sometimes requires reference materials. Do you normally:		
Supply most of this material for your pupils? .....	1	
Ask the pupils to find their own? .....	2	21
16. Do you regularly give your pupils homework?		
No .....	1	
Yes .....	2	22
(Specify what areas, if you wish)		23
17. In organising the work of your class, roughly what emphasis do you give to each of these different approaches? Indicate approximately what percentage of time is spent on each approach. Your total should come to 100%, although this is not intended to imply that all the work necessarily fits into these five categories. (Use the period of a 'normal' week to guide your calculation.)		
1. (a) Teacher talking to the class as a whole .....		
(b) Teacher talking to small groups and individuals .....		
2. Pupils working together cooperatively in groups, on work given by the teacher. ....		
3. Pupils working together cooperatively in groups, on work of their own choice .....		
4. Pupils working individually, at their own pace, on work given by the teacher .....		
5. Pupils working individually at their own pace, on work of their own choice .....		24-35
TOTAL 100%		



	Response Code Number	For Computer Use
18. In organising your curriculum is the emphasis of your programme upon Integrated activities ..... OR Teaching of subjects separately .....	<div>1</div> <div>2</div>	36
19. On which aspect of number work do you generally place more emphasis? (i) Developing computational skills through graded exercises? ..... (ii) Exploring concepts with materials or apparatus? .....	<div>1</div> <div>2</div>	37
20. Do you encourage fluency and originality in written English, even if for many children this may be at the expense of grammatical accuracy? No ..... Yes .....	<div>1</div> <div>2</div>	38

**TESTING AND MARKING**

21. Do you put an actual mark or grade on the work of all your pupils? Not at all* ..... Some of the time ..... Most of the time .....	<div>1</div> <div>2</div> <div>3</div>	39
22. Do you generally correct most spelling and grammatical errors? No ..... Yes .....	<div>1</div> <div>2</div>	40
23. Do you generally use incentives to encourage pupils to produce their best work? (i.e. 'stars', stamps, etc.) Not at all ..... Some of the time ..... Most of the time .....	<div>1</div> <div>2</div> <div>3</div>	41
24. Do you give your pupils an arithmetic (mental or written) test at least once a week? No ..... Yes .....	<div>1</div> <div>2</div>	42
25. (a) Do you give your pupils a spelling test at least once a week? No ..... Yes .....	<div>1</div> <div>2</div>	43
(b) Do you regularly test your pupils in reading Fluency No ..... Yes ..... Comprehension No ..... Yes .....	<div>1</div> <div>2</div> <div>1</div> <div>2</div>	44 45
26. Do you have 'end of term' tests? (not including end of year tests) No ..... Yes .....	<div>1</div> <div>2</div>	46

**DISCIPLINE**

27. How many pupils in your class create discipline problems?	<div></div>	47-48
28. Do you find verbal reproof and/or reasoning normally sufficient to settle the problems? No ..... Yes .....	<div>1</div> <div>2</div>	49

		Response Code Number	For Computer Use
29.	For persistent disruptive behaviour, where verbal reproof fails to gain the pupil's cooperation, do you use any of the following disciplinary measures?		
(i)	extra work	No ..... Yes .....	<div>1</div> <div>2</div> 50
(ii)	'corporal' punishment	No ..... Yes .....	<div>1</div> <div>2</div> 51
(iii)	withdrawal of privileges	No ..... Yes .....	<div>1</div> <div>2</div> 52
(iv)	send to Principal	No ..... Yes .....	<div>1</div> <div>2</div> 53
(v)	send out of room	No ..... Yes .....	<div>1</div> <div>2</div> 54

ALLOCATION OF TEACHING TIME

30. When time has been deducted for 'registration' and assembly, the number of hours per week left for teaching is approximately 25. Estimate as accurately as possible how your time is distributed among subjects and activities in the table below, by putting the appropriate number of hours in the boxes provided. Please use last week as your reference unless this was in some way unusual. (For example, 'Open' Day). (If your class programme is integrated please specify as well as you can).

	Number of Hours	
Number work .....		
English (including creative writing, poetry, spelling) .....		
Writing .....		
Reading .....		
Social Studies .....		
French and/or other language .....		
Science .....		
Scripture .....		
Physical Education .....		
Music .....		
Art .....		
Craft .....		
Music and Movement .....		
Drama .....		
Free choice activity .....		55-69
TOTAL	25 hrs (approx)	<div>9</div> 70

## PART 3 OPINIONS ABOUT EDUCATION

In this section you are asked to give your opinions about a number of educational topics. I am anxious to record the frank opinions of professional teachers and there is no suggestion that there are right or wrong answers. It is important to answer every question. If you would like to elaborate on any item please make use of the space provided at the end of the questionnaire.

### TEACHING AIMS

The following are probably all worthwhile teaching aims, but their relative importance may be influenced by the situation in which the teacher works. Please rate *each* aim on the five-point scale to indicate its importance in relation to your class, by circling the appropriate response code number. (The scales are: Not Important, Fairly Important, Important, Very Important, Essential.)

Response Code Number

#### Teaching Aims in the Primary School

- A. Preparation for academic work in secondary schools .....
- B. An understanding of the world in which pupils live .....
- C. The acquisition of basic skills in reading and number work .....
- D. The development of pupils' creative abilities .....
- E. The encouragement of self-expression .....
- F. Helping pupils to cooperate with each other .....
- G. The acceptance of normal standards of behaviour .....
- H. The enjoyment of school .....
- I. The promotion of a high level of academic attainment .....

Not important	Fairly important	Important	Very important	Essential
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

1-9

### OPINIONS ABOUT EDUCATION ISSUES

Please indicate the strength of your agreement or disagreement with the following statements by circling the appropriate response code. (The scales are Strongly Disagree, Disagree, No Opinion, Agree, Strongly Agree.)

- A. Most pupils in upper primary school have sufficient maturity to choose a topic to study and carry it through .....
- B. Most pupils in upper primary school feel more secure if told what to do and how to do it .....
- C. 'Creativity' is an educational fad, which should soon die out. ....
- D. Firm discipline by the teacher leads to good self-discipline on the part of the pupils .....
- E. Streaming by ability is undesirable in primary school .....
- F. The teacher should be well liked by the class .....
- G. Children working in groups waste a lot of time arguing and 'messaging about' .....
- H. Pupils work better when motivated by marks or 'stars' .....
- I. Too little emphasis is placed on keeping order in the classroom nowadays .....
- J. Teachers need to know the home background and personal circumstances of their pupils .....

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

10-19

## OPINIONS ABOUT TEACHING METHODS

To what extent would you agree or disagree with the following statements when they are applied to (a) FORMAL or TRADITIONAL teaching methods, and (b) INFORMAL or OPEN teaching methods? [Please answer both (a) and (b).]

### (a) FORMAL OR TRADITIONAL METHODS

	Strongly disagree	Disagree	No opinion	Agree	Strongly agree	For Computer Use
(i) Could create discipline problems . . . . .	1	2	3	4	5	
(ii) Fail to bring the best achievement out of bright pupils . . . . .	1	2	3	4	5	
(iii) Make heavy demands on the teacher (in terms of time and emotional energy)	1	2	3	4	5	
(iv) Encourage responsibility and self-discipline . . . . .	1	2	3	4	5	
(v) Teach basic skills and concepts effectively . . . . .	1	2	3	4	5	
(vi) Encourage time wasting or day-dreaming . . . . .	1	2	3	4	5	
(vii) Leave many pupils unsure of what to do . . . . .	1	2	3	4	5	
(viii) Provide the right balance between Teaching and individual work . . . . .	1	2	3	4	5	
(ix) Allow each child to develop her/his full potential. . . . .	1	2	3	4	5	
(x) Teach pupils to think in their own ways . . . . .	1	2	3	4	5	20-29

### (b) INFORMAL OR OPEN METHODS

	Strongly disagree	Disagree	No opinion	Agree	Strongly agree	For Computer Use
(i) Could create discipline problems . . . . .	1	2	3	4	5	
(ii) Fail to bring the best achievement out of bright pupils . . . . .	1	2	3	4	5	
(iii) Make heavy demands on the teacher (in terms of time and emotional energy)	1	2	3	4	5	
(iv) Encourage responsibility and self-discipline . . . . .	1	2	3	4	5	
(v) Teach basic skills and concepts effectively . . . . .	1	2	3	4	5	
(vi) Encourage time wasting or day-dreaming . . . . .	1	2	3	4	5	
(vii) Leave many pupils unsure of what to do . . . . .	1	2	3	4	5	
(viii) Provide the right balance between Teaching and individual work . . . . .	1	2	3	4	5	
(ix) Allow each child to develop her/his full potential. . . . .	1	2	3	4	5	
(x) Teach pupils to think in their own ways . . . . .	1	2	3	4	5	30-39

9 40

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE

If you would like to make additional comments, or elaborate on answers to the questions, or to suggest aspects of the classroom which have been overlooked, please make use of this page. Your comments are valuable not only to this project, but for enlarging our understanding of Teachers' views on the development of Primary Education generally.

A handwritten signature in black ink, appearing to read 'Wm Ramsay', with a long horizontal flourish extending to the right. Below the signature, the name 'WILLIAM RAMSAY' is printed in a small, sans-serif, all-caps font.

WILLIAM RAMSAY

## APPENDIX F

### Additional Information in Relation to the Teacher Questionnaire (TQ)

- Modifications to the Bennett Instrument
- Piloting of the TQ
- Validation of the TQ
- TQ items

## EXAMPLES OF MODIFICATION TO BENNETT (1976) TEACHER QUESTIONNAIRE

The following table provides a list, in summary form, of modifications to the Teacher Questionnaire employed by Bennett (1976). In many cases numerous modifications were effected to a single item. e.g. Classroom organisation, no. 8. In general the modifications were applied to items in the interest of enabling the responses to display more clearly a tendency toward 'Open' or 'Traditional' teaching behaviour. Obviously some items were likely to be less powerful than others in providing such clarification. In this respect it was important to note that some form of 'clustering' of items would ultimately crystallize the discrimination between teaching behaviours.

TABLE 10  
SUMMARY LIST OF MODIFICATIONS TO BENNETT TEACHER QUESTIONNAIRE

TQ Item	Expanded Items	TQ Item	New Items
PART 1: TEACHER BACKGROUND			
4.	<u>'Training'</u>  Specification of length of Pre-service training and also nature of college attended.	4.	<u>'Training'</u>  Addition of item providing information regarding In-Service ("Post Full-time") 'Training'.
		5.	<u>Teaching Experience</u>  Type of school experience was specified in terms of regional location categories.
		7ii.	Incidence of Cooperative Team Teaching - considered an effective indicator of tendency to 'Openness' in teaching style.
8.	<u>Grading</u> - Further expanded and defined; eg. according to grouping and ability across different classes	8.	<u>Grading</u> - additional items in terms of number of school classes for the grade specified; additional information as to how the grading was worked out.
12.	<u>Supply of Materials</u>  (Re "Storage Facilities" in Bennett). Rather than a simple indication as to whether 'storage facilities' were available to classroom, this item requested information as to the extent of the raw materials supply that was available for the purpose of sponsoring the independent work of pupils.		



TABLE 10 (Cont.)

TQ Item	Expanded Items	TQ Item	New Items
PART 2: TEACHING METHODS			
6.	(5 in Bennett) <u>Movement</u> - this additional category extended range of indication as to options for movement allowed by Teacher to pupils in the classroom.	5.	<u>Seating</u> - related to movement of pupils according to seating; additional questions would make clearer the degree of flexibility in seating arrangements.
7.	<u>Pupil Talk</u> - additional category provided for clearer indication of teacher's range of options relating to pupil talk allowed.		
9.	<u>Monitors</u> - whether pupils were appointed as monitors was elaborated to specify number of monitors appointed by Teacher at any one time.		
10.	<u>Taking pupils out of School</u> <u>Specification of frequency</u> of out-of-school activity during 'normal' class time made this item a stronger potential indicator of Teacher 'Openness' in relation to Curriculum organisation.		
13.	(12 in Bennett) <u>Materials for basic subjects</u> <u>additions to this item</u> included: <ul style="list-style-type: none"> <li>specification as to what 'basic subjects' meant to imply</li> <li>clarification as to whether texts were used or not, in addition to the simple alternate "specially prepared materials".</li> <li>specification as to whether texts were used in conjunction with materials self-prepared by the teacher; the extent of reliance on standardised and other - prepared materials could be an indicator of "Openness" in curriculum planning.</li> </ul>	12.	<u>Tasmanian "Curricula"</u> - indication of Teacher's use of specifically Tasmanian Education Department curriculum materials and guidelines; this item also signified the Teacher's curriculum flexibility, a fair indicator of "Openness" in curriculum organisation.

TABLE 10 (Cont.)

TQ Item	Expanded Items	TQ Item	New Items
PART 2: TEACHING METHODS (continued)			
		14.	<u>Reading</u> - Whether and in what ways pupils were required to read aloud in class. The functional approach to reading employed by Teachers, together with responses to other items about language, could indicate fairly accurately the tendency to 'Openness' of teaching method.
23.	(21 in Bennett) <u>Incentives</u> - may be employed by both 'open' and 'Traditional' teachers; the evidence in Bennett's report indicated an inverse relationship between 'Openness' and use of incentives, hence this item was modified to determine more clearly the extent to which Tasmanian Teachers used incentives. Note that this item was an example of those in the Teacher Behaviour sections of the Questionnaire which were taken up again in part 3, concerning Teacher Opinions.		
25.	(23 in Bennett) <u>Testing</u> (reading and spelling) - Questions regarding the testing of reading fluency and comprehension were added to the one directed at 'spelling'. Responses to this item clarified the emphasis of testing in language. Also the addition of these 'reading' elements of language was considered a logical extension in view of the language testing instruments employed for the pupils.		

TABLE 10 (Cont.)

TQ Item	Expanded Items	TQ Item	New Items
PART 3: TEACHER OPINIONS			
Opinions about Teaching Methods.			
In general the items in the Teacher opinion section were clear, and clearly defined the various emphases likely to be endorsed by Teachers. One item only was modified, viz.			
(iii)	Whether 'open' or 'Traditional' methods made heavy demands on the Teacher was specified in terms of time allocation		

TABLE 11  
SUMMARY DATA OF SCHOOLS INCLUDED IN PILOTING OF TEACHER QUESTIONNAIRE

School	No. of Teachers	No. of Classes	Class Levels*
Lauderdale	3	3	5 (1); 6 (2)
Rokeby	4	4	5/6 (4)
Risdon Vale	3	3	6 (3)
Howrah	5	5	5/6 (3); 6 (2)
Bellerive	5	5	5/6 (5)
Chigwell	2	2	6 (2)
Mornington	1	1	6 (1)
Warrane	2	2	5/6 (1); 6 (1)
8 Schools	25	25	5 (1); 5/6 (13); 6 (11)

\* (Number of classes shown in brackets)

TABLE 12  
SUMMARY OF PROCEDURE FOR VALIDATION OF TEACHER QUESTIONNAIRE

No. of Schools	17
No. of Classrooms	19
Order of Item Numbers in Teacher Questionnaire	Part I: Items 6 to 14 Inc. (Classroom Organisation) Part II: Items 11 to 30 Inc. (Teaching Methods)
Number of Questionnaire Items Verified by Classroom Observations	Part I 11 Part II 49 — Total 60 —

TABLE 13  
 VALIDATION DATA - VERIFICATION OF TEACHER QUESTIONNAIRE RESPONSES  
 VIA CLASSROOM OBSERVATIONS

TQ Case No. (N = 19)	No. of Items With Agreed Response N = 60*	% of Agreement
245	42	70.0
243	38	65.5
48	43	71.7
23	45	81.8
20	41	74.5
40	42	79.2
246	44	73.3
247	42	75.0
77	36	65.5
51	40	75.5
210	40	68.8
63	45	75.3
241	46	77.9
87	42	72.4
92	38	67.9
242	38	64.4
104	37	67.3
230	39	73.6
82	37	80.4

\* In some cases the optimum no. of items compared was <60 due to the inaccessibility of the information (Teacher absence in part of observation period etc.) In these cases the lower denominator was used in calculating agreement of response.

TABLE 14  
RATINGS FOR VERIFICATION OF TEACHER RESPONSES VIA OBSERVERS' CLASSROOM  
DESCRIPTIONS

Case No.	No. of Items of Agreement $\Sigma = 60$	Response Agreement Rating (%)
243	36	60
87	43	71
242	37	61
246	44	73
104	36	60
247	45	75
20	39	65

TABLE 15

LIST OF QUESTIONNAIRE ITEMS IDENTIFYING TEACHER BEHAVIOURS GROUPED  
ACORDING TO FEATURES WHICH OPERATIONALLY DEFINE TEACHING STYLE  
(TEACHING BEHAVIOUR COMPONENT)

Feature	Teacher Questionnaire Item No.
<b>1. <u>Role of the Child in Learning</u></b>	<b>Part 2</b>
Pupil movement	6
Pupil talk	7
Freedom to leave classroom	8
Use of textbooks	11
Homework	16
Curriculum emphasis	18
Emphasis - aspects of number	19
Emphasis - aspects of language	20
Pupils working cooperatively and individually on work chosen by the teacher and the pupil respectively	17
Discipline	27
<b>2. <u>Diagnostic Evaluation</u></b>	
Use of rote learning (tables)	14
Marking grading of pupil work	21
Correction of spelling	22
Use of incentives	23
Weekly test - arithmetic	24
Weekly test - spelling	25(a)
Testing in reading - fluency	25(b)
Testing in reading - comprehension	"
Term testing	26



TABLE 15 (Cont.)

Feature	Teacher Questionnaire Item No.	
3. <u>Manipulation of Materials</u>	Part 1	
Use of class library		11
Resources for independent work		12
Pupils able to leave room for class work	Part 2	10
Use of reference materials		15
4. <u>Individualising of Instruction</u>		
Size of class	Part 1	6
Method for pupil reading	Part 2	14(b)
Extent of teacher talk to whole class		17.1(a)
Extent of teacher talk to individuals/group		(b)
5. <u>Grouping of Pupils</u>		
Grouping by grading	Part 1	8(iii)
Grouping by ability	Part 2	3
6. <u>Use of Space</u>		
Pupil choice of seating	Part 1	1
Form of seating - static by day		4
Form of seating - static by term		5
7. <u>Cooperative Team Teaching</u>		
Extent of team teaching		7(ii)

TABLE 15 (Cont.)

## (TEACHER ATTITUDE COMPONENT)

Feature	Teacher Questionnaire Item No.
8. <u>Teaching Aims</u>	Part 3
Pupils' preparedness for secondary work	A
Pupils' understanding of the world they live in	B
Acquisition of basic skills	C
Development of pupils' creative abilities	D
Encouragement of self-expression	E
Helping pupils cooperate	F
Acceptance of normal standards of behaviour	G
Pupils' enjoyment of school	H
Promotion of high level of academic attainment	I
9. <u>Educational Issues</u>	
Pupil maturity in study	A
Pupil security in terms of being directed in study	B
Creativity - its educational status	C
Discipline	D
Streaming	E
Teacher image of being 'liked' by class	F
Assessment of pupil group work	G
Incentives	H
Keeping order in the classroom	I
Knowing the home background of pupils	J

TABLE 15 (Cont.)

Feature	Teacher Questionnaire Item No.
<b>10. <u>'Traditional' Methods of Teaching</u></b>	
Do these ...	
Create discipline problems	(i)
Fail to bring out best in 'bright pupils'	(ii)
Make heavy demands on teachers	(iii)
Encourage self-discipline in pupils	(iv)
Teach basic skills, concepts effectively	(v)
Encourage day-dreaming	(vi)
Leave pupils unsure of what to do	(vii)
Provide balance between teacher directed and individual work	(viii)
Allow individuals to develop full potential	(ix)
Teach pupils to think individually	(x)
<b>11. <u>'Open' Methods of Teaching</u></b>	
Items as for Feature 10	

## APPENDIX G

### The Tasmanian Tests of Mathematical Understanding

**MATHEMATICAL UNDERSTANDING****PARTS A-H AND B-H COMBINED****(For Grades 4, 5, or 6)**

Name ..... Age ..... years ..... months .....

School ..... Class ..... Date .....

**PRACTICE EXAMPLES***Example I:*

Another way of writing twelve is—

☐ 2; ☒ 12; ☐ 21; ☐ 120.*Example II:*

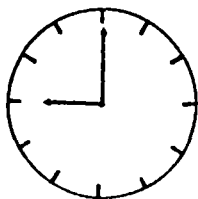
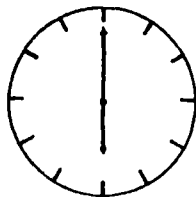
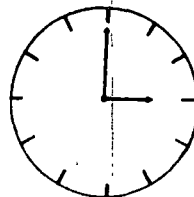
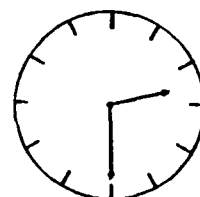
What is one half of ten?

Answer .....

*Example III:*

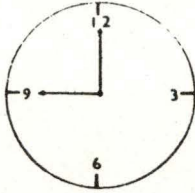
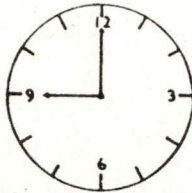
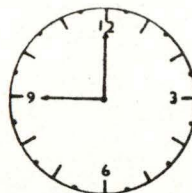
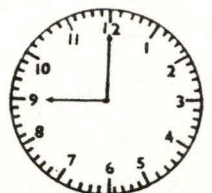
Which clock shows 6 o'clock?

Put a cross in the box under this clock.

☐☐☐☐**DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD**

# Mathematical Understanding Test—Start

1. Which would be the best clock to show exactly 12 minutes past 9? Put a cross in the box under this clock.


☐

☐

☐

☐

2. Mark the largest number with a  $\times$ ;

☐ 13; ☐ 32; ☐ 322; ☐ 230.

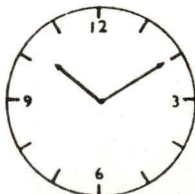
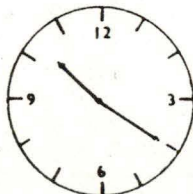
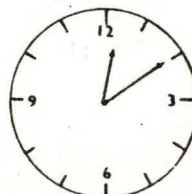
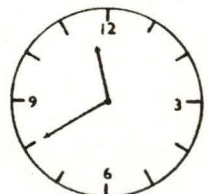
3. Mark the heaviest one with a  $\times$ ;

☐ 11 grams; ☐  $\frac{3}{4}$  kilo; ☐ 1 kilo; ☐ 19 grams.

4. Mark the longest period of time with a  $\times$ .

☐ 1 day; ☐ 3 hours; ☐ 6 minutes; ☐ 10 seconds.

5. Which two of these clocks show ten minutes difference in time? Put a cross in the boxes.


☐

☐

☐

☐

6. Twenty six is the same as—

☐ 260; ☐ 206; ☐ 62; ☐ 26.

7. 6 hundreds, 7 tens and 3 ones is the same as—

☐ 637; ☐ 607; ☐ 376; ☐ 673.

8. When you see  $6 + 3$  you,

☐ add; ☐ subtract; ☐ multiply; ☐ divide.

9. Here are three signs which you use in mathematics—

$=$ ;  $>$ ;  $<$ .

Place the correct sign between these pairs of numbers—

(a) 7      5;

(c) 0      3;

(b) 2      2;

(d) 100 cm      1 m.

10. Which of the following numbers has a 7 in the tens place?

☐ 763; ☐ 17; ☐ 276; ☐ 710.

11. If I cut an apple into  $\frac{1}{4}$ ths how many pieces would be in  $\frac{1}{2}$  the apple?

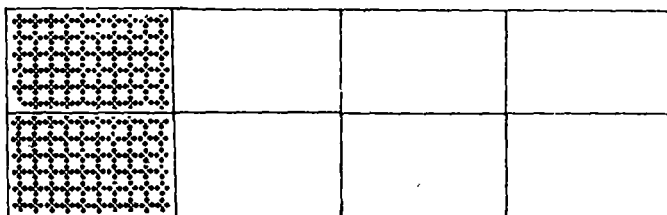
Answer . . . . .

12.  $7 + \boxed{\phantom{00}} = 10$ .

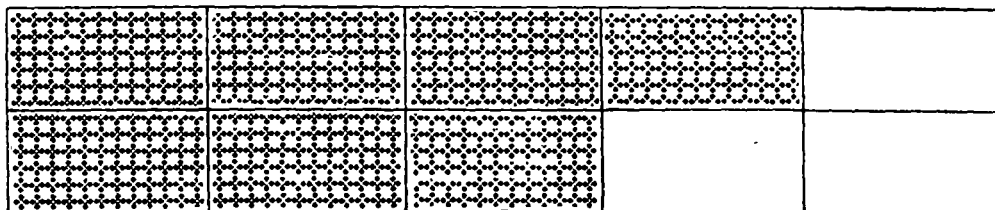
Which pair of the numbers below if put in the box would make the sentence true?

☐  $13 - 3$ ; ☐  $2 + 5$ ; ☐  $9 + 1$ ; ☐  $9 - 6$ .

13. What fraction of this figure is shaded?



14. What decimal of this figure is shaded?



15. Put a  $\times$  in the ☐ that is third from the  $\Delta$ .

☐ ☐ ☐ ☐  $\Delta$  ☐ ☐

16. When you count by 3's up to 21, which two of the following numbers would you use as you count?

☐ 6 and 10; ☐ 13 and 9; ☐ 9 and 18; ☐ 12 and 4.

17. If you come fifth in your class in a test, by how many places do you beat the person who came eighth?

18.—

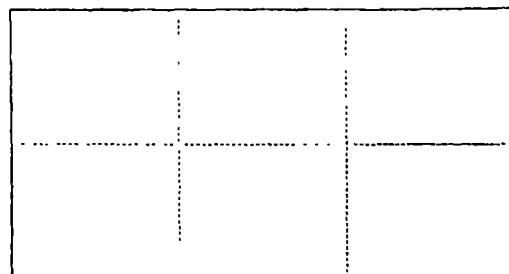
18  
9  
—

9 Here the person has;

☐ added; ☐ subtracted; ☐ multiplied; ☐ divided.

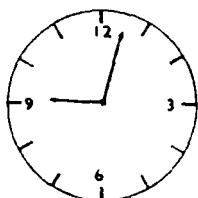
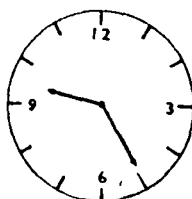
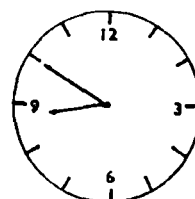
**GO STRAIGHT ON TO THE NEXT PAGE**

19. This is a piece of paper and the dotted lines are crease lines.



How many times has the piece of paper been folded?

20. Of the clocks below, one is fast and one is slow. Which clock shows the correct time?


☐

☐

☐

21. If you were counting backwards by 100's, the next number to 2000 would be?

☐ 2100; ☐ 1000; ☐ 1900; ☐ 2900.

22. Which of the fractions below is nearest to one whole?

☐  $\frac{1}{2}$ ; ☐  $\frac{7}{8}$ ; ☐  $\frac{8}{4}$ ; ☐  $\frac{5}{4}$ .

23. Which of these fractions is the greatest?

☐  $\frac{5}{6}$ ; ☐  $\frac{7}{10}$ ; ☐  $\frac{1}{2}$ .

24. 3543 estimated to the nearest 100, would be—

☐ 3500; ☐ 3540; ☐ 3600; ☐ 4000.

25.  $12 \times 34$  is the same as—

☐  $21 \times 43$ ; ☐  $14 \times 32$ ; ☐  $13 \times 24$ ; ☐  $34 \times 12$ .

26. Which of the following is one thousand, two hundred and twenty-one?

☐ 1,200,210; ☐ 102,021; ☐ 2,201; ☐ 1,221.



**MATHEMATICAL UNDERSTANDING PART B-H****PRACTICE EXAMPLES**

For each question a number of possible answers is given. You have to choose the one correct answer from these and underline it

Here are some examples to show you how to answer the test.

*Example (i)—*

Which of these is a quarter of a million dollars?

- a. \$2,500.
- b. \$25,000.
- c. \$250,000.
- d. \$2,500,000.

The correct answer is \$250,000. This is answer 'c'. You should have underlined the line: 'c. \$250,000'.

*Example (ii)—*

The number 110 is greater than the number 100 by—

- a. 1.
- b. 10.
- c. 11.
- d. 100.
- e. 110.

The correct answer is ten. This is answer 'b'. You should have underlined the line 'b. 10.'

Now try this one yourself.

*Example (iii)—*

When a number is multiplied by one, the answer is—

- a. equal to the number.
- b. always zero.
- c. one more than the number.

(1) If you cannot decide which is the correct answer for a question DO NOT GUESS. Leave it and go on to the next one.

(2) All the questions can be worked out mentally. The only writing you should do is in underlining your answer.

(3) The test contains 40 questions and you should be able to complete it in 35 minutes. You will be allowed an extra few minutes to complete the test if you need it.

**DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD**

**Mathematical Understanding Test (Grades V–VI) Start**

1. A country town has a population of 1,200 people.  
Written in words 1,200 is,
  - a. twelve thousand;
  - b. ten thousand two hundred;
  - c. one thousand two hundred;
  - d. one thousand and twenty.
2. When a number is divided by one, the answer is,
  - a. one less than the number;
  - b. several less than the number;
  - c. always zero;
  - d. equal to the number.
3. The correct time is 11.32 a.m. This is about the same as,
  - a. a quarter-to-twelve in the morning;
  - b. a quarter-past-eleven in the morning;
  - c. half-past-eleven in the morning;
  - d. twelve noon.
4. How do the answers to  $13 \times 18$  and  $18 \times 13$  compare with each other in size?
  - a.  $13 \times 18$  is the same as  $18 \times 13$ ;
  - b.  $13 \times 18$  is larger than  $18 \times 13$ ;
  - c.  $13 \times 18$  is smaller than  $18 \times 13$ ;
  - d. it is impossible to compare the answers unless they are worked out.
5. When zero is subtracted from another number, the answer is,
  - a. always zero;
  - b. less than the number;
  - c. more than the number;
  - d. the same as the number.
6. The remainder in a division sum where the divisor is 65, is—
  - a.  $> 65$ ;
  - b.  $< 65$ ;
  - c.  $= 65$ ;
  - d. either  $> 65$  or  $< 65$ .
7. When the number 4,690 is changed to the nearest thousand it becomes,
  - a. 5,000; b. 4,600; c. 4,700 d. 4,000.
8. Which one of the following fractions is less than one-half?
  - a.  $\frac{1}{2}$ ; b.  $\frac{2}{3}$ ; c.  $\frac{3}{4}$ ; d.  $\frac{1}{4}$ .
9. Which of the following could be used as a measure of area?
  - a. ; b. ; c.  $\bigcirc$ ; d. .
10. If you were counting backwards by 100's the number next to 7,000 would be,
  - a. 7,900;
  - b. 6,000;
  - c. 7,100;
  - d. 6,900.

**GO STRAIGHT ON TO THE NEXT PAGE**

11. In an addition there are two numbers. These are zero and some other number. The answer is,
- smaller than the other number;
  - larger than the other number;
  - zero;
  - the same as the other number.

12. All numbers which can be exactly divided by 12 can also be exactly divided by,
- 3;
  - 8;
  - 24;
  - no other number.

13. The number which has 54 hundreds and 7 units is,
- 5470;
  - 5407;
  - 54007;
  - 547.

14. Look at this subtraction—

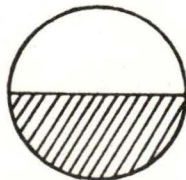
$$\begin{array}{r} \$ \quad c \\ 14 \quad 07 \\ - \\ \hline 9 \quad 89 \end{array}$$

You will notice that the answer is given, but that the middle line is missing.  
The missing line—

- can be worked out by subtracting \$9.89 from \$14.07;
  - can be worked out by adding \$14.07 to \$9.89;
  - can only be worked out by guessing;
  - can not be worked out at all.
15.  $(72 \times 43) =$
- $(72 \times 4) + (72 \times 3)$ ;
  - $(72 \times 40) + (72 \times 3)$ ;
  - $(70 \times 40) + (2 \times 3)$ ;
  - none of these.
16. Which is the heaviest?
- 0.4 tonnes;
  - 0.08 tonnes;
  - 0.30 tonnes;
  - 0.125 tonnes;
17. To find the difference between two numbers you would,
- find how many times the smaller number goes into the larger number;
  - subtract the smaller from the larger number;
  - find the product of the two numbers;
  - be unable to decide what to do because you are not told the numbers;
  - add the two numbers together.
18. Multiplying a number by 5 gives the same answer as multiplying,
- twice the number by 10;
  - an odd number by 10;
  - half the number by 10;
  - the number by 10.

19. A man increased his bank savings by 100% over a certain period. This means that he then had,
- \$100 in the bank;
  - doubled his bank savings;
  - \$100 more in the bank than he had before;
  - 100 times as much money in the bank as he had before.
20. Multiplication is a quick way of,
- adding several equal numbers;
  - adding several numbers but they do not have to be equal;
  - adding several unequal numbers.
21. When nine different odd numbers are added together, the answer,
- could be either even or odd;
  - is certainly even;
  - is certainly odd.
22. How many times greater is the place value of 3 in 300 than the place value of 3 in 30?
- three times;
  - ten times;
  - thirty times;
  - one hundred times.
23. Which one of these is NOT another way of writing 25%?
- $25/100$ ;
  - 0.25;
  - $\frac{1}{4}$ ;
  - 2500.
24. John is a normal boy in Grade VI. He would weigh about,
- 7 kg;
  - 21 kg;
  - 40 kg;
  - 80 kg;
25. To estimate the answer to this addition—  
 $7.8 + 3.1 + 11.9$ ,  
We would add,
- $7.8 + 3.1 + 11.9$ ;
  - $7 + 3 + 11$ ;
  - $.8 + .1 + .9$ ;
  - $8 + 3 + 12$ ;
  - $8 + 1 + 9$ .

26.—



The shaded portion of this circle is called a (an),

- sector;
- segment;
- arc;
- diameter.

27. If  $\square$  is to  $\triangle$  as 2 is to 1,

Then,

a.  $\square > \triangle$ ;

b.  $\square = \triangle$ ;

c.  $\square < \triangle$ ;

d. we cannot tell what is the relation between  $\square$  and  $\triangle$ .

28. Where is Janet's finger on her 30 cm ruler? She starts at zero. She moves up 6 cm, back 5 cm, up 2, up 6, back 2. Her finger is,

a. at 7 cm;

b. at 10 cm;

c. at 3 cm;

29. Estimate the value of  $1588 \div 19$ . The quotient is nearest,

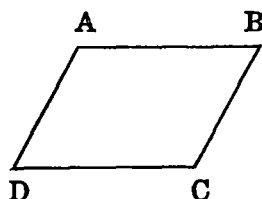
a. 70;

b. 80;

c. 700;

d. 800.

30.—



In this figure the side A B is parallel to the side D C and the side A D is parallel to the side B C.

This figure is called a,

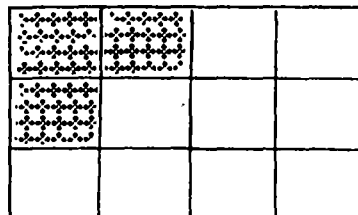
a. triangle;

b. square;

c. parallelogram;

d. rectangle.

31. What percentage of this figure is shaded?



a.  $\frac{1}{4}\%$ ;

b. 3%;

c. 25%;

d. 30%;

e. more than 30%.

32. Which one of these statements about the decimals 0.1 and 0.01 is true?

a. 0.1 is 10 times greater than 0.01;

b. 0.1 is 100 times greater than 0.01;

c. 0.01 is 10 times greater than 0.1;

d. 0.01 is 100 times greater than 0.1.

33. An ordinary breakfast tea-cup holds about,
- a. one twentieth of a litre;
  - b. a litre;
  - c. half a litre;
  - d. a fifth of a litre.
34. The numerator (3) and the denominator (5) of the fraction  $\frac{3}{5}$  are each multiplied by four. The new fraction is equal to,
- a. four times  $\frac{3}{5}$ ;
  - b. one fourth of  $\frac{3}{5}$ ;
  - c.  $\frac{3}{5}$ ;
  - d.  $\frac{3}{20}$ .
35. The difference between  $54 \times 39$  and  $53 \times 39$ ,
- a. is 54;
  - b. is 53;
  - c. is 39;
  - d. is 1;
  - e. can only be found by working out the two products.
36. If eight whole numbers which are each less than 6 are added, the sum,
- a. must be less than 40;
  - b. must be 40 or less;
  - c. must be more than 40;
  - d. could be either more or less than 40.
37. If you wish to find out how many times one number is greater than a smaller number you would,
- a. multiply the two numbers together;
  - b. subtract the smaller from the larger number;
  - c. divide the larger by the smaller number;
  - d. add the two numbers together.
38. The size of the angle between the hands of a clock at five past twelve,
- a. is about 10 degrees;
  - b. is about 30 degrees;
  - c. is about 60 degrees;
  - d. depends on the size of the clock.
39. When a whole number greater than one is divided by a fraction which is between zero and one the answer,
- a. is always less than one;
  - b. is always more than one but less than the number;
  - c. is always more than the number;
  - d. may be either less than the number or more than the number.

40. Look at these two sentences,

$$2,688 \div 48 = 56;$$

$$1,344 \div \square = 28.$$

Notice that 1,344 is half of 2,688 and that 28 is half of 56. The missing number,

*a.* is 96;

*b.* is 48;

*c.* is 24;

*d.* can only be found by working out the answer.

**GO BACK AND CAREFULLY CHECK YOUR WORK**

## APPENDIX H

### The Tasmanian Test for Reading Comprehension



THE TASMANIAN TEST FOR  
**READING COMPREHENSION - II**

279

Name .....

School ..... Grade or Class.....

Age ..... years ..... months ..... Date of Birth.....

---

**COMPREHENSION**

**READ THIS CAREFULLY**

Time: 30 minutes.

This is a test to see how well you understand what you read. It is made up of stories for you to read and questions about them for you to answer. Some of the questions are answered by writing in the spaces, and some are answered by underlining the right words.

Do these for practice—

1. The boy was fishing. He was sitting by the river with a fishing rod in his hand, and while I was watching he caught six fish. At four o'clock he packed up and walked away.

- (1) This story is about a—

tree; boy; school; policeman; trout; creek; lake.

(Did you put a line under boy?)

- (2) How many fish did the boy catch? .....

(Did you write six?)

- (3) At what time did the boy pack up? .....

(Did you write 4 o'clock?)

2. Near the lake was a large tree. One of its branches spread over the water. Several birds were hiding under the large green leaves of the tree.

- (4) Which word in the story means big? .....

(Did you write large?)

- (5) The birds were—

on the lake; in a nest; on the ground; in the tree; by the house; hopping about; in the air.

(Did you put a line under: in the tree?)

- (6) The tree was—

flowering; ugly; dead; rotten; growing; broken; crooked.

(Did you put a line under: growing?)

---

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

1. Ruff was Peter's dog. He was a small puppy with a short tail. He was often very troublesome and naughty. He dug holes in the garden and buried his bones in them.

- (1) Where did Ruff bury his bones?
- (2) Ruff's master was called?
- (3) Which word in the story means little?
- (4) Which word in the story means the opposite of long?
- (5) About how old was Ruff?  
5 years, 4 years, 6 months, 7 years, 9 years.

2. He was such a strange looking little man, only six inches tall, with big ears that stuck right out beyond his green cap. He slowly stretched and yawned. Then with a merry chuckle, he winked at me.

- (6) Which word in the story means laugh?
- (7) What colour was the little man's cap?
- (8) Which would be the best name for him?  
Mr. Big, Tiny, Sad face, Cross patch, Short ears.
- (9) Which word in the story means closed and opened one eye?
- (10) Which word in the story means opened his mouth wide?

3. Later on that evening, when the children had unpacked and had their tea, Mrs. Green said she would read them a story. Although it was the 20th December, the evening was cool; so Mrs. Green had lit a log fire. The children sat around it and waited for her to begin.

- (11) Why did Mrs. Green light a fire?
- (12) How many days was it to Christmas Day?
- (13) Which word in the story means start?
- (14) What were the children waiting for?
- (15) What time do you think it was when Mrs. Green began reading? o'clock

4. Richard, Henry, Sally and Susan were excited. They each took hold of a bottle and a lamb, and pushed the rubber teat against the lamb's mouth. All the lambs cheered up at once, and sucked and sucked until the bottles were all empty. They looked extremely bloated and fat.

- (16) How many girls were there?
- (17) Why did the lambs cheer up?
- (18) Which word in the story means greatly?
- (19) How many lambs did the children feed?
- (20) Which word in the story means swollen?

5. Bill got up early to pick a bunch of poppies and carnations for his teacher. After a hurried breakfast it was still only eight o'clock, but he ran all the way to school and arrived there at fifteen minutes past eight. When Miss White appeared five minutes later he presented the flowers with a beaming smile.

- (21) How many kinds of flowers did Bill pick?
- (22) What was his teacher's name?
- (23) About how long did it take Bill to run from home to school?
- (24) Which word in the story means reached?
- (25) How do you know that Bill was pleased to see his teacher?

6. The officer looked at his watch. It was after midnight. He gave an impatient sigh and glanced over the airfield. Usually, at this time, when the pilots had finished their night-flying, the lights of the airfield were turned off. But tonight they were expecting Ralph in his little Chipmunk, so the lights remained on.

(26) Ralph would arrive by—

car, jeep, foot, plane, boat, horse.

(27) Which word in the story means ended?

(28) Why was the officer impatient?

(29) Which word in the story means stayed?

(30) When were the lights usually turned off?

7. The streets looked gayer than usual as though celebrating the nearness of the holidays. People hurrying happily to work got in the way of shop-keepers who were pulling out striped awnings and blinds to protect their windows; in the city's gardens masses of flowers were in bloom; and high overhead flags strained away from poles that looked like white, gleaming knitting-needles against the blue sky.

(31) Which word in the story means shining?

(32) The city was: cold, grey, colourful, ugly, drab, quiet?

(33) From what were the shopkeepers protecting their windows?

(34) How do you know the wind was blowing?

(35) It was probably springtime because

(36) Which word in the story means 'moving quickly'?

8. When I was in the United States, a friend gave me a 'cattle-caller', a motor horn that instead of making a sharp beeping noise gives out a low, mooing sound, just like a cow calling to her calf. Apparently it is used on big ranches for bringing up cattle, and it must be very effective. Once or twice when driving past a field where there were cattle I have light-heartedly sounded the 'caller' and have seen how at once they look alert and turn their heads in the direction of the sound.

(37) The best name for this story would be—

Bonanza, A Country Drive, Western Adventures, The Cattle Caller, A Mean Trick.

(38) Which word in the story means cattle-farms?

(39) Where did the man get the motor horn?

(40) When the cattle hear the horn they think it is

(41) Which word in the story means works well?

(42) Which word in the story means paddock?

9. As the first strokes of the hour rang out from the belfry, the moon sailed free of the clouds to show the figure of a man dashing across the road. His feet, strangely enough, made no sound. In a flash he had reached the wall and scrambled over. The thick blackness swallowed him up, but there was a muffled curse as he blundered into a tombstone.

(43) You know the man ran into a graveyard because

(44) What was unusual about the way in which the man ran across the road?

(45) The man could be seen because

(46) Which word in the story means 'running quickly'?

(47) Which words in the story mean ran into by mistake?

(48) What is another way of saying 'he disappeared into the darkness'?

10. Most villages in England, and many in Wales and Scotland as well, have not only an ancient parish church but other buildings dating back into the Middle Ages. Much of the past history of villages in Great Britain can also be learnt from the names and shapes of the old fields; we may even be able to trace in the rise and fall of the ground something of the strip system of farming as it was in the days before modern methods of agriculture came into use.

(49) Which word in the story means old?

(50) What can be learnt from the names and shapes of old fields?

(51) One old method of agriculture was called the

(52) The period before modern times is called the

(53) What is another name for England, Scotland and Wales?

(54) Which words in the story means ways of farming?

(55) Which word in the story means follow or make out?

11. The painter Canaletto has left us a vivid description of London as he saw it in 1746 from the terrace of a nobleman's West End mansion. The towers and spires of Sir Christopher Wren's churches, rebuilt after the great fire of 1666, the fine buildings which lined the river bank, the traffic on the river, and the elegant costumes of the onlookers must all have made him feel that there could be no disputing the greatness of mid-eighteenth century London.

(56) Which famous English architect is mentioned in the paragraph?

(57) How many years after the great fire of London was this description?

(58) Which word in the story means arguing about?

(59) Which words in the story mean tasteful clothing?

(60) In which part of London did the wealthy and important people live?

(61) The eighteenth century began in the year

(62) Which two letters at the beginning of a word mean again?

12. The clipper ships were built with more regard for speed than for the comfort of their crews. Their purpose was to transport valuable cargoes as expeditiously as possible, and expense was not spared in their construction. They raced home from China with the new season's tea, their lofty masts bending like whips under piles of snowy canvas. The ships heeled over to the wind as though they must capsize. For days on end their decks were awash with green water, and everyone on board was cold and wet; but few men minded, for every one on board the winner of the year would be respected among sailors for the rest of his days.

(63) Which word in the story means smartly or speedily?

(64) Which word in the story means turn over or upset?

(65) How do we know that the tea was freshly picked?

(66) Clipper ships were driven by

(67) Which words in the story mean for the remainder of his life?

(68) Which word in the story means thought or consideration?

(69) Why was everybody on board cold and wet?

(70) The most suitable name for this paragraph would be—

The Campdown Races, A Wet Trip, The China Clippers, Oriental Tales, Homeward Bound, Wind and Sea.

(71) What was the main aim in the construction of a clipper?

13. According to our guide Belgium has a greater length of railway in proportion to her size than any other country in the world. He boasted that she had been the first country on the European continent to build railways, and had outstripped all other countries in the development of her railways system. "You islanders began before us", he said, "but it is noteworthy that our freights and fares are lower than yours". Belgian railways were formerly owned by the State and run not for profit, but primarily to provide cheap transport. At the time of our visit they were managed by a company, but the fares were still remarkably low, and one could travel second class for less than a penny per mile. However, the seats in the second class compartments were not as comfortable as those on our own railways.

(72) In which continent is Belgium?

(73) The visitors came from

(74) Which word in the story means got ahead of?

(75) Which word in the story means firstly?

(76) Which word in the story means very or exceptionally?

(77) Travel by rail costs in Belgium than it does in Australia.

(78) Travel by rail in the visitors' country was comfortable than it was in Belgium.

(79) Which word in the story means worth remembering?

(80) Which word in the story means previously?

14. The seaplane banked steeply to port. This was the area they had been looking for. With its two jutting headlands like silent sentries guarding the entrance to the bay this island matched perfectly with the description in the fable. High cliffs extending entirely round the coastline save for the narrow gap between the headlands made the island almost inaccessible by sea and, as a natural fortress, quite impregnable. The terrain spread out beneath the wings of the sea plane as it circled round the bay, seemed thickly wooded but not too dense for habitation. If the race of very early men so vividly described in the ancient tale, had anywhere survived the passing of time, isolated from the growth of civilization and contact with the outer world, then this would be the logical place.

(81) Which word in the story means cannot be reached?

(82) Which word in the story means a story handed down from olden times?

(83) Which word in the story means old?

(84) Which words in the story mean for people to live there?

(85) Which word in the story means left alone?

(86) Which word in the story means safe against attack?

(87) Where would the aircraft land?

(88) Which word in the story means stretching out?

(89) Which word in the story means remain alive?

(90) Why was it difficult to land on the island?

## APPENDIX I

### Tasmanian Word Knowledge Test

TASMANIAN WORD KNOWLEDGE TEST

FORM Q

Name ..... Grade .....  
Date of Test ..... Date of Birth .....  
School .....

INSTRUCTIONS

This is a test to see how many words you know. Each word in heavy black type is followed by five other words. Choose the word which has the same or most nearly the same meaning as the word in heavy black type, and write its number in the brackets at the end of the line. In the first example, happy is the correct answer so 3 is written in the brackets at the end.

Try to do as many items as you can and guess if you are not sure of the right answer.  
Do the other practice examples on this page.

PRACTICE EXAMPLES

---

glad: .....	1 wise .....	2 silly .....	3 happy .....	4 sad .....	5 old .....	( 3 )
fall: .....	1 sit .....	2 dry .....	3 spring .....	4 eat .....	5 drop .....	( )
over: .....	1 near .....	2 under .....	3 above .....	4 good .....	5 right .....	( )
sadness: ...	1 anger .....	2 joy .....	3 sorrow .....	4 hope .....	5 surprise .....	( )
little dog..	1 cat .....	2 bear .....	3 kitten .....	4 pup .....	5 horse .....	( )

---

(DO NOT TURN OVER UNTIL TOLD TO DO SO)

1 calm .....	1 chosen .....	2 quiet .....	3 mad .....	4 bare .....	5 near .....	( )
2 account ...	1 knee.....	2 iron .....	3 bill .....	4 light .....	5 family .....	( )
3 evil .....	1 fat .....	2 bad .....	3 burnt .....	4 sick .....	5 foreign .....	( )
4 finish .....	1 discover .....	2 accident .....	3 complete ....	4 increase .....	5 divide .....	( )
5 experiment	1 test.....	2 wire .....	3 nail .....	4 debt .....	5 pipe .....	( )
6 several ....	1 soft .....	2 some .....	3 safe .....	4 silver .....	5 sudden .....	( )
7 kindness ..	1 charity .....	2 cherry .....	3 groan.....	4 function ....	5 grandfather ....	( )
8 pail .....	1 trader .....	2 phase .....	3 buyer .....	4 paddle .....	5 bucket .....	( )
9 request ....	1 wheel .....	2 horse .....	3 appeal .....	4 scale .....	5 parent .....	( )
10 foolish ....	1 rocky .....	2 silly .....	3 extraordinary	4 charming ....	5 working .....	( )
11 brief .....	1 rich .....	2 short .....	3 deep.....	4 half .....	5 big.....	( )
12 scent .....	1 perfume .....	2 site .....	3 lustre .....	4 disposition...	5 scholar .....	( )
13 pond .....	1 pump .....	2 rainbow .....	3 swamp .....	4 parlour .....	5 pool .....	( )
14 broad .....	1 wide .....	2 kind .....	3 near .....	4 under .....	5 hot .....	( )
15 frighten ...	1 subdue .....	2 torture .....	3 impress.....	4 startle .....	5 withdraw .....	( )
16 bent .....	1 actual .....	2 faint.....	3 final .....	4 bowed .....	5 civil .....	( )
17 shy .....	1 quaint .....	2 timid .....	3 worthless ....	4 thoughtful...	5 concrete .....	( )
18 marvellous	1 desperate ....	2 remarkable..	3 extreme.....	4 scientific ....	5 tight .....	( )
19 ledge .....	1 sash .....	2 hazard .....	3 shelf .....	4 oracle .....	5 raid .....	( )
20 inform ....	1 cease .....	2 depart .....	3 harvest .....	4 develop.....	5 advise .....	( )
XXXXXXXXXX						
21 identify ..	1 embrace .....	2 respect .....	3 exhibit .....	4 assign .....	5 recognize .....	( )
22 vacant ....	1 hurried .....	2 blank .....	3 harsh .....	4 shrill.....	5 prime .....	( )
23 well-known	1 gross.....	2 infinite .....	3 renowned ....	4 radical .....	5 ragged .....	( )
24 announce	1 appoint .....	2 cheer .....	3 determine...	4 recover .....	5 declare .....	( )
25 hearty ....	1 crazy .....	2 rude .....	3 frozen .....	4 lively .....	5 nervous .....	( )
26 hesitate ...	1 retreat .....	2 prevail .....	3 acquaint ....	4 pause .....	5 doubt .....	( )
27 quiver ....	1 cluster .....	2 panic .....	3 linger .....	4 tremble.....	5 reassure .....	( )
28 transmit...	1 communicate	2 specialise ....	3 uphold .....	4 tarry.....	5 wedge .....	( )
29 society ....	1 speech .....	2 attitude .....	3 branch .....	4 club .....	5 material .....	( )
30 wretched	1 dried .....	2 shallow.....	3 miserable ....	4 haunted ....	5 scarce .....	( )
31 pursue ....	1 blend .....	2 improve .....	3 borrow .....	4 chase .....	5 neglect .....	( )
32 bewitch ..	1 enchant .....	2 apologise ....	3 infect .....	4 precipitate...	5 succour .....	( )
33 expose ....	1 distort .....	2 perplex .....	3 examine .....	4 overlay .....	5 uncover .....	( )
34 combine ..	1 defeat .....	2 command ....	3 unite .....	4 affect .....	5 match .....	( )
35 detect .....	1 endure .....	2 discover .....	3 conceal.....	4 deceive .....	5 fetch .....	( )

(GO ON TO NEXT PAGE)



36 courageous	1 unwilling ....	2 petty .....	3 ghastly .....	4 fearless .....	5 unfair .....	( )
37 barrier ....	1 obstacle .....	2 fireplace .....	3 behaviour ....	4 extension ....	5 fatigue .....	( )
38 woe .....	1 platform ....	2 fan .....	3 security.....	4 weakness ....	5 distress .....	( )
39 conceal....	1 discourage ..	2 reveal .....	3 betray .....	4 hide .....	5 contrast .....	( )
40 ointment	1 balm .....	2 raft .....	3 quail .....	4 sanitary .....	5 sanctuary .....	( )
41 illegal .....	1 instinctive ...	2 unlawful ....	3 unoccupied..	4 unmarried ...	5 uneven .....	( )
42 arrest .....	1 abandon ....	2 mock .....	3 detain.....	4 reform .....	5 dispute .....	( )
43 significant	1 substantial ..	2 casual .....	3 decent .....	4 crude .....	5 artistic .....	( )
44 proclamation	1 delusion .....	2 heritage .....	3 announcement	4 prevention..	5 liege .....	( )
45 lasting .....	1 victorious....	2 joyful .....	3 elegant .....	4 persisting ...	5 transparent.....	( )
46 revolt .....	1 discontent ...	2 menace.....	3 rebellion ....	4 hardship .....	5 revenge.....	( )
47 massacre..	1 yearn .....	2 sympathize..	3 stun .....	4 restrict .....	5 slaughter .....	( )
48 stubborn	1 metallic .....	2 ruddy .....	3 widespread..	4 obstinate ....	5 partial .....	( )
49 excess .....	1 exquisite .....	2 irregular .....	3 educational..	4 surplus .....	5 delicate.....	( )
50 humble....	1 violent .....	2 sober .....	3 moderate ....	4 earnest .....	5 modest .....	( )
51 annoy ....	1 resent .....	2 conflict .....	3 grimace .....	4 provoke .....	5 detest .....	( )
52 submit ....	1 yield .....	2 release .....	3 suspect .....	4 refer .....	5 dispute .....	( )
53 uncouth...	1 juicy.....	2 jumpy .....	3 knightly ....	4 unwise .....	5 barbarous.....	( )
54 excel .....	1 analyse .....	2 inspect .....	3 grope .....	4 reassure .....	5 surpass .....	( )
55 carry .....	1 catch .....	2 include .....	3 bear .....	4 better.....	5 suggest .....	( )
56 relate .....	1 scorn .....	2 suspect .....	3 commit .....	4 influence ....	5 describe .....	( )
57 forsake ....	1 renounce ....	2 augment ....	3 graft.....	4 label.....	5 pout .....	( )
58 farce .....	1 mockery ....	2 heretic .....	3 fraction.....	4 flaw .....	5 asset.....	( )
59 deviation	1 daintiness ....	2 damnation ...	3 deafness .....	4 digression ...	5 diplomatist ....	( )
60 horrible ...	1 tremendous	2 healthy.....	3 foul .....	4 fearful .....	5 useless .....	( )
61 intricate ..	1 entangled ....	2 invalid .....	3 composed ...	4 devoted ....	5 tranquil .....	( )
62 contemptuous	1 gifted .....	2 ancestral ....	3 frivolous ....	4 scornful .....	5 gaseous .....	( )
63 revelation	1 announcement	2 radiator .....	3 spire .....	4 restriction ...	5 inheritance ....	( )
64 sanctity ..	1 stratagem ....	2 ratification ..	3 sacredness ...	4 legacy .....	5 suppression.....	( )
65 thwart ....	1 frustrate ....	2 smack .....	3 wriggle .....	4 inflame.....	5 verify .....	( )
66 antagonist	1 abolition .....	2 absurdity ....	3 academic ....	4 adversary ....	5 actress .....	( )
67 beseech ..	1 amend .....	2 invert .....	3 entreat .....	4 modify .....	5 ramble .....	( )
68 spectre ....	1 ghost .....	2 diversion ....	3 sage .....	4 relic .....	5 asset .....	( )
69 temperance	1 maintenance	2 moderation ..	3 domain.....	4 restoration...	5 aggregate .....	( )
70 similitude	1 semblance....	2 sufficiency ..	3 witticism ....	4 habitat .....	5 gentility .....	( )

(GO ON TO NEXT PAGE)

71 despondent	1 deceitful ....	2 dejected ....	3 defiant .....	4 deplorable ...	5 devout .....	( )
72 passive ....	1 lacking .....	2 inert .....	3 eccentric ....	4 gaudy .....	5 outrageous .....	( )
73 pious .....	1 devout .....	2 childish .....	3 incredible ....	4 naughty .....	5 impatient .....	( )
74 commiseration	1 conservation	2 condolence..	3 centralization	4 chatterbox ..	5 columnist .....	( )
75 shameful..	1 refined .....	2 pathetic .....	3 cowardly ....	4 scandalous...	5 genial .....	( )
76 fastidious	1 ulterior .....	2 meticulous...	3 roguish .....	4 slavish .....	5 nebulous .....	( )
77 lethargic ..	1 flawless .....	2 managerial ..	3 torpid .....	4 presentable..	5 igneous .....	( )
78 affinity ....	1 relationship	2 supplement	3 variable .....	4 disposal .....	5 remnant .....	( )
79 insidious	1 fearless .....	2 greedy .....	3 treacherous..	4 industrious..	5 joyful .....	( )
80 flamboyant	1 piratical .....	2 statutory ....	3 florid .....	4 nomadic .....	5 clement .....	( )
XXXXXXXXXX						
81 pauperism	1 disloyalty ....	2 penury .....	3 pathos .....	4 assessor .....	5 rehabilitation...	( )
82 regress .....	1 superinduce	2 deteriorate ..	3 reconsecrate	4 apologize ....	5 dispute .....	( )
83 abridgement	1 abatement ...	2 adhesion .....	3 depravity ....	4 shortening ..	5 gratification ....	( )
84 exposition	1 provocation	2 scandal .....	3 commentary	4 prophecy ....	5 formality .....	( )
85 sanction ..	1 ratify .....	2 originate .....	3 meddle .....	4 redeem .....	5 garnish .....	( )
86 substantiate	1 exacerbate ..	2 corroborate..	3 collate .....	4 reanimate ....	5 glaciare .....	( )
87 disconsolate	1 debatable ....	2 delirious .....	3 descriptive...	4 detestable....	5 depressed .....	( )
88 indoctrinate	1 inculcate.....	2 examine .....	3 interrogate ..	4 anaesthetize	5 terrorize .....	( )
89 munificence	1 subjugation..	2 bounteousness	3 beatitude ....	4 veracity .....	5 declivity .....	( )
90 retrenchment	1 infusion .....	2 nominalism..	3 amputation..	4 reduction ....	5 innovation.....	( )
91 flaccid ....	1 explicable ...	2 mesmeric ....	3 unbalanced..	4 flabby .....	5 demonic .....	( )
92 insular .....	1 beamed .....	2 high-minded	3 hellish .....	4 harmonic ....	5 detached .....	( )
93 abstracted	1 absent-minded	2 depraved ....	3 corrugated ..	4 fatalistic ....	5 disinclined .....	( )
94 supercilious	1 arrogant .....	2 articulate ....	3 silky .....	4 boastful .....	5 efficacious.....	( )
95 propensity	1 manipulation	2 luminosity ..	3 inclination...	4 approbation	5 fabrication .....	( )
96 adroitness	1 rapacity .....	2 verbosity ....	3 suavity .....	4 dexterity .....	5 stateliness .....	( )
97 conjugal ..	1 matrimonial	2 inarticulate..	3 possessive ....	4 coastal .....	5 cheerless .....	( )
98 poignant..	1 theological ..	2 sleek .....	3 sinister .....	4 touching ....	5 abominable ....	( )
99 alacrity ....	1 allegory .....	2 ambiguity....	3 intricacy ....	4 versatility ....	5 briskness .....	( )
100 contentious	1 painstaking..	2 straightforward	3 vindictive ....	4 quarrelsome	5 optimistic .....	( )
101 perpetrate	1 fraternize ....	2 belittle .....	3 equate .....	4 commit .....	5 dispose .....	( )
102 incendiary	1 pyromaniac	2 proboscis ....	3 mediator ....	4 zealot .....	5 surrogate .....	( )
103 petulance	1 potentiality..	2 predicament	3 cupidity .....	4 trepidation..	5 irascibility .....	( )
104 transmogrification	1 expectoration	2 endive.....	3 sequestration	4 mastication..	5 metamorphosis	( )
105 palaver ....	1 wheedle .....	2 decant .....	3 disrupt .....	4 imbrue .....	5 solemnize .....	( )

## APPENDIX J

### Tasmanian Junior Test of General Ability

**TASMANIAN JUNIOR TEST OF GENERAL ABILITY-II**

**PART I (NON-VERBAL)**

NAME: \_\_\_\_\_ GRADE: \_\_\_\_\_

**SCHOOL:** ..... **DATE:** .....

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

**The first type of question will be like this:**

**Write the missing number at the end of the line:**

**Example A:**

14    13    —    11    10    9                      ( )

**Example B:**

$$2 \quad 2 \quad 3 \quad 3 \quad - \quad 4 \quad ( \quad )$$

**The second type of question will be like this:**

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

**Example C:**

E F G H I J K — ( )

**Example D:**

V T R P — ( )

**The third type of question will be like this:**

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

**Example E:**

3 5 7 9 11 — 15 — 19 ( , )

**Example F:**

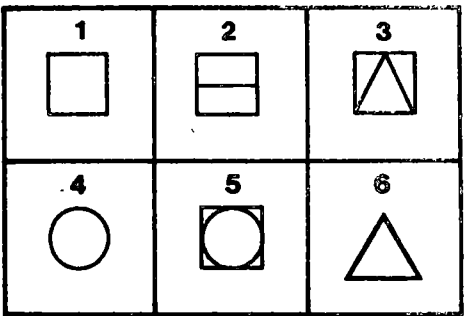
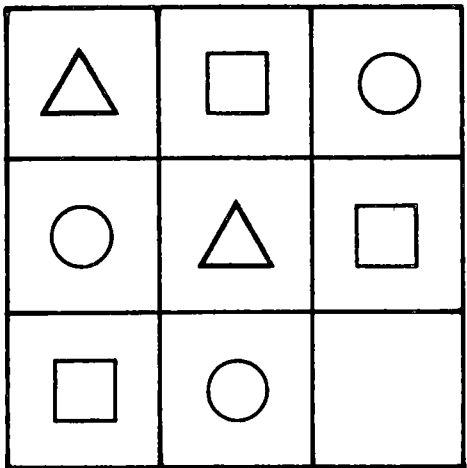
3 2 5 4 7 — 9 — 11 ( , )

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

The last type of question looks like this:

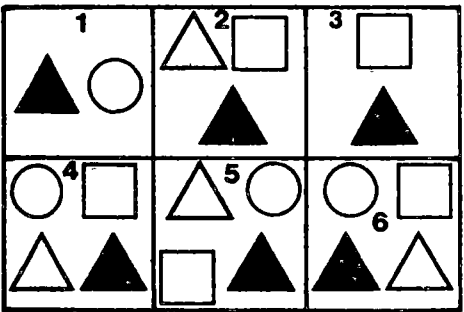
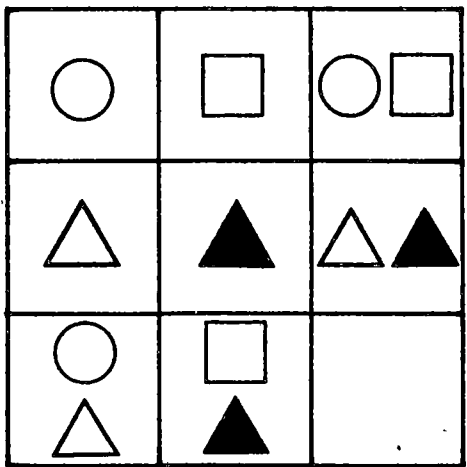
Which of the six pieces in the long box is the one missing from the picture at left.  
Write your answer in the brackets.

*Example G:*



(   )

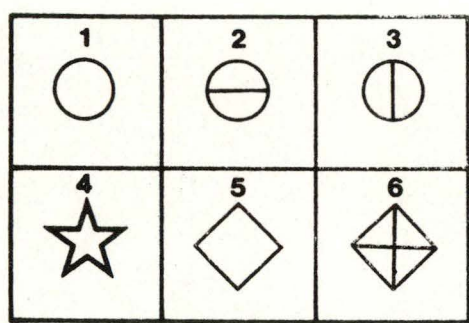
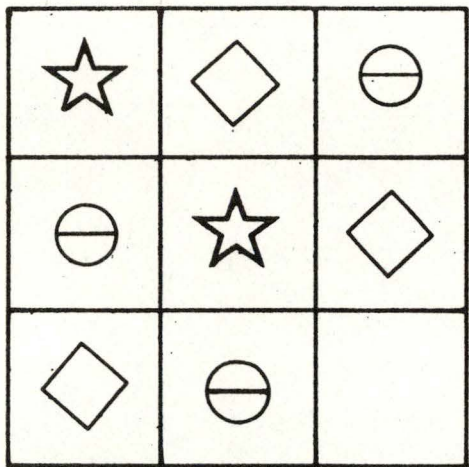
*Example H:*



(   )

**DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD TO DO SO**

1.



( )

2. 13 11 9 — 5 3

( )

3. 14 — 34 44 54 64

( )

4. Q R S Q R S T U V T —

( )

5. H I J U V W H I J U —

( )

6. 31 — 53 64 75 86

( )

7. 25 23 21 — 17 — 13 11

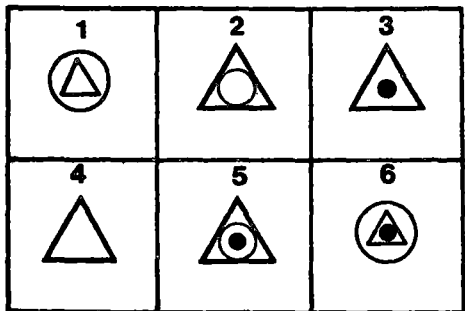
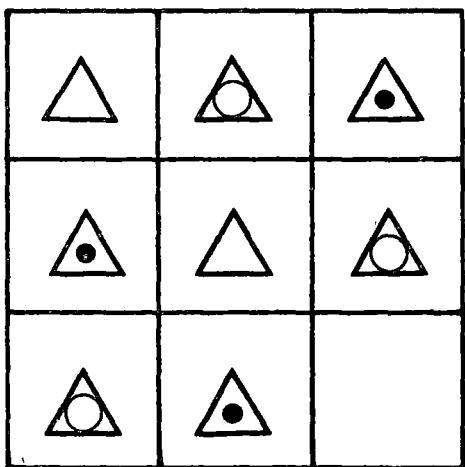
( , )

8. 5 4 7 6 9 — 11 —

( , )

ABCDEFGHIJKLMNOPQRSTUVWXYZ

9.



( )

10. O P Q O P R O —

( )

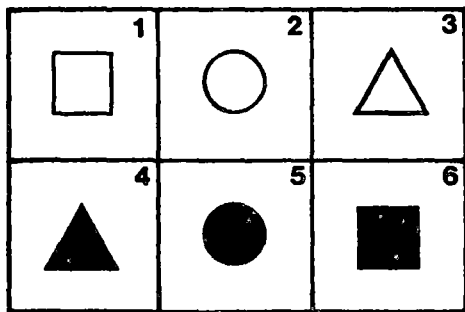
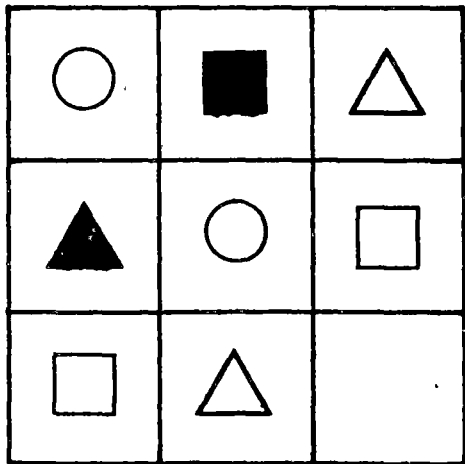
11. 25 15 45 35 65 — 85 —

( , )

12. 7 11 13 — 19 23

( )

13.

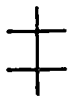

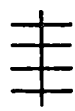

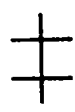
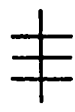




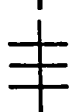


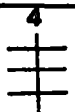
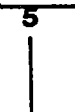

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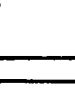

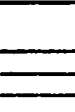



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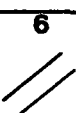
		
		
		

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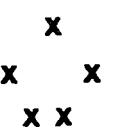
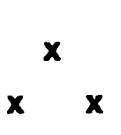
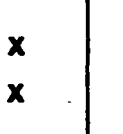
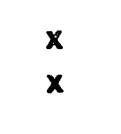

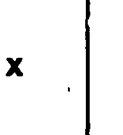
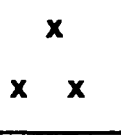
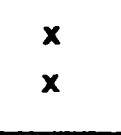
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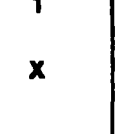
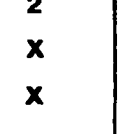
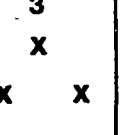
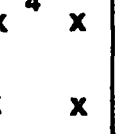
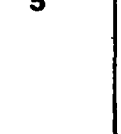
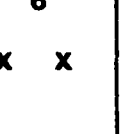
		
		
		

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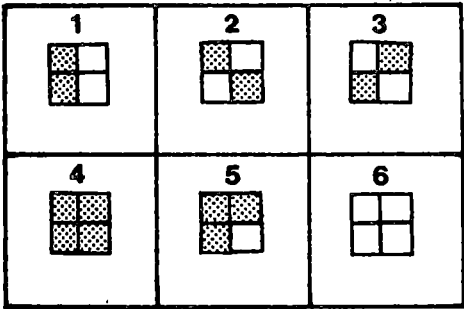
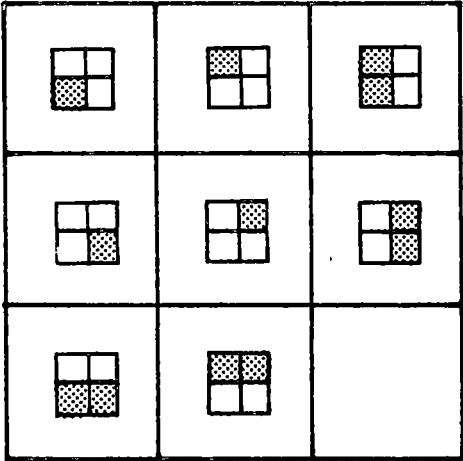
		
		
		

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17.



( )

18. D E Y E F X F G W — ( )

19. S T U G F E V W X D C B — ( )

20. 4 6 5 8 6 — 7 — ( , )

ABCDEFGHIJKLMNOPQRSTUVWXYZ

**TASMANIAN JUNIOR TEST OF GENERAL ABILITY—H H****PART 2 (VERBAL)**

NAME: ..... GRADE: .....

SCHOOL: ..... DATE: .....

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

**EXAMPLES**

**Pretty** means nearly the same as

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

**Wet** is the opposite of

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

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

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

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

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

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

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

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

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

**DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD TO DO SO**

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

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

( )

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

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

## APPENDIX K

### Childrens' Personality Questionnaire (CPQ)



## CPQ, Form A (1975 Edition)

Part A<sub>1</sub>

## What You Do and What You Think

Print Your Name: First \_\_\_\_\_ Last \_\_\_\_\_

Your Age \_\_\_\_\_ Date of Birth \_\_\_\_\_ Boy ☐ Girl ☐

Teacher \_\_\_\_\_ Grade in School \_\_\_\_\_

Read each question and then fill in the box, like this ☒, on the side that fits you better. If you have an answer sheet, mark only on that. If you do not have an answer sheet, mark on the booklet.

Here are two examples.

1. Would you rather read a book ☐ or ☐ play a game

If you would rather read a book, you would fill in the box on the left, next to that answer. If you would rather play a game, you would fill in the other box, on the right side next to that answer. There is no right or wrong answer, because people like to do different things.

There are a few questions that do have a right answer, and they have three answers to choose from, like example 2. The right answer is 8, so the box next to 8 is filled in.

2. The next number in 2, 4, 6, \_\_, is 2 ☐ or 8 ☒ or 12 ☐

Don't spend too much time on any one question, even if it seems hard to answer. Just mark it the best you can. Be sure to mark every question. While you are working, if you don't know a word, raise your hand and the teacher will come to you. You may begin now.

1. After school do you get together with others for games and fun ☐ or ☐ would you rather do things on your own
2. When a classmate tells you you're wrong to believe something, do you keep on believing it anyway ☐ or ☐ ask other people if you're right
3. Are your ideas better than other children's ideas ☐ or ☐ usually not quite so good
4. Do you make a lot of mistakes ☐ or ☐ just a few
5. Do you wish you had more time to be alone ☐ or ☐ do you enjoy spending the time with your friends
6. Does your mother say you are too slow ☐ or ☐ do you do things quickly and well
7. Do you feel unhappy at a party that keeps going on and on ☐ or ☐ do you wish the party would last a lot longer
8. Do your plans often not work out ☐ or ☐ do they work out well
9. When your mother tells you to wash your hands, do you wash them ☐ or ☐ wash them only if you think she'll check them
10. Are you usually sure of yourself ☐ or ☐ do you often not feel very sure of yourself

**GO RIGHT ON TO THE NEXT PAGE**

Do not write here.

A \_\_\_\_\_ C \_\_\_\_\_



In every question, mark just one box.

11. Dry is the opposite of *wet* ☐ or *cool* ☐ or *sticky* ☐
12. Is it hard to keep from laughing when others make mistakes ☐ or ☐ do you not feel like laughing at them
13. If you saw some small wild animals in the woods, would you rather just watch them ☐ or ☐ catch them or hunt them with a bow and arrow
14. If your parents scold you, do you get mad ☐ or ☐ do you feel like crying
15. Work is to play as night is to *dark* ☐ or *light* ☐ or *day* ☐
16. Does your teacher often have to tell you to pay attention to your work ☐ or ☐ do you hardly ever "fool around"
17. Do you go to friends' houses without telling your mother ☐ or ☐ do you always first tell your mother where you're going
18. Can you put unpleasant things out of your mind as if they never happened ☐ or ☐ is it hard for you to forget unpleasant things
19. The next number in 2, 5, 8, \_\_, is 7 ☐ or 11 ☐ or 9 ☐
20. Do you obey the rules all the time ☐ or ☐ only when you have to
21. Would you rather be a teacher ☐ or ☐ a scientist
22. Do you think you could easily learn to fly an airplane ☐ or ☐ would it be too hard
23. Which one of these does not belong with the others: *string, rope, catch, wire* *rope* ☐ or *wire* ☐ or *catch* ☐
24. Does your teacher think you are good at sitting still ☐ or ☐ that you move around the room too much
25. Do you have many accidents ☐ or ☐ do you keep away from things that are dangerous
26. Do people often hurt your feelings ☐ or ☐ does this hardly ever happen
27. If Mary's uncle is my father, what relation is Mary's sister to me *cousin* ☐ or *niece* ☐ or *aunt* ☐
28. If a classmate calls you a bad name, do you call him another ☐ or ☐ keep your temper and just let it pass
29. Do you usually wear your coat neatly zipped or buttoned up ☐ or ☐ do you just throw it on
30. If you were a man, would you rather be the captain of a peaceful ocean liner ☐ or ☐ captain of a submarine in a war

GO RIGHT ON TO THE NEXT PAGE

Do not write here.

B \_ D \_ E \_ F \_

*In every question, mark just one box.*

31. When people talk about a place you know well,  
do you start telling them about it too ☐ or ☐ do you keep quiet until they finish
32. Are you wide awake most days ☐ or ☐ are there some days when you aren't  
much good at things
33. Would you rather play a rough game, like touch  
football ☐ or ☐ fly a kite
34. Do most of the kids in your class read better  
than you ☐ or ☐ can you read well
35. Do you do things you should do ☐ or ☐ only things you like to do
36. Are you afraid of large dogs in the street ☐ or ☐ do you like to go over and pat them
37. Would you rather dream you had become an  
elf or pixie ☐ or ☐ that you were on a tiger hunt
38. Do you wish you were better looking ☐ or ☐ do you think you're good looking  
enough
39. If you were a teacher, would you let the kids  
be noisy ☐ or ☐ would you make them be quiet
40. Do you lie awake thinking about things ☐ or ☐ do you usually go right to sleep
41. Do you like to read about wars and battles ☐ or ☐ do they frighten you
42. Do you forget things you have told people you  
will do ☐ or ☐ do you usually remember what you  
said you'd do
43. When your mother is annoyed with you, is it  
often her fault ☐ or ☐ do you usually feel you are wrong
44. If people aren't doing something the way it  
should be done, do you tell them ☐ or ☐ do you feel you shouldn't say anything
45. If you had to choose, would you rather be a  
school teacher ☐ or ☐ a great hunter or athlete
46. Do people pay enough attention to you ☐ or ☐ do you have to do things to make  
people notice you
47. Would you rather listen to a teacher ☐ or ☐ talk yourself
48. Can you easily keep track of everything that  
belongs to you ☐ yes ☐ or ☐ no
49. If you had a choice, would you go to auto races ☐ or ☐ a dog show
50. Do you succeed in most things you try ☐ or ☐ do things often go wrong for you

**GO RIGHT ON TO THE LAST PAGE**

Do not write here.

G \_\_\_\_\_ H \_\_\_\_\_ I \_\_\_\_\_ J \_\_\_\_\_

*In every question, mark just one box.*

51. Do grownups at home talk to you as if your feelings don't matter ☐ or ☐ do they respect you and try not to hurt your feelings
52. Are other people easy for you to understand ☐ or ☐ are you sorry that you can't get to know people easily
53. When there's group singing, would you rather not join in ☐ or ☐ would you gladly join in with the others
54. If people tease you, do you boil up inside ☐ or ☐ do you smile and not care too much
55. Do people say you're the first one to try exciting new things ☐ or ☐ do they say you're pretty careful
56. Do you usually feel happy and contented ☐ or ☐ do you often feel that any little thing could make you cry
57. Would you rather learn a lesson in school ☐ or ☐ watch a game
58. Does it make you mad to have to stop and change your clothes before you go out to play ☐ or ☐ do you just change them anyway
59. Do you like being a student in school ☐ or ☐ would you quit school if you could
60. Do you hardly ever feel lonely ☐ or ☐ feel lonely quite often
61. When people play a joke on you, do you get all upset ☐ or ☐ take it quietly
62. Do you often do things so fast that you're sorry later ☐ or ☐ are you pretty relaxed and careful about everything you do
63. Would you rather learn something new in school ☐ or ☐ watch television
64. Do so many things seem to go wrong for you that you feel upset a lot of the time ☐ or ☐ don't you feel upset very often
65. Do you do your homework without being told ☐ or ☐ must you be reminded a few times before you get started
66. When your teacher reads aloud do you listen to every word ☐ or ☐ do you begin to think about something else
67. Would you rather not have to be polite to people ☐ or ☐ do you like to be polite
68. When you have to go to the doctor, is it hard to be brave ☐ or ☐ doesn't it bother you a bit
69. When you are told exactly how to do a job, do you still do it the way that seems easiest to you ☐ or ☐ do you do it just as you are told
70. Do you remember most of what you learn ☐ or ☐ do you forget things easily

**DID YOU PUT ONE MARK DOWN FOR EVERY STATEMENT? CHECK BACK AND SEE.**

Do not write here.

N \_\_\_\_\_ O \_\_\_\_\_ Q<sub>1</sub> \_\_\_\_\_ Q<sub>2</sub> \_\_\_\_\_



## CPQ, Form A (1975 Edition)

Part A<sub>2</sub>

## What You Do and What You Think

Print Your Name: First \_\_\_\_\_ Last \_\_\_\_\_

Your Age \_\_\_\_\_ Date of Birth \_\_\_\_\_ Boy ☐ Girl ☐

Teacher \_\_\_\_\_ Grade in School \_\_\_\_\_

Read each question and then fill in the box, like this ☒, on the side that fits you better. If you have an answer sheet, mark only on that. If you do not have an answer sheet, mark on the booklet.

Here are two examples.

1. Would you rather read a book ☐ or ☐ play a game

If you would rather read a book, you would fill in the box on the left, next to that answer. If you would rather play a game, you would fill in the other box, on the right side next to that answer. There is no right or wrong answer, because people like to do different things.

There are a few questions that do have a right answer, and they have three answers to choose from, like example 2. The right answer is 8, so the box next to 8 is filled in.

2. The next number in 2, 4, 6, \_\_, is 2 ☐ or 8 ☒ or 12 ☐

Don't spend too much time on any one question, even if it seems hard to answer. Just mark it the best you can. Be sure to mark every question. While you are working, if you don't know a word, raise your hand and the teacher will come to you. You may begin now.

1. Do you think most grownups are nice ☐ or ☐ do you like to make fun of them when they're not around
2. Do you find other children take advantage of you ☐ or ☐ are they kind to you
3. Do you think people like you just as much as they like most other people yes ☐ or ☐ no
4. Do people think that you don't do things very well ☐ or ☐ that you do most things right
5. Are you alone most of the time ☐ or ☐ almost always with at least one friend
6. Do grownups think you don't behave very well ☐ or ☐ that you're well-behaved
7. Do you like just a few children ☐ or ☐ do you like nearly all children
8. When there's a game on the playground, are you usually standing around and watching ☐ or ☐ are you usually one of the players
9. Do most people gladly help you when you ask them ☐ or ☐ do they really wish you hadn't asked them to help
10. Are you getting along well ☐ or ☐ do you seem to have lots of problems

GO RIGHT ON TO THE NEXT PAGE

Do not write here.

A \_\_\_\_\_ C \_\_\_\_\_

**In every question, mark just one box.**

11. *Remain* is the opposite of *go* ☐ or *stay* ☐ or *happen* ☐
12. In your dreams, do animals chase you ☐ or ☐ are dreams nice
13. Do people say you do what others want you to do ☐ or ☐ that you are stubborn and do things your own way
14. When it's dark, can you walk down your street without feeling worried ☐ or ☐ are you very careful to have company and look around often
15. *Hive* is to *bees* as *nest* is to *home* ☐ or *eggs* ☐ or *birds* ☐
16. When you are disappointed, do you feel like fighting ☐ or ☐ do you feel tired
17. Would you rather go to a football game ☐ or ☐ take a walk on the beach
18. When you hear a sad story do you soon laugh and joke about it ☐ or ☐ does it make you very serious
19. The next number in 12, 9, 6, \_\_, is 4 ☐ or 3 ☐ or 5 ☐
20. Do you think more often about your lessons and what you'll learn in school ☐ or ☐ about exciting things you would like to do
21. Would you rather be a movie star ☐ or ☐ take a trip to the moon
22. Would you rather travel as a crew member of a spaceship ☐ or ☐ work with books in a bookstore
23. Which one of these does not belong with the others: *first*, *count*, *ninth*, *second* *ninth* ☐ or *second* ☐ or *count* ☐
24. In your family, are you the quiet one ☐ or ☐ the one who gets into trouble
25. If people leave their things at your house, do you sometimes not bother to return them ☐ or ☐ do you take the trouble to return their things to them
26. If you do something wrong, do you worry about it a lot ☐ or ☐ soon forget it
27. If Jane's aunt is my mother, what relation is Jane's brother to me *cousin* ☐ or *nephew* ☐ or *uncle* ☐
28. Do you wish school would not be such a bother ☐ or ☐ is school all right as it is
29. When you get a poor mark on a test, do you wish you had worked harder ☐ or ☐ doesn't it matter too much
30. If you saw wild animals or snakes, would you be scared ☐ or ☐ would you think it was fun

**GO RIGHT ON TO THE NEXT PAGE**

Do not write here.

B \_ D \_ E \_ F \_

**In every question, mark just one box.**

- |  |                          |    |  |
|--|--------------------------|----|--|
| 31. Would you rather be in a class where the kids misbehave a bit                              | <input type="checkbox"/> | or | <input type="checkbox"/> where almost all of them are well behaved                         |
| 32. When you start to make something or to paint a picture, do you usually have time to finish | <input type="checkbox"/> | or | <input type="checkbox"/> do you often find that you have to rush from one thing to another |
| 33. In a play, would you rather be a test pilot of fast planes                                 | <input type="checkbox"/> | or | <input type="checkbox"/> a famous writer   |
| 34. Do loud noises scare you   | <input type="checkbox"/> | or | <input type="checkbox"/> do you just laugh at them   |
| 35. Would you rather make something the way the teacher says is best                           | <input type="checkbox"/> | or | <input type="checkbox"/> make it the way you feel like doing it                            |
| 36. When you're with grownups, do they talk so much that you feel you must not butt in         | <input type="checkbox"/> | or | <input type="checkbox"/> are they always willing to listen to you                          |
| 37. Would you rather watch beautiful scenery   | <input type="checkbox"/> | or | <input type="checkbox"/> watch a bulldozer knocking a building down                        |
| 38. Do teachers scold you for not paying attention   | <input type="checkbox"/> | or | <input type="checkbox"/> do they think you pay attention well enough                       |
| 39. Would you rather go on an outing with some other kids                                      | <input type="checkbox"/> | or | <input type="checkbox"/> with your parents and relatives                                   |
| 40. Do you sometimes feel as if you never do anything right                                    | <input type="checkbox"/> | or | <input type="checkbox"/> do you usually do things well                                     |
| 41. Can you touch a big bug  | <input type="checkbox"/> | or | <input type="checkbox"/> do you hate to touch bugs   |
| 42. Would you rather watch animals at the zoo  | <input type="checkbox"/> | or | <input type="checkbox"/> climb a mountain  |
| 43. Do you leave your games or things for someone else to put away after you have used them    | <input type="checkbox"/> | or | <input type="checkbox"/> do you do it yourself   |
| 44. Do wonderful things happen every day   | <input type="checkbox"/> | or | <input type="checkbox"/> do most days seem pretty much the same                            |
| 45. If you were very high up on a big rock, would you be scared                                | <input type="checkbox"/> | or | <input type="checkbox"/> would you like looking down and waving to people                  |
| 46. Does almost everyone like you  | <input type="checkbox"/> | or | <input type="checkbox"/> only some people  |
| 47. Do you do your homework carefully because it's good to do things that way                  | <input type="checkbox"/> | or | <input type="checkbox"/> don't you care how it's done as long as your teacher will take it |
| 48. Are you glad to do what your friends want to do  | <input type="checkbox"/> | or | <input type="checkbox"/> aren't you happy unless they do what you want to do               |
| 49. Do you like to play fast, hard games   | <input type="checkbox"/> | or | <input type="checkbox"/> slower, less rough games  |
| 50. Are your parents always ready to listen to you   | <input type="checkbox"/> | or | <input type="checkbox"/> are they usually too busy   |

**GO RIGHT ON TO THE LAST PAGE**

Do not write here.

G \_\_\_\_ H \_\_\_\_ I \_\_\_\_ J \_\_\_\_

*In every question, mark just one box.*

- |   |                              |    |   |
|---|------------------------------|----|---|
| 51. Does your teacher like other children more than she likes you                     | <input type="checkbox"/> yes | or | <input type="checkbox"/> no   |
| 52. When people say, "Let's work together on this," do you usually agree              | <input type="checkbox"/>     | or | <input type="checkbox"/> do you say, "I can't be bothered"                                      |
| 53. Would you rather let someone else clean your room                                 | <input type="checkbox"/>     | or | <input type="checkbox"/> do it yourself, so it's exactly the way you want it                    |
| 54. Do you have a lot of bad luck with school work going wrong                        | <input type="checkbox"/>     | or | <input type="checkbox"/> just the usual amount of bad luck                                      |
| 55. Most days, do you feel a bit "low"  | <input type="checkbox"/>     | or | <input type="checkbox"/> happy and full of pep and energy                                       |
| 56. When you pass a horrible fire or an accident, do you look to see what's happening | <input type="checkbox"/>     | or | <input type="checkbox"/> would you rather not look, but just hear what happened later           |
| 57. When you go to a movie, do you enjoy it all                                       | <input type="checkbox"/>     | or | <input type="checkbox"/> do you get tired and lose interest about halfway through               |
| 58. Do little things upset you so you feel like kicking something                     | <input type="checkbox"/>     | or | <input type="checkbox"/> don't little things upset you  |
| 59. Would you rather do things that are safe and right                                | <input type="checkbox"/>     | or | <input type="checkbox"/> dangerous and exciting things  |
| 60. Do you try to be polite to old people   | <input type="checkbox"/>     | or | <input type="checkbox"/> do you keep away from old people                                       |
| 61. When you're playing, do you complain a little when you don't win                  | <input type="checkbox"/>     | or | <input type="checkbox"/> do you believe good sports don't complain                              |
| 62. When you get angry, do you talk back and even yell                                | <input type="checkbox"/>     | or | <input type="checkbox"/> can you always keep your voice quiet even if you're angry              |
| 63. If you don't think a rule is meant for you, do you obey it anyway                 | <input type="checkbox"/>     | or | <input type="checkbox"/> don't you  |
| 64. Do you think people are sometimes mean just for the sake of being mean            | <input type="checkbox"/>     | or | <input type="checkbox"/> are they usually kind  |
| 65. Who do you think is happier: a person with a good job                             | <input type="checkbox"/>     | or | <input type="checkbox"/> a person who does whatever he wants                                    |
| 66. Do you think you are always polite  | <input type="checkbox"/>     | or | <input type="checkbox"/> are you perhaps a little too noisy                                     |
| 67. If people talk about a game that's a bit dangerous, do you say, "Let's try it"    | <input type="checkbox"/>     | or | <input type="checkbox"/> do you think it's better to keep out of games where you might get hurt |
| 68. Do you like a party where you can decide what games to play                       | <input type="checkbox"/>     | or | <input type="checkbox"/> a party with planned games   |
| 69. Do people say you're not too neat about your things                               | <input type="checkbox"/>     | or | <input type="checkbox"/> do you keep your things in good order                                  |
| 70. If you were angry, would you go quietly to your room                              | <input type="checkbox"/>     | or | <input type="checkbox"/> would you slam the door as you went                                    |

**DID YOU PUT ONE MARK DOWN FOR EVERY STATEMENT? CHECK BACK AND SEE.**

Do not write here.

N \_\_\_\_\_ O \_\_\_\_\_ Q<sub>1</sub> \_\_\_\_\_ Q<sub>2</sub> \_\_\_\_\_

## APPENDIX L

### Additional Descriptive and Statistical Data in Relation to the CPQ



TABLE 16  
SYMBOLS AND NAMES OF  
PRIMARY SOURCE TRAITS MEASURED BY THE C.P.Q.

Low Score Description	Factor
RESERVED, Detached, Critical, Cool, Aloof (Sizothymia)	A
DULL (Crystallized, power measure) (Low intelligence)	B
AFFECTED BY FEELINGS, Emotionally Less Stable, Easily Upset (Lower ego strength)	C
PHLEGMATIC, Undemonstrative, Deliberate, Inactive, Stodgy (Phlegmatic temperament)	D
OBEDIENT, Mild, Accommodating, Easily Led (Submissiveness)	E
SOBER, Prudent, Serious, Taciturn (Desurgency)	F
EXPEDIENT, Disregards Rules (Weaker superego strength)	G
SHY, Threat-sensitive, Diffident, Timid (Threctia)	H
TOUGH-MINDED, Self-reliant, Realistic, No-nonsense (Harria)	I
ZESTFUL, Likes Group Action, Vigorous (Zeppia)	J
FORTHRIGHT, Natural, Artless, Sentimental (Artlessness)	N
SELF-ASSURED, Confident, Secure, Complacent (Untroubled adequacy)	O
UNDISCIPLINED SELF-CONFLICT, Follows Own Urges, Careless of (Low self-sentiment integration) Social Rules	Q <sub>3</sub>
RELAXED, Tranquil, Torpid, Composed, Unfrustrated (Low ergic tension)	Q <sub>4</sub>

TABLE 16 (Cont.)

High Score Description	Factor
WARMHEARTED, Outgoing, Easygoing, Participating (Affectothymia, formerly Cyclothymia)	A
BRIGHT (Crystallized, power measure) (High intelligence)	B
EMOTIONALLY STABLE, Faces Reality, Calm, Mature (Higher ego strength)	C
EXCITABLE, Impatient, Demanding, Overactive, Unrestrained (Excitability)	D
DOMINANT, Assertive, Competitive, Aggressive, Stubborn (Dominance)	E
ENTHUSIASTIC, Happy-go-lucky, Heedless (Surgency)	F
CONSCIENTIOUS, Persevering, Staid, Rule-bound (Stronger superego strength)	G
VENTURESOME, Socially Bold, Uninhibited (Parmia)	H
TENDER-MINDED, Sensitive, Over-protected (Premsia)	I
CIRCUMSPECT INDIVIDUALISM, Reflective, Internally Restrained (Coasthenia)	J
SHREWD, Calculating, Artful (Shrewdness)	N
GUILT-PRONE, Apprehensive, Worrying, Troubled, Insecure (Guilt proneness)	O
CONTROLLED, Socially Precise, Following Self-image, Compulsive (High self-concept control)	Q <sub>3</sub>
TENSE, Frustrated, Driven, Overwrought, Fretful (High ergic tension)	Q <sub>4</sub>

(Cattell and Porter, 1972, p. 10)

TABLE 17  
 CALCULATING SECOND-ORDER FACTORS  
 OF THE CHILDREN'S PERSONALITY QUESTIONNAIRE (C.P.Q.):  
 CORRELATIONS AMONG C.P.Q. PRIMARY FACTOR SCORES (SUM OF FORMS A AND B)

Personality Factors	A	B	C	D	E	F	G	H	I	J	N	O	Q <sub>3</sub>	Q <sub>4</sub>
A	100													
B	18	100												
C	34	18	100											
D	-28	02	-33	100										
E	-17	04	07	34	100									
F	-11	-04	14	19	61	100								
G	24	07	14	-45	-51	-39	100							
H	31	03	39	-37	08	22	19	100						
I	11	-01	-15	-22	-62	-72	41	-19	100					
J	-34	-10	-40	45	06	-08	-29	-41	08	100				
N	-31	-12	-20	37	38	39	-47	-15	-40	29	100			
O	-33	-07	-44	30	-01	-17	-23	-49	13	45	24	100		
Q <sub>3</sub>	30	16	23	-37	-43	-39	49	24	48	-27	-52	-19	100	
Q <sub>4</sub>	-24	05	-22	44	25	14	-48	-26	-18	43	42	34	-44	100

Notes: Based on approximately 300 4th-grade boys and girls from rural Illinois communities.

Decimal points have been omitted.

Cattell and Porter (1972, p. 36)

TABLE 18  
EQUATIONS FOR CALCULATING SECOND-ORDER  
FACTOR SCORES OF THE C.P.Q.

Second Order Factor	Equation
Extraversion	$= .16A + .13E + .18F + .20H - .09Q_3 + 2.31$
Anxiety	$= -.13C + .10D + .05F - .08G - .08H + .130 - .13Q_3 + .08Q_4$
Tough Poise	$= -.18A + .13E - .07G + .15H - .21I - .06Q_3 + 6.82$
Independence	$= .11C + .13D + .24E + .07F + .34J - .07N + .130 + .21Q_3 + .06Q_4 - 1.21$

(Calculations made from sten scores (A - Q<sub>4</sub>) on the primary scales)

TABLE 19  
AN EXAMPLE OF SIMPLIFIED PROCEDURE  
FOR CALCULATING C.P.Q. SECOND-ORDER SCORES

Person's Sten Scores	I Extraversion	II Anxiety	III Tough Poise	IV Independence
A 7	2 → 14		2 → 14	
B 8				
C 2		1 → 2		1 → 2
D 6		1 → 6		1 → 6
E 3	1 → 3		1 → 3	2 → 6
F 8	2 → 16	1 → 8		1 → 8
G 5		1 → 5	1 → 5	
H 4	2 → 8	1 → 4	2 → 8	
I 1			2 → 2	
J 3				3 → 9
N 6				1 → 6
O 7		1 → 7		1 → 7
Q3 6	1 → 6	1 → 6	1 → 6	2 → 12
Q4 5		1 → 5		1 → 5
Constant	22	55	72	06
	63	81	83	55
-	6	17	27	12
	5.7	6.4	5.6	4.3
	I Extraversion	II Anxiety	III Tough Poise	III Independence

(Cattell and Porter 1972, p. 38)

## SECONDARY ORDER FACTORS OF THE C.P.Q. WITH THEIR PSYCHOLOGICAL MEANINGS BRIEFLY DEFINED

### Extraversion vs. Introversion

This is a general tendency to social interaction as opposed to a general inhibitedness in all aspects of social interaction. The child who scores high on this factor is a socially outgoing, uninhibited person, good at making and maintaining interpersonal contacts, while the child who scores low on this factor tends to be shy, restrained, and inhibited in interpersonal contacts. Consequently, we are measuring here a factor which predicts the child's seeking or avoiding *social* interaction generally.

### High Anxiety vs. Low Anxiety.

This trait has the usual meaning of anxiety, as shown by its relation to clinical symptoms, change with therapy, agreement with psychiatric ratings, relation to physiology, and change under anxiety stimuli, in research at other age levels (Cattell and Scheier, 1961; Scheier, 1966). Anxiety should not be confused with neuroticism (see Section 9), for although most neurotics are decidedly above average on anxiety, a normal person in a threatening real-life situation also scores very high. Neuroticism is actually a composite of a number of factors, including anxiety. A special score is derivable (page 46) from the C.P.Q. quite separate and distinct from that for anxiety to reflect degree of neuroticism. In interpreting anxiety scores derived from the C.P.Q., the reader is also reminded that the score may indicate a relatively permanent characteristic of the individual or a transitory mood or some combination of the two.

It is, therefore, quite important to evaluate these situational aspects before inferring any deep-seated psychological problem from a high anxiety score.

#### Tough Poise vs. Tenderminded Emotionality

High scores on this factor express greater activation level, as shown by quick reaction time, fast ideomotor performance, and other signs of cortical alertness and energy (Pawlik and Cattell, 1965). The low-scoring individual, on the other hand, seems to live at a level of accepted frustration with more feeling or affect generally.

#### Independence

This source trait is associated with ability to maintain "field independence" in perception, higher criticalness of judgment, precision and exactitude of performance, masculine aggressiveness, and creativity.

(Cattell and Porter, 1972, p. 39)

TABLE 20

C.P.Q. DEPENDABILITY COEFFICIENTS: TEST-RETEST AFTER TWO DAYS

Personality Factors	Form A <sup>a</sup>	Form B <sup>b</sup>	Form A + Form B <sup>a</sup>	Form A + Form B <sup>b</sup>
A	.59	.42	.56	.71
B	.72	.71	.80	.84
C	.47	.57	.65	.70
D	.67	.58	.73	.69
E	.67	.56	.72	.66
F	.70	.46	.70	.76
G	.66	.54	.73	.64
H	.58	.48	.65	.60
I	.72	.48	.72	.76
J	.59	.48	.64	.64
N	.70	.50	.75	.69
O	.60	.61	.71	.70
Q <sub>3</sub>	.61	.56	.72	.71
Q <sub>4</sub>	.56	.49	.65	.72

<sup>a</sup>N = 88 boys and girls

(Cattell and Porter, 1972, p.13)

<sup>b</sup>N = 52 boys and girls



TABLE 21  
C.P.Q. HOMOGENEITIES OF INDIVIDUAL SCALES <sup>a</sup>

Personality Factors	Form A	Form B
A	.51	.29
B	.37	.32
C	.62	.31
D	.58	.32
E	.53	.32
F	.60	.28
G	.59	.29
H	.52	.29
I	.68	.19
J	.25	.07
N	.40	.14
O	.45	.27
Q <sub>3</sub>	.55	.52
Q <sub>4</sub>	.41	.26

$a_N$  = 124 boys and girls

(Cattell and Porter, 1972, p.13)

These values were computed using the Kuder-Richardson Formula 20.

TABLE 22  
CPQ DIRECT VALIDITY COEFFICIENTS<sup>a</sup>

Personality Factors	Form A*	Form B	Form A + Form B
A	.55	.79	.81
B	.82	.78	.92
C	.73	.51	.71
D	.83	.71	.88
E	.33	.57	.53
F	.91	.57	.85
G	.72	.45	.70
H	.64	.75	.81
I	.69	.75	.83
J	.65	.29	.59
N	.52	.64	.71
O	.68	.61	.78
Q <sub>3</sub>	.79	.87	.95
Q <sub>4</sub>	.76	.69	.83

(Cattell and Porter 1972, p.14)

a<sub>N</sub> = 124 boys and girls

\* Form used in present study

TABLE 23  
C.P.Q. INDIRECT VALIDITY COEFFICIENTS<sup>a</sup>

Personality Factors	*Form A	Form B
A	.90	.90
B	.79	.83
C	.76	.76
D	.93	.93
E	.66	.75
F	.88	.88
G	.86	.78
H	.87	.77
I	.82	.80
J	.81	.76
N	.90	.90
O	.91	.94
Q <sub>3</sub>	.91	.87
Q <sub>4</sub>	.92	.95

a<sub>N</sub> = 124 boys and girls

(Cattell and Porter, 1972, p.15)

\* Form used in present study.

The tables 24 and 25 show the probability among the individuals, having a given predicted sten score on the equation, for reaching or exceeding the grade level listed for that row.

TABLE 24

PROBABLE PERFORMANCE RELATIVE TO CURRENT GRADE PLACEMENT IN READING FOR  
USE WITH C.P.Q. STEN SCORES FROM EQUATION 1

Expected Performance	Predicted Sten Score from Equation 1									
	1	2	3	4	5	6	7	8	9	10
	Probability									
No lower than two grade levels below present placement	.32	.59	.82	.94	.99	.99	.99	.99	.99	.99
No lower than one grade level below present placement	.12	.30	.56	.81	.94	.99	.99	.99	.99	.99
At least at present placement	.03	.10	.28	.54	.78	.93	.98	.99	.99	.99
At least one grade level above present placement	.02	.02	.09	.26	.52	.76	.92	.98	.99	.99
At least two grade levels above present placement	.00	.00	.02	.08	.24	.49	.75	.91	.98	.99

(Cattell and Porter, 1972, p.43)

TABLE 25

PROBABLE PERFORMANCE RELATIVE TO CURRENT GRADE PLACEMENT IN ARITHMETIC  
FOR USE WITH C.P.Q. STEN SCORES FROM EQUATION 2

Expected Performance	Predicted Sten Score from Equation 2									
	1	2	3	4	5	6	7	8	9	10
	Probability									
No lower than two grade levels below present placement	.41	.61	.78	.90	.96	.99	.99	.99	.99	.99
No lower than one grade level below present placement	.09	.20	.37	.56	.75	.88	.95	.98	.99	.99
At least at present placement	.01	.03	.07	.17	.33	.52	.71	.85	.94	.98
At least one grade level above present placement	.00	.00	.01	.02	.06	.14	.29	.48	.67	.83
At least two grade levels above present placement	.00	.00	.00	.00	.00	.02	.05	.12	.25	.43

(Cattell and Porter, 1972, p.43)

STEN EQUATIONS FOR PREDICTED SCORES IN ESTIMATIONS OF ACHIEVEMENT LEVELS;  
READING AND ARITHMETIC

$$\text{Reading Achievement} = .87B + .20C + .18D + .20E + .17G + .59N + .72Q_3 - 10.62 \quad (1)$$

$$\text{Arithmetic Achievement} = .38A + .47B + .33C + .21G + .48H + .22J + .101N + .73Q_3 - 7.87 \quad (2)$$

## APPENDIX M

### Letters to Schools



# The University of Tasmania

Postal Address: Box 252C, G.P.O., Hobart, Tasmania, Australia 7001

Telephone: 23 0561. Cables 'Tasuni' Telex: 58150 UNTAS

Faculty of Education

28 March 1979

IN REPLY PLEASE QUOTE

FILE NO

IF TELEPHONING OR CALLING

ASK FOR

*RE*

*ATTAINMENT AND PERSONALITY TESTING SERIES*

The attached lengthy letter essentially asks if I may visit your school during April or early May for the purpose of a small amount of testing of Grade 5/6 pupils relating to my Research.

I will, of course, contact you again closer to the day I would like to come.

Yours sincerely,

William Ramsay  
Lecturer in Education



# The University of Tasmania

Postal Address: Box 252C, G.P.O., Hobart, Tasmania, Australia 7001

Telephone: 23 0561. Cables 'Tasuni' Telex: 58150 UNTAS

Faculty of Education

IN REPLY PLEASE QUOTE.

FILE NO

2nd May 1979

IF TELEPHONING OR CALLING

ASK FOR

*RE*

## *THE TEACHER QUESTIONNAIRE*

Enclosed are copies of a Teacher Questionnaire which have been sent to all Primary Schools, in the State, as part of my doctoral research study of aspects of teaching and learning, at the "levels" of grade 5 and 6. Mr. J. Scott, Director of Schools and Colleges, has given permission for me to ask your cooperation.

I wonder, therefore, if you would be kind enough to distribute a copy of the questionnaire to each teacher of grades 5, 5/6, 6 in your school? Would you also ask each teacher to fill in the questionnaire and return it before the beginning of second term (i.e. by 12 June)? An envelope has been supplied for each teacher also so that the return can be confidential.

This will be the only research instrument which all teachers will be asked to complete. However, following analysis of this data gathered from all Primary Schools, a sample of schools will be invited to cooperate in some paper and pencil test items for some pupils under the guidance of teachers.

If your school is selected may I seek your cooperation again later in the year? I will contact you to make an arrangement convenient to you and the school.

Thanking you for your assistance.

Yours sincerely,

William Ramsay  
Lecturer in Education





# The University of Tasmania

Postal Address: Box 252C, G.P.O., Hobart, Tasmania, Australia 7001

Telephone: 23 0561. Cables 'Tasuni' Telex: 58150 UNTAS

Faculty of Education

IN REPLY PLEASE QUOTE

FILE NO

5 May, 1979

IF TELEPHONING OR CALLING

ASK FOR

RE

## *OBSERVATIONS FOR VALIDATION OF TEACHER QUESTIONNAIRE*

Dear

You will remember that earlier this year you were kind enough to have your teachers complete a Questionnaire for purposes of my Research.

There are about three further stages to the Research, one of which I would like to complete before the end of this term.

This involves the gathering of observational data from a random sample of schools. All that is required is for the research assistant to observe a class in 'action' for a period of two days. The information gathered will be organisationally based, and no specific 'performance' or any like data will be required. In addition you are assured that the data is for purposes of total sampling and hence the analysis will not specify any one classroom or school. Strict confidentiality will be maintained as previously.

This particular observational information will assist in both validating the previous instrument and possibly providing further insights which might have been missed. Hence I trust that you and the teacher will allow the observation, as is convenient to you.

Also it was appropriate for me to engage the assistance of our final year students to do the observations, since the work could coincide with their presence in the schools for Practice Teaching. The student will of course see you to confirm permission to enter the classroom and to make mutually acceptable arrangements.

The grade level for the observation is grade 5, or 5/6, or 6, depending on which teacher(s) returned the initial questionnaire. I trust that you don't mind making the arrangement with the student as to the choice of the class(es) to be observed.

Please note that the student will have no access to the previous teacher questionnaire information.

Please let me know if there is any further information you would want. Thank you for your assistance and cooperation.

Yours sincerely,

William Ramsay  
Lecturer in Education



# The University of Tasmania

Postal Address: Box 252C, G.P.O., Hobart, Tasmania, Australia 7001

Telephone: 23 0561. Cables 'Tasuni' Telex: 58150 UNTAS

Faculty of Education

8 May, 1979

IN REPLY PLEASE QUOTE

FILE NO

IF TELEPHONING OR CALLING

ASK FOR

Firstly may I express my appreciation of the fact that you gave your cooperation, and that of your school, to my Research Study early this year. This involved your staff member(s) (at Grade 5, 5/6 or 6 levels) filling out a Teacher Questionnaire. Some schools also enabled me, with the help of research assistants, to gather some additional data which aided the verification of the questionnaire responses.

You may recall that in my original letter (in May 1979) I mentioned that at a further stage of the study, a sample of schools would be invited to cooperate again. This time the purpose is some brief paper and pencil test items for some pupils under the guidance of Teachers.

Since your school is one of the selected samples (taken randomly within each of the three regions of the State) I wonder if you would agree to have these brief tests in your school. It would involve only one class or group at the grade 5/6 level and one Teacher to supervise. There are three tests - two of about 30 minutes and one of about 7 minutes - and they can be taken separately and at any time convenient to you.

I would like to bring the test materials to the school during April or early May. This would enable me to go over any questions you might have and discuss the procedures etc. Also, on the day I come to the school I, myself, would like to give one test which could take up to an hour.

May I make the point that I will take responsibility for the marking, that all the results will be available to you and that all information gathered, as before, will be kept confidential in terms of individual schools. Also the study is not intended to make comparison between schools.

The schedule of visits to schools includes the Northern region in early April, the South in late April, and the North West in early May.

.../2

- 2 -

May I then have your cooperation? I am hoping that the end results of the study will prove to be beneficial to all schools in the State, at the upper primary level, but much depends on the assistance, which is usually so readily given, by Principals.

Unless I hear to the contrary may I assume that I can visit your school? I shall, of course, be in contact closer to the day of the visit.

Yours sincerely,

William Ramsay  
Lecturer in Education

FREQUENCY DISTRIBUTION OF FACTOR SCORES ON TEACHING STYLE FEATURES  
(BEHAVIOUR AND ATTITUDE)

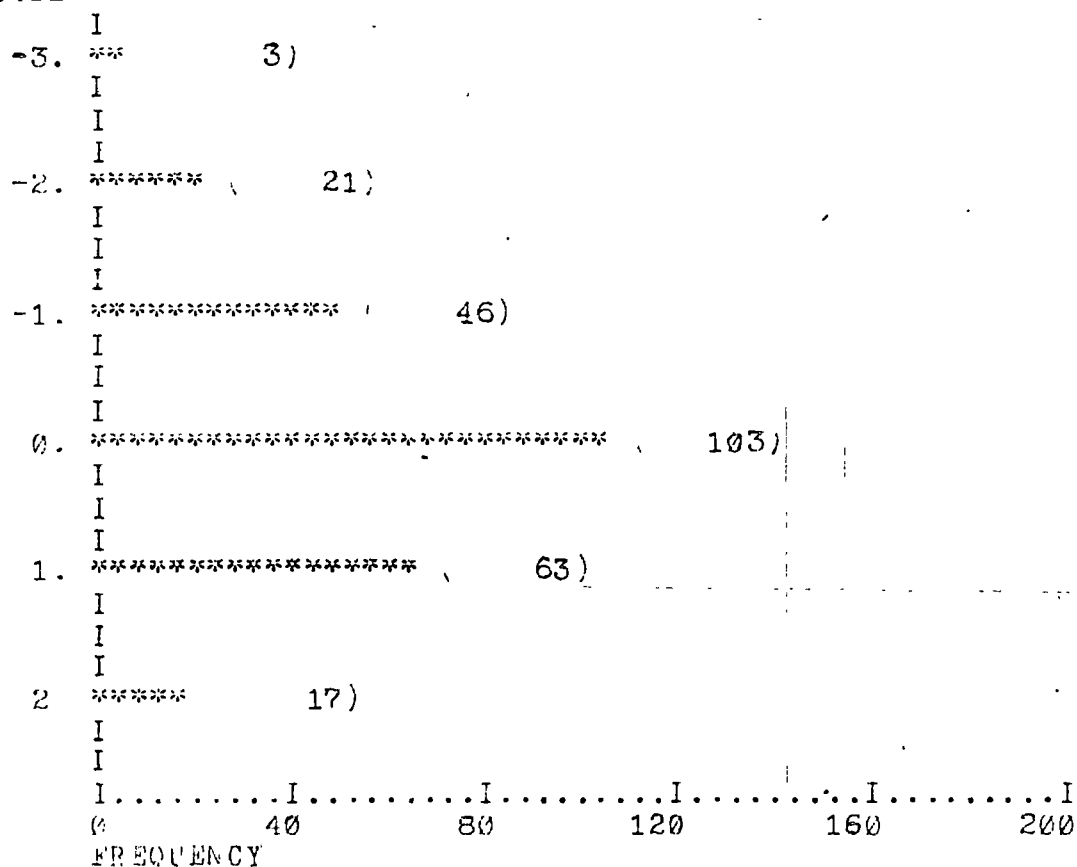
CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
-3.	3	1.2	1.2	1.2
-2.	21	8.3	8.3	9.5
-1.	46	18.2	18.2	27.7
0.	103	40.7	40.7	68.4
1.	63	24.9	24.9	93.3
2.	17	6.7	6.7	100.0
TOTAL	253	100.0	100.0	

## FREQ. FASSCORES

FILE FREQ (CREATION DATE = 05/08/83) /FASSCORES

## FASSCORE

CODE



VALID CASES

253

MISSING CASES

0

## (TEACHING BEHAVIOUR FACTOR SCORES)

CATEGORY LABEL	CODE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (PERCENT)	ADJUSTED FREQUENCY (PERCENT)	CUMULATIVE ADJ. FREQ (PERCENT)
	-2	3	1.2	1.2	1.2
	-1	61	24.1	24.1	25.3
	0	135	53.4	53.4	78.7
	1	43	17.0	17.0	95.7
	2	11	4.3	4.3	100.0
TOTAL		253	100.0	100.0	

1 FREQUENCIES / FA SCORES

FILE FREQUENC (CREATION DATE = 08/15/83) /FA/SCORES

2 FAC2 TEACHER BEHAVIOUR FACTOR SCORES

CODE	
-2	I *** 3)
-1	I I I ***** 61,
0	I I I ***** 135)
1	I I I ***** 43)
2	I I I ***** 11)
	I I I.....I.....I.....I.....I.....I.....I
	0 40 80 120 160 200
	FREQUENCY

2 VALID CASES 253 MISSING CASES 0

## (TEACHER ATTITUDE FACTOR SCORES)

CATEGORY LABEL	CODE	ABSOLUTE FREQUENCY	RELATIVE FREQUENCY (PERCENT)	ADJUSTED FREQUENCY (PERCENT)	CUMULATIVE ADJ FREQ (PERCENT)
0	-2	7	2.8	2.8	2.8
0	-1	66	26.1	26.1	28.9
0	0	110	43.5	43.5	72.3
0	1	57	22.5	22.5	94.9
0	2	12	4.7	4.7	99.6
0	3	1	0.4	0.4	100.0
TOTAL		253	100.0	100.0	

1FREQUENCIES /FA/SCORES

FILE FREQUENC (CREATION DATE = 08/15/85) /FA/SCORES

2FAC3 TEACHER PERSONALITY FACTOR SCORES

CODE	
-2	I *** ( 7 ) I I
-1	I I ***** ( 66 ) I I
0	I I ***** ( 110 ) I I
1	I I ***** ( 57 ) I I
2	I I *** ( 12 ) I I
3	I I * ( 1 ) I I I.....I.....I.....I.....I.....I.....I
0	40 80 120 160 200
	FREQUENCY

## APPENDIX 0

- . List, and graph of Teaching Style Factor Scores (N=28)
- . List of Feature Scores for Teachers (N=253)

100	196	-1762588
200	252	-1364004
300	112	-1204074
400	151	-1101251
500	209	-874987
600	109	-778001
700	248	-592049
800	83	-550038
900	30	-482323
1000	68	-471549
1100	23	-465448
1200	148	-448859
1300	192	-429198
1400	129	-419591
1500	114	-263678
1600	225	-127913
1700	50	-87637
1800	186	-82887
1900	125	-30384
2000	132	334272
2100	249	408487
2200	141	494469
2300	111	494743
2400	251	759111
2500	250	1093516
2600	202	1299579
2700	183	1726663
2800	253	1888766

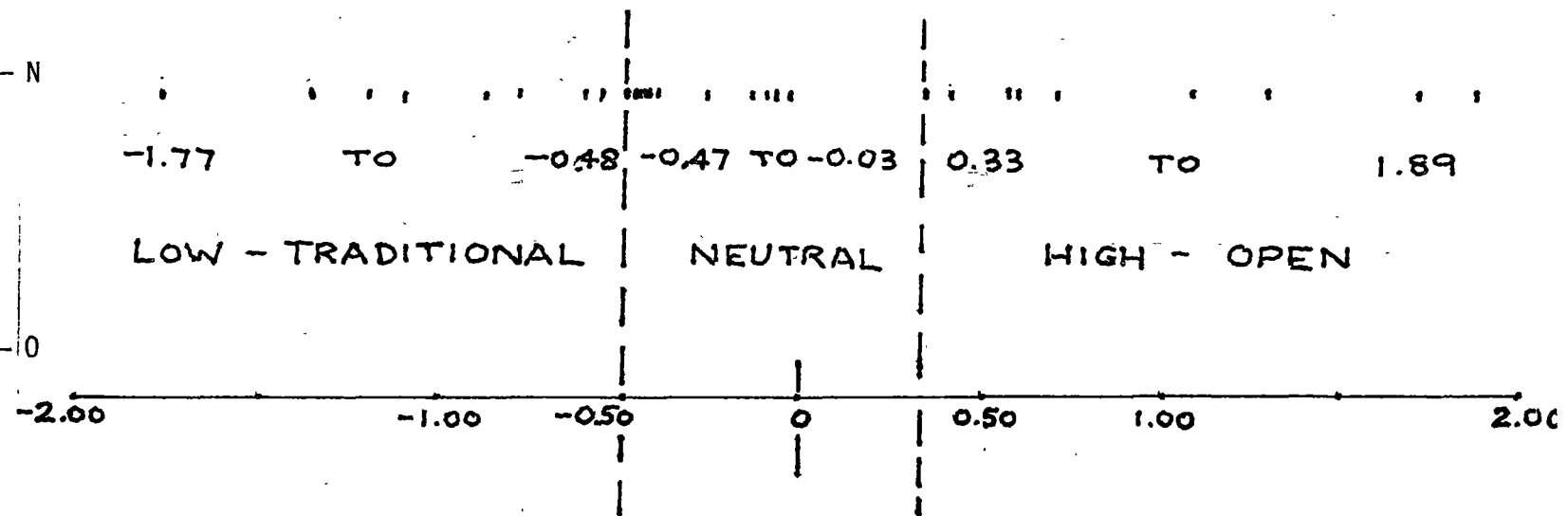
TABLE 42

SORTED/FACTORS

FIGURE 5

GRAPH SHOWING DISTRIBUTION  
OF TEACHER FACTOR SCORES

N = 28





# FEATURE SCORES FOR TEACHERS

329

	Teaching Behaviour Features 1-6					Teacher Attitude Features 7-10				
100	0	-1	10	3	-5	0	4-20	2	-2	
200	-3	-8	5	5	5	1	7-22	-1	-6	
300	1	-1	5	0	10	1	6-20	-6	6	
400	-2	-5	-3	-5	-5	0	2-27	4	4	
500	-2	1	0	-5	10	1	4-22	-10	-7	
600	-5	-1	5	10	-5	0	2-27	-4	-2	
700	4	-1	5	5	10	1	6-19	-3	12	
800	-3	-4	0	0	0	0	0-23	-7	-2	
900	-4	-3	5	-5	-5	0	2-30	-6	-5	
1000	-2	-3	0	5	-5	0	4-17	-5	-10	
1100	0	-8	5	-5	0	0	7-24	-6	-2	
1200	-2	-3	5	5	-3	9	3-24	-10	-6	
1300	-4	-5	0	0	-5	0	4-25	-9	-4	
1400	-2	-3	5	3	0	0	8-20	5	0	
1500	-3	-5	0	5	-5	9	1-32	-8	-11	
1600	2	6	5	0	3	0	2-19	5	6	
1700	-1	-6	5	0	0	0	8-14	0	0	
1800	-2	6	5	0	3	0	6-20	-8	3	
1900	3	3	5	10	10	1	11-14	12	5	
2000	-5	-5	0	0	10	0	4-20	-14	-5	
2100	1	5	0	5	-5	0	6-20	-12	-9	
2200	-4	-8	0	0	-3	0	10-25	-11	-1	
2300	-2	-3	0	5	-3	0	3-21	-1	-6	
2400	-3	-6	0	-5	-5	0	-3-17	-6	-6	
2500	0	10	10	5	-5	1	7-14	-2	2	
2600	-5	-1	0	5	-5	0	6-25	-3	-4	
2700	-3	-3	5	-5	-5	0	4-21	-4	1	
2800	-1	-6	5	3	10	0	3-19	-11	0	
2900	-5	-8	5	-5	-5	0	7-20	-11	0	
3000	4	5	5	5	5	0	8-22	-12	-5	
3100	4	-3	10	5	5	0	8-18	-1	9	
3200	-1	3	5	5	-3	1	2-21	6	0	
3300	0	-8	0	-5	0	0	7-20	-8	2	
3400	1	1	0	-5	0	0	9-17	-7	3	
3500	2	-5	5	10	5	0	9-16	-6	7	
3600	1	-4	0	-5	5	0	8-15	-5	2	
3700	-4	-10	5	-5	0	0	3-29	-3	-6	
3800	-2	-6	0	10	10	0	3-18	0	8	
3900	3	4	5	0	5	0	7-20	1	-4	
4000	4	-3	5	0	5	0	0-22	-10	0	
4100	0	-6	5	0	5	0	4-24	-13	-2	
4200	-5	-5	10	0	-5	0	1-27	-4	1	
4300	0	1	10	5	3	0	6-14	5	5	
4400	-3	-5	10	5	-3	1	7-22	0	0	
4500	-4	-1	5	5	5	1	8-16	6	9	
4600	3	-3	5	3	5	0	7-13	-6	7	
4700	-4	-6	5	0	3	0	10-22	8	-4	
4800	0	6	0	5	3	0	9-23	3	-1	
4900	-2	-5	5	0	3	0	4-27	-9	-5	
5000	-3	-6	10	10	0	1	7-15	2	1	
5100	2	-5	5	0	0	9	4-17	-2	-6	
5200	0	-5	5	0	5	0	3-22	-10	-2	
5300	-3	-6	0	5	0	0	6-18	-9	1	
5400	-2	-6	5	0	-5	9	0-24	-9	4	
5500	-2	6	5	5	3	0	12-23	-5	-8	
5600	0	3	5	0	5	1	4-21	-2	7	
5700	0	5	10	5	-3	0	13-17	-1	-1	

5800	-1	-5	5	0	0	0	4-19-10	-1	
5900	-1	-6	5	5	10	1	9-22	2	6
6000	-2	-5	5	0	5	0	1-17	-2	0
6100	-1	-6	5	5	10	1	9-22	4	6
6200	-1	-6	5	5	10	1	9-22	4	6
6300	0	-6	5	5	0	0	9-19	-2	4
6400	-5	-6	0	-5	-3	1	1 0	-3	3
6500	0	-1	5	5	5	0	8-17	-7	-3
6600	-1	-1	5	0	10	0	11-21	-1	1
6700	-2	3	0	3	0	0	7-23	0	0
6800	-3	-6	-5	5	-5	1	9-13-14	0	
6900	-3	-3	5	5	5	0	2-16	0	0
7000	0	-6	0	-5	0	0	7-23	-4	-2
7100	-1	-5	0	0	0	0	3-18-14	-7	
7200	-3	-5	5	-5	5	0	4-25	-5	-5
7300	-1	-1	0	0	0	0	7-14	-2	0
7400	-5	-8	10	5	-5	0	1-27-12	-6	
7500	-4	-6	-5	0	0	1	8-20	-7	-2
7600	-4	-5	5	0	0	0	9-17	3	3
7700	-1	-5	5	0	10	0	7-19	11	12
7800	-2	-3	10	0	5	0	6-17	-4	0
7900	-3	-5	10	-5	-5	1	7-26-15	-2	
8000	-1	-6	0	-5	5	1	9-23	-9	-6
8100	0	-1	0	0	-5	9	6-12	-3	6
8200	-3	6	0	5	3	0	4-23	-8	-5
8300	-1-10	5	0	0	0	0	8-20	-9	-4
8400	-4	3	5	3	3	0	8-18	5	2
8500	1	3	5	10	5	0	9-15	1	9
8600	1	5	5	10	10	1	9-15	9	7
8700	-5	1	0	-5	0	0	7-20	0	-3
8800	-3	1	5	-5	3	0	9-20	-3	-7
8900	1	-5	5	-5	0	0	8-21	-6	-9
9000	-1	10	10	5	0	0	6-24	-9	-3
9100	-1	-3	0	10	0	1	8-15	-8	12
9200	2	6	0	0	10	1	4-22	-1	1
9300	-2	8	0	5	-5	0	4-22	-6	-3
9400	1	-5	0	0	0	0	12-12	11	10
9500	-2	5	0	5	-5	0	8-18	-8	4
9600	-2	-6	0	5	0	9	6-12	-2	3
9700	-1	-5	5	5	10	0	2-26	-6	3
9800	1	-6	5	0	5	0	9-23	-4	2
9900	2	-6	-5	-5	0	0	7-10	2	3
10000	0	-3	5	5	5	9	8-14	0	0
10100	0	-5	5	5	0	9	6-20	-7	-5
10200	1	5	10	0	10	0	11-11	8	6
10300	-1	-1	0	5	0	0	9-17	0	3
10400	5	-3	5	5	5	1	8-17	6	7
10500	3	-1	5	5	5	1	8-17	6	7
10600	1	-5	5	5	0	0	3-21	2	-2
10700	-5	-6	0	5	-5	0	6-29	11-15	
10800	-4	-4	10	0	5	1	7-18	-9	0
10900	-4	-6	0	5	0	0	4-18	-9	-2
11000	-2	10	5	0	0	0	2-20	-8	-1
11100	4	-3	5	0	10	0	4-18	-5	-1
11200	-2	10	5	5	-3	0	-1-22	-6	-5
11300	-2	1	0	3	0	0	3-22	-4	0
11400	-5	-5	0	3	-5	0	7-26	4	0
11500	-5	3	-5	5	5	0	4-26-12	-6	
11600	-3	-3	10	0	0	1	8-18	2	7
11700	-3	-3	10	0	5	1	4-17	6	1

11800	-4	-3	-5	-5	5	0	4-27-12	-6
11900	5	3	5	5	5	1	10-23	8 5
12000	0	-6	0	5	3	0	3-25-13	-6
12100	-2	-10	5	0	5	0	8-15	-2 -5
12200	-4	-6	5	-5	-5	9	3-22-10	-7
12300	-1	-5	5	5	-10	0	3-15	-2 0
12400	-2	-3	5	-5	0	0	9-21	-4 -2
12500	-5	-5	10	0	5	1	6-21	-1 -1
12600	-3	-8	0	-5	-10	0	1-19	-7 -3
12700	0	-6	0	3	5	0	8-23	-9 -2
12800	2	-3	5	5	10	9	9-27	0 1
12900	-1	-6	10	5	0	0	9-24	-8 -2
13000	-2	-6	5	0	0	0	2-19-12	3
13100	4	6	5	0	5	1	10-16	7 7
13200	0	-3	0	0	0	0	3-20	2 4
13300	0	-5	5	0	5	1	9-17	-3 -1
13400	0	-1	0	0	5	1	8-18	-7 9
13500	-2	1	5	0	5	1	14-10	10 7
13600	0	5	0	5	5	1	8-17	10 11
13700	-2	-6	0	5	3	1	8-27	-4 0
13800	-1	1	0	-5	0	1	14-22-10	2
13900	-1	-5	5	-5	-3	0	6-18-12	-6
14000	-1	-6	5	-5	-5	0	0-24	-1-12
14100	-2	-8	0	0	0	0	7-17	6 3
14200	0	-6	5	-5	-5	9	8-24	8 4
14300	0	-8	10	5	0	0	7-18	-9 2
14400	-5	-5	5	0	0	0	2-22	-4 -5
14500	-1	-6	-5	0	-5	9	3-22	0 2
14600	0	-4	5	0	0	0	8-18	-6 2
14700	-1	-5	10	0	0	0	4-22	-9 0
14800	-1	-1	5	0	-5	0	9-21	-7 -5
14900	0	5	10	5	5	1	10-16	0 6
15000	-3	3	10	5	3	0	8-19	1 -3
15100	-3	-8	5	0	-5	1	6-21-11	-6
15200	-5	-5	5	5	5	0	6-22-15	5
15300	0	-8	5	-5	5	9	-1-21	-8 -9
15400	-3	-3	5	0	-3	0	9-22	-4 -5
15500	-4	-5	5	5	5	9	6-22	-5 -5
15600	-1	-5	0	-5	3	0	9-29	3 4
15700	-1	5	5	5	0	0	9-23	2 -1
15800	1	-3	5	5	0	9	13-12	7 6
15900	-3	8	5	0	-3	9	8-18-15	9
16000	0	-8	0	-5	0	1	1-25-10	-10
16100	3	-8	5	0	-5	1	-1-21-11	6
16200	-1	-8	-5	0	5	1	0-22-10	-9
16300	0	-6	0	0	0	0	6-24-11	-4
16400	-3	-8	5	0	-5	1	13-19	-2 0
16500	-3	-5	0	-5	-3	1	6-20-13	1
16600	-1	-3	5	-5	0	0	7-17	-6 -9
16700	-2	-6	5	3	0	0	0-28-13	-11
16800	-1	1	-5	0	-5	1	4-18	-9 -7
16900	-5	-8	5	0	10	9	3-20	-6 3
17000	-3	-6	5	3	3	9	1-18	0 0
17100	-3	-3	5	5	0	9	2-15	-3 -5
17200	-5	-8	5	0	-3	9	4-19	-5 -2
17300	-2	-8	5	0	0	0	1-18	-8 8
17400	-3	-8	5	-5	-5	0	2-24	-7 -2
17500	-2	-8	0	5	3	9	4-22-11	5
17600	-3	-5	5	5	3	0	11-14	-2 8
17700	-2	-3	10	-5	0	9	1-20	-6 4

17800	0	-5	10	5	0	0	13-17	-4	-2
17900	-1	-3	5	0	0	0	7-20	5	3
18000	-3	-8	5	-5	5	1	6-21	-3	0
18100	-3	-8	5	-5	5	1	8-19	-3	1
18200	1	-5	5	5	5	0	8-18	3	6
18300	4	-5	10	10	5	0	10-13	1	8
18400	1	-10	10	5	5	1	9-24	-2	10
18500	-1	-5	5	-5	0	0	7-17	1	-2
18600	-2	5	10	-5	0	1	4-25	-6	3
18700	1	-6	5	0	0	0	8-24	-8	-5
18800	0	-6	5	-5	0	0	10-19	-4	-1
18900	1	1	5	0	5	0	4-12	6	9
19000	3	-6	5	5	-3	0	10-24	-5	0
19100	-2	-5	0	0	-10	0	4-22	-5	-1
19200	-1	-6	10	5	5	1	0-24	-2	0
19300	-2	-5	5	0	5	0	3-19	0	-1
19400	0	-6	5	5	-3	0	6-23	-9	-3
19500	0	-5	10	5	10	1	7-22	-2	-3
19600	-2	-5	0	5	0	0	3-28	-9	-20
19700	-3	-6	5	0	5	0	4-18	-1	-1
19800	0	-6	5	5	0	0	3-22	-2	0
19900	3	-8	0	5	0	0	7-19	-1	0
20000	-3	1	-5	5	5	0	11-19	2	-1
20100	0	-1	5	5	0	0	0-18	-4	3
20200	3	-6	0	0	10	0	8-13	-2	9
20300	-2	-8	5	0	0	9	8-25	-14	-2
20400	-1	-8	5	5	-5	9	6-20	-8	0
20500	1	-3	0	5	0	1	7-19	10	-2
20600	-4	-8	0	0	3	0	7-17	-5	0
20700	-1	-8	5	0	0	1	6-15	2	3
20800	-2	-1	5	5	0	1	1-17	-5	-1
20900	-3	-3	0	0	-5	0	8-24	-10	-4
21000	-3	-1	5	5	10	1	3-23	11	-5
21100	-2	-1	5	5	-10	1	3-23	-10	-3
21200	-3	-5	5	5	10	1	8-16	-5	5
21300	1	1	5	10	10	1	7-14	2	4
21400	1	1	5	10	10	1	6-17	8	8
21500	1	-6	5	5	0	0	3-18	-8	1
21600	5	-3	5	10	10	0	8	-8	13
21700	-2	-1	0	5	5	0	6-22	-7	-8
21800	-1	-8	5	5	0	1	6-18	-3	5
21900	3	-3	5	0	5	0	6-26	-10	-12
22000	-2	-8	0	0	3	0	3-25	-7	-4
22100	-3	-5	5	5	-3	0	7-16	-14	3
22200	-1	1	0	5	10	0	11-15	-2	-2
22300	4	3	5	5	5	1	11-17	10	7
22400	4	6	5	-10	10	0	10-17	4	6
22500	-3	-8	0	5	0	0	7-24	-3	3
22600	0	-3	5	5	10	1	6-21	3	6
22700	1	-8	5	0	5	0	6-16	7	9
22800	-1	-6	5	0	-5	9	6-26	0	-8
22900	3	-10	0	-5	5	0	3-24	-1	0
23000	3	-3	5	-5	0	0	10-23	0	0
23100	-1	-6	10	0	0	0	8-19	-10	6
23200	1	-5	0	10	-10	9	2-12	-5	4
23300	-3	-5	0	-5	5	0	6-25	7	4
23400	-3	-6	0	0	-5	9	2-23	-6	-3
23500	0	-6	5	5	-10	9	6-22	-12	-8
23600	0	-8	0	0	5	9	0-23	-9	0
23700	3	-8	10	5	5	0	8-20	1	-2

## FEATURE SCORES FOR TEACHERS (Cont.)

23800	-2	-6	-5	0	-5	0	3-21	-9	-7
23900	-2	1	10	0	3	9	3-22	12	-3
24000	-1	5	0	0	10	0	4-25	2	1
24100	-1	1	5	5	10	0	4-20	-4	10
24200	-2	1	5	0	-10	0	6-19	-5	-1
24300	-2	-1	0	5	10	1	8-18	-3	7
24400	-3	-3	0	5	10	1	8-18	-3	7
24500	2	-1	5	-5	0	0	2-19	2	5
24600	-1	-5	5	0	5	1	10-20	2	2
24700	1	-8	10	-5	0	0	4-19	4	4
24800	-4	-5	5	3	-3	0	7-23	-4	-5
24900	0	-6	5	5	5	1	8-19	-6	3
25000	0	-1	5	10	5	1	7-16	0	5
25100	-4	-3	10	5	5	0	9-13	2	-1
25200	-5	-6	0	5	-5	0	0-24	-7	-7
25300	1	5	5	10	5	0	12-15	4	7

## APPENDIX P

### Listing - Pupil Data:

Background

Test Scores

## APPENDIX N

### Frequency Distributions of Factor Scores on Teaching Style Features

## PUPIL DATA

SCHOOL	AGE	SEX	SOCIO	GA1	GA2	MTHS	M A Y		PERSONALITY
							WORD	READ	
S01	1008	1	3	13	19	35	29	43	
S01	1005	1	0	12	15	32	15	34	
S01	1007	2	0	12	19	35	31	42	
S01	0911	1	0	12	14	27	29	39	
S01	1009	1	3	11	13	26	21	29	
S01	1001	1	3	10	18	33	16	26	
S01	0911	1	3	8	9	19	16	15	
S01	0911	2	3	12	20	39	31	32	
S01	0911	2	4	16	22	44	27	43	
S01	1010	2	3	16	13	33	27	37	
S01	1007	2	3	15	23	39	39	46	
S01	1007	1	3	13	20	30	34	36	
S01	1010	2	4	13	10	19	7	2	
S01	1002	2	4	13	14	27	16	21	
S01	1103	2	0	12	12	23	11	16	
S01	1006	1	0	9	12	23	25	30	
S01	1000	1	3	13	20	34	34	39	
S01	1007	1	4	14	13	37	18	36	
S01	0911	1	4	9	18	30	25	41	
S01	1004	2	0	12	21	26	15	25	
S01	0911	1	0	10	15	28	24	42	
S01	1001	1	3	12	16	23	20	31	
S01	1010	2	4	12	18	26	35	17	
S01	1101	2	4	6	6	12	13	3	
S01	1009	1	0	19	23	28	36	46	
S02	1001	1		7	13	28	12	24	49 45 54 51
S02	1105	1	0	15	23	39	30	51	55 61 67 43
S02	1107	2	5	9	12	30	20	30	54 55 57 60
S02	1008	2	4	8	14	28	14	28	45 62 65 54
S02	1102	1	4	16	19	42	20	45	48 64 67 64
S02	1005	1	4	12	17	31	27	40	56 42 45 45
S02	1006	2	3	7	11	30	18	30	60 41 58 38
S02	1105	1	4	7	13	29	19	27	44 77 58 60
S02	1004	2	8	14	13	26	9	27	56 50 50 46
S02	1003	2	5	17	11	40	16	24	50 43 69 41
S02	1110	1	3	3	7	17	4	8	-1 -1 -1 -1
S02	1002	2	4	8	13	40	11	39	39 52 49 49
S02	1006	1	5	9	8	26	21	36	43 60 59 61
S02	1100	2	5	17	19	41	27	37	49 21 52 40
S02	1105	2	5	12	23	39	30	46	60 46 62 53
S02	1010	2	0	10	13	27	21	35	48 39 59 52
S02	1200	2	4	15	7	34	14	27	51 62 66 52
S02	1001	1	4	14	15	31	8	27	49 58 74 65
S02	1011	2	4	14	15	30	10	30	55 50 54 56
S02	1009	1	5	13	28	40	45	67	56 62 49 60
S02	1002	1	4	13	22	29	30	37	49 59 55 49
S02	1106	1	7	17	30	52	45	73	62 64 61 46
S02	1102	1	3	15	17	26	26	45	50 52 73 51
S03	1203	1	4	17	25	48	26	46	59 39 58 52
S03	1206	1	4	8	15	31	28	42	54 50 51 56
S03	1107	2	4	8	19	32	31	40	41 68 49 54
S03	1108	1	6	19	32	55	50	61	54 57 60 48
S03	1111	1	8	16	29	46	31	50	56 36 51 23
S03	1206	2	8	6	17	18	27	37	44 46 44 57



S03	1202	2	8	12	19	31	19	29	43	54	42	57
S03	1207	2	5	12	22	28	17	35	46	54	50	51
S03	1110	1	7	16	33	47	49	61	32	49	44	57
S03	1111	2	5	11	22	39	42	51	39	58	53	61
S03	1202	1	5	14	27	32	36	43	47	47	49	50
S03	1204	1	7	13	16	38	29	46	46	48	49	51
S03	1200	1	4	12	22	30	26	42	52	57	56	50
S03	1107	1	4	16	18	41	21	38	51	68	51	56
S03	1106	2	5	17	20	43	28	42	43	54	44	36
S03	1202	1	5	12	27	47	21	44	63	39	54	49
S03	1208	2	6	9	21	29	30	46	64	49	69	43
S03	1203	2	7	19	29	46	29	45	50	54	56	49
S03	1201	1	5	12	20	36	30	36	44	45	50	55
S03	1200	1	5	12	21	32	27	41	49	49	54	45
S03	1109	1	5	9	18	33	25	60	51	50	51	44
S04	1009	1	0	7	8	13	11	13	51	52	74	50
S04	1105	1	3	7	10	19	16	19	51	60	69	40
S04	1005	1	0	12	10	18	3	28	53	57	55	50
S04	1009	2	4	12	12	25	23	38	39	46	46	47
S04	1006	2	4	15	10	24	6	20	52	61	60	39
S04	1101	2	5	9	15	19	10	23	54	50	58	45
S04	1007	1	0	16	29	41	45	58	50	75	73	65
S04	1011	1	4	11	12	20	15	33	56	65	55	61
S04	1105	1	4	9	17	28	29	40	60	44	56	47
S04	0909	2	4	5	5	16	9	2	51	63	62	59
S04	1011	2	0	16	20	30	28	33	44	62	69	52
S04	1006	1	5	11	13	24	11	21	55	60	45	56
S04	1001	2	5	5	10	14	15	23	65	54	56	38
S04	0910	1	3	11	10	23	29	35	54	46	43	53
S04	1010	2	3	4	5	11	20	27	48	54	45	58
S04	1007	2	3	5	11	24	13	34	60	43	50	45
S04	1004	1	0	15	22	40	33	44	71	50	64	40
S04	1006	2	4	12	10	27	9	15	57	56	53	57
S04	1000	1	5	15	23	39	33	43	57	44	63	43
S04	1101	1	0	7	7	34	20	21	50	59	53	57
S04	0909	2	4	12	17	36	22	35	49	47	62	50
S04	1000	1	4	14	20	43	25	37	44	51	54	38
S05	1007	1	4	11	19	36	22	33				
S05	1004	2	3	13	15	26	29	35				
S05	1105	1	5	12	20	39	22	42				
S05	1001	1	5	4	13	34	32	41				
S05	1006	1	4	10	12	18	30	30				
S05	1002	1	3	16	21	39	35	56				
S06	1101	2	4	11	15	29	14	51	56	59	63	49
S06	1004	2	4	14	25	40	39	47	57	47	57	48
S06	1002	1	6	12	20	36	20	39	49	52	54	44
S06	1006	2	4	15	20	39	31	42	46	33	51	40
S06	1001	2	5	14	18	29	25	37	43	46	51	56
S06	1000	1	5	16	23	37	33	40	40	55	55	46
S06	1105	2	3	9	11	40	7	20	49	55	54	53
S06	1000	2	4	14	25	41	41	46	59	40	57	29
S06	1001	1	5	13	16	38	21	40	62	54	49	39
S06	1001	1	5	16	19	39	34	39	54	48	32	37
S06	1010	2	5	15	32	50	26	38	49	61	57	61
S06	0905	2	5	12	24	42	35	50	52	77	57	37
S06	1006	2	5	11	14	28	18	26	60	55	58	50
S06	1004	2	4	12	19	32	23	40	-1	-1	-1	-1
S06	1001	2	5	14	22	30	24	46	61	77	49	49
S06	1002	2	6	7	13	26	18	30	45	38	44	42
S06	1002	2	3	11	14	28	20	26	-1	-1	-1	-1

S06	1008	1	7	14	24	31	33	42	45	51	60	47
S06	1008	1	6	16	22	43	24	38	41	39	41	53
S06	1100	2	3	10	14	24	21	30	62	44	64	58
S06	1001	2	6	15	23	40	28	48	46	49	41	48
S06	1005	2	3	11	20	38	26	36	50	40	48	40
S06	1001	2	7	13	21	32	34	49	51	67	62	53
S06	1003	1	4	14	17	36	22	37	39	54	42	52
S06	1010	1	5	16	20	31	27	38	42	48	54	46
S06	1002	2	6	9	21	38	28	48	52	70	66	62
S06	1006	2	4	6	8	17	15	26	43	48	44	55
S07	1110	2	0	14	15	17	21	19				
S07	1011	2	5	11	14	15	15	30				
S07	1010	2	0	14	18	21	20	22				
S07	1011	2	3	12	19	19	23	35				
S07	1011	2	4	18	22	21	27	45				
S07	1101	2	4	15	25	19	40	54				
S07	1105	1	3	19	30	18	33	49				
S07	1103	1	6	12	19	19	27	42				
S07	1006	2	3	12	19	21	23	35				
S07	1005	2	3	13	22	19	24	40				
S07	1006	2	4	15	14	16	33	40				
S07	1006	2	4	11	17	13	25	41				
S07	1009	1	3	12	18	17	27	43				
S07	1000	1	4	13	29	23	47	61				
S07	1011	1	3	13	14	19	12	30				
S07	1101	1	0	4	11	7	4	5				
S07	1001	1	5	9	16	10	9	21				
S08	1102	1	6	12	27	43	34	51				
S08	1103	1	5	13	19	37	27	43				
S08	1101	1	3	15	25	45	33	45				
S08	1104	1	4	15	21	37	31	42				
S08	1102	1	4	15	16	43	16	23				
S08	1108	1	4	7	13	35	26	37				
S08	1100	1	3	14	16	30	8	34				
S08	1101	1	4	14	14	39	21	37				
S08	1100	1	3	13	19	44	22	38				
S08	1011	1	3	11	16	27	16	31				
S08	1109	1	3	6	7	18	6	14				
S08	1104	2	4	13	29	51	35	53				
S08	1100	2	5	17	26	40	26	43				
S08	1100	2	5	17	21	49	30	48				
S08	1011	2	4	13	25	36	33	46				
S08	1110	2	4	12	21	39	28	45				
S08	1109	2	3	16	10	39	11	23				
S08	1103	2	3	13	9	39	23	24				
S08	1108	2	4	5	7	22	19	12				
S08	1104	2	3	2	5	9	12	7				
S09	1010	1	6	19	24	53	32	47	47	68	52	47
S09	1008	2	5	16	29	49	39	54	59	59	64	52
S09	1008	1	6	9	23	50	26	54	54	50	54	48
S09	1101	1	4	15	25	47	36	51	42	51	57	44
S09	1010	1	5	20	20	44	40	60	52	45	53	58
S09	1202	2	3	15	25	45	42	49	54	52	59	41
S09	1007	2	6	16	30	53	49	76	55	81	76	62
S09	1010	2	4	7	29	47	50	69	57	77	71	62
S09	1011	2	5	12	28	50	34	44	65	60	54	52
S09	1105	1	6	19	33	59	46	69	61	75	74	65
S09	1009	2	5	17	30	52	44	64	59	70	74	57
S09	1009	2	4	13	23	38	29	47	42	52	41	54
S09	1110	2	6	15	30	43	43	56	50	64	64	57

S09	1011	2	4	17	25	50	37	53	44	66	65	61
S09	1105	1	5	15	34	53	40	52	51	57	56	49
S09	1109	2	4	8	19	42	31	43	59	63	61	54
S09	1100	2	8	9	7	28	18	27	61	65	59	52
S09	1102	2	6	14	30	55	40	70	55	58	53	58
S09	1105	2	4	15	30	55	46	55	55	67	65	56
S10	0904	2	5	11	21	53	29	42				
S10	1107	2	5	17	28	45	34	47				
S10	1107	2	3	15	13	49	22	31				
S10	1010	2	6	12	12	41	16	30				
S10	1103	1	5	16	22	29	31	46				
S10	1002	1	5	16	18	49	28	41				
S10	1100	2	4	16	23	59	29	49				
S10	1002	1	4	18	24	41	39	44				
S10	1011	2	4	12	25	43	44	59				
S10	1004	1	5	16	19	50	21	36				
S10	1010	2	5	13	19	33	21	40				
S10	1206	2	5	14	19	40	23	38				
S10	1004	2	0	12	12	45	14	29				
S10	1110	1	0	13	21	51	20	30				
S10	1109	1	5	16	30	49	37	61				
S10	0910	2	5	7	15	53	12	29				
S10	1005	2	5	16	25	48	42	50				
S11	0911	2	5	11	13	36	34	50				
S11	1003	2	5	16	20	44	34	63				
S11	0909	2	5	7	11	30	21	18				
S11	1009	2	4	9	14	30	24	35				
S11	1005	2	6	19	21	45	39	53				
S11	0910	2	7	18	28	46	38	43				
S11	1102	2	5	7	11	15	16	31				
S11	0909	2	4	16	27	53	42	67				
S11	0910	2	7	17	27	47	45	72				
S11	1004	2	6	13	19	34	25	43				
S11	1000	2	6	15	30	47	34	57				
S11	0909	1	5	15	29	49	34	51				
S11	1004	1	7	13	20	34	32	46				
S11	1006	1	8	14	23	32	31	43				
S11	1003	1	4	9	20	32	32	40				
S11	1000	1	5	10	16	32	33	51				
S11	1007	1	4	16	25	36	39	68				
S11	0909	1	4	14	19	36	22	45				
S11	1009	1	0	12	16	30	26	44				
S11	1006	1	7	13	13	36	19	37				
S12	1101	1	4	14	26	31	36	56	55	48	55	54
S12	1011	2	3	7	8	12	8	10	59	60	61	50
S12	1102	1	5	12	15	29	17	32	53	46	59	54
S12	0911	1	4	12	17	23	15	31	48	54	51	52
S12	1011	1	0	19	29	37	45	49	53	45	48	38
S12	0911	1	5	13	19	34	27	40	40	42	53	51
S12	1100	2	5	16	23	42	37	42	61	54	78	50
S12	1000	2	7	17	27	42	39	41	58	48	66	51
S12	0907	1	5	16	25	36	32	46	51	43	40	51
S12	1101	2	4	11	20	31	35	42	29	58	54	56
S12	1004	2	5	15	16	16	14	23	60	57	67	40
S12	1100	1	3	8	12	24	24	31	49	48	56	38
S13	1001	2	6	17	28	49	28	51	51	35	55	43
S13	1001	2	6	16	26	28	40	54	51	49	51	36
S13	1200	1	0	17	29	48	37	39	42	52	52	41
S13	1109	1	6	20	31	50	40	53	67	60	50	57
S13	1010	2	0	19	25	45	36	57	-1	-1	-1	-1

S13	1005	2	5	17	30	60	40	65	45	58	51	48
S13	1203	2	6	14	24	37	43	44	51	52	45	38
S13	1005	2	6	17	27	56	44	54	45	40	51	36
S13	1111	2	8	18	26	55	35	45	41	50	38	56
S13	1010	2	7	15	24	51	46	58	43	58	52	56
S13	1003	1	0	17	26	36	62	46	43	61	45	56
S13	1109	2	3	17	31	53	42	67	57	43	55	25
S13	1006	2	6	18	34	63	49	60	59	48	60	48
S13	1100	1	6	17	27	48	37	66	52	68	60	60
S13	1111	2	3	14	22	37	30	50	57	65	65	54
S13	1107	2	0	9	13	32	22	22	49	57	50	35
S13	1200	2	5	11	20	41	34	51	43	41	49	40
S13	0900	2	7	14	23	40	47	47	44	56	57	57
S13	1111	1	6	20	25	48	35	57	48	72	54	66
S13	1002	2	6	11	28	45	40	55	60	48	52	60
S13	1101	2	4	17	24	47	35	39	51	48	54	43
S14	1202	1	5	13	17	26	23	33				
S14	1104	1	5	17	31	44	43	59				
S14	1108	2	4	13	12	27	10	23				
S14	1110	1	0	15	30	47	45	62				
S14	1102	2	4	16	26	51	35	59				
S14	1307	2	5	8	15	31	11	25				
S14	1106	2	4	18	27	37	46	65				
S14	1105	1	5	15	24	41	40	54				
S14	1110	2	5	6	10	33	13	30				
S14	1204	1	0	15	23	30	19	37				
S14	1101	2	5	15	26	52	39	54				
S14	1104	1	5	16	27	47	37	51				
S14	1202	2	7	16	17	45	31	54				
S14	1109	1	4	14	17	36	16	31				
S14	1011	2	3	13	17	38	12	36				
S14	1102	2		10	16	34	11	31				
S14	1101	2	5	16	23	47	22	31				
S14	1108	2	5	18	20	47	33	44				
S15	1002	1	3	11	10	20	12	25	59	54	69	60
S15	1107	1	5	9	8	19	15	35	70	49	44	49
S15	1010	1	3	15	11	31	15	32	44	60	63	49
S15	1005	1	4	16	27	38	28	48	39	48	43	45
S15	1008	1	5	17	28	47	34	52	35	40	45	33
S15	0911	1	3	10	10	20	12	32	40	67	64	56
S15	1003	1	4	11	16	27	25	40	54	51	60	40
S15	1005	1	3	13	24	29	29	50	59	45	64	53
S15	0911	1	5	15	16	42	21	50	34	65	50	65
S15	1007	1	6	15	32	41	39	59	38	49	48	43
S15	1008	2	5	13	22	31	26	43	40	44	38	44
S15	1008	2	4	9	14	25	36	45	35	50	44	60
S15	1006	2	3	15	16	34	22	35	-1	-1	-1	-1
S15	1004	2	5	7	18	26	19	33	55	66	57	53
S15	1008	2	4	11	11	24	16	33	55	37	51	44
S15	1010	2	3	10	12	29	2	29	55	58	59	43
S15	1003	2	5	15	17	42	39	50	45	65	59	58
S15	1009	2	3	13	13	29	20	27	57	58	63	53
S15	1107	1	0	16	29	44	41	61	40	56	56	38
S15	1105	1	4	20	27	47	34	42	56	47	66	58
S15	1102	1	3	9	14	24	18	25	47	44	58	56
S15	1111	1	3	12	17	37	20	28	57	43	44	38
S15	1106	2	7	14	27	43	43	60	59	54	65	54
S15	1103	2	6	15	29	40	26	41	55	57	75	48
S15	1203	2	3	15	23	42	15	30	48	48	47	50
S15	1105	2	5	17	31	52	32	52	48	40	61	54

S15	0911	1	5	15	18	40	17	32	47	60	58	49
S15	1001	1	4	14	17	28	30	38	64	52	54	46
S15	1004	1	3	4	10	15	6	34	49	57	48	52
S15	1200	1	4	7	11	17	5	18	49	69	70	44
S15	1005	1	4	10	20	33	27	43	44	72	62	46
S15	1002	1	7	13	22	33	32	45	55	57	54	47
S15	1007	1	4	11	17	35	29	50	44	44	45	42
S15	1004	1	4	15	26	39	37	48	55	42	61	49
S15	1009	1	4	13	18	33	24	36	45	48	45	39
S15	1000	2	3	17	28	40	37	65	58	49	66	42
S15	1009	2	4	3	12	19	13	23	45	58	51	52
S15	1008	2	5	10	9	28	16	10	45	50	46	53
S15	1106	1	3	15	22	36	37	61	57	41	53	44
S15	1101	1	4	14	24	39	38	58	55	63	73	42
S15	1101	1	3	16	25	34	38	51	45	64	67	72
S15	1106	2	4	15	30	55	42	53	57	42	59	47
S15	1211	2	5	13	25	35	36	55	61	63	75	55
S15	1208	2	4	13	18	24	23	24	49	63	59	50
S15	1200	2	3	14	19	39	19	32	56	50	58	51
S15	1102	2	5	11	26	36	24	42	53	44	67	58
S15	1105	2	3	13	26	42	37	52	45	55	48	58
S15	1107	2	5	12	24	36	29	43	48	61	54	51
S16	1010	1	4	17	30	52	49	66	-1	-1	-1	-1
S16	1004	1	4	17	22	41	21	42	-1	-1	-1	-1
S16	1010	2	5	11	27	47	41	59	66	51	58	40
S16	1009	1	5	16	26	45	20	46	47	46	46	45
S16	1008	2	7	14	26	50	38	52	-1	-1	-1	-1
S16	1003	2	7	20	33	52	40	65	-1	-1	-1	-1
S16	0909	1	5	14	29	49	36	64	-1	-1	-1	-1
S16	1000	1	5	18	30	51	41	67	-1	-1	-1	-1
S16	1001	1	0	16	23	43	38	58	-1	-1	-1	-1
S16	1004	1	0	6	6	25	10	26	-1	-1	-1	-1
S16	1002	1		15	17	47	42	52	-1	-1	-1	-1
S16	1001	2	5	14	26	47	46	57	-1	-1	-1	-1
S16	1011	1	3	14	16	44	14	36	49	55	51	47
S16	1005	2	4	10	8	29	17	34	-1	-1	-1	-1
S16	1003	1	4	9	14	38	17	36	37	63	44	47
S16	1008	1		12	21	34	32	34	-1	-1	-1	-1
S16	1007	2	8	18	29	54	41	63	-1	-1	-1	-1
S16	1011	2	8	15	19	37	28	42	-1	-1	-1	-1
S16	1005	2	4	12	20	33	17	38	-1	-1	-1	-1
S16	1003	1	4	15	23	44	33	51	-1	-1	-1	-1
S17	1102	1	3	17	18	47	17	36				
S17	1108	1	3	12	12	29	22	31				
S17	1101	1	5	19	26	54	43	56				
S17	1103	1	4	12	19	47	22	37				
S17	1105	1	5	19	30	43	43	54				
S17	1108	1	5	17	28	51	40	55				
S17	1106	1	4	11	10	33	32	39				
S17	1011	1	4	13	15	40	29	45				
S17	1010	1	4	13	10	32	18	41				
S17	1010	1	3	16	24	44	30	39				
S17	1107	2	5	18	19	36	18	33				
S17	1107	2	0	15	21	32	20	30				
S17	1107	2	4	11	25	39	34	40				
S17	1110	2	3	19	27	40	49	70				
S17	1101	2	4	13	20	34	28	35				
S17	1109	2	0	15	26	35	44	44				
S17	1105	2	5	16	25	44	44	64				
S18	1104	2	3	12	10	34	9	31	60	51	74	54

S18	1106	2	0	12	21	35	15	38	63	55	61	52
S18	1105	1	8	16	22	42	41	66	43	60	61	52
S18	1011	1	3	8	15	23	15	44	49	54	49	48
S18	1105	1	0	14	15	37	16	33	-1	-1	-1	-1
S18	1104	2	4	11	29	43	43	64	49	42	53	44
S18	1108	2	3	18	24	47	26	49	57	64	51	46
S18	1011	2	3	11	25	38	33	53	52	47	57	44
S18	1011	2	0	14	18	43	25	46	49	42	53	33
S18	1104	1	5	18	29	50	47	74	54	48	58	47
S18	1106	2	3	15	30	42	45	78	56	52	51	41
S18	1107	2	3	15	29	52	40	58	80	50	67	63
S18	1100	1	6	12	26	45	36	59	64	39	62	46
S18	1102	2	5	10	29	47	28	46	48	47	53	50
S18	1109	2	4	8	17	40	19	36	50	47	53	40
S18	1104	1	0	10	23	41	42	74	45	49	48	45
S18	1010	1	4	16	26	36	34	62	47	53	69	45
S18	1108	2	0	12	19	23	20	45	55	40	64	36
S18	1000	2	0	19	31	51	34	67	58	39	51	44
S18	1010	2	4	17	25	42	30	55	56	37	43	45
S18	1010	1	6	16	33	47	40	58	55	53	41	57
S18	1202	1	3	10	24	28	8	44	50	47	55	40
S18	1011	1	5	11	20	38	11	45	66	46	64	57
S18	1106	1	7	12	23	38	34	51	55	71	76	54
S18	1010	2	5	16	16	39	24	44	33	63	51	49
S18	1100	2	3	12	25	32	40	61	50	40	47	45
S19	1007	2	4	9	10	29	22	28	55	62	53	46
S19	1106	2	4	8	9	25	17	9	47	63	61	61
S19	1003	2	4	7	12	27	16	30	45	67	65	57
S19	1006	1	4	10	16	28	25	33	42	54	57	45
S19	1102	2	3	5	15	22	31	38	44	67	58	50
S19	1003	2	3	7	12	28	7	20	56	62	68	48
S19	1011	2	4	10	11	20	27	14	59	67	66	55
S19	1011	1	4	6	13	24	14	21	55	57	44	59
S19	0911	2	3	10	18	34	27	32	-1	-1	-1	-1
S19	1008	1	4	15	17	34	13	23	38	72	50	56
S19	1001	1	4	9	13	24	16	31	58	61	65	48
S19	1006	1	7	13	13	26	25	35	45	49	54	51
S19	1010	2	4	10	5	14	7	13	54	52	63	50
S19	1008	2	0	12	13	33	12	28	52	50	51	51
S19	1011	2	4	8	10	18	8	6	56	58	58	56
S19	1010	2	4	7	7	13	12	4	46	51	42	62
S19	1100	2	4	7	7	17	10	20	56	50	55	48
S19	1004	2	4	4	7	16	8	9	43	55	55	48
S19	1004	1	4	9	18	29	22	37	47	48	49	61
S19	1004	2	0	9	10	23	18	25	47	61	61	47
S20	1006	2	4	12	17	21	16	29	-1	-1	-1	-1
S20	1006	1	4	10	18	22	27	38	48	54	39	58
S20	1005	1	4	8	8	29	20	30	73	47	47	60
S20	1000	2	5	9	20	23	29	33	44	51	63	50
S20	1007	2	4	18	22	43	38	51	-1	-1	-1	-1
S20	1006	1	4	19	33	56	41	57	-1	-1	-1	-1
S20	1001	1	5	11	12	25	13	35	-1	-1	-1	-1
S20	1003	1	4	14	17	31	19	37	40	62	38	63
S20	1008	1	6	13	18	31	35	51	56	52	51	47
S20	1009	1	0	12	14	37	29	41	58	68	70	60
S20	0910	1	0	11	14	41	32	48	35	51	49	52
S20	1009	2	8	13	25	45	39	53	-1	-1	-1	-1
S20	1001	2	5	13	16	29	24	36	-1	-1	-1	-1
S20	1006	2	0	13	21	36	27	44	62	65	73	61
S20	1004	1	4	8	12	34	27	38	29	54	42	59

S20	1011	1	5	9	10	32	13	33	-1	-1	-1	-1
S20	1100	1	4	9	12	20	30	49	54	55	52	49
S20	1001	1	4	7	12	20	15	40	51	61	53	52
S20	1000	1	0	14	15	26	20	33	55	46	53	51
S20	1005	2	4	10	14	30	18	35	51	53	52	52
S20	1000	1	3	15	17	31	23	38	45	55	44	50
S20	1000	1	4	9	11	28	11	29	58	54	61	56
S20	1000	1	5	17	29	45	36	66	59	43	59	51
S20	1001	1	4	9	17	33	35	45	47	47	53	38
S20	1009	1	4	10	22	38	34	46	57	35	88	35
S20	1000	2	3	5	15	29	25	35	-1	-1	-1	-1
S20	1002	1	4	8	14	22	26	32	44	67	64	67
S20	1000	1		15	22	41	27	45	41	34	52	33
S20	1008	2	5	8	11	17	19	28	-1	-1	-1	-1
S20	1004	1	5	14	20	44	39	52	38	53	59	44
S20	1002	1	4	11	16	32	27	47	48	53	49	39
S20	1105	2	0	13	7	14	17	20	-1	-1	-1	-1
S21	1106	2	0	1	3	19	6	5				
S21	1000	2	3	10	10	32	32	39				
S21	1010	2	3	8	14	31	17	26				
S21	1007	2	3	10	13	31	16	29				
S21	1002	2	4	8	9	25	20	18				
S21	1010	1	4	8	19	35	26	42				
S21	1004	1	4	15	16	29	17	32				
S21	1001	1	4	11	21	35	16	40				
S21	1202	2	0	3	14	28	24	36				
S21	1011	2	0	12	21	41	28	48				
S21	1011	2	3	13	25	47	35	52				
S21	1102	2	4	11	8	29	16	17				
S21	1103	2	4	19	29	55	39	60				
S21	1108	1	4	16	27	46	31	58				
S21	1102	1	6	4	10	25	29	44				
S22	1107	1	4	15	21	46	29	51				
S22	1200	2	4	10	17	32	20	39				
S22	1111	2	4	14	13	46	20	40				
S22	1110	1	3	12	13	42	20	37				
S22	1108	1	4	15	18	40	24	40				
S22	1202	1	5	10	13	28	26	40				
S22	1211	2	4	8	6	11	12	6				
S22	1104	2	4	9	10	25	12	27				
S22	1204	1	4	13	24	39	17	31				
S22	1106	2	5	18	22	51	40	62				
S22	1101	2	6	16	32	47	33	50				
S22	1109	1	5	16	26	47	43	59				
S22	1107	2	4	10	12	30	16	41				
S22	1011	1	5	13	17	36	24	40				
S22	1106	2	5	17	24	43	38	60				
S22	1101	1	4	13	20	37	27	45				
S22	1106	1	3	16	25	35	34	48				
S23	1004	1	3	17	30	45	48	62	52	60	56	66
S23	0905	1	5	13	17	23	35	41	-1	-1	-1	-1
S23	1008	2	7	11	21	33	34	46	-1	-1	-1	-1
S23	0909	2	5	12	24	29	33	43	-1	-1	-1	-1
S23	1007	2	3	9	12	31	33	27	45	66	64	52
S23	1008	2	4	12	20	32	32	34	-1	-1	-1	-1
S23	1003	1	5	17	27	44	32	47	44	46	41	31
S23	0906	1	6	14	19	40	31	46	-1	-1	-1	-1
S23	1009	1	3	8	12	27	31	23	51	45	62	45
S23	1007	2	5	15	21	31	27	32	-1	-1	-1	-1
S23	1009	2	6	7	14	23	25	30	-1	-1	-1	-1

S23	1006	2	5	15	15	32	22	30	45	49	48	29
S23	0907	1	5	11	16	30	22	29	-1	-1	-1	-1
S23	0904	1	5	11	16	21	21	23	-1	-1	-1	-1
S23	1102	1	0	7	9	22	13	15	41	57	61	38
S23	0911	1	0	6	7	17	11	22	48	41	53	51
S23	1008	2	4	12	7	23	11	8	-1	-1	-1	-1
S23	1001	2	4	3	8	13	9	4	51	65	75	53
S23	1007	2	4	15	11	21	6	17	-1	-1	-1	-1
S23	1000	1	4	5	5	8	5	17	-1	-1	-1	-1
S23	1004	2	5	9	7	9	3	12	-1	-1	-1	-1
S24	1110	2	4	16	18	34	20	39				
S24	1008	1	5	19	25	50	34	49				
S24	1102	1	3	17	28	46	47	79				
S24	1108	1	3	11	15	32	24	37				
S24	1102	2	5	11	10	22	16	32				
S24	1205	1	4	12	14	29	26	38				
S24	1101	1	0	17	23	41	38	55				
S24	1104	1	4	13	25	41	31	53				
S24	1006	1	5	17	26	38	34	63				
S24	1111	2	5	16	20	38	34	45				
S24	1111	1	5	4	4	14	3	13				
S24	1108	2	5	15	24	50	29	40				
S24	1101	1	4	15	16	31	24	46				
S24	1105	1	3	19	32	48	41	66				
S24	1010	1	3	16	20	43	25	41				
S24	1202	1	0	9	19	30	14	27				
S24	1004	2	5	11	16	40	29	34				
S24	1109	1	5	13	22	36	18	52				
S24	0910	2	4	19	23	49	34	61				
S24	1102	1	5	15	26	43	31	51				
S24	1009	2	4	12	17	33	24	48				
S24	1104	2	4	13	15	25	12	29				
S24	1011	2	4	12	19	42	31	50				
S24	1010	2	8	18	18	38	25	45				
S24	1106	1	4	17	16	35	31	51				
S24	1006	1	5	16	27	44	39	57				
S25	1011	1	4	15	25	41	34	33	43	58	52	53
S25	1107	1	4	14	20	38	32	38	38	60	50	52
S25	1211	1	0	7	12	26	19	28	38	71	64	60
S25	1206	2	0	13	12	26	3	19	-1	-1	-1	-1
S25	1106	2	0	6	9	24	5	15	-1	-1	-1	-1
S25	1002	2	4	10	11	27	12	25	55	55	54	42
S25	1009	2	3	14	16	42	17	35	44	46	47	57
S25	1008	1	4	13	15	43	26	41	56	35	43	50
S25	0906	1	4	16	20	37	31	43	38	69	49	59
S26	1106	2	0	9	14	25	21	21				
S26	1106	2	3	11	8	23	17	27				
S26	1210	2	0	0	5	12	5	5				
S26	1205	2	4	9	12	19	11	23				
S26	1108	2	4	0	6	12	2	14				
S26	1106	2	5	11	17	37	36	50				
S26	1105	2	3	15	16	33	36	52				
S26	1109	2	5	11	17	30	23	33				
S26	1107	1	0	6	8	20	18	32				
S26	1107	1	4	11	15	29	27	35				
S26	1103	1	5	14	18	27	34	48				
S26	1202	1	3	6	4	18	13	15				
S26	1104	1	3	16	21	33	20	34				
S26	1009	1		12	14	32	21	33				
S26	1207	1	0	4	10	18	20	30				



## PUPIL DATA (Cont.)

S26	1011	1	5	17	28	48	47	58				
S26	1202	1	5	12	20	34	20	36				
S26	1208	1	4	8	17	28	20	25				
S27	1105	1	4	12	6	17	9	7	55	51	64	56
S27	1007	1	4	16	29	35	36	45	64	45	46	50
S27	1002	2	5	16	17	40	21	36	44	33	45	31
S27	1107	2	5	17	23	41	34	53	51	50	60	50
S27	1009	2	4	5	13	38	20	29	65	50	69	46
S27	1007	2	5	10	15	27	9	16	59	45	57	47
S27	1101	2	4	16	9	34	7	23	53	59	53	44
S27	1105	1	4	17	16	34	27	39	52	39	49	61
S27	1109	2	4	2	4	13	16	4	48	59	59	43
S27	1011	1	4	7	9	14	9	16	-1	-1	-1	-1
S27	1104	1	5	9	15	35	21	43	51	57	58	73
S27	1010	1	4	9	18	33	41	50	45	72	61	64
S27	1105	1	5	10	11	26	9	14	36	56	44	41
S27	1104	2	4	15	13	30	14	13	50	52	46	64
S27	1105	2	4	14	14	34	16	23	59	43	53	50
S27	1011	2	4	11	9	18	9	22	60	55	56	40
S27	1107	1	4	12	21	33	44	55	54	52	70	51
S27	0910	2	4	11	19	26	24	38	61	54	58	56
S27	1209	2	4	10	9	27	17	37	-1	-1	-1	-1
S28	1005	2	5	13	28	40	42	57	50	68	70	65
S28	1003	2	4	9	22	38	29	38	53	50	71	49
S28	1009	2	5	15	20	41	32	52	43	53	56	52
S28	1007	1	3	11	25	49	27	51	57	46	49	39
S28	1007	1	3	10	17	31	17	39	51	40	49	41
S28	1107	2	3	16	21	30	33	41	47	57	43	48
S28	1003	2	5	11	18	27	13	31	45	42	48	44
S28	1009	1	3	17	30	41	39	77	64	52	56	46
S28	1002	2	5	13	17	37	20	37	46	52	59	52
S28	1003	2	4	13	14	40	11	27	49	54	70	41
S28	1008	2	4	16	22	41	28	47	45	46	46	41
S28	1008	1	4	14	20	32	27	36	46	39	46	43
S28	1005	2	5	12	25	41	28	45	62	55	64	44
S28	0911	1	4	17	22	44	25	48	41	45	40	40
S28	1007	2	4	16	34	46	48	79	49	45	58	41
S28	1007	1	3	16	22	42	21	46	66	49	60	41
S28	1006	1	4	13	21	34	21	34	41	53	60	38
S28	1006	1	5	12	27	45	21	31	58	42	55	39

APPENDIX Q

Additional Statistical Tables

TABLE 29

### CORRELATION COEFFICIENTS - TEACHING STYLE FEATURES

Scores 1-6: Teaching Behaviour  
7-10: Teacher Attitude

	SCORE1	SCORE2	SCORE3	SCORE4	SCORE5	SCORE6	SCORE7	SCORE8	SCORE9
/ SCORE10									
SCORE1 / 0.34871	1.00000	0.19488	0.12885	0.17162	0.34773	-0.04408	0.21773	0.25073	0.32499
SCORE2 / 0.18445	0.19488	1.00000	0.03820	0.21175	0.22224	-0.12306	0.28766	0.22050	0.30683
SCORE3 / 0.16220	0.12885	0.03820	1.00000	0.13443	0.12851	0.01111	0.11535	0.07939	0.17205
SCORE4 / 0.25320	0.17162	0.21175	0.13443	1.00000	0.17051	0.03041	0.17429	0.22116	0.26463
SCORE5 / 0.39725	0.34773	0.22224	0.12851	0.17051	1.00000	-0.14701	0.30991	0.23456	0.36896
SCORE6 /-0.04920	0.04408	-0.12306	0.01111	0.03041	-0.14701	1.00000	-0.15659	-0.01281	-0.11908
SCORE7 / 0.31528	0.21773	0.28766	0.11535	0.17429	0.30991	-0.15659	1.00000	0.28363	0.34065
SCORE8 / 0.48928	0.25073	0.22050	0.07939	0.22116	0.23456	-0.01281	0.28363	1.00000	0.38632
SCORE9 / 0.48973	0.32499	0.30683	0.17205	0.26463	0.36896	-0.11908	0.34065	0.38632	1.00000
SCORE10 / 1.00000	0.34871	0.18445	0.16220	0.25320	0.39725	-0.04920	0.31528	0.48928	0.48973

TABLE 31

COEFFICIENTS FOR CANONICAL VARIABLES OF THE FIRST SET  
(TEACHING BEHAVIOUR)

	CANVAR 1	CORRELATIONS
SCORE1	-0.34444	-0.6513
SCORE2	-0.30892	-0.5651
SCORE3	-0.16516	-0.3219
SCORE4	-0.28325	-0.5113
SCORE5	-0.49515	-0.7683
SCORE6	0.10354	0.2191

COEFFICIENTS FOR CANONICAL VARIABLES OF THE SECOND SET  
(TEACHER ATTITUDE)

	CANVAR 1	CORRELATIONS
SCORE7	-0.34663	-0.6633
SCORE8	-0.09497	-0.5738
SCORE9	-0.48581	-0.8336
SCORE10	-0.39420	-0.7879
1CANCORR/TEACHERS		

TABLE 33  
TEACHING BEHAVIOUR DIMENSION

1Correlation Matrix

1.000  
0.1951.000  
0.1290.0381.000  
0.1720.2120.1341.000  
0.3480.2220.1290.1711.000  
-.044-.1230.0110.030-.1471.000  
10Output from Subroutine OF<sup>C</sup>OMM

Normalized Residual Correlation Matrix

1.000  
-.0231.000  
0.014-.0521.000  
-.0110.0940.0681.000  
0.025-.023-.004-.0431.000  
0.052-.0660.0480.090-.0621.000

TABLE 36  
TEACHER ATTITUDE DIMENSION

1Correlation Matrix

1.000  
0.2841.000  
0.3410.3861.000  
0.3150.4890.4901.000  
10Output from Subroutine OFCOMM

0Normalized Residual Correlation Matrix

1.000  
-.0041.000  
0.066-.0391.000  
-.0470.031 .0011.000

TABLE 39  
TEACHING STYLE: BEHAVIOUR AND ATTITUDE

1Correlation Matrix

```

1.000
0.1951.000
0.1290.0381.000
0.1720.2120.1341.000
0.3480.2220.1290.1711.000
-.044-.1230.0110.030-.1471.000
0.2180.2880.1150.1740.310-.1571.000
0.2510.2200.0790.2210.235-.0130.2841.000
0.3250.3070.1720.2650.369-.1190.3410.3861.000
0.3490.1840.1620.2530.397-.0490.3150.4890.4901.000
1Output from Subroutine CFCCMM

```

0Normalized Residual Correlation Matrix

```

1.000
0.0021.000
0.023-.0561.000
-.0120.0770.0571.000
0.1070.0070.007-.0431.000
0.026-.0760.0430.038-.0871.000
-.0360.1140.005-.0130.049-.1031.000
-.043-.007-.0610.012-.1190.080-.0041.000
-.0220.0530.0250.014-.018-.035-.006-.0171.000
0.003-.1450.006-.0130.0130.007-.0620.1430.0011.000

```

TABLE 45

COEFFICIENTS: TEACHER FEATURE SCORES WITH PUPIL PERFORMANCE TESTS

	PERF1	PERF2	PERF3	PERF4	PERF5
SCORE1	0.14993	0.16171	0.01436	0.08928	0.14414
SCORE2	-0.05033	-0.02425	-0.05152	-0.08412	-0.03745
SCORE3	0.11748	0.08684	0.04594	0.06953	0.05999
SCORE4	-0.04670	-0.01457	-0.17169	-0.07865	0.00137
SCORE5	0.07512	0.10454	0.02204	0.07335	0.12943
SCORE6	0.00796	0.01347	0.04714	-0.01880	-0.00769
SCORE7	-0.04478	-0.00285	-0.17401	-0.02668	-0.03235
SCORE8	0.14040	0.23481	0.07357	0.10151	0.18337
SCORE9	-0.06051	-0.00689	-0.13991	-0.03195	-0.04274
SCORE10	0.06695	0.14708	0.02395	0.04409	0.06600



TABLE 46

## COEFFICIENTS FOR CANONICAL VARIABLES OF THE FIRST SET

	CANVAR 1	CANVAR 2	CANVAR 3	CANVAR 4
SCORE1	0.32889	-0.25037	-0.56999	0.09075
SCORE2	-0.24603	-0.30426	0.61845	-0.44588
SCORE3	0.01395	-0.33991	-0.46866	0.15176
SCORE4	0.60087	-0.15951	0.70551	0.30386
SCORE5	-0.09323	0.21926	0.45564	0.82694
SCORE6	-0.18937	0.34460	-0.09804	-0.19678
SCORE7	0.74862	0.61823	-0.44135	-0.16740
SCORE8	-0.10882	-1.05804	-0.02047	-0.22706
SCORE9	0.31308	0.58616	-0.39945	-0.34469
SCORE10	-0.39107	-0.14913	0.16820	-0.59364

## COEFFICIENTS FOR CANONICAL VARIABLES OF THE SECOND SET

## PUPIL PERFORMANCE

	CANVAR 1	CANVAR 2	CANVAR 3	CANVAR 4
PERF1	0.22820	-0.22096	-0.66831	0.61401
PERF2	0.43330	-0.86419	-0.12620	-1.65137
PERF3	-1.56209	0.09581	0.29883	-0.07336
PERF4	-0.18507	0.99918	-1.41574	0.26613
PERF5	0.69982	-0.80977	1.31124	1.22749
1CANCORR/INDIV/MAY/TESTS				

TABLE 51

COEFFICIENTS: TEACHER FEATURE SCORES WITH PUPIL PERSONALITY TESTS

Ø	PERS1	PERS2	PERS3	PERS4
SCORE1	-0.2487 ( 358) P=0.000	-0.2948 ( 358) P=0.000	-0.2700 ( 358) P=0.000	-0.2885 ( 358) P=0.000
SCORE2	0.2797 ( 358) P=0.000	0.2177 ( 358) P=0.000	0.2529 ( 358) P=0.000	0.2346 ( 358) P=0.000
SCORE3	0.1798 ( 358) P=0.000	0.1770 ( 358) P=0.000	0.1447 ( 358) P=0.003	0.1697 ( 358) P=0.001
SCORE4	0.1195 ( 358) P=0.012	0.0547 ( 358) P=0.151	0.1311 ( 358) P=0.007	0.0872 ( 358) P=0.050
SCORE5	-0.1940 ( 358) P=0.000	-0.2029 ( 358) P=0.000	-0.2195 ( 358) P=0.000	-0.2260 ( 358) P=0.000
SCORE6	0.1056 ( 358) P=0.023	0.1238 ( 358) P=0.010	0.1463 ( 358) P=0.003	0.1163 ( 358) P=0.014
SCORE7	0.0974 ( 358) P=0.033	0.0188 ( 358) P=0.352	0.0473 ( 358) P=0.186	-0.0099 ( 358) P=0.426
SCORE8	0.0416 ( 358) P=0.217	-0.0875 ( 358) P=0.049	-0.0575 ( 358) P=0.139	-0.1175 ( 358) P=0.013
SCORE9	0.0888 ( 358) P=0.047	-0.0797 ( 358) P=0.066	-0.0898 ( 358) P=0.045	-0.0846 ( 358) P=0.055
SCORE10	-0.0653 ( 358) P=0.109	-0.0671 ( 358) P=0.103	-0.0668 ( 358) P=0.104	-0.0913 ( 358) P=0.042
PERS1	1.0000 ( 0) P=*****	0.8105 ( 358) P=0.000	0.8954 ( 358) P=0.000	0.8338 ( 358) P=0.000

Ø(COEFFICIENT / (CASES) / SIGNIFICANCE)  
1ADD/INDIV/PERS

(A VALUE

TABLE 53

N = 358

## COEFFICIENTS FOR CANONICAL VARIABLES OF THE FIRST SET

	CANVAR 1	CANVAR 2
SCORE1	0.45605	-0.74906
SCORE2	-0.71602	-0.16664
SCORE3	-0.42328	0.09992
SCORE4	-0.39924	-0.53343
SCORE5	0.61467	0.71431
SCORE6	0.09580	0.52523
SCORE7	0.17410	-0.35696
SCORE8	-0.25175	-0.81436
SCORE9	0.34886	0.23810
SCORE10	0.21849	0.45449

## COEFFICIENTS FOR CANONICAL VARIABLES OF THE SECOND SET

## PUPIL PERSONALITY

	CANVAR 1	CANVAR 2
PERS1	-0.43439	-1.19717
PERS2	0.12804	1.48173
PERS3	-0.37229	0.80761
PERS4	-0.36165	0.67692
1CANGCORR/SCORFS/PUPILS		

TABLE 55

## COEFFICIENTS: TEACHER BACKGROUND WITH TEACHING STYLE

	SEX	AGE	TRAIN	SCHOOL	FACSCORE	FABEH	FAPERS
SEX	1.0000 ( 0) P=*****	-0.2129 ( 250) P=0.000	0.1028 ( 244) P=0.055	0.1587 ( 251) P=0.006	0.0170 ( 251) P=0.394	0.0424 ( 251) P=0.252	0.0005 ( 251) P=0.497
AGE	-0.2129 ( 250) P=0.000	1.0000 ( 0) P=*****	-0.5263 ( 244) P=0.000	-0.1308 ( 251) P=0.019	-0.1102 ( 251) P=0.041	-0.0804 ( 251) P=0.102	-0.1093 ( 251) P=0.042
TRAIN	0.1028 ( 244) P=0.055	-0.5263 ( 244) P=0.000	1.0000 ( 0) P=*****	0.0599 ( 245) P=0.175	0.0975 ( 245) P=0.064	0.0432 ( 245) P=0.251	0.1080 ( 245) P=0.046
SCHOOL	0.1587 ( 251) P=0.006	-0.1308 ( 251) P=0.019	0.0599 ( 245) P=0.175	1.0000 ( 0) P=*****	0.0726 ( 252) P=0.126	0.0297 ( 252) P=0.319	0.0792 ( 252) P=0.105
FACSCORE	0.0170 ( 251) P=0.394	-0.1102 ( 251) P=0.041	0.0975 ( 245) P=0.064	0.0726 ( 252) P=0.126	1.0000 ( 0) P=*****	0.8132 ( 253) P=0.000	0.9427 ( 253) P=0.000
FABEH	0.0424 ( 251) P=0.252	-0.0804 ( 251) P=0.102	0.0432 ( 245) P=0.251	0.0297 ( 252) P=0.319	0.8132 ( 253) P=0.000	1.0000 ( 0) P=*****	0.5836 ( 253) P=0.000
FAPERS	0.0005 ( 251) P=0.497	-0.1093 ( 251) P=0.042	0.1080 ( 245) P=0.046	0.0792 ( 252) P=0.105	0.9427 ( 253) P=0.000	0.5836 ( 253) P=0.000	1.0000 ( 0) P=*****

TABLE 56

## COEFFICIENTS: FEATURE SCORES WITH TEACHER BACKGROUND

	SEX	AGE	TRAIN	SCHOOL		SEX	AGE	TRAIN	SCHOOL
SEX	1.0000 ( 0 ) P=*****	-0.1634 ( 253 ) P=0.005	0.1372 ( 253 ) P=0.015	0.1606 ( 253 ) P=0.005	SCORE5	-0.0581 ( 253 ) P=0.179	-0.1188 ( 253 ) P=0.030	0.0239 ( 253 ) P=0.353	-0.0121 ( 253 ) P=0.424
AGE	0.1634 ( 253 ) P=0.005	1.0000 ( 0 ) P=*****	-0.4877 ( 253 ) P=0.000	-0.1028 ( 253 ) P=0.051	SCORE6	-0.0254 ( 253 ) P=0.344	0.1250 ( 253 ) P=0.023	-0.0615 ( 253 ) P=0.165	-0.0386 ( 253 ) P=0.270
TRAIN	0.1372 ( 253 ) P=0.015	-0.4877 ( 253 ) P=0.000	1.0000 ( 0 ) P=*****	0.0550 ( 253 ) P=0.192	SCORE7	0.0005 ( 253 )	-0.0877 ( 253 )	0.0729 ( 253 )	0.0281 ( 253 )
SCHOOL	0.1606 ( 253 ) P=0.005	-0.1028 ( 253 ) P=0.051	0.0550 ( 253 ) P=0.192	1.0000 ( 0 ) P=*****	SCORE8	-0.0124 ( 253 ) P=0.422	-0.0746 ( 253 ) P=0.119	0.0383 ( 253 ) P=0.272	0.0341 ( 253 ) P=0.295
SCORE1	0.0216 ( 253 ) P=0.366	0.0213 ( 253 ) P=0.358	-0.0173 ( 253 ) P=0.392	0.0059 ( 253 ) P=0.463	SCORE9	-0.0524 ( 253 ) P=0.203	-0.0741 ( 253 ) P=0.120	0.0615 ( 253 ) P=0.165	0.0891 ( 253 ) P=0.079
SCORE2	0.0832 ( 253 ) P=0.094	0.0349 ( 253 ) P=0.291	0.0103 ( 253 ) P=0.435	0.0233 ( 253 ) P=0.356	SCORE10	0.0141 ( 253 ) P=0.412	-0.0839 ( 253 ) P=0.092	0.1315 ( 253 ) P=0.018	0.0535 ( 253 ) P=0.198
SCORE3	0.1736 ( 253 ) P=0.003	-0.0890 ( 253 ) P=0.079	0.0862 ( 253 ) P=0.086	0.0442 ( 253 ) P=0.242					
SCORE4	-0.0148 ( 253 ) P=0.407	-0.0920 ( 253 ) P=0.072	0.1067 ( 253 ) P=0.045	0.0122 ( 253 ) P=0.423					

TABLE 57

## COEFFICIENTS: TEACHER BACKGROUND WITH PUPIL PERFORMANCE

	SEX	AGE	TRAIN	SCHOOL	PERF1	PERF2	PERF3	PERF4	PERF5
SEX	1.0000 ( 0 ) P=*****	-0.2197 ( 574 ) P=0.000	-0.2522 ( 524 ) P=0.000	-0.1604 ( 574 ) P=0.000	0.1131 ( 574 ) P=0.003	0.0532 ( 574 ) P=0.102	0.0832 ( 574 ) P=0.023	0.0410 ( 574 ) P=0.163	0.0262 ( 574 ) P=0.265
AGE	-0.2197 ( 574 ) P=0.000	1.0000 ( 0 ) P=*****	-0.5540 ( 524 ) P=0.000	0.3186 ( 574 ) P=0.000	0.0097 ( 574 ) P=0.409	-0.0098 ( 574 ) P=0.407	0.0454 ( 574 ) P=0.139	-0.0118 ( 574 ) P=0.389	0.0417 ( 574 ) P=0.159
TRAIN	-0.2522 ( 524 ) P=0.000	-0.5540 ( 524 ) P=0.000	1.0000 ( 0 ) P=*****	-0.1805 ( 524 ) P=0.000	0.0332 ( 524 ) P=0.224	0.0803 ( 524 ) P=0.033	0.0316 ( 524 ) P=0.235	0.1647 ( 524 ) P=0.000	0.0074 ( 524 ) P=0.362
SCHOOL	-0.1604 ( 574 ) P=0.000	0.3186 ( 574 ) P=0.000	-0.1805 ( 524 ) P=0.000	1.0000 ( 0 ) P=*****	-0.0803 ( 574 ) P=0.027	-0.1549 ( 574 ) P=0.000	0.2278 ( 574 ) P=0.000	-0.1462 ( 574 ) P=0.000	-0.1486 ( 574 ) P=0.000
PERF1	0.1131 ( 574 ) P=0.003	0.0097 ( 574 ) P=0.409	0.0332 ( 524 ) P=0.224	-0.0803 ( 574 ) P=0.027	1.0000 ( 0 ) P=*****	0.6964 ( 574 ) P=0.000	0.6503 ( 574 ) P=0.000	0.5564 ( 574 ) P=0.000	0.1007 ( 574 ) P=0.000
PERF2	0.0532 ( 574 ) P=0.102	-0.0098 ( 574 ) P=0.407	0.0803 ( 524 ) P=0.033	-0.1549 ( 574 ) P=0.000	0.6964 ( 574 ) P=0.000	1.0000 ( 0 ) P=*****	0.7203 ( 574 ) P=0.000	0.7596 ( 574 ) P=0.000	0.7902 ( 574 ) P=0.000
PERF3	0.0832 ( 574 ) P=0.023	0.0454 ( 574 ) P=0.139	0.0316 ( 524 ) P=0.235	-0.2278 ( 574 ) P=0.000	0.6503 ( 574 ) P=0.000	0.7203 ( 574 ) P=0.000	1.0000 ( 0 ) P=*****	0.6410 ( 574 ) P=0.000	0.7132 ( 574 ) P=0.000
PERF4	0.0410 ( 574 ) P=0.163	-0.0118 ( 574 ) P=0.389	0.1647 ( 524 ) P=0.000	-0.1462 ( 574 ) P=0.000	0.5564 ( 574 ) P=0.000	0.7596 ( 574 ) P=0.000	0.6410 ( 574 ) P=0.000	1.0000 ( 0 ) P=*****	0.8364 ( 574 ) P=0.000
PERF5	0.0262 ( 574 ) P=0.265	0.0417 ( 574 ) P=0.159	0.0074 ( 524 ) P=0.062	-0.1486 ( 574 ) P=0.000	0.6007 ( 574 ) P=0.000	0.7902 ( 574 ) P=0.000	0.7132 ( 574 ) P=0.000	0.8364 ( 574 ) P=0.000	1.0000 ( 0 ) P=*****

TABLE 58

## COEFFICIENTS: TEACHER BACKGROUND WITH PUPIL PERSONALITY

	SEX	AGE	TRAIN	SCHOOL	PERS1	PERS2	PERS3	PERS4
SEX	1.0000 ( 0 ) P=*****	-0.3959 ( . 358 ) P=0.000	-0.1805 ( . 326 ) P=0.001	-0.4121 ( . 358 ) P=0.000	-0.0522 ( . 358 ) P=0.162	-0.0729 ( . 358 ) P=0.084	-0.0643 ( . 358 ) P=0.112	-0.0593 ( . 358 ) P=0.131
AGE	-0.3959 ( . 358 ) P=0.000	1.0000 ( 0 ) P=*****	-0.6090 ( . 326 ) P=0.000	0.4728 ( . 358 ) P=0.000	0.0119 ( . 358 ) P=0.411	-0.0140 ( . 358 ) P=0.396	0.0088 ( . 358 ) P=0.434	0.0049 ( . 358 ) P=0.463
TRAIN	-0.1805 ( . 326 ) P=0.001	-0.6090 ( . 326 ) P=0.000	1.0000 ( 0 ) P=*****	-0.1142 ( . 326 ) P=0.020	-0.1007 ( . 326 ) P=0.035	-0.0790 ( . 326 ) P=0.077	-0.1487 ( . 326 ) P=0.004	-0.1029 ( . 326 ) P=0.032
SCHOOL	-0.4121 ( . 358 ) P=0.000	0.4728 ( . 358 ) P=0.000	-0.1142 ( . 326 ) P=0.020	1.0000 ( 0 ) P=*****	-0.0152 ( . 358 ) P=0.387	0.0052 ( . 358 ) P=0.461	0.0132 ( . 358 ) P=0.402	0.0131 ( . 358 ) P=0.403
PERS1	-0.0522 ( . 358 ) P=0.162	0.0119 ( . 358 ) P=0.411	-0.1007 ( . 326 ) P=0.035	-0.0152 ( . 358 ) P=0.387	1.0000 ( 0 ) P=*****	0.9205 ( . 358 ) P=0.000	0.9254 ( . 358 ) P=0.000	0.9383 ( . 358 ) P=0.000
PERS2	-0.0729 ( . 358 ) P=0.084	-0.0140 ( . 358 ) P=0.396	-0.0790 ( . 326 ) P=0.077	0.0052 ( . 358 ) P=0.461	0.9205 ( . 358 ) P=0.000	1.0000 ( 0 ) P=*****	0.9442 ( . 358 ) P=0.000	0.9606 ( . 358 ) P=0.000
PERS3	-0.0643 ( . 358 ) P=0.112	0.0088 ( . 358 ) P=0.434	-0.1487 ( . 326 ) P=0.004	0.0132 ( . 358 ) P=0.402	0.9254 ( . 358 ) P=0.000	0.9442 ( . 358 ) P=0.000	1.0000 ( 0 ) P=*****	0.9335 ( . 358 ) P=0.000
PERS4	-0.0593 ( . 358 ) P=0.131	0.0049 ( . 358 ) P=0.463	-0.1029 ( . 326 ) P=0.032	0.0131 ( . 358 ) P=0.403	0.9383 ( . 358 ) P=0.000	0.9606 ( . 358 ) P=0.000	0.9335 ( . 358 ) P=0.000	1.0000 ( 0 ) P=*****

TABLE 60

COEFFICIENTS: PUPIL PERSONALITY WITH PUPIL PERFORMANCE

	PERF1	PERF2	PERF3	PERF4	PERF5
PERS1	0.0054 ( 358) P=0.459	0.1066 ( 358) P=0.022	0.0795 ( 358) P=0.067	0.0460 ( 358) P=0.193	0.0889 ( 358) P=0.047
PERS2	-0.0402 ( 358) P=0.224	0.0431 ( 358) P=0.208	0.0355 ( 358) P=0.246	0.0527 ( 358) P=0.160	0.0482 ( 358) P=0.182
PERS3	-0.0165 ( 358) P=0.378	0.0853 ( 358) P=0.253	0.0644 ( 358) P=0.112	0.0583 ( 358) P=0.133	0.0697 ( 358) P=0.094
-----PERS4-----	-0.0304 ( 358) P=0.284	0.0463 ( 358) P=0.191	0.0396 ( 358) P=0.227	0.0518 ( 358) P=0.164	0.0494 ( 358) P=0.176



TABLE 61  
COEFFICIENTS: PUPIL BACKGROUND WITH PUPIL PERFORMANCE

	PERF1	PERF2	PERF3	PERF4	PERF5
GRADE	0.1752 ( 574) P=0.000	0.2294 ( 574) P=0.000	0.2488 ( 574) P=0.000	0.1793 ( 574) P=0.000	0.2328 ( 574) P=0.000
AGE	-0.0247 ( 574) P=0.278	0.0247 ( 574) P=0.277	0.0109 ( 574) P=0.397	-0.0367 ( 574) P=0.190	-0.0222 ( 574) P=0.298
SEX	-0.0744	-0.0684	-0.0182	-0.0636	-0.1287
	( 574) P=0.037	( 574) P=0.051	( 574) P=0.332	( 574) P=0.064	( 574) P=0.001
SOCIO	0.2142 ( 507) P=0.000	0.2905 ( 507) P=0.000	0.2711 ( 507) P=0.000	0.2733 ( 507) P=0.000	0.2575 ( 507) P=0.000

TABLE 62  
PUPIL MAY AND NOVEMBER PERFORMANCE  
N = 574

NUMBER	EIGENVALUE	CANONICAL CORRELATION	WILK S LAMBDA	CHI-SQUARE	D.F.	SIGNIFICANCE
1	0.81996	0.90552	0.10176	1301.35970	9	0.000
2	0.37477	0.61218	0.56524	324.90316	4	0.000
3	0.09595	0.30976	0.90405	57.44594	1	0.000

COEFFICIENTS FOR CANONICAL VARIABLES OF THE FIRST SET

	CANVAR 1	CANVAR 2	CANVAR 3
PERF3	0.22302	1.37603	-0.34564
PERF4	0.22829	-0.68336	-1.68968
PERF5	0.62744	-0.52345	1.83782

COEFFICIENTS FOR CANONICAL VARIABLES OF THE SECOND SET

	CANVAR 1	CANVAR 2	CANVAR 3
PERF6	0.24508	1.49001	-0.33669
PERF7	0.25516	-0.81062	-1.80235
PERF8	0.57022	-0.54379	1.99536
1CANCORR/INDIV			

TABLE 63

COMPARED CATEGORISATION OF SCHOOLS:  
OPEN, NEUTRAL, TRADITIONAL (ONT)

School No. in Sample	Tasmania Directory (1980)			Analysis: Present Study		
	O	N	T	O	N	T
23			*		*	
30		*				*
55		*			*	
68			*		*	
83			*			*
109			*			*
111		*		*		
112			*			*
114	*				*	
125			*		*	
129			*		*	
132	*			*		
141			*	*		
148			*		*	
151		*				*
183			*	*		
186			*		*	
192	*				*	
196			*			*
202			*	*		
209			*			*
225	*				*	
248	*					*
249	*			*		
250	*			*		
251		*		*		
252			*			*
253			*	*		
CATEGORY TOTALS =	7	5	16	9	10	9