

THE MIGRANT STUDENT

HOME ENVIRONMENT AND SCHOOL ACHIEVEMENT

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ABSTRACT

This investigation sought to clarify possible differences in school achievement between groups defined as migrant students, that is, having parents of non-English speaking origin, and non-migrant students of Anglo-Australian origin. Comparison of the contributions made by home-based variables to the school achievement of such groups was undertaken.

Migrant and non-migrant groups were drawn from 2,367 students who had taken part in the I.E.A. Science Project in 1970, age 14 cohort, and remained at school until 1972. Of these students, 347 had one or both parents of non-English speaking origin; the majority being Italian or Greek (121) and German or Dutch (57).

Examination of Science & Word Knowledge scores collected in 1972, showed lower scores for migrant than non-migrant groups regardless of increasing period of residence in Australia of the migrant families. Significantly lower scores in achievement and verbal ability were also evident for specified groups, viz., Italian or Greek, than for non-migrant, German or Dutch groups. Within the Western and Southern European group (German and Dutch, Italian and Greek) the relationship between test scores and factors defining the home environment (Home Literacy, Parents' Interest (in school), English Use) was examined. Significantly lower test scores were related to lower levels of English Use but intercorrelation between variables prevented further elucidation of the environment - achievement relationship using a factorial design. Investigation of the relationship between factors defining the home environment (Home Literacy, Parents' Interest (in school), English Use) and ethnic origin showed that the Western European group scored significantly higher than the Southern European group on English Use and Home Literacy measures but findings concerning Parents' Interest were ambiguous.

Analysis of the relationships between variables defining the home environment and Science or Word Knowledge scores by step-wise multiple regression changed emphases concerning aspects of the home environment and its influence. The analysis emphasised the significance of relationships involving parents' education and the level of literacy in the home, rather than those involving English use in the home.

Within the Anglo-Australian sample, a parallel relationship emphasising the role of parents' education and home literacy as influences on school achievement is noted. It is argued that the similarity between migrant and non-migrant groups encourages a uniform approach to remedial action directed towards countering underachievement regardless of the ethnic origin of the children.

CHAPTER 1

REVIEW OF THE LITERATURE

Introduction

In 1960 a committee headed by the Honourable Mr. Justice Dovey, reported to the Commonwealth Immigration Advisory Council in the following terms concerning migrant children:

"Most young migrants, about 97 per cent, settle down well to life in Australia and as a group they are above average in scholarship. (p.3)...."in scholastic performance migrants, as a group, surpass Australians.... the children of refugee parents are outstanding in scholarship, leadership, social activities and sporting ability." (p.12)

Yet by 1973, the situation of migrant children was described by a group of sponsors in the following terms:

"Even in the teaching of the most basic skill, English, our schools fail migrant children. Many children lose all hope of making a success of their schooling and are limited to the less skilled occupations and an inferior social status." (D'Urso & Smith, 1978, p.293)

This change in community attitude followed increasing concern over evidence citing low levels of school achievement by migrant children, difficulties of a breadth and duration which had not been contemplated a decade earlier. The urgency of the problem is emphasised when it is considered that, on estimate, in 1976 more than 800,000 children in Australia between the ages of one and nineteen had mothers who were born in non-English speaking countries (Schools Commission, 1978). (See Table 1, p.21).

Early Studies and Later Surveys

Optimism distinguished the Report of the Commonwealth Immigration Advisory Council (1960) (the Dovey Report) and the Survey conducted by the Queensland Department of Education (1961). These reports spoke in terms of the complete integration of the migrant child within one year of arrival, an adequate grasp of English after this period of time and school achievement at least equal to that of Australians within the same class at school.

The "Dovey Report" has since been criticised on many grounds. (Smolicz and Wiseman, 1971). It failed to distinguish between British and non-English speaking migrant groups, as well as between different ethnic groups; data was quoted in terms of percentage response regardless of the numbers of children involved in the class; doubts were cast on the sampling procedures undertaken within the schools and the reliability of teacher response where outside value judgement could result; the validity of a teacher's opinion of a child's ability at "settling in" to school life was also questioned. Similar criticisms are also valid in the case of the Queensland Report, particularly the failure to distinguish between British and non-English speaking groups.

As it became apparent that assimilation was neither as rapid nor complete as had been reported, schools were forced to acknowledge the foreigner within. Publications of the case study type were widespread. These offered advice from personal experience, background information and foreign customs and interviews with children and parents, rather than conclusions based on research evidence.

Information such as the article entitled "Greek Children" Their conflict of Social Patterns & Attitudes" (Migrant Education Work Group, 1970) or Two Worlds: school and the migrant family, (Brotherhood of St, Laurence, 1971) are typical of this stage.

Surveys conducted at a later date also emphasised prolonged language difficulties and poor achievement records. Nicholls (1970) quoted the findings of two New South Wales studies. She reported that primary school children resident in Australia for at least three years still experienced language difficulties, as did secondary students resident at least five years. A large proportion of these children rarely used English at home. Matthews (1973) quoted several studies which emphasised the plight of many children in Victorian schools. Less than 10 per cent of a group of migrant students tested in reading were at their age level or in advance of it. Another survey quoted by Matthews indicated that many students handicapped by language difficulties had been resident in Australia for more than two years. Surveys were undertaken in 1970 and 1974 to establish the numbers and distribution of children with language difficulties (Gallagher & Margitta, 1970; Elliott & Margitta, 1975). The 1970 survey defined a migrant child as having been in Australia for less than six years and with at least one parent whose native tongue was not English. In 1974 the definition was broadened to include a "minority" group as those resident in Australia for more than six years, who had at least one parent whose native tongue was not English and who were considered in difficulty with English. Thus the longer term nature of language acquisition problems was recognized. These studies were concerned with location and description of the migrant population in schools. No attempt was made to assess particular difficulties or the degree of difficulty experienced. In addition, the problems concerning migrant children in school were viewed in terms of language difficulties and the lack of sufficient specialised tuition. The assumed definition of "migrant" as related to insufficient grasp of English to enable learning in the classroom, emphasises the significance placed on language acquisition.

A study by Elliott (1977) concerning migrant education in the City of Fitzroy

outlined the steps taken within this limited group of schools in recognizing the migrant "problem" and attempting to deal with the situation. Once again the emphasis is placed on language acquisition as in the following definition:

"A migrant child is defined as a child who experiences pronounced English language difficulties related to the ethnic origin of his family. This definition focuses on the concept of English language acquisition for migrant children..." (p.15)

Achievement at School

Research evidence to clarify the degree and extent of under-achievement among migrant children has been of varied quality and limited quantity. Findings in several of the following studies are subject to reservations because of a lack of rigour in experimentation of poor sampling technique.

In an extensive study in Victorian primary schools, de Lemos (1975) compared non-English speaking migrants, English speaking migrants and Australian children at Grades 2,4 and 6 levels. She concluded that there were no significant differences in scores on non-verbal intelligence tests between groups but significant differences were evident in verbal intelligence test scores and other achievement tests, regardless of the length of time resident in Australia. De Lemos also reported that the maximum differences in test scores were associated with verbal ability and, in particular, reading comprehension. Her conclusions, however, are not supported by adequate statistical analysis. Differences in verbal ability were also reported by Evans & Poole (1975). Evans & Poole were specifically concerned with the differences between migrant and Australian children of low socio-economic status. They concluded that performance differed between the groups, with the migrant group particularly disadvantaged by a lack of the functional use of language. Migrant pupils performed better in tasks requiring greater cognitive demand so that the deficit in language was less marked.

Weaknesses are evident in this study. The migrant group was selected only from three schools having a high percentage of migrants and the non-migrant group only from three schools having a low percentage of migrants. Sampling both groups from both environments would seem a better alternative. In addition, the "low migrant" schools, while representing areas of low socio-economic status are all classified above the "high migrant" schools in social ranking. It is possible that differences between the schools chosen and between the environments in which the schools are situated could influence apparent differences between the migrant and non-migrant groups under discussion. However, the results are of interest when considered with the findings of Pickering (1971) who also detected differences between ethnic and Australian groups as well as social class differences in verbal ability. Pickering's study attempted to provide Australian and Greek groups of matched socio-economic status at high and low levels, unlike the previous studies discussed (de Lemos, 1975; Evans & Poole, 1975). He concluded that migrant children overcome their initial language disadvantage by Year 3 so that by secondary levels, migrant children and Australian children of lower socio-economic status are on equal footing. This was not supported by these later studies of de Lemos and Evans & Poole.

Apart from data concerned with the influence of inadequately developed oral language on verbal intelligence and achievement scores, differences in the area of cognitive development have been reported. In a preliminary study of Greek children, Kelly et al (1973) found that, of the children who failed on conservation when tested in English, 25 per cent showed conservation when tested in Greek. When the test was repeated in English the children again failed. These children had initially passed a language pre-test. Although this report is not backed by adequate sampling or a complete experimental design, it illustrates the complexity of language acquisition as it influences the education process.

Problem solving strategies have also been examined by Goodnow & Davis (1977), who reported significant differences between matched groups of children of Greek parents and children of Australian born parents, related to the ability to employ grouping strategies in a "20 Questions" task. The differences between ethnic groups appeared to relate to the differential use of known strategies to a given task rather than differences in conceptual level.

Empirical studies concerning the achievement of migrant children at secondary school levels are limited. Wiseman (1971) investigated achievement, home environment and student attitudes among Dutch, Polish and Italian students, both first and second generation members of their particular ethnic community. The Italian and Polish groups scored lower in intelligence tests than the Dutch group and little difference was evident between the first and second generation sub-groups within each ethnic group. This study exhibited many methodological weaknesses: a marked inequality of numbers between groups; lack of uniformity within groups for which no provision was made in analysis (28 per cent of the "Polish" group had Australian mothers and a further 32 per cent had one parent of a European nationality other than Polish); non-uniformity of testing procedures between schools participating in the study; incomplete data on the obtained measures; and inadequate analysis of data. Despite such reservations, the differences reported between ethnic groups and the apparent continued low levels of intelligence test scores in the Italian group born in Australia of migrant parents, warrant further consideration in a more rigorous study.

Further evidence concerning the influence of a migrant background on achievement, even among the second generation group, was provided in the study of Literacy and Numeracy in Australian Schools (Keeves & Bourke; 1976). With particular reference to the migrant group in this study, Hewitt (1977) concluded that the achievement of mastery levels on Reading & Numeracy tests were related to the amount of English spoken in the home, rather than the

length of the family's residence in Australia.

Comparing the total migrant group with the Australian norm indicated a more marked difference in reading mastery than numeracy mastery. Forty-one per cent of 10 year old migrant students had reached an 80 per cent mastery criterion in reading, compared with 53 per cent of Australian students overall. At 14 years, the mastery criterion was reached by 57 per cent of the migrant group compared with 72 per cent of Australian students overall. In numeracy mastery tests, within the migrant group, 68 per cent of 10 year olds and 66 per cent of 14 year olds reached the 80 per cent mastery criterion compared with 75 per cent of Australian students at both age levels.

School Achievement and the Home Environment

Studies concerning the achievement of migrant children have emphasised the influence of the use of English at home (de Lemos, 1975; Hewitt, 1977). However, increasing evidence has become available which relates school achievement with many facets of the home environment within the community at large. This development may be studied in an historical sequence in a review by Walberg & Marjoribanks (1976).

An early study by Campbell (1952) showed that the home environment influenced school achievement in a manner which could be examined in empirical terms. Fraser (1959) reported a higher correlation between variables associated with the home environment and school achievement than between the home environment and I.Q., with particular regard to the influence of the quality of home activities and parental values as well as the material circumstances of the family. Major surveys in Great Britain, the Plowden Report (1967), and the United States of America (Coleman et al, 1966), acknowledged the importance of the home environment in relation to the education of the child.

The analysis of data emerging from surveys such as documented in the "Plowden Report" was possible as a result of the advancements in statistical methods in relation to electronic data processing, allowing for a multivariate approach to the examination of the learning environment of the child. Within Australia, the major contribution employing a multivariate study of variables related to school achievement is that undertaken by Keeves (1972). This worker employed a path analysis approach to clarify the separate influences on achievement of home, peer group and school. Aspects of the home environment, defined as the structural, attitudinal and process dimensions, were found to be separately related to change in achievement in science and mathematics as well as linked in a path model of the educational environment. However, the structural dimension of the home (parents' education, occupation, family size) made only a slight contribution as an independent entity.

As well, some comparison of the influences of home and school on achievement in mathematics and science have been undertaken in studies conducted by the International Association for the Evaluation of Educational Achievement in which Australia participated (Husen, 1967; Comber & Keeves, 1974).

Comber & Keeves have employed a multiple regression approach to compare factors within the students' environment as they influence measured achievement and considerable attention has been paid to the Science test data to clarify home-based influences in relation to the achievement of Australian students.

Information concerning the influence of the home environment on the achievement of the migrant child is limited. Wiseman (1971) questioned Dutch, Polish and Italian students concerning parental assistance with homework and found that the majority of the Dutch group reported such assistance but only a quarter of the Italian group claimed assistance at home.

Similarly, Dutch parents were reported to be much more active in school affairs than the other groups. No attempt was made to relate this information to the achievement differences reported in this study.

Examination of a group of Greek children (Leathart, 1973) provided information that higher achievement was related to increased family involvement with ethnic activities, high parental aspirations for their child's future, community involvement and knowledge of English within the family. The family's prior experiences, present occupational status or material resources had little influence on achievement. This study employed multivariate techniques (canonical correlation) to investigate the relationships of factors associated with the home environment.

De Lemos (1975) also recorded data concerning the home environment in the survey of migrant children at primary levels. Migrant families defined as non-English speaking tended to rank low on socio-economic status, level of parents' education and the frequency of reading in the home. Although separate analyses of variance provided evidence of significant differences between the non-English speaking group and others in relation to these home-based variables, no attempt was made to order the relationships using a multivariate approach. Nor was allowance made for the influence of differences in socio-economic status between groups, in the comparison of test scores recorded by the various language groups.

The family environment in relation to school achievement has received attention from Marjoribanks (1978). This work is of particular interest because it represents a departure in attitude within the group of studies concerning migrant children at school. Whereas other workers have compared migrant groups with Australian students, or compared specified ethnic groups, in order to clarify differences in achievement between groups or specify factors which may influence such differences, Marjoribanks has begun with the unspoken premise that the differences between ethnic groups are fixed.

Ethnic group may then be combined with social class to produce comparative groups defined as "ethclasses". Having fixed ethnic groups as separate entities in this way, the comparison of the Australian experience with the findings in accepted multi-cultural societies such as the United States of America and Canada may follow.

Based on these defined social groupings, Marjoribanks was able to provide evidence of limited support for the combined influence of ethclass and school attitudes in relation to school achievement. The study provided further evidence of the difference in test scores between Greek or Italian students and Australian or English groups of similar socio-economic status; the high level of parental aspirations among Greek parents and the lack of influence of such aspirations on achievement when considered in conjunction with a low motivation to improve English skills.

This work is significant because several aspects of the home environment are included in a multi-dimensional study concerning ethnic background and school achievement. However, it should be considered that were Marjoribanks' concept of "ethclass" to be employed in other studies, an inherent difficulty could be the inability of the original definition of "ethclass" to provide groups which may be compared. Social Status classification of each group was determined by an equally weighted composite of father's occupation, father's education and mother's education.

An alternative to the comparison of school achievement between migrant and Australian born children, is the examination of school attainment. This has been viewed as an equally significant measure as illustrated by the following:

"While it must be acknowledged that there are other outcomes of the educational process that are important, the two that manifestly influence opportunities for future occupation and income are the number of years of education completed-attainment-

and level of performance on tasks of learning-achievement."

(Keeves, 1975, p.49).

Taft (1978) has reported that the attainment of migrant children and successful completion of secondary schooling is high. In his limited sample, the migrant group largely of Southern European origin had a retention rate to Higher School Certificate level double that of the Australian group and within one Convent school with a high proportion of students of Italian origin, successful completion of Higher School Certificate was only slightly lower among the migrant group than the Australian group.

Although this data and the examination of such data is limited, Taft's conclusions are noteworthy because of the marked contrast with the largely gloomy situation projected elsewhere. It would appear that further investigation must be undertaken to allow a reasonable conclusion when such extremes are advanced, as illustrated by the following contrast:

".....our schools fail migrant children. Many children lose all hope of making a success of their schooling...."

(D'Urso & Smith, 1978, p.293). "Migrant school children aim high, have a remarkable capacity for perseverance and have some degree of success, although the latter does not match their aspirations". (Taft, 1978, p.291)

CHAPTER 2

THE PROBLEM FOR INVESTIGATION

Despite the volume of evidence that migrant children and the children of migrants tend to score lower in achievement and verbal intelligence tests than do Australian children of English speaking parents, the possibility of drawing valid conclusions is clouded by methodological deficiencies in many studies. To a large extent, previous workers have concentrated on small-scale empirical studies which have not accounted adequately for the differences between migrant groups. Nor has consideration been directed to the influence of factors associated with the home environment on school achievement. (Evans & Poole, 1975; Pickering, 1971; Wiseman, 1971). The influence of a migrant background has been considered largely in terms of a language problem.

Repeatedly, under-achievement has been reduced to the consequences of the use of little English in the home. This has resulted because, frequently, workers have chosen to define the "migrant" group in terms of ethnic background in conjunction with a limited experience of English at home. (Evans & Poole, 1975; Hewitt, 1977). The degree of English use may define a practical means of scaling the influence of a migrant background but adoption of such a measure prejudices the conclusions reached in investigations. The effect is reinforcement of the view of under-achievement as a language problem.

Alternatively, it is possible to examine three dimensions which define the influence of a non Anglo-Australian background.

The first dimension describes the country of origin of the family (Ethnic Origin). Workers have described differences between specific regional groups in relation to assimilation to the Anglo-Australian society. Timms (1969) concluded that Greek, Yugoslav & Italian migrant communities were

less well assimilated than other European groups, regardless of the time spent in Australia. Wiseman (1971) reported differences between Dutch, Polish and Italian students in regard to ethnic affiliation and identification, with the Italian group more strongly identified by ethnic referents.

"Ethnic Origin" may be considered as defining a qualitative measure of the influence of a migrant background.

The second measure by which a migrant background may be defined is in terms of the duration of the family's residence in Australia (Migrancy). Surveys have indicated that migrant students are over-represented in the group of low achievers even after long terms of residence in Australia (Elliott & Margitta, 1975; de Lemos, 1975). Other workers have described the differences as of a short-term nature (Pickering, 1971). Further comparisons concerning the differences related to "Duration of residence" appear essential.

The third measure concerns the degree to which English is spoken in the home (English Use). Adoption of English by parents may indicate assimilation and the continued use of a foreign language is frequently employed in the definition of the migrant group. Consideration of these three criteria within a diverse population has been lacking. The majority of studies have been restricted to a limited number of schools and, sometimes as a result of this restriction, to a limited range of socio-economic levels. The comparative significance of the criteria in relation to school achievement has not been specified. This study will examine the significance of these three measures using an Australia wide sample representing a wide cross-section of the population of a specified age cohort.

A major shortcoming in prior studies has been inadequate examination of the home environment of the migrant child as it relates to school achievement. Several workers have published data concerning the family environment

but have failed to correlate or order the information (de Lemos, 1975; Wiseman, 1971).

Multivariate examinations were undertaken by Leathart (1973) and Marjoribanks (1978). The information available from the former study is limited because it deals with a small number of subjects from one ethnic community and the latter study is restricted because the ethnic groups represented are limited to a single level of social status, - (working class Italian, working class Greek, etc.). In addition, Marjoribanks has chosen to define the social status of each group, migrant and non migrant, in terms of an equal weighting of parents' education and occupation. One may doubt the suitability of such an assumption when the parents concerned have not been subject to approximately uniform educational opportunities or employment experiences.

The present study would seek to support the proposition that factors not considered in terms of migrant background, but nevertheless associated with the home environment, are of significant influence on school achievement and measured verbal ability of the migrant child. The difference in achievement between Australian and migrant children and between certain ethnic groups should be considered in terms of the influence of the home environment as well as in terms of the influence of a specified ethnic background.

The influence of family attitudes and practices have been emphasised as exerting considerable influence on school achievement within the Australian born community (Keeves, 1972). It is proposed that such differences are of equal significance in the migrant population. Furthermore, the criterion "English Use", may be shown to correlate highly with other family practices. This study will include such family practices as parental involvement with homework and school activities, parental encouragement of reading and educational activities which have been highlighted as influences on children's achievement at school.

In the absence of such measures in previous studies concerning the achievement of migrant children, it is proposed that "English Use" may have received an unwarranted exclusive emphasis as a major influence on the achievement and verbal ability of the migrant child.

In relation to the proposals outlined, the following tasks are considered:-

- a) A comparison of test scores achieved by defined migrant groups and Anglo-Australian students.
- b) A comparison of test scores achieved by migrant groups defined in terms of difference in time resident in Australia.
- c) Comparison of test scores achieved by specified migrant groups and the relationships between such scores and English use in the home, parental interest in schooling and level of home literacy.
- d) Investigation of correlations between English use in the home, parental interest in schooling, home literacy and school achievement.

Operational hypotheses relevant to these tasks are specified in Chapter 4.

CHAPTER 3

DEFINITION OF TERMS

a) The Migrant Student

Any discussion concerned with Australia's "migrant" population is complicated by the diversity of countries of origin, languages and customs which are represented, as well as the varying length of time resident in this country. Table 1 (p.21) illustrates this diversity of origin.

Timms (1969) has shown that different national groups approach assimilation with the Australian born population at different rates. Wiseman (1971) has indicated that comparisons in achievement at secondary school show differences between certain regional groups.

To a large extent, this study is concerned with the comparison of two specific regional groups of European origin. These groups have exhibited, in prior studies, diverse abilities to integrate with the wider Australian society, contrasting attitudes towards the family and maintenance of an ethnic identity (e.g. Wiseman, 1971). The migrant groups considered were established in Australia largely during the post World War II immigration boom. So these communities do not have a large number of recently arrived individuals with outstanding language or assimilation difficulties. The migrant groups specified for comparison have been compared with an English speaking sample of Anglo-Australian origin.

TABLE 1

Estimated population of non-English speaking origin, nineteen and under, 1976.

Origin (a)	Age Group (years)				Total
	0-4	5-9	10-14	15-19	
German	13,820	16,585	15,580	14,705	60,690
Scandinavian	1,325	1,145	1,760	1,155	5,385
Dutch	14,835	15,125	16,145	16,025	62,130
French	1,515	1,520	2,040	1,890	6,965
Swiss	280	330	645	500	1,755
Baltic	1,135	1,390	1,655	2,030	6,210
Russian	1,305	1,615	1,840	2,340	7,100
Polish	4,215	3,205	4,505	6,210	18,135
Czech/Slovak	1,050	925	1,160	1,450	4,585
South Slav	24,280	20,530	18,660	16,255	79,725
Italian	37,670	44,895	49,445	43,035	175,045
Spanish	7,995	6,890	6,460	5,265	26,610
Greek	28,720	34,960	27,320	21,095	112,095
Maltese	11,475	10,840	9,735	11,400	43,450
Arabic	14,350	9,650	7,005	7,675	38,680
Turkish	3,460	3,470	2,980	2,195	12,105
Chinese	6,525	7,015	6,560	8,380	28,480
Indian	7,460	6,805	6,145	9,640	30,050
SE & E. Asian	4,990	4,180	3,905	5,685	18,760
African and minorities	2,270	2,065	2,205	3,000	9,540
Oceania (except New Zealand)	4,275	5,195	4,005	4,095	17,570
Hungarian	1,780	1,925	2,315	2,840	8,860
Estonian & Finnish	1,100	990	1,050	1,460	4,600
Rumanian	200	215	415	495	1,325
Israeli	860	670	510	655	2,695
Total	196,890	202,135	194,045	189,475	782,545 (b)

(a) Country of origin refers to the country in which a person was born, or if born in Australia, the country in which the person's mother was born. Some adjustments have been made for anomalies such as Slav Macedonians born in Greece. Hungarians born in Yugoslavia and Polish and other East European refugees born in refugee camps in Germany.

(b) The estimated total population in Australia between 0-19 years was five million.

Source: Department of Demography. Research School of Social Sciences. Australian National University.

(Schools Commission.

Report for the Triennium 1979-81, 1978)

The following definitions qualify the populations considered in the present study:

1. The Western European Group

Consists of children born either in Australia or Europe but with both parents of German or Dutch birth.

2. The Southern European Group

Consists of children born either in Australia or Europe but with both parents of Italian or Greek birth.

3. The Anglo-Australian Control Group

Consists of those students born in Australia whose parents were both born in an English speaking country.

4. The Total Migrant Sample

Consists of all children whose parents were both born in any non-English speaking country.

English Speaking Country

For the purposes of this study, the term "English speaking country" defines a country in which English is the language commonly spoken in which the population is largely of Anglo-Saxon origin.

The Migrant Group

Throughout this study, the term "migrant" will refer to both first or second generation members of the group. The term is not restricted to the group exhibiting language difficulties or defined in terms of language used at home. The migrant group is defined by the country of birth of the child's parents.

(b) Classification of Migrant Background.

Three separate classifications are defined to enable comparisons of migrant background based on the dimensions previously outlined

(page 16).

1. Ethnic Origin

Qualitative dimension

- (i) Children with both parents born in an English speaking country.
- (ii) Children with both parents of Western European origin.
(Dutch or German)
- (iii) Children with both parents of Southern European origin.
(Italian or Greek)

2. Duration of family's residence in Australia(Migrancy)

Quantitative dimension

- (i) Children born in Australia and with both parents of English speaking origin.
- (ii) Children born in Australia, with one parent of English speaking origin and the other parent of Southern European or Western European origin.
- (iii) Children born in Australia but with both parents of Southern European or Western European origin.
- (iv) Children of Southern European or Western European birth, with both parents of Southern European or Western European origin, who have resided in Australia for at least ten years.
- (v) Children of Southern European or Western European birth, with parents of Southern European or Western European origin, who have resided in Australia for less than ten years.

3. Use of English in the home

Assimilation dimension

- (i) English mainly used in the home by both parents.
- (ii) Some English used in the home by at least one parent.
- (iii) Little or no English used in the home by either parent.

Achievement and verbal ability scores

The hypotheses under examination in this study rely largely on measured differences in achievement between specified groups. This requires a definition of "achievement" for use in the study.

Since the hypotheses are concerned with school achievement, as well as measured verbal ability, it is preferable to employ an achievement test closely associated with school learning. In this case, the test is concerned with Science knowledge, a score generally considered to be more strongly influenced by school than tests concerned with verbal intelligence which may be considered as more closely related to home factors. This consideration played an important part in the rationale for the IEA Study of Science Achievement undertaken in 1970 as the following quotation testifies:

"Study into Science achievement provided an opportunity to examine school effects in this subject area where learning takes place largely within the influence of the school. Underlying the study was therefore the hypothesis that in a predominantly school based subject area such as Science the influence of the school and its teachers would, in contrast to say, Reading, no longer be as small as has been indicated by earlier studies...." (Comber & Keeves, 1973, p.187)

Achievement is defined as the score on a uniform test of Science knowledge corrected for guessing.

A test of word knowledge is employed to provide a verbal ability score. In many situations, word knowledge score is considered as a good correlate of verbal intelligence. In this study, the adoption of the term "verbal intelligence" would be inadvisable since the migrant groups considered may be operating at a disadvantage in such a test.

CHAPTER 4

EXPERIMENTAL

Sampling procedure

This study was undertaken to clarify the relationships between school achievement and the home background of migrant students within secondary schools. Such an examination required the participation of a broad cross section of students at a specified age level within Australian schools so that a complete spectrum of family circumstances and behaviours would be included, as well as an adequate representation of the migrant population as specified.

The International Association for the Evaluation of Educational Achievement, (I.E.A.), Science Project, in which Australia participated during 1970, involved collection of data in nineteen countries to study the relationships between students' achievement in science and various home and school factors (Comber & Keeves, 1973). Special attention was paid to problems concerning sampling and collection of data, to produce achievement and environment data from a large and randomly chosen group of students at age fourteen and sixteen years. In Australia, sampling included Government and non-Government schools in all states so that a proportionate representation within each state was produced. The fourteen year old group also participated in a Follow-up Project in 1972 at age sixteen, providing further test data as well as personal and career choice information.

In particular, the following properties concerning the population under examination in the I.E.A. Study should be noted, together with the suitability of the available data for the proposed examination of hypotheses.

- a) The sample was drawn from the three educational systems - Government, Catholic and Independent, within each state and from metropolitan and country schools. Thus, a wide

range of environment and achievement data is available for examination.

- b) Questionnaires concerning home practice details were completed by students at age fourteen and sixteen years. These provide a broad range of information suitable for a multi-variate investigation. As well, the advanced school age of the children in question lends credence to the information provided in such questionnaires.
- c) Testing was organised by personnel of the Australian Council for Educational Research (A.C.E.R.) as part of the I.E.A. survey. Adequate involvement of school-based co-ordinators was sought to maintain effective test administration and data collection.
- d) Data provided by the participating schools allows for adequate control of school influences on student achievement if such control is required.
- e) Testing at age fourteen and sixteen years provided information concerning a target population which had remained at school beyond the compulsory age of attendance. That is, the population consists of "voluntary" rather than "compulsory" students.

The sampling procedure employed in the I.E.A. Science Project in Australia involved selection of a two-stage stratified random sample from each state. First, schools were selected, with a probability of selection proportional to size, and then twenty-five students of the required age were chosen at random from each school selected. Details concerning sampling and administration of the I.E.A. Science Project have been published (Rosier & Williams, 1973).

The 1970 sample was drawn up to comply with the I.E.A. recommendations that standard errors of sampling of .03 to .04 of a student standard deviation be observed in the national samples. The population size consisted of 950 students per state.

Follow-up data collected in 1972 divided the original fourteen year old sample into two groups - those who had remained at school (Students) and the group who had left school in the intervening two years (Leavers). The present study employs data provided by the Student group and collected in 1970 and 1972.

Collection of test data

Testing of students was carried out under school-appointed supervision during a defined period in 1970 and again in 1972. In 1970, throughout Australia 222 schools were involved in testing 5,250 students chosen on the basis of birth dates from the target population of all students aged 14.0 to 14.11 years at August 1, 1970 and attending normal secondary schools. These students were again approached in 1972 to complete further testing and the experimental data is limited to the results from the 2,367 students who responded and who were still at school. The implications of limitation of the study to retain students is discussed later (p.78). Completed test material was returned to A.C.E.R. for checking and coding. All information available from the 1970 and 1972 testings was later condensed and combined into a single data set suitable for storage and analysis. It is this data set which was made available for the present study. It is described as "I.E.A. Population II and Follow-up" (IEAPOP2).

Generation of experimental groups

The following questions included in the 1972 Questionnaire provided identification of the migrant students in the population:

How long have you lived in Australia?

In which country were you born?

In which country was your father born?

In which country was your mother born?

Do your father and mother speak English at home?

(Separate responses for father and mother were provided).

Restrictions in the collection and storage of data made it necessary to limit this study to the migrant groups defined as Southern European, Western European, other Migrant, together with the Anglo-Australian Control. Table 2 (p.31) describes the distribution of migrant groups in IEAPOP2 and also in the limited sample selected for more particular analysis (IEAPOP2R). The limited sample was generated by taking a random sample of the Anglo-Australian Control group (153 subjects) together with those subjects in the migrant groups with father of the specified ethnic origin. Details concerning the generation of the random control group in IEAPOP2R are available in Appendix 1.

To allow for a simple assignment of subjects to ethnic categories it was desirable that the classification be restricted to one parent. The ethnic origin of the father was chosen. This choice allowed for a comparison with the earlier study by Wiseman (1971) who included a similar "mixed" grouping. In addition, immigration patterns have resulted in a larger number of families in which the father only is of non-English speaking origin than the reverse. In the 1972 IEA study there were a total of 328 students with father of non-English speaking origin and 295 students with mother of non-English speaking origin.

It should be noted that the majority of hypotheses for examination are concerned with those students having both parents of the same ethnic origin, as defined on page 22. An exception is the comparison of test scores associated with migrancy and English Use criteria. In these instances, it seemed preferable to include a group of students with one parent only of non-English speaking origin as an intermediate group.

TABLE 2

Distribution of ethnic groups in the 1972 survey -
Student Sample.

Ethnic Origin of student	Total File (IEAPOP 2)	Restricted File (IEAPOP 2R)	Subfile Title
English Speaking Origin	Both parents 2020 Father only 31 <hr/> Total 2051	(AA1) 150 (AA2) 7 <hr/> 157	Anglo Australian
Italian or Greek Origin	Both parents 100 Father Only 21 <hr/> Total 121	(SE1) 100 (SE2) 18 <hr/> 118	Southern European
German or Dutch Origin	Both parents 39 Father Only 13 <hr/> Total 52	(WE1) 39 <hr/> 10 49	Western European
Other Origins	Both parents 111 Father only 44 <hr/> Total 155	(01) 111 (02) 44 <hr/> 155	Other
Total Students	2379	479	

Test Instruments

a) Criterion variables

1. Science Test 1970

(Appendix IX, Comber & Keeves, 1973)

Two one-hour Science achievement tests containing 80 multiple choice items were administered to the sample students. This test was developed from four sets of pre-tests considered relevant to the sample students. This test was developed from four sets of pre-tests considered relevant to the countries participating in the IEA study and covered the areas of biology, chemistry, physics and practical knowledge. Its development is described by Comber & Keeves (1973).

2. Science Test 1972

(Australian Council for Educational Research, 1972)

A 30 item multiple choice Test covering biology, chemistry, physics. This test is a modified version of the IEA Population II science test described above.

3. Word Knowledge Test, 1970

(Appendix XI, Comber & Keeves, 1973)

A 40 item test, consisting of word pairs. Each pair requires a decision whether the words are similar or opposite in meaning. This test, developed by Thorndike (1973) was designed as a test of verbal ability and has a satisfactory level of equivalence across various English speaking countries.

4. Word Knowledge Test, 1972

(Australian Council for Educational Research, 1972)

A 60 item test, consisting of word pairs.

This test is a modified version of the IEA Population II & IV word knowledge tests described in Comber & Keeves (1973).

Science and Word Knowledge scores were corrected for guessing using the formula.

$$\text{CORRECTED SCORE} = R - (W/(N-1))$$

where R = raw score

W = number of incorrect responses minus
number of items omitted

N = Number of possible alternatives for
each item.

b) Predictor variables.

General Questionnaire 1970

General Questionnaire 1972

(Australian Council for Educational Research, 1972) Data collected from the students during the 1970 and 1972 surveys supplied information concerning home circumstances and family practices as well as other factors associated with their education. A composite file containing information collected on either of these occasions and restricted to thirty-nine relevant variables was employed in the present study. Largely, variables were restricted to those which expressed in numerical terms, the student answers to single questions posed in either of the questionnaires. That is, the majority were primary variables. However, certain variables required recoding to maintain positive correlations between variables, while some others, ("English Use", "Home Literacy" and "Parents' Interest" were generated from information collected as primary variables. (See Appendix 3). The construction and selection of variables from the raw data is described by Rosier (1978). The present study was concerned solely with selection of relevant information from the completed data set entitled "IEA Population II & Follow-up" and not with the generation of such variables.

School Information

Background information concerning the participating schools was also obtained from school principals in 1970 and 1972. Only a limited number of items obtained from the schools were employed in the present study.

A list of the variables included in the data file, together with frequency distributions of the respondents, is included in Appendix 2.

Examination of the data

Two aspects of the data collected during the IEA survey and follow-up are to be examined. The first is a comparison of migrant and non-migrant groups in relation to ethnic differences. This involves the examination of the specific hypotheses defined below.

- a) Comparison of test scores achieved by Anglo-Australian and defined migrant groups.

Hypothesis 1.

Scores in tests of Science and Word Knowledge will be significantly higher for students of Anglo-Australian and Western European origin than scores for students of Southern European origin.

Hypothesis 2.

Within the combined Southern European and Western European groups, scores obtained by Australian born children of "European" parents in tests of Science and Word Knowledge will be significantly higher than those obtained by children who are themselves of "European" birth.

- b) Comparison of test scores achieved by defined migrant groups in relation to factors associated with the home environment.

The basis of this study is that significant differences in school achievement are evident both between "migrant" and non migrant" groups as well as between groups within the "migrant" population. Further, these differences may be related to differences in factors associated with the home environment and with the influence of a migrant background on home practices. Investigation of the following hypothesis is undertaken to distinguish the influence of certain home factors on achievement and verbal ability.

Hypotheses 3

Within the combined Southern European and Western European groups, scores in tests of Science and Word Knowledge are significantly higher.

- a) when English Use (in the home) is higher
 - b) when Parents' Interest (in school) is higher
 - c) when Home Literacy is higher
- c) Examination of differences in data related to the home environment, undertaken within defined migrant groups. Prior studies have indicated significant differences between migrant groups as variously defined, in relation to degree of assimilation, attitudes to school, retention of ethnic identity (Timms, 1969; Marjoribanks, 1978; Wiseman, 1971). If Hypothesis 3 is upheld in the present investigation, examination of the following hypothesis is undertaken to distinguish between ethnic groups in terms of differences in specific home-based variables which may be related to school achievement.

Hypothesis 4

Students with both parents of Western European birth will score significantly higher than the corresponding Southern European group in the following measures:

- a) Parents' Interest (in school)
- b) English Use (in the home)
- c) Home Literacy

The comparisons specified in Hypotheses 3 and 4 are undertaken in a factorial design to enable comparisons between defined groups in relation to home habits and school achievement. The bases of these analyses are as described by Nie et al (1975) and a classical experimental design was employed. Such analysis, while adequate to identify support for the hypotheses proposed, is unsuited to further investigations involving comparisons between factors associated with the home environment as they relate to school achievement. Such an undertaking requires techniques associated with correlation of variables (see Appendix 4).

The second aspect of the data for examination is concerned with the comparison of variables. Correlations between family circumstances and practices and test scores are to be examined. Such analysis is undertaken to establish which home-based variables make contributions of a significant magnitude to explained variances in Science and Word Knowledge scores in a multiple regression statement. Particular attention is given to English Use, Parents' Interest and Home Literacy.

Consideration of defined hypotheses is not proposed in such a basically exploratory analysis. Multiple regression may signify an order among the group of home-based variables included in this survey, according to the relative contribution of each variable to the variation in test scores. The validity of such an analysis is limited by difficulty in expressing all relevant information in terms which allow a relationship with the criterion variable. Much information associated with the home environment can be expressed in such terms. For example, Parents' Interest, and Migrancy define variables which may be, within the context of this study, related to the criterion test scores in terms of "mathematical" relationships. Ethnic Origin cannot be considered in such terms. Ethnic Origin is an unordered categorical variable as against the others which are metric variables.

Regression studies are broadened to include examination of the Total Migrant Sample, regardless of ethnic origin. Data collected from all students with both parents of non-English speaking origins are included in the analysis. Comparison can also be made between the total Migrant Sample and an English speaking sample as defined in Appendix 1, in relation to a number of predictor variables.

Previous studies have largely neglected comparisons between predictor variables associated with the home environment. While other workers have reported significant differences in test scores between migrant and English speaking groups, English use in the home was the assumed cause of such differences on the basis of concurrent fluctuations in variance between test scores and English use and by definition of the "migrant" group in terms of families maintaining their native language at home.

Variables associated with the home environment are frequently correlated to a significant degree. Within the group of variables defined as home constructs one would expect significant correlations between parents' education and occupations, mother's education and father's education; between home practices such as level of literacy and parents' participation in school activities, and between migrant based factors such as English use and duration of residence in Australia. One would expect differences between migrant and non-migrant groups concerning correlations of home constructs and practices. These should be of significance to the outcome of this study.

The relative influence of each predictor variable is dependent on its correlation with the criterion and also on its relationships with other predictors. Peaker (1971) divided predictors into sets on an historical basis; these sets were entered into the regression analysis in chronological order.

The contribution of each set was given by the reduction in unexplained variance accompanying its inclusion in the regression statement. Keeves (1972) also employed an hierarchical method. In addition, within each set, stepwise multiple regression eliminated variables not making a consistent significant contribution to the regression statement.

The regression analysis proposed assumes that variables representing the educational environment may be divided into "blocks" based on the chronological sequence in which these "blocks" influence achievement. Regression solution in steps is then possible.

- a) Stepwise inclusion (Nie, et al, 1975). Within each "block", variables are entered in the regression statement in the order which provides maximum reduction in unexplained variance at each step. Variables are entered only if they meet certain statistical criteria. The result is isolation of a subset of available predictor variables yielding an optimal prediction equation with as few terms as possible.
- b) Hierarchical inclusion (Nie, et al, 1975). A combination of home constructs and home habits in which the subset of predictor variables isolated in Block 1 enters the regression statement before variables in Block 2.

The examination of change in regression coefficients is undertaken to provide further knowledge of the inter-relationships among predictor variables.

RESULTS

1. COMPARISON OF TEST SCORES AND THE EXAMINATION OF RELATED HYPOTHESES.

Table 3 (p.35) summarises the differences in test scores between the migrant and non migrant groups as defined by the criteria previously cited (p. 19). In relation to Table 3, the following should be noted:

- a) Ethnic Origin. The sample is limited to those students having both parents of the same European ethnic origin in order to clarify possible ethnic differences within the European group. (Table 2: AA1, SE1, WE1).
- b) Migrancy. The sample includes students with one or both parents of European birth and is not restricted to parents of the same ethnic origin. (Table 2: AA1, AA2, SE1, SE2, WE1, WE2).
- c) English Use. The sample is restricted to those students with at least one parent of European birth. (Table 2: SE1, SE2, WE1, WE2).

Analysis of variance associated with the groups defined by the criteria are summarised in Table 4 (pp.36,37).

HYPOTHESIS 1 - Ethnic Origin

Scores in tests of Science and Word Knowledge will be significantly higher for students of Anglo-Australian and Western European origin than scores for students of Southern European origin.

Lower scores are recorded for the Southern European group in both Science and Word Knowledge (Table 3). Significance tests support differences between groups defined in terms of Ethnic Origin (Table 4 (a)). Orthogonal contrasts indicate that the significant contrast is between the Southern European group and the "rest" for both Science and Word Knowledge.

(Gp 1, 2 vs Gp 3)

HYPOTHESIS 2 - Migrancy

Within the combined Southern and Western European groups, scores obtained by Australian born children of "European" parents in tests of Science and Word Knowledge will be significantly higher than scores obtained by students who are themselves of "European" birth.

Some differences between groups recorded in Table 4(b) are significant. Orthogonal contrasts support Hypothesis 2 in relation to Science but not Word Knowledge scores. In addition, for both Science and Word Knowledge, highly significant differences are recorded between the group of students with both parents of Anglo-Australian birth and the "rest" (Gp 1 vs Gp 2, 3, 4, 5), with the Anglo-Australian group scoring higher.

English Use as a criterion of migrant influence also defined significantly different groups in relation to Science and Word Knowledge scores. Orthogonal contrasts of significance are also recorded in Table 4(c).

Test Scores.

a) Groups defined by ethnic origin - (Anglo-Australian, Western European and Southern European subfiles. Restricted to both parents of same ethnic origin.)

Group	Science 1972			Word Knowledge 1972		
	N	Mean	s.d.	N	Mean	s.d.
Both parents Anglo-Australian	150	13.17	6.51	150	30.82	14.29
Both parents Western European	39	12.40	6.80	39	30.46	11.90
Both parents Southern European	100	9.62	6.62	100	22.82	12.56

b) Groups defined by Migrancy - (Anglo-Australian, Southern European and Western European subfiles.)

Group	Science 1972			Word Knowledge 1972		
	N	Mean	s.d.	N	Mean	s.d.
Both parents Anglo-Australian	150	13.24	6.51	150	31.09	14.29
One parent European born; Aust- ralian born subject	41	11.27	7.96	41	23.80	12.39
Both parents European born; Aust- ralian born subject	92	11.18	6.55	92	26.33	13.29
Subject European born and > 10 years residence	30	9.81	5.68	30	22.03	12.76
Subject European born and < 10 years residence	17	7.26	6.97	17	22.76	9.15

c) Groups defined by English Use in the home - (Southern European and Western European subfiles.)

Group	Science 1972			Word Knowledge 1972		
	N	Mean	s.d.	N	Mean	s.d.
High	23	13.66	7.60	23	29.64	12.62
Moderate	51	11.49	6.43	51	27.47	12.12
Low	91	9.15	5.32	91	22.37	12.85

a) Ethnic Origin (See Table 3A)

Source	Science					Word Knowledge				
	df	S.S.	M.S.	F	P	df	S.S.	M.S.	F	P
Between										
Gp1, vs Gp2	1	18.37	18.37	0.43	n.s.	1	4.01	4.01	0.02	n.s.
Gp1,2 vs Gp3	1	554.19	554.19	13.04	<.001	1	3383.25	3383.25	18.49	<.001
Within	286	12147.67	42.47			286	52326.02	182.95		
Total	288	12720.23				288	55713.28			

b) Migrancy (See Table 3B)

Source	Science					Word Knowledge				
	df	S.S.	M.S.	F	P	df	S.S.	M.S.	F	P
Between										
Gp2,3 vs Gp4,5	1	227.19	227.19	5.28	<.05	1	223.82	223.82	1.25	n.s.
Gp4 vs Gp5	1	70.67	70.67	1.64	n.s.	1	5.78	5.78	.03	n.s.
Gp2 vs Gp3	1	0.23	0.23	.01	n.s.	1	525.28	525.28	2.94	n.s.
Gp1 vs Gp2,3,4,5	1	772.59	772.59	17.95	<.01	1	3707.07	3707.07	20.75	<.01
Within	325	13986.90	43.03			325	58053.33	178.62		
Total	329	15057.58				329	62515.28			

TABLE 4 (continued)

c) English Use (See Table 3C)

<u>Source</u>	Science					Word Knowledge				
	df	S.S.	M.S.	F	P	df	S.S.	M.S.	F.	P.
Between										
Gp1,2 vs Gp3	1	438.93	438.93	10.53	<.01	1	1431.40	1431.40	9.28	<.01
Gp1 vs Gp2	1	74.74	74.74	1.79	n.s.	1	74.74	74.74	0.48	n.s.
Within	162	6750.37	41.66			162	24978.06	154.18		
Total	164	7264.04				164	26484.20			

2. EXAMINATION OF THE INFLUENCE OF THE HOME ENVIRONMENT AND ETHNIC BACKGROUND OF EUROPEAN GROUPS ON TEST SCORES.

Hypothesis 3

Within the combined Southern European and Western European groups, scores in tests of Science and Word Knowledge are significantly higher;

- a) when English Use is higher
- b) when Parents' Interest is higher
- c) when Home Literacy is higher.

Parents' Interest and Home Literacy, as derived in Appendix 3, were recoded as high and low categories. English Use was divided into the three levels described in Table 5(a) (p.40). The sample consisted of those students with both parents of the same European origin (Table 2: SEI, WEL), totalling 139 cases. Missing data reduced for analysis to 129.

The influences on test scores of English Use, Parents' Interest and Home Literacy were examined. Marked differences in means were recorded in relation to English Use, with higher test scores associated with higher English Use values. Differences in Parents' Interest and Home Literacy scores were not associated with differences in test scores. Table 5(a) summarises the comparison of means associated with English Use differences.

Significance tests were undertaken using the classical experimental approach described by Nie, et al (1975). Main effects estimates were obtained from the additive model after interactions were given by the residual components of the effects of the factors. This method was employed because a logical sequence within the factors was not evident and the prime objective was the examination of main effects introduced in the hypothesis. When this method is employed, a significant result may be observed for the total of all main effects while individual main effects remain non-significant, if factors are strongly correlated.

Tables 5(b) and 5(c) summarise the significance tests. Father's occupation was included in the analysis to allow for possible interactions with the hypothesised factors. However, there are no significant interactions recorded.

Concerning Science results, English Use is the sole main effect of significance. For Word Knowledge, English Use and Father's Occupation are significant.

In the case of Home Literacy and Parents' Interest, Hypothesis 3 is not upheld by these results. Significant correlations between main effects (Table 6) would influence conclusions based on this data. As already described, a factorial design may be considered unsuited to variables exhibiting such correlation. The examination of Hypothesis 3 is therefore limited to the following observations.

- a) Ethnic background, as represented by English Use, is of significant influence on Science and Word Knowledge, with higher levels of English Use associated with higher test scores.
- b) Intercorrelations inhibit clarification of the role of other aspects of the home environment.

The multiple regression analysis displayed in Tables 8 and 9 are undertaken to further elucidate these points.

TABLE 5(a)

Comparison of means associated with significant main effects (Hypothesis 3).

A) Main Effect - English Use

English Use	Science	Word Knowledge	Valid Cases
Low	9.27	22.37	88
Moderate	12.17	29.04	42
High	19.35	44.00	4

B) Main Effect - Father's Occupation

Father's Occupation	Science	Word Knowledge	Valid Cases
Unskilled, Semiskilled	9.03	21.56	57
Skilled, Clerical	11.46	26.53	41
Managerial, Professional	11.28	29.58	36

Parents' Interest. Low/High
 Home Literacy. Low/High
 English Use. Low/Moderate/High

Source of variation	S.S.	d.f.	M.S.	F.	p.
<u>Main Effects:</u>	765.35	6	127.55	3.08	.008
A. Father's Occupation	151.26	2	75.63	1.82	n.s.
B. Parents' Interest	19.20	1	19.20	.46	n.s.
C. Home Literacy	24.42	1	24.42	.59	n.s.
D. English Use	517.41	2	258.71	6.24	.003
<u>2-way Interactions:</u>	443.20	12	36.93	.89	n.s.
AB	167.74	2	83.87	2.02	n.s.
AC	100.60	2	50.30	1.21	n.s.
AD	171.67	4	42.91	1.03	n.s.
BC	8.31	1	8.31	.20	n.s.
BD	57.42	2	28.71	.69	n.s.
CD	6.61	1	6.61	.16	n.s.
<u>3-way Interactions:</u>	95.88	7	13.69	.33	n.s.
ABC	19.87	2	9.93	.24	n.s.
ABD	60.17	2	30.09	.72	n.s.
ACD	47.02	2	23.51	.56	n.s.
BCD	2.04	1	2.04	.04	n.s.
Explained	1304.44	25	52.17	1.26	
Residual	4266.34	103	41.42		
Total	5570.78	128	43.52		
139 cases processed					
10 cases were missing					

Word Knowledge by Father's Occupation. Unskilled, semi-skilled/skilled, clerical/managerial, professional.
1972

Parents' Interest. Low/High
Home Literacy. Low/High
English Use. Low/Moderate/High

Source of variation	S.S.	d.f.	M.S.	F.	p.
<u>Main Effects:</u>	4068.44	6	678.07	4.44	.001
A. Father's Occupation	1264.56	2	632.28	4.14	.019
B. Parents' Interest	150.83	1	150.83	.99	n.s.
C. Home Literacy	159.57	1	159.57	1.04	n.s.
D. English Use	2109.13	2	1054.57	6.91	.002
<u>2-way Interactions:</u>	1081.26	12	90.10	.59	n.s.
AB	1.54	2	.77	.005	n.s.
AC	343.46	2	171.73	1.12	n.s.
AD	475.08	4	118.77	.77	n.s.
BC	11.33	1	11.33	.07	n.s.
BD	187.24	2	93.62	.61	n.s.
CD	40.28	1	40.28	.26	n.s.
<u>3-way Interactions:</u>	706.68	7	100.95	.66	n.s.
ABC	228.46	2	114.23	.74	n.s.
ABD	177.92	2	88.96	.58	n.s.
ACD	11.93	2	5.96	.03	n.s.
BCD	79.36	1	79.36	.52	n.s.
Explained	5856.39	25	234.25	1.53	
Residual	15700.82	103	152.43		
Total	21557.22	128	168.41		
139 cases processed					
10 cases were missing					

TABLE 6

Intercorrelations among main effects (Hypothesis 3)
 (Western European and Southern European subfiles)

	B	C	D
A. Father's Occupation	0.965	.0717	.2269 *
B. Parents' Interest		.3615 *	.1726 *
C. Home Literacy			.0596
D. English Use			

* Denotes probability < 0.05

3. EXAMINATION OF THE INFLUENCE ON FAMILY PRACTICES OF ETHNIC ORIGIN AND FAMILY CIRCUMSTANCES

Hypothesis 4

Students with both parents of Western European birth will score significantly higher than the corresponding Southern European group in the following measures.

- a) Parents' Interest (in school)
- b) English Use (in the home)
- c) Home Literacy

A similar approach was taken to the examination of Hypothesis 3. Table 7(a) (p.) summarises the comparison of means associated with difference in ethnic origin. The Western European group score significantly higher for English Use and Home Literacy but no significant difference between groups was apparent for Parents' Interest.

Table 7(b, c & d) summarise the accompanying significance tests. Parents' Occupation, Sex and Family Size were included in the analysis to allow for possible interactions.

In the analysis of Parents' Interest scores (Table 7(b)) significant interaction between Ethnic Origin and Father's Occupation is evident. The data is summarised in Table 7(e) and Figure 1 and presents a complex set of circumstances, making interpretation difficult (Appendix 4).

Table 7(c), summarising English Use scores, also indicates a significant interaction between Ethnic Origin and Sex (Table 7(e) and Figure 2). In this case, the difference in English Use between ethnic groups is greater for boys than girls. This difference will also be discussed later, but it should be noted here that the overall comparison between ethnic groups

is significant despite the discrepancy between the sexes.

No significant interactions are recorded in Table 7(d) summarising Home Literacy tests.

Hypothesis 4 is upheld for English Use and Home Literacy, with the Western European group scoring significantly higher than the Southern European group. Concerning Parents' Interest, no significant difference is apparent and interactions inhibit conclusions concerning this factor.

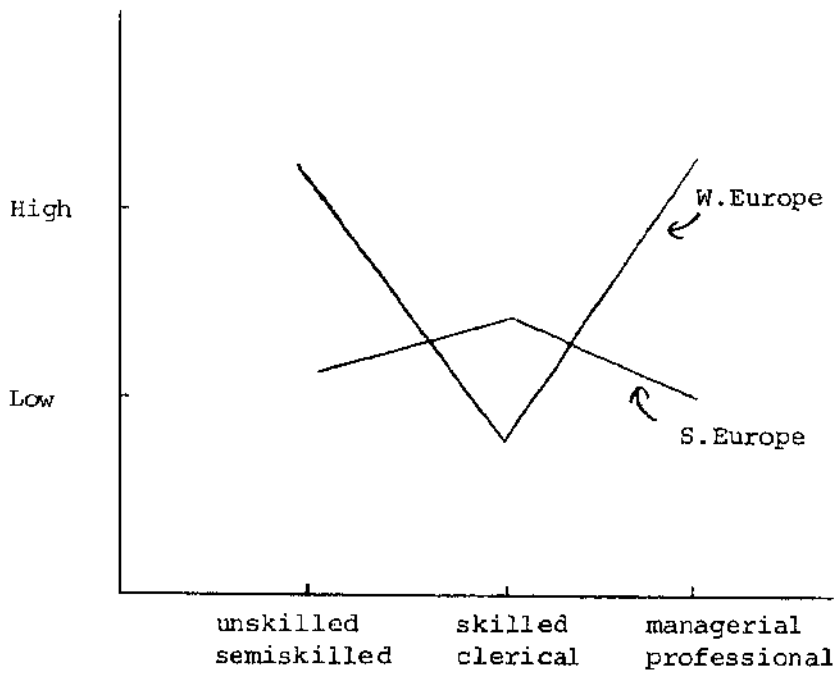


Figure 1. Graphical interpretation of significant interaction in analysis of Parents' Interest scores.
- Father's Occupation/Ethnic Origin.

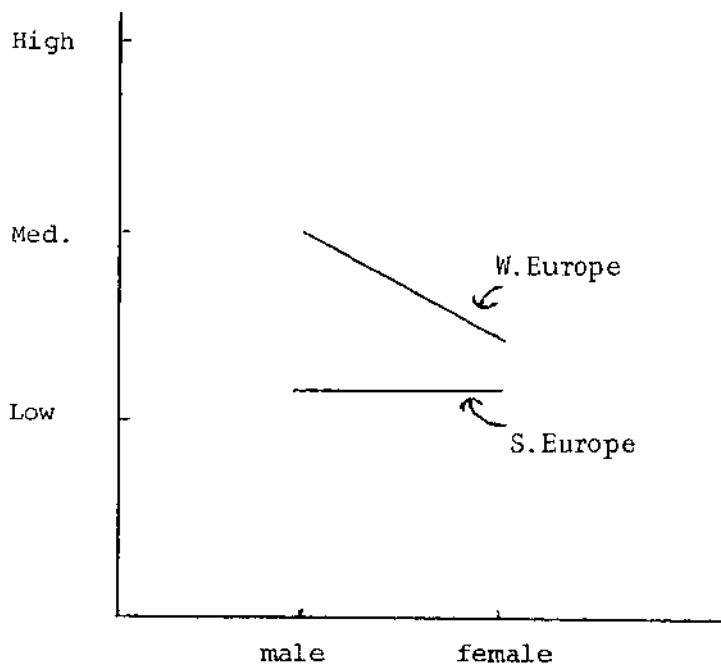


Figure 2. Graphical interpretation of significant interaction in analysis of English Use scores
- Sex/Ethnic Origin

TABLE 7(a) Comparison of means associated with difference in Ethnic Origin (Hypothesis 4).

Sample restricted to students having both parents of same Ethnic Origin.

Ethnic Origin	Parents' Interest		English Use		Home Literacy	
	N	Mean	N	Mean	N	Mean
Southern European	96	1.22	98	*1.23	96	*1.96
Western European	37	1.59	35	*1.76	37	*2.65

*Significant difference between groups.

Father's Occupation Unskilled, semiskilled/skilled, clerical/managerial,
professional

Sex Male/Female

Family Size 3 children or less/more than 3 children

Source of variation	S.S.	d.f.	M.S.	F.	p.
<u>Main Effects:</u>					
A. Ethnic Origin	6.07	1	6.07	2.68	n.s.
B. Father's Occupation	2.06	2	1.03	.45	n.s.
C. Sex	.16	1	.16	.07	n.s.
D. Family Size	14.50	1	14.50	6.40	.013
<u>2 way Interactions:</u>					
AB	20.47	2	10.23	4.52	.013
AC	.00	1	.00	.00	n.s.
AD	.04	1	.04	.02	n.s.
BC	1.85	2	.92	.40	n.s.
BD	5.52	2	2.76	1.22	n.s.
CD	.07	1	.07	.03	n.s.
<u>3 way Interactions:</u>					
ABC	2.93	2	1.46	.64	n.s.
ABD	.90	2	.45	.19	n.s.
ACD	2.84	1	2.84	1.25	n.s.
BCD	5.94	2	2.97	1.31	n.s.
Explained	59.00	21	2.81	1.24	
Residual	242.20	107	2.26		
Total	301	128	2.35		
139 cases processed					
10 cases were missing					

English Use by Ethnic Origin.

Western European/Southern European

Father's Occupation. Unskilled, semi-skilled/skilled, clerical/managerial,
professional

Sex Male/Female

Family Size 3 children or less/more than 3 children

Source of variation	S.S.	d.f.	M.S.	F.	p.
<u>Main Effects:</u>	8.39	5	1.67	7.31	.001
A. Ethnic Origin	6.43	1	6.43	28.04	.001
B. Father's Occupation	.57	2	.28	1.25	n.s.
C. Sex	.57	1	.57	2.52	n.s.
D. Family Size	.16	1	.16	.70	n.s.
<u>2 way Interactions:</u>	3.47	9	.38	1.66	n.s.
AB	.10	2	.05	.22	n.s.
AC	2.08	1	2.08	9.09	.003
AD	.55	1	.55	2.40	n.s.
BC	.66	2	.33	1.45	n.s.
BD	.13	2	.07	.30	n.s.
CD	.00	1	.00	.01	n.s.
<u>3 way Interactions:</u>	2.25	7	.32	1.40	n.s.
ABC	.79	2	.39	1.72	n.s.
ABD	1.15	2	.57	2.50	n.s.
ACD	.00	1	.00	.01	n.s.
BCD	.37	2	.19	.82	n.s.
Explained	14.07	21	.67	2.92	
Residual	24.54	107	.22		
Total	38.62	128	.30		

139 cases processed

10 cases were missing

Father's Occupation. Unskilled, semi-skilled/skilled, clerical/managerial professional

Sex. Male/Female

Family Size 3 children or less/more than 3 children

Source of variation	S,S,	d.f.	M.S.	F.	p.
<u>Main Effects:</u>	24.90	5	4.98	2.11	.06
A. Ethnic Origin	11.29	1	11.29	4.79	.03
B. Father's Occupation	3.42	2	1.71	.72	n.s.
C. Sex	6.37	1	6.37	2.70	n.s.
D. Family Size	5.90	1	5.90	2.50	n.s.
<u>2 way Interactions:</u>	15.79	9	1.75	.74	n.s.
AB	7.30	2	3.65	1.55	n.s.
AC	1.48	1	1.48	.63	n.s.
AD	4.39	1	4.39	1.86	n.s.
BC	.67	2	.33	.14	n.s.
BD	3.25	2	1.62	.69	n.s.
CD	.87	1	.87	.87	n.s.
<u>3 way Interactions</u>	21.73	7	3.10	1.31	n.s.
ACD	10.48	2	5.24	2.22	n.s.
ABD	1.79	2	.89	.38	n.s.
ACD	2.51	1	2.51	1.06	n.s.
BCD	3.81	2	1.90	.81	n.s.
Explained	62.44	21	2.97	1.26	
Residual	251.94	107	2.35		
Total	314.38	128	2.45		

139 cases processed

10 cases were missing

A. Criterion - Parents' Interest

Interaction - Ethnic Origin/Father's Occupation.

Father's Occupation	Parents' Interest		Parents' Interest	
	N	Mean	N	Mean
Unskilled, semi-skilled	51	1.18	6	2.17
Skilled, clerical	23	1.44	17	0.77
Managerial, professional	22	1.05	14	2.22
<p>B. Criterion - English Use</p> <p>Interaction - Ethnic Origin/Sex</p>				
	Southern European		Western European	
Sex	English Use		English Use	
	N	Mean	N	Mean
Male	57	1.23	20	2.00
Female	41	1.24	15	1.46

4. COMPARISON OF THE RELATIONSHIPS BETWEEN HOME VARIABLES AND SCHOOL ACHIEVEMENT AMONG STUDENTS OF UNSPECIFIED MIGRANT BACKGROUNDS

a) Correlation Matrices

Table 8(a) summarises the inter-correlations between the home variables for students with both parents of non-Anglo-Australian origins. Several variables are strongly correlated, particularly those defining parents' education and occupation with those defining family practices (language, interest in school, literacy).

Correlations between significant predictor variables and the criterion variables (Science & Word Knowledge) are also recorded in Tables 8(b) and (c). In relation to Science scores, Years in Australia does not correlate significantly (at the .05 level) with the criterion, nor does Parents' Interest. The negative correlation co-efficient for the Sex-Science relationship indicates a significantly higher score among the male sample. In the case of Word Knowledge scores, Mother's Education, Father's Occupation and Father's Education are significantly correlated and, in addition, English Use and Home Literacy maintain significant correlations with Word Knowledge.

b) Stepwise regression analyses

Stepwise multiple regression analyses were performed on the three dimensions isolated for examination in this study. These consisted of -

1. HOME CONSTRUCTS. Variables defining the family and its socioeconomic status.
2. HOME HABITS. Variables describing family practices.

3. SCHOOL CONSTRUCTS. Variables influencing achievement but unrelated to the family or the immediate environment.

Variables were permitted to enter the equation according to the value of the F ratio computed in a test of significance of the regression coefficient. (F to enter and remove = 3.0). Variables entered the equation in the order which provided maximum explanation of variance in the dependent variable with each step.

Table 8(b) summarises three stepwise multiple regression analyses performed in relation to Science score. Considering Home Constructs, Mother's Education is the most powerful variable while Sex and Family Size remain significant in terms of explained variance. Considering Home Habits, English Use and Home Language both maintain significant relationships with Science, School Constructs significant in explaining variance in Science score are Form and School System.

In the case of Word Knowledge scores, stepwise multiple regression runs again provide a changed perspective to the simple correlation matrix. (Table 8(c)). Mother's Education and Father's Occupation remain significant Home Constructs but Father's Education does not maintain a significant independent contribution whereas Years in Australia is included in the regression statement. Both English Use and Home Literacy maintain significant contributions to the explained variance in Word Knowledge score but once again, Parents' Interest is excluded. Once again, the School Construct variables included in the regression statement are Form and School System.

To isolate the subset of home-related variables which would yield an optimal prediction equation as concisely as possible, Home Constructs and Home Habits were combined and a further stepwise regression analysis performed. This procedure was undertaken with Peaker's assumption that "prior events may influence later events" (Peaker, 1971, p.15) so that the group of variables

considered as Home Constructs were introduced into the equation before the group of variables described as Home Habits.

In the analysis between Science & "Home Variables", the total variance explained by Home Constructs has been reduced from 14.43 per cent to 12.49 per cent and 7.8 per cent explained by Home Habits in addition to this amount. The contributions of Mother's Education & Home Language have been reduced by about 40 per cent as a result of the combination of dimensions.

The stepwise regression analysis between Word Knowledge & "Home Variables" produced a reduction from 12.67 per cent explained variance in relation to Home Constructs to 8.35 per cent, with an additional 10.71 per cent due to Home Habits. Once again Mother's Education, Home Language as well as Home Literacy have been reduced as contributors to explained variance in Word Knowledge score as a result of the joint analysis.

TABLE 8(a) Intercorrelation among predictor variables

Total Migrant Sample

		2	3	4	5	6	7	8	9
Mother's Education	1	0.59 *	0.25 *	-0.05	0.15 *	0.01	0.36 *	0.17 *	0.18 *
Father's Education	2		0.35 *	0.02	0.07	0.05	0.32 *	0.15 *	0.19 *
Father's Occupation	3			-0.01	-0.08	0.01	0.32 *	0.12	0.16 *
Sex	4				-0.01	0.08	-0.06	0.15 *	0.12
Family Size (Reversed)	5					0.00	-0.02	0.08	0.19 *
Years in Australia	6						-0.09	0.00	0.12
English Use	7							0.09	0.15 *
Home Literacy	8								0.36 *
Parents' Interest	9								

* denotes probability $< .05$

TABLE 8(b)

MULTIPLE REGRESSION
Science 1972
TOTAL MIGRANT SAMPLE

Step	Variable entered	F to enter	r	b	rbx100 % variance
<u>HOME CONSTRUCTS</u> Block 1.					
1	Mother's Education	18.25 *	.27504 *	.23989	6.59
2	Sex	11.64 *	-.22994 *	-.21506	4.94
3	Family Size (Reversed)	5.83 *	.18991 *	.15205	2.88 (100 R ² = 14.43)
Variables excluded (F < 3.0)	Years in Australia Father's Education Father's Occupation		-.09198 .21871 .14992		
<u>HOME HABITS</u> Block 2.					
1	English Use	13.05 *	.23520 *	.21589	5.07
2	Home Literacy	9.15 *	.21587 *	.19443	4.19 (100 R ² = 9.26)
Variables excluded (F < 3.0)	Parents' Interest		.00753		
<u>SCHOOL CONSTRUCTS</u> Block 3.					
1	Form 1972	28.17 *	.31750 *	.31591	10.03
2	System	7.87 *	.16998 *	.16998	2.83 (100 R ² = 12.87)
Variables excluded (F < 3.0)	Program 1970 Region		-.08813 .00679		

* denotes probability < .05

r denotes simple correlation coefficient

b denotes standardised partial regression coefficient

rbx100 coefficient of contribution

TABLE 8(c)

MULTIPLE REGRESSION
Word Knowledge 1972
TOTAL MIGRANT SAMPLE

Step	Variable entered	F to enter	r	b	rbx100% variance explained
<u>HOME CONSTRUCTS</u>					
1.	Mother's Education	18.20 *	.27474 *	.22671	6.22
2.	Father's Occupation	8.71 *	.25127 *	.19202	4.82
3.	Years in Australia	4.13	-.12664	-.12785	1.61 (100R ² = 12.67)
Variables excluded (F < 3.0)	Sex Father's Education Family Size (Reversed)		.05072 .26352 .06452		
<u>HOME HABITS</u>					
1.	English Use	26.79 *	.32754	.30787	10.08
2.	Home Literacy	10.09 *	.22862 *	.19804	4.52 (100R ² = 14.61)
Variables excluded (F < 3.0)	Parents' Interest		.02330		
<u>SCHOOL CONSTRUCTS</u>					
1.	Form 1972	42.36 *	.38263 *	.37105	14.19
2.	System	11.06 *	.19527 *	.28513	5.56 (100R ² = 19.38)
Variables excluded (F < 3.0)	Program 1970 Region		.06432 -.05246		

* denotes probability < .05

TABLE 8(d)

MULTIPLE REGRESSION

TOTAL MIGRANT SAMPLE

The relationships between "Home Variables" and Science 1972

Block	Variable entered	r	b	rbx100	$\Delta R^2 \times 100$
1	a) Mother's Education	.27504	.14957	4.05	7.5
	b) Sex	-.22994	-.24104	5.54	4.6
	c) Family Size (Reversed)	.18991	.15291	2.90	2.2
2	a) Home Literacy	.21587	.19963	4.30	4.0
	b) English Use	.23520	.14917	3.50	1.9

Multiple R = 0.45142

 $100R^2 = 20.37$

The relationships between "Home Variables" and Word Knowledge 1972

Block	Variable entered	r	b	rbx100	$\Delta R^2 \times 100$
1	a) Mother's Education	.27474	.13793	3.79	7.5
	b) Years in Australia	-.12664	-.10726	1.36	1.7
	c) Father's Occupation	.25127	.12740	3.20	3.4
2	a) Home Literacy	.22862	.16889	3.86	2.8
	b) English Use	.32754	.20923	6.85	3.5

Multiple R = 0.43662

 $100R^2 = 19.06$

5. COMPARISON OF THE RELATIONSHIPS BETWEEN HOME VARIABLES AND SCHOOL
ACHIEVEMENT - THE ANGLO-AUSTRALIAN GROUP

a) Correlation Matrices

Table 9(a) summarises the intercorrelations between the home variables for the Anglo-Australian control group. Once again, variables defining socio-economic status are significantly correlated with those defining family practices.

Correlations between predictor variables and the criteria in Tables 9(b) and (c) record significant values (prob $< .05$) for Sex & Father's Occupation & Parents' Interest, prefaced by a negative value, in relation to Science. Consideration of Word Knowledge scores produced significant correlations with Father's Occupation, Mother's Education & Home Literacy.

b) Stepwise regression analyses

Table 9(b) summarises the analyses related to Science score. Variables included in the Home Construct's statement follow the correlation coefficients closely. Parents' Interest provides a significant negative contribution to Science score. School Program & Region make significant contributions to the reduction in unexplained variance.

In relation to Word Knowledge score, Sex & Father's Occupation make significant contributions to the reduction in unexplained variance, as does Home Literacy. Parents' Interest does not make a significant contribution. The combination of dimensions in a further stepwise procedure has produced small changes in the contributions related to Science & Word Knowledge scores (Table 9(d)).

TABLE 9(a)

Intercorrelation among predictor variables

Anglo-Australian Control Group

		2	3	4	5	6	7
Mother's Education	1	0.36 *	0.18 *	0.06	-0.06	0.22 *	0.16 *
Father's Education	2		0.38 *	0.01	-0.05	0.17 *	0.20 *
Father's Occupation	3			0.02	0.01	0.25 *	0.22 *
Sex	4				0.11	0.15 *	0.24 *
Family Size (Reversed)	5					-0.27 *	-0.07
Home Literacy	6						0.23 *
Parents' Interest	7						

* denotes probability < 0.05

TABLE 9(b)

MULTIPLE REGRESSION

Science 1972

ANGLO-AUSTRALIAN CONTROL GROUP

Step	Variable entered	F to enter	r	b	rbx100	% variance explained
<u>HOME CONSTRUCTS</u>						
1	Sex	9.15 *	-.25024 *	-.25336	6.34	
2	Father's Occupation	3.46	.14743	.15261	2.25	(100R ² =8.59)
Variables excluded (F 3.0)	Father's Education		-.03495			
	Mother's Education		-.05793			
	Family Size (Reversed)		.11946			
<u>HOME HABITS</u>						
1	Parents' Interest	7.28 *	-.2240 *	-.22399	5.01	
Variables excluded (F 3.0)	Home Literacy	2.09	.06168			(100R ² =5.01)
<u>SCHOOL CONSTRUCTS</u>						
1	Program 1970	28.29 *	.40059 *	.37333	14.95	
2	Form 1972	3.25	.21155 *	.13758	2.91	(100R ² =17.87)
Variables excluded (F 3.0)	System Region		.00466 -.19452			

* denotes probability .05

TABLE 9(c)

MULTIPLE REGRESSION
Word Knowledge 1972
ANGLO-AUSTRALIAN CONTROL GROUP

Step	Variable entered	F to enter	r	b	rbx100	% variance explained
<u>HOME CONSTRUCTS</u>						
1	Father's Occupation	6.59 *	.21425	.18747	4.01	(100R ² =6.65)
2	Mother's Education	3.01	.18062	.14630	2.64	
Variables excluded (F 3.0)	Sex Father's Education Family Size (Reversed)		.02957 .10571 .02963			
<u>HOME HABITS</u>						
1	Home Literacy	5.24	.19180	.19180	3.67	(100R ² =3.67)
Variables excluded (F 3.0)	Parents' Interest	2.54	.08420			
<u>SCHOOL CONSTRUCTS</u>						
1	Program 1970	17.88 *	.32834 *	.29428	9.66	(100R ² 13.38)
2	Region	4.42 *	.22565 *	-.16486	3.72	
Variables excluded (F 3.0)	Form 1972 System		.17234 .10672			

* denotes probability .05

TABLE 9(d)

MULTIPLE REGRESSION

ANGLO-AUSTRALIAN CONTROL GROUP

The relationships between "Home Variables" and Science 1972

Block	Variable entered	r	b	rbx100	R ² x 100
1	a) Sex	-.25435	-.21572	5.48	6.46
	b) Father's Occupation	.14978	.18060	2.70	2.37
2	a) Home Literacy	.06405	.10671	0.67	0.44
	b) Parents' Interest	-.22400	-.23730	5.31	4.89

Multiple R = 0.37662

100R² = 14.18

The relationships between "Home Variables" and Word Knowledge 1972

Block	Variable entered	r	b	rbx100	R ² x 100
1	a) Father's Occupation	.21390	.19069	4.07	4.57
	b) Mother's Education	.18021	.14169	2.55	2.05
2	a) Parents' Interest	-.08420	-.18734	1.57	2.44
	b) Home Literacy	.19180	.15491	2.97	2.10

Multiple R = 0.33438

100R² = 11.18

CHAPTER 6

DISCUSSION

COMPARISON OF MEANSa) Dealing with the criteria

Significant differences in test scores between Anglo-Australian and migrant groups as defined in terms of ethnic origin, duration of residence in Australia and use of English in the home are summarised in Table 3 (p.35), with supporting analysis of variance in Table 4 (p.36). Examined in isolation, each scale of migrant influence provides support for prior evidence concerning the observed under-achievement of migrant children at school and each scale could be employed to "isolate" those students more likely to emerge as under-achievers".

The differences recorded in Table 4(a) indicate that those students having at least one parent of Southern European origin score significantly lower on both Science and Word Knowledge tests than do the combined Anglo-Australian and Western European groups. A significant difference between the groups was postulated as Hypothesis 1. Wiseman (1971) and Keeves & Bourke (1976) reported on the relative under-achievement of children of Southern European origin. Such observations are supported by this evidence. This finding emphasizes the fallacy which may arise when generalisations concerning "migrants" are made. Such was the case in the "Dovey Report" which spoke in terms of "most young migrants ... are above average in scholarship" or, alternatively, "our schools fail migrant children", as quoted previously (D'Urso & Smith, 1978).

The results summarised in Table 3(b) emphasise the long term differences

in achievement related to migrant background. Hypothesised comparisons focused on differences between migrant children and the Australia-born children of migrants (Hypothesis 2). However the major contrast of significance was between the Anglo-Australian group and the migrant group, defined as having at least one parent of European birth (Gp 1 vs Gp 2, 3, 4, 5 in Table 4(b)). Long term differences between migrant and non-migrant groups were first intimated in the Victorian surveys of 1970 and 1973 and emphasised at primary levels by de Lemos (1975) and at secondary levels by Keeves and Bourke (1976). The migrant group at risk was defined by Hewitt (1977) in these terms, "A student who came from a family unit where at least one parent was from outside Australia and where no English, or a language in addition to English was spoken in the home". p159.

The combination of parent's country of birth and home language described by Hewitt is also supported by the present study. Significant differences between migrant and non-migrant groups defined by the degree of English use at home are obtained in both Science and Word Knowledge scores (Table 3(c)). Those students whose parents use little or no English at home perform least satisfactorily.

It could be misleading, however, to over-emphasize the importance of English use in Hewitt's definition cited above. It may be observed in this survey that, despite the predominance of English as the chosen language within homes with "mixed" parentage (migrant/Australian), such students scored significantly lower in Science and Word Knowledge than the Anglo-Australian group (Appendix 2, Table XXIX and Table 3(b), p.35).

In summary, the following aspects of the criteria are of particular note:

- a) The Southern European group scored significantly lower than the Western European group despite similarities in the duration of residence in Australia by members of these communities. This finding

supports prior evidence.

- b) In general an Anglo-Australian group scored higher than the total migrant group defined as the children of migrant parents.
- c) Migrant families tend to maintain the use of the parents' native tongue at home regardless of the duration of the family's residence in Australia.

Differences in achievement between migrant and non-migrant groups are evident on each classification. Because categories within separate indicators overlap, false conclusions may be drawn if the term "migrant" is employed without suitable qualification. This is illustrated by the broad but falsely optimistic conclusions of the Dovey Committee as well as the over-pessimistic view of the D'Urso and Smith quotation cited previously. A more complete description of the subject is required, as taken by Hewitt (1977), de Lemos (1975), Pickering (1972), or Leathart (1974), but even then, care must be taken to avoid the confusion of category and cause. For example, although a child of Southern European birth, resident in Australia less than 10 years, whose family speak little English at home would be statistically more likely to score below average than a child of Western European birth and similar period of residence, whose family speak some English at home, it would be fallacious to conclude that either ethnic origin or home language were the cause of the difference in achievement, on the basis of such comparisons. Migrancy criteria must be examined in relation to other aspects of the home environment to establish the extent of such influence.

b) Migrancy and the home environment

Previous workers have noted the trend linking ethnic origin and achievement. The following observations were made by de Lemos concerning Victorian primary school pupils.

"Comparisons between the test performance of the different national groups in the non-English origin sample indicated a clear trend for the mean scores of the Northern European group to be higher than those of the other national groups." (de Lemos, 1975, p.21).

As well, the relationship between ethnic origin and English Use was noted.

"The characteristics of English speaking children (at home) of non-English origin tended to be closer to those of the Australian and English origin migrant children than to those of the non-English speaking migrant children. This group included a high proportion of Northern European children" (p.39). The trend linking English use and achievement was also noted.

"An analysis of the relationship between the use of English in the home and test scores in the non-English origin group, indicated a consistent trend for higher scores to be associated with greater use of English in the home". (p.23)

Taken together with a measure of non-verbal general ability, the following causal relationship was proposed. "The lack of significant differences on the non-verbal general ability test indicates that there are no significant differences in general ability between these groups that could account for the differences on the language tests, and that these differences must therefore be attributed to other factors, the most likely factor being the difference in the language background of the two groups." (p.37).

Hewitt reached a similar conclusion concerning migrant students aged 10 and 14 years in relation to literacy and numeracy mastery.

"Several factors appeared to be related to this low level of reading mastery for migrant students. The most important influence appeared to be the amount of English spoken in the home where, if no English was spoken, the chance of reading mastery was considerably reduced.

....Whilst the amount of English spoken in the home again appeared to influence numeration mastery, the effect was not as great as for reading." (Hewitt, 1977, pp191,192)

While placing considerable emphasis on language acquisition in relation to test scores, de Lemos also admitted that there was a likely contribution by socio-economic status, parents; education and frequency of reading in the home to the differences in achievement between the Australian and migrant children, but this aspect was not pursued further.

In the case of Hewitt's examination of the data from the Literacy and Numeracy Survey, the only other home-based information included in the analysis was the frequency with which an English language newspaper was received in the home. Other home factors were not considered and the causal relationship between English spoken in the home and reading mastery was assumed.

Analysis of IEAPOP2 data was undertaken to clarify the Ethnic Origin - English Use - achievement relationship, as well as the possibility of Home Literacy and Parents' Interest as intermediaries, Tables 7(a & c) record significant differences linking Ethnic Origin with English Use, and also Ethnic Origin with Home Literacy.

Although the data appears to support English Use as the significant factor, the evident correlation between main effects jeopardises

conclusions concerning Home Literacy. Problems associated with the interpretation of analysis of variance on non-experimental data exhibiting significant correlation are summarised in Appendix 4.

It is difficult to clarify the causal relationship Ethnic Origin - English Use - achievement. Certainly, the first step is well supported as is the additional relationship Ethnic Origin - Home Literacy. Further clarification of the "Home factors" - achievement link requires an alternative analysis.

These results emphasise the potentially misleading step previously taken by other workers who have employed a very limited description of the home environment. Until adequate data are available it is advisable to summarize findings as a significant relationship between ethnic origin, home factors as represented by English Use and achievement existing within a specified migrant population.

Further evidence concerning the significance of home factors in relation to achievement and verbal ability is given by the significant difference in Word Knowledge scores associated with the difference in Father's Occupation. (Table 6(b)). De Lemos (1975) made a similar observation but preferred to emphasise language background, characterised by English Use in the home, in relation to language scores.

Further conclusions are limited by unsuitability of the classical experimental design for such data.

COMPARISON OF HOME VARIABLES IN RELATION TO ACHIEVEMENT

The regression analysis performed on scores of children within the Total Migrant Sample (definition p.18) has produced several results which contrast with the conclusions of earlier workers. In particular, this analysis emphasizes the significance of variables associated with the parents' education and interest in learning, in relation to the achievement in Science and Word Knowledge tests of their children. See tables 8 and 9 to examine summaries of the step-wise regression analysis.

Observations associated with the regression results

a) The correlation coefficients.

The number of correlation coefficients which are significant (prob. 0.05) supports the difficulties previously outlined concerning interpretation of the results of analysis employing a factorial design with non-experimental data. (Table 8(a)).

Tables 8 and 9 illustrate the difference in correlation coefficients between the migrant and non-migrant groups. The non-migrant group has a markedly lower correlation of Mother's Education, Father's Education and Father's Occupation with Science and Word Knowledge than the migrant group. These low correlations also contrast with high values of similar statistics reported by Keeves (1972) for the correlation of Father's Occupation and education with Science and Mathematics achievement ($r = 0.03$, $N = 215$). Keeves sample was restricted to Year 7 students in the A.C.T.

The comparison of the Anglo-Australian Control Group and Keeves' sample is logical because both populations are defined as "English speaking". The observed differences in correlation between the two groups could be influenced by the age difference between the samples.

The IEAPOP2 sample consists of those students who have chosen to remain at school beyond the minimum leaving age so that a non-random sampling has already taken place within this group. Indeed, at the time of testing at age sixteen, 54.4% of the original age 14 cohort had already left school. Rosier (1978) has reported that socio-economic level explains a significant proportion of variance in school retentivity so that Father's Occupation and Parents' Educations have influenced IEAPOP2 sampling.

As a consequence of the dissimilarities between the Anglo-Australian Group and the Total Migrant Sample in relation to home variables (Appendix 2), it seems logical to concentrate on the comparison of correlation coefficients for migrant and non-migrant groups within IEAPOP2, rather than the similarities between the largely dissimilar populations of the Total Migrant Sample and Keeves' 12 year old group (1972). Retentivity was cited as a possible influence on the contrast between the Anglo-Australian Group and Keeves' sample. This influence is not present when one considers differences in correlation coefficients between the Anglo-Australian Group and the Total Migrant Sample drawn for IEAPOP2.

Comparing migrant and non-migrant groups within IEAPOP2 Rosier (1978) has reported that migrant background made only a small contribution to explained variance in school retentivity after allowance was made for the basic family environment. This small contribution favoured higher retentivity among the migrant group. Differing patterns in school retentivity cannot explain the variation in correlations between the groups. The difference may be associated with dissimilarities between migrant non-migrant groups in the distribution of Father's Occupation and Parents' Education. Tables IV, V, XVII (Appendix 2) illustrate that the distribution of Father's Occupation, Parents' Education are skewed toward the low end of the scale within the Total Migrant Sample.

- b) Stepwise multiple regression within the separate dimensions of the educational environment.

The order of significance for the variables defined as Home Constructs in relation to the achievement and verbal ability scores within the migrant group, emphasize the influence of the mother's education rather than the family's socio-economic status. The latter variable makes a significant contribution in the verbal ability statement only. The inclusion of Years in Australia in this statement supports earlier comments that verbal ability is more adversely influenced by the consequences of a migrant background than are other achievement criteria (de Lemos, 1975, and Hewitt, 1977).

Concerning Home Habits, the significance of both English Use and Home Literacy are maintained in regression statements defining achievement and verbal ability but the contribution of Parents' Interest is not significant.

- c) Stepwise multiple regression combining home variables.

The results of the "combined regressions are summarised in Table 8(d). Concerning the Science statement, it may be noted that English Use is the last variable to enter the regression equation and makes a lesser contribution to explained variance in Science score than does Home Literacy. Mother's Education remains the major contributor to explained variance although the direct influence has been reduced as a result of the combination of dimensions. It would appear that, in part, the mother's influence in respect of her educational attainment, is related to English use and her concern with things literary within the home.

In the Word Knowledge statement, the proportion of variance explained by English Use is again reduced drastically when the blocks of home-based

variables are introduced consecutively and more particularly, the additional contribution English Use makes to R^2 is markedly reduced. Again, both Mother's Education and Father's Occupation influence Word Knowledge scores, in part, through associated practices concerning language use and literacy at home but, as well, make a further significant contribution in their own right.

These observations contrast markedly with the interpretations of several other workers concerning the observed under-achievement of migrant students. The emphasis placed on English language acquisition by de Lemos (1975) & Hewitt (1977) has been noted. However, when formulating such interpretations, de Lemos was restricted by the limited analysis of data undertaken in support of her study, while Hewitt was restricted by the limited range of information concerning the home environment which was available from the Literacy and Numeracy Survey.

Further conclusions based on limited and possibly misleading data are also evident from a survey of the literature. For example, Pickering (1971) based conclusions concerning the achievement of migrant children in relation to socio-economic status, on a definition in terms of father's occupation and suburb of residence and concluded "the migrant's educational achievement is hampered not only by the need to learn another language is probably less than adequate for satisfactory educational achievement." (p.79)

Pickering was referring to both migrant groups, regardless of differences in defined socio-economic status.

Evidence available from regression analysis of IEAPOP2 data could allow for an alternative interpretation to that of Pickering, which can be described in the following adaption of Pickering's conclusion that, "the migrant's educational achievement is hampered not only by the need to

learn another language, but also by the fact that his learning model for the language is probably less than adequate for satisfactory educational achievement." (p.79).

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Evidence available from regression analysis of IEAPOP2 data could allow for an alternative interpretation to that of Pickering, which can be described in the following adaption of Pickering's conclusion that, "the migrant's educational achievement is hampered not only by the need to learn another language but also by the fact" that the educational environment in the home "is less than adequate for satisfactory educational achievement."

It should be emphasized that a similar interpretation to that of de Lemos (1975), Hewitt (1977) and Pickering (1971) would have resulted from an examination of IEAPOP2 data solely in terms of a factorial design.

- d) Comparison of the migrant sample with the Anglo-Australian control group. The examination of regression statements related to the home environment for the migrant and Anglo-Australian groups produces several observations concerning the differences between such groups as they relate to school achievement (Tables 8 and 9). With reference to the Science statement, Mother's Education is a significant predictor within the migrant group but not within the Anglo-Australian group, as is Family Size. Home Literacy is also more prominent in the regression statement related to the migrant sample. Examination of the frequency tables included in Appendix 2 illustrate the contrasting educational experiences of the migrant and Anglo-Australian groups. 35.6 per cent of the mothers in the Southern European group had received less than five years' schooling

compared with 2.4 per cent of mothers of the Anglo-Australian group. Similar comparisons exist in the case of Father's Education (Tables IV & V, p. 95).

Discussing the relationship between the structural dimensions of the home environment and generalised achievement Keeves (1972) commented:

"When the variables making an effective contribution to the structural dimension of the home are considered together, they seem to be associated with the cultural level of the home rather than the socio-economic status of the home."(p.122)

This comparison supports the emphasis Leathart (1973) placed on family behaviour in relation to the achievement of a group of Greek boys and the lack of influence related to socio-economic status. In terms of the results obtained from IEAPOP2, if the cultural level of the home were significant in influencing achievement, the relationship between the criterion test scores and parents' education would be of greater significance within the migrant group where extremes in educational experience are evident.

Significant negative correlation between achievement and family size was also reported by Keeves (1972), who included family size within the group of five variables characterising the structural dimension of the home within the educational environment. While this emphasis is supported by data from the migrant group in IEAPOP2, it is not supported by the Anglo-Australian group. The target population in 1972 was aged 16. School attendance was no longer compulsory, so that a selection process defining Students & Leavers had been active between 1970 and 1972. One would expect family circumstances as an influence in a decision to leave school to be more evident among students from larger families as well as from those of lower socio-economic status. The relationship between family size and achievement would thus be

reduced amongst the IEAPOP2 Student population in comparison with Keeves' Form 1 cohort.

Concerning the Word Knowledge regression statements, migrant and Anglo-Australian groups show fewer contrasts. Once again Mother's Education is a greater contributor within the migrant group. The outstanding difference is the major contribution of English Use to explained variance in test score in the migrant group.

In both Science & Word Knowledge statements, the home environment as described, explains a greater proportion of the variation in test scores within the migrant group than the Anglo-Saxon group. This difference is only partially accounted for by the influence of English Use. Evidence also points to the influence of the wide variation in the cultural level of the home as characterised by parents' education. Once again, the significance of the home environment described solely in terms of language spoken in the home must be questioned.

It must be emphasised that this study is concerned with the achievement of the children of migrant parents but frequently of Australian birth, rather than being restricted to the newly-arrived non-English speaker. Since a comparison of means has indicated that children of migrants tend to score lower than predicted, regardless of the duration of years' residence in Australia, Years in Australia is of limited predictive value in the regression statements.

Within the Anglo-Australian group, Parents' Interest is a significant contributor to both the Science and Word Knowledge statements, in contrast with the migrant group. This variable has a negative value for simple correlation coefficient and standardised partial regression coefficient. It would appear from this data that within the Anglo-Australian group, at the upper secondary level (age 16 years), an active

interest by parents in school work has a negative relationship with the child's achievement. As perceived by the child, a greater interest is taken by parents when the level of achievement is low.

REGRESSION RESULTS

- STATISTICAL INFERENCE

The foregoing discussion concerning the results of the regression analyses has been presented in descriptive terms to enable the best possible linear prediction of the criteria in terms of available home environmental data. The comparison of home variables as summarised in the regression statements, encompasses the following: Home Literacy and English Use are significantly related to both Science and Word Knowledge in a multivariate situation, maintaining an emphasis on family practices in relation to school achievement which Keeves (1972) had described within an English speaking, Australian sample. In addition, those variables which influence school achievement within the Anglo-Australian population are more closely related to school achievement within the migrant population than are those variables specifically concerned with a measure of the migrant background.

Years in Australia does not make a significant separate contribution to explained variation in Science when compared with Home Constructs such as parents' education and occupation. Then, inclusion of a second block of variables defined as Home Habits, produces a greater contribution to explained variance by Home Literacy than by English Use. Although the migrancy measure English Use makes a significant contribution to the variation explained in Science score, this contribution may be viewed as the result of "borrowing" from variables previously included in the regression statement rather than a major independent contribution. The speaking of English at home may be seen as only one of the mediators of the advantage to a child of having parents with more education or a higher level of employment and is probably of no more importance than home literacy.

Verbal ability scores are more closely related to "migrancy" predictors than are achievement scores. However, within the combined stepwise regression analysis, English Use again enters at the last step, indicating that the additional influence of English Use is less significant than that of Home Literacy.

In the analysis of IEAPO2 data, the application of multiple regression has been limited to a comparison of predictors to enable the best prediction of achievement and verbal ability scores in terms of home environment data. No mention has been made of cause and effect in such relationships.

Walberg and Marjoribanks (1976) have summarised the assumptions under which causality may be inferred from regression results.

1. All variables that might affect the dependent variable are either included in the regression equation or are uncorrelated with the variables that are included.
2. Terms are included in the regression equation to handle any curvilinear or interaction effects.
3. The dependent variable has no effect on the independent variable.
4. The dependent and independent variables are measured without error.

A greater range of comparisons has been attempted in this study than in prior surveys. Thus, though the results will not provide a complete investigation of causal relationships between the home environment and school achievement.

the picture is more detailed than that available from other sources. For example, Hewitt (1977), de Lemos (1975) and Pickering (1971) have emphasised the role of English Use in relation to verbal ability and factorial studies of IEAPOP2 data supported such conclusions. Regression analysis allowed far less emphasis on English Use when alternative measures of the home environment were included.

The second assumption was violated by Parents' Interest in relation to interactions. Parents' Interest proved a difficult variable to interpret and will be discussed later. Since Parents' Interest is significantly correlated with other predictors this could lead to some difficulties in relation to Assumption One.

The third assumption does not present difficulty since the relationships have been limited to Home Constructs with test scores and Home Habits with test scores. Hypothesis concerning a network of relationships examined by path analysis would require a more thorough examination of complex relationships.

The existence of errors of measurement (Assumption Four) is of major concern in such a study. The use of survey data involves inherent uncertainty concerning the reliability of measures and of the subjects' responses. For example, the use of children's reports regarding parents' education and occupation have been variously criticised and commended. Kerckhoff, Mason and Poss (1973) have reported high correlations between parent and children's reports of these criteria, but a degree of uncertainty must remain, particularly concerning variables requiring information concerning parental activities such as help with homework, encouragement of reading, etc. Evidence of significant relationships between home environment factors and achievement in spite of the high probability of some errors in measurement should encourage further exploration. Attention to a reduction in errors would produce a strengthening of the relationships already observed.

In view of these considerations, extension of the regression analysis to investigate a network of causality would have been ill-advised. However, based on the findings of this analysis, a further study employing path analysis to relate school achievement with a measure of non-verbal intelligence, mediated by the home and school environments, would be possible.

Sampling error

Although data collected in the IEA study and Follow-up represented an acceptable stratified random sample in terms of the Australia-wide 14 year old cohort, certain difficulties accompany the generalisation of data obtained from the migrant group within this sample. The experimental group (IEAPOP2) was obtained by sampling schools in each State and then testing a given number of students within each school, chosen at random. Since that section of the population defined as of "migrant" origin is not uniformly distributed between States or between metropolitan and country areas (Appendix 2, Table XXV) the migrant group included in IEAPOP2 does not represent a strictly random sample of the migrant population. A further study with sampling based on the enrolments of students of non Anglo-Australian origin within schools rather than sampling based on schools in relation to total enrolments would clarify the predictability of the observations from IEAPOP2 data.

THE PROBLEMS ASSOCIATED WITH PARENTS' INTEREST

The difficulty related to elucidation of the variable defined as Parents' Interest has several aspects. The first concerns the difference between migrant and Anglo-Australian groups in relation to the correlation of Parents' Interest with the criteria.

Within the Anglo-Australian group, the influence of Parents' Interest on Science & Word Knowledge scores is consistent but negative. In terms of the characteristics used to compile this variable, those students who scored well in the Science or Word Knowledge tests perceived their parents as

assisting little with homework
suggesting few cultural outings
asking little about school activities

while those students who scored poorly indicated positive parental actions concerning such activities. The variable Parents' Interest as constructed in Appendix 3, shows marked similarity with the process dimension which Keeves (1972) described as a significant influence related to change in Science achievement at Form 1 level. This consisted of

- a) Parents report favourable relations between home and school.
- b) Use of books and library facilities.
- c) Provision of help with formal schoolwork.
- d) Arrangements made for tackling home assignments.

An explanation of such a marked difference may lie in the method of collection of home environmental data. Keeves employed a home interview schedule with parents, whereas the IEAPO2 study relied upon the student questionnaire. Children may be unable to perceive their parents' actions as supporting such educational aims and so respond differently to similar questions. Children may perceive their parents' involvement in terms of "pushing" when they are not succeeding at school, as may indeed be the case. Alternatively, the children having reached higher secondary levels, parents may no longer seek to provide such stimulation to successful students, in whom "achieving" practices are already internalised.

The relationships of Parents' Interest within the migrant group are inconsistent and largely insignificant. In the comparison of Southern European & Western European groups, Parents' Interest proved of little value at partitioning Science and Word Knowledge scores. Its value was not associated with difference in Ethnic Origin or Father's Occupation. Interactions suggested that the variable may not be unitary over the range of Father's Occupation. When included in a regression statement related to the influence

of Home Habits on Science and Word Knowledge scores, its contribution was not significant, inviting deletion of the term as a variable of little consequence in a regression statement.

As observed by de Lemos (1975), Taft (1975) and Marjoribanks (1978), many migrant families exhibit high levels of aspiration for their children, regardless of socio-economic status. If the variable Parents' Interest is viewed as the active component of such aspirations one would expect a difference between migrant and Anglo-Australian groups concerning the correlation of this variable with the test criteria. Such a difference is evident although the relationship of Parents' Interest with the criteria within the migrant group is not linear and requires further examination. The second aspect of concern is associated with the validity of the measure of Parents' Interest. Along with the concern for the reliability of survey data, particularly as supplied by children concerning home background information, one may question the interpretation of the data supplied. As indicated, several workers have been concerned with the aspirations of migrant parents for their children's future but the study of IEAPO2 data has sought to transfer the measure to the active level of parental participation, defined at Parents' Interest in school. This data was not collected specifically for comparison of migrant and non-migrant groups in relation to home factors. Further study may define a more valid measure of parental participation to enable comparison of migrant and non-migrant groups in relation to home factors. Further study may define a more valid measure of parental participation to enable comparison of migrant and non-migrant groups in relation to school achievement, and also, investigation of parental aspiration in relation to parental participation within the migrant group. The uncertainties related to the variable Parents' Interest in both the Anglo-Australian and migrant groups make such investigation desirable.

AVENUES FOR FURTHER INVESTIGATION

Despite certain difficulties adapting the IEAPOP2 data to an investigation concerning the home environment, this study has highlighted several directions for further investigation. It has emphasised the significance of the home environment of the migrant child in relation to achievement at school and, in particular, those variables specifying the educational environment of the home but not characterised as "migrancy" factors. The most significant of these are Mother's Education & Home Literacy. De Lemos (1975) has reported no significant difference between migrant and English speaking groups on a measure of non-verbal general ability. A further study including such a measure along with home environment data, school data and achievement scores would allow a more thorough investigation of causal relationships. The significance of Mother's Education & Home Literacy in the regression statements for achievement and verbal ability direct attention towards the attitudes of the migrant parents in relation to achievement. The home environment of the migrant child could be related to change in achievement if a more rigorous investigation of the home and associated attitudes and practices were undertaken. Such an investigation would preferably employ interview schedules and, necessarily, be undertaken within a limited sample of the migrant group.

Collection of IEAPOP2 data took place in 1970 and 1972. There have been several significant developments in the intervening decade. In 1970, the Federal Government took financial responsibility for the teaching of English as a second language within Australian schools (Lynch, 1970). By 1974-1975, 1,890 specifically trained migrant teachers were appointed in 1,220 schools. (Schools Commission, 1975). A policy change in 1976 enabled diversification of Commonwealth funds "to adapt the school program and operations in this and more general ways to the bicultural experience of migrant students". (Schools Commission, 1978; p.103). A "replication" of the IEAPOP2 study, in relation to the migrant population, could elucidate the adequacy of the

programmes undertaken in the intervening decade, which has spanned the 16 year cohort's educational experience. In view of the considerable capital outlay and the dearth of information related to the consequences of such educational undertakings such an investigation appears urgent.

The pattern of migration has seen a marked change during the last decade. This has included a decrease in arrivals with an emphasis on family reunions and a change in the traditional backgrounds of new arrivals. Several non-European communities have been established, for example, the Turkish, Timorese & Vietnamese groups. Table 10 illustrates this changing pattern.

Ethnic groups of non-European origin provide an opportunity to investigate further the relative significance of home constructs in relation to home attitudes and practices associated with differing models of the home environment. The influence of "migrancy" factors such as English acquisition may be contrasted further with that of attitudes and practices of an alternative cultural background.

As indicated previously, elucidation of the influence of Parents' Interest has been far from satisfactory. Further investigation concerning the migrant parent's aspirations, attitudes to schooling and participation in learning experiences is desirable.

RECOMMENDATIONS

Further investigation concerning the involvement of the home environment of the migrant child with school achievement is desirable. However, the findings of the present study provide evidence of the direction which the education of migrant children should take at school. The analysis of IEA data has emphasised the significance of the educational and literacy level of the home as well as the opportunity to improve language skills in English. For those children where the home offers limited scope in either of these areas, the school is frequently involved in programmes to compensate for

SETTLERS ARRIVING BY COUNTRY OF LAST RESIDENCE

	Number	
	1970	1977
South Africa	1,751	2,704
Other Africa	3,799	994
<u>Total Africa</u>	<u>5,550</u>	<u>3,698</u>
Canada	2,080	918
U.S.A.	4,909	1,358
Other America	4,262	3,716
<u>Total America</u>	<u>11,251</u>	<u>5,992</u>
India, Pakistan and Sri Lanka	4,119	1,101
Lebanon	3,974	8,192
Malaysia and Singapore	1,501	3,458
Turkey	4,399	1,264
Other Asia	4,014	10,390
<u>Total Asia</u>	<u>18,007</u>	<u>24,405</u>
U.K. and Ireland	77,522	21,384
Austria	12,790	348
Germany	5,106	985
Greece	10,098	1,605
Italy	8,843	1,969
Yugoslavia	15,717	1,662
Other Europe	14,102	3,760
<u>Total Europe</u>	<u>144,178</u>	<u>31,713</u>
New Zealand	5,532	7,995
Other Oceania	807	1,694
<u>Total Oceania</u>	<u>6,339</u>	<u>9,689</u>
Not Stated		143
Total	185,325	75,640

(Australian Bureau of Statistics, 1979)

such shortcomings. Logically, emphasis should be paid to reading and the development of verbal skills of communication and vocabulary.

Evans & Poole (1975) noted a difference between migrant children fluent in spoken English and low socio-economic status Australian children which was related to the higher motivation of the migrant group. This compensated for language deficiencies in tasks requiring higher cognitive processing. They concluded "If the low socio-economic status group is characterised by poor motivation, the educational problem is quite different from that posed by the language deficiencies of the migrant child." (p.229).

Assuming that a parallel can be drawn between the primary school pupils of the Evans & Poole study, and the middle/higher secondary students of IEAPOP2, such conclusions are questionable. The implications are significant in relation to remedial action for migrant and low socio-economic status children of Australian origin. Whilst one must admit the significance of English Use, particularly in relation to verbal ability scores within the migrant group, the regression analysis of IEAPOP2 data indicated many similarities between the migrant and Anglo-Australian groups. The cultural level of the home as characterised by Mother's Education, Home Literacy, Father's Occupation provided the major impact on school achievement in relation to the home environment in both groups. Similar action, directed towards compensation for such shortcomings within the home environment amongst migrant and non-migrant groups, is required if an improvement in achievement scores is considered a valid pursuit by the school.

Success in such compensation activities could improve poor motivation. Thus, initial differences in motivation between migrant and non-migrant groups (Evans & Poole, 1975) would be irrelevant if compensated by joint action.

Since the areas of remedial action consist of literacy as well as English language skills, further consideration should be given to the use of the

family's first language in the education of the migrant child. In particular, at the early stages of formal education when many children of migrants are disadvantaged by lack of a working knowledge of English. Development of literacy could be encouraged further by the provision of foreign language books in schools and municipal libraries readily accessible to both children and parents.

Considerable attention has been paid to the high aspirations of many migrant parents concerning their children's futures. Within the present study, differences are apparent between migrant & Anglo-Australian groups concerning Parents' Interest and achievement measures. Although the status of Parents' Interest requires clarification, schools could harness the evident aspirations of migrant parents at an early stage of the child's schooling. Such a move to encourage parental participation at home, for example with increased reading activities, may possibly affect an early intervention in the home environment - school achievement cycle. Assisting with reading activities would have the additional benefit of concurrently aiding parents' language skills, along with the encouragement of literacy at home by provision of foreign language children's books on loan. Adequate communication concerning such aims and activities in a form which is understood by parents is, of course, assumed.

The Schools Commission (1975 & 1978 Reports) have recognised the importance of bilingualism within Australia's pluralist society and the recommendations of the Commission are supported by evidence relating literacy and achievement rather than English language and achievement.

CHAPTER 7

CONCLUSIONS

The aim of this study was investigation of the assumed differences in achievement between migrant students with non-English speaking parents and an Anglo-Australian group and, further, investigation of the relationships between factors associated with the home background of migrant students and their achievement at school.

The results of analysis of data collected from a randomly selected sample of students in Australian schools at age sixteen supported earlier findings that certain ethnic groups scored significantly differently from each other. For example, in the present study, students of German and Dutch origin scored significantly higher in tests of achievement and verbal ability than those of Italian or Greek origin. The children of migrant parents scored significantly lower than those with Anglo-Australian parents which emphasised other observations concerning the longevity of the problem of poor school achievement by migrant students. This may be considered in relation to both the duration of residence of the family in Australia, and the duration of the child's experience in Australian schools. The achievement of the migrant group was significantly related to the degree to which English was used at home as had been emphasised by other workers. English use at home was significantly related to ethnic origin when students of Southern European and Western European origin were compared. However, when achievement and verbal ability scores were regressed on a collection of variables characterising the educational environment of the home, it was observed that measures related to the parent's education and the literacy level in the home were able to explain a greater percentage of variance in the test scores than was explained by English use at home, for a group of students of non Anglo-Australian origin. English Use made the least additional independent contribution to the multiple correlation coefficient amongst the significant variables included in the regression statement.

It may be concluded that migrant students are disadvantaged, in relation to their ability to perform at the expected level in achievement tests at school, primarily by the educational environment of their homes. Certainly such disadvantage is frequently accompanied by the parents' limited use of English at home but it may be inaccurate to assume that inadequate English language experience at home is the major cause of failure. Such a conclusion is made in relation to the finding of de Lemos (1975) concerning the lack of significant differences in non-verbal general ability between Anglo-Australian students, students whose parents use English frequently at home and those who employ their native language at home. Non-verbal intelligence data was not collected in the present study.

If "many children lose all hope of making a success of their schooling and are limited to the less skilled occupations and an inferior status", the cause of such failure must be sought within the family environment as well as within the school and its inability to provide "teaching of the most basic skill, English".....(D'Urso & Smith, 1978)

Further investigation is necessary to clarify the relative achievement of the children of migrants after a decade of Federal funding directed to the teaching of English as a second language in schools, and to pursue the relationships between the home environment of the migrant child and his achievement at school which have been intimated by this study. Such investigation requires a careful selection of valid predictors of the home environment related to a known random sampling of the "migrant" population, adequately defined.

Again, it should be emphasised that the subjects of this investigation were the children of migrants rather than a group of newly arrived children with obvious English difficulties. It may be concluded that once the initial acquisition of English has provided a "working knowledge" of the language, the children of migrants are the victims of certain disabilities in common with the lower socio-economic status Australian group. These are related to the educational history

of the family and, in general terms, the "cultural level" of the home environment. The implications of such similarities should not be ignored by educators.

APPENDIX 1

GENERATION OF FILE IEAPOP2R

A random sample from the Anglo-Australian control group in IEAPOP2 was desirable. The sample should consist of approximately equal number of subjects as the combined migrant groups, with which it was to be combined as IEAPOP2R.

Each subject included in the original 1970 I.E.A. sample had been defined by an identification number. These identification numbers were retained so that the 1972 Students file (IEAPOP2) represented a sample of the original I.E.A. sample. A further random sampling was obtained by selecting those subjects in the Anglo-Australian group whose identification numbers ended in zero e.g. 10, 20.....

Identification numbers were assigned numerically to each subject in the 1970 survey within each school sample of 25 subjects. These students were selected by a random procedure using birth dates.

VARIABLE LIST - IEAPOP 2

Variable Title	Source	Primary/Secondary Variable
School	Identification	
Student	Identification	
Science	1970	Corrected Score
Word Knowledge	"	Corrected Score
1 Father's Occupation	"	Primary
2 School Program 1970	"	"
3 Sex	"	"
4 Father's Education	"	"
5 Mother's Education	"	"
6 Amount of Homework	"	"
7 Place for Homework	"	"
8 Time for Homework	"	"
9 Parents Help With Homework	"	"
10 Dictionary in Home	"	"
11 Parents Encourage Reading	"	"
12 Parents Ask About Schoolwork	"	"
13 Parents Encourage Culture	"	"
14 Books in Home	"	"
15 Hours Reading for Pleasure	"	"
16 Number of Siblings	"	"
17 Father's Occupation 1972	1972	"
18 Form	"	"
19 Years in Australia	"	"
20 Country of Birth-Self	"	"
21 Ethnic Origin - Father	"	"
22 Ethnic Origin - Mother	"	"
23 Speak English - Father	"	"
24 Speak English - Mother	"	"
Science	"	Corrected Score
Word Knowledge	"	Corrected Score
25 Parents' Interest	1970	Secondary
26 Home Literacy	1970	"
27 English Use	1972	"
28 Family Size (Reverse)	1970	"
29 Migrancy	1972	"
30 System	School 1970	Primary
31 Region	School 1970	Primary

Frequency Tables IEAPOP2

Selected variables by Ethnic Origin (Father)

I Father's Occupation 1970

(Column per cent) Value & category	Ethnic Origin (Father)			
	Anglo-Australian	W. Europe	S. Europe	Other
(1) Unskilled	9.9	12.3	18.7	10.7
(2) Semiskilled	15.1	12.2	33.1	22.7
(3) Skilled	13.5	34.7	18.6	30.0
(4) Clerical	13.2	4.1	0.8	8.7
(5) Managerial	26.4	18.4	26.3	14.7
(6) Professional	19.7	14.3	0.8	13.3
Number	2031	49	118	151

II School Program 1970

Value & category	Ethnic Origin (Father)			
	Anglo-Australian	W. Europe	S. Europe	Other
(1) General	33.9	22.4	34.7	29.0
(2) Technical	10.0	20.4	8.5	7.7
(3) Academic	54.0	57.1	55.1	61.3
Number	2031	49	118	155

III Sex

Value & category	Ethnic Origin (Father)			
	Anglo-Australian	W. Europe	S. Europe	Other
(1) Male	49.7	56.3	55.1	53.2
(2) Female	50.3	43.8	44.9	46.8
Number	2025	48	118	154

IV Father's Education

(Column per cent)		Ethnic Origin (Father)			
		Anglo-Australian	W.Europe	S.Europe	Other
Value & Category					
(1)	None	-	-	4.3	1.9
(2)	< 5 years	3.3	-	42.7	13.6
(3)	5 - 10	61.2	40.4	47.9	46.1
(4)	11 - 15	27.0	48.9	3.4	29.9
(5)	>15 years	8.4	10.6	1.7	8.4
Number		2008	47	117	154

V Mother's Education

Value & Category		Ethnic Origin (Father)			
		Anglo-Australian	W.Europe	S.Europe	Other
(1)	None	0.2	-	8.5	3.3
(2)	< 5 years	2.2	2.1	35.6	14.6
(3)	5 - 10	65.8	59.6	46.6	52.3
(4)	11 - 15	28.8	36.2	7.6	27.2
(5)	>15 years	3.0	2.1	1.7	2.6
Number		2003	47	118	151

VI Amount of Homework

Value & Category		Ethnic Origin (Father)			
		Anglo-Australian	W.Europe	S.Europe	Other
(1)	< 2 hours	14.3	8.3	15.3	13.1
(2)	2 - 5	25.0	22.9	22.9	28.1
(3)	6 - 10	35.3	47.9	35.6	33.3
(4)	11 - 20	23.1	16.7	23.7	24.8
(5)	> 20	2.3	4.2	2.5	0.7
Number		2013	48	118	153

VII Place for Homework

(Column per cent) Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) With people:noisy	9.6	4.2	6.8	8.4
(2) With people:quiet	27.5	29.2	17.8	20.1
(3) Alone	59.7	66.7	69.5	68.8
(4) At school	2.9	-	5.9	2.6
(5) No homework	0.3	-	-	-
Number	2019	48	118	154

VIII Time for Homework

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) Fixed time	48.0	56.3	53.8	49.7
(2) No fixed time	51.3	43.8	46.2	50.3
(3) No homework	0.7	-	-	-
Number	2019	48	117	153

IX Parents Help With Homework

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) Often	16.2	16.7	2.5	13.6
(2) Occasionally	37.9	20.8	27.1	32.5
(3) Hardly ever	45.9	62.5	70.3	53.9
Number	2014	48	118	154

X Dictionary in Home

(Column per cent)	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
Value & Category				
(1) Often used	44.0	39.6	39.0	40.6
(2) Occasionally used	52.7	58.3	50.8	55.5
(3) Never used, no dictionary	3.3	2.1	10.2	3.9
Number	2017	48	118	155

XI Parents Encourage Reading

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) Often	36.5	52.1	44.1	44.2
(2) Sometimes	42.2	29.2	44.1	39.0
(3) Never	21.3	18.8	11.9	16.9
Number	2021	48	118	154

XII Parents Ask About Schoolwork

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) Often	40.8	48.9	40.7	37.0
(2) Sometimes	47.5	44.7	49.2	52.6
(3) Never	11.6	6.4	10.2	10.4
Number	2019	47	118	154

XIII Parents Encourage Culture

(Column per cent)	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
Value & Category				
(1) Often	34.5	37.5	29.7	37.3
(2) Occasionally, Hardly ever	65.5	62.5	70.3	62.7
Number	2006	48	118	153

XIV Books in Home

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) > 25 books (High)	92.4	91.5	65.3	80.9
(2) Low	7.6	8.5	34.7	19.1
Number	2023	47	118	152

XV Hours Reading for Pleasure

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) More than 3 hours	33.3	39.6	29.7	35.1
(2) 1 to 3 hours	39.4	31.3	35.6	36.4
(3) Up to 1 hour	27.3	29.2	34.7	28.6
Number	2020	48	118	154

XVI Number of Siblings

(Column per cent) Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) None	3.3	2.1	7.6	5.8
(2) 1	18.6	20.8	22.9	33.8
(3) 2	27.5	18.8	28.8	26.0
(4) 3	22.4	33.3	20.3	14.9
(5) 4 or more	28.2	25.0	20.3	19.5
Number	2023	48	118	154

XVII Father's Occupation 1972

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) Labourer	4.0	8.5	13.8	6.0
(2) Farm worker	2.4	-	-	0.7
(3) Service worker	3.7	4.3	5.2	4.0
(4) Semi-skilled	15.4	12.8	33.6	22.7
(5) Skilled	13.8	36.2	19.0	30.0
(6) Clerical	13.5	4.3	0.9	8.7
(7) Managerial	27.0	19.1	26.7	14.7
(8) Lower professional	4.5	4.3	0.9	4.0
(9) Higher professional	15.7	10.6	-	9.3
Number	1987	47	116	150

XVIII Form 1972

(Column per cent)	Ethnic Origin (Father)			
	Value & Category	Anglo-Australian	W.Europe	S.Europe
(1) One	0.1	-	-	-
(2) Two	0.2	-	0.8	-
(3) Three	6.5	6.1	12.7	7.7
(4) Four	48.3	42.9	44.9	51.0
(5) Five	41.9	49.0	37.3	38.1
(6) Six	2.1	-	1.7	2.6
Number	2012	48	115	154

XIX Years in Australia

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) Up to 10 years	0.5	4.1	12.7	23.9
(2) More than 10 years	99.5	95.9	87.3	76.1
Number	2031	49	118	155

XX Country of Birth - Self

(Column per cent) Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) Australia	92.0	73.5	69.5	56.8
(2) Other English speaking	7.2	4.1	-	7.1
(3) Italy	-	-	16.1	-
(4) Greece	-	-	12.7	-
(5) Germany	-	6.1	-	-
(6) Netherlands	-	14.3	-	1.2
(7) Other	0.7	2.0	1.7	34.8
Number	2030	49	118	155

XXI Ethnic Origin - Mother

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) Anglo-Australian	99.4	19.2	14.9	20.6
(2) W. Europe	0.4	75.0	-	1.9
(3) S. Europe	0.1	-	82.6	5.8
(4) Other	-	5.8	2.5	71.6
Number	2030	48	118	155

XXII Speak English - Father

(Column per cent)	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
Value & Category				
(1) No English at home	0.5	10.0	2.5	10.8
(2) Some English at home	0.3	16.0	43.2	29.9
(3) Mostly English at home	1.9	50.0	25.0	32.0
(4) Only English at home	97.3	24.0	6.8	27.2
Number	2012	50	120	147

XXIII Speak English - Mother

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) No English at home	0.7	12.2	30.5	12.3
(2) Some English at home	0.4	22.4	42.4	26.5
(3) Mostly English at home	1.1	38.8	16.9	28.4
(4) Only English at home	97.3	26.5	9.3	31.0
Number	2010	49	117	155

XXIV System

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) Government	69.8	79.6	66.1	73.5
(2) Catholic	17.5	12.2	33.1	21.3
(3) Independent	12.8	8.2	0.8	5.2
Number	2031	49	118	155

XXV Region

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
Metropolitan	58.0	75.5	85.6	83.2
Non-metropolitan	42.0	24.5	14.4	16.8
Number	2031	49	118	155

XXVI Parent Interest

(Column per cent)	Ethnic Origin (Father)			
	Anglo-Australian	W. Europe	S. Europe	Other
Value & Category				
(1) High	18.0	24.0	9.1	16.4
(2) Moderate	56.7	40.0	52.9	53.3
(3) Low	25.3	36.0	38.0	30.0
Number	2013	50	121	152

XXVII Home Literacy

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W. Europe	S. Europe	Other
(1) High	28.5	40.4	20.4	31.6
(2) Moderately high	23.8	14.9	23.7	25.7
(3) Moderately low	22.6	14.9	23.7	14.5
(4) Low	25.1	29.8	32.2	28.3
Number	2006	47	118	152

XX VIII English Use

(Column per cent)	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
Value & Category				
(1) Low	0.7	26.1	67.3	37.5
(2) Moderate	0.8	45.7	24.8	30.6
(3) High	98.6	28.3	8.0	31.9
Number	1970	46	113	144

XX IX English Use by MIGRANCY

(Migrant sample only)

Value & Category	One parent not Australian born	Both parents not Australian born	Subject not Australian born	Subject resident 10 years
(1) Low	1.2	49.4	68.9	67.3
(2) Moderate	17.1	43.0	26.7	15.4
(3) High	81.7	7.6	4.4	17.3
Number	82	158	45	52

XXX Migrancy

Value & Category	Ethnic Origin (Father)			
	Anglo-Australian	W.Europe	S.Europe	Other
(1) Both parents Anglo-Australian: subject Aust.born	98.7	(2.0)	-	-
(2) One parent non Anglo-Australian: subject Aust.born	0.5	18.4	15.3	20.6
(3) Both parents non Anglo- Australian: subject Aust. born	-	57.1	54.2	44.5
(4) Subject not Australian born: resident > 10 years.	0.2	18.4	17.8	11.0
(5) Subject resident < 10 years in Australia	0.5	4.1	12.7	23.9
Number	2031	49	118	155

APPENDIX 3

SECONDARY VARIABLES

1. Parent's Interest

Generated by the addition of primary variable scores.

- | | |
|-----------------------------------|----------|
| 9. Parents Help with Homework. | 3 levels |
| 12. Parents Ask About Schoolwork. | 3 levels |
| 13. Parents Encourage Culture. | 2 levels |

Correlations

	9.	12.	13.
9.		.1168	.1397
12.			.2406

Variable generation rule

Addition of scores.

$$9. + 12. + 13. = \text{Parents' Interest (Raw Score)}$$

Missing data was omitted.

$$\text{Parents' Interest} = \text{Recode Parents' Interest (Raw Score)}$$

$$7,8=1/5, 6=2/3, 4=3 / \text{Missing data} = 9$$

This recoding allowed a high score to reflect high interest.

2. Home Literacy

Generated by the addition of primary variable scores.

10.	Dictionary in Home.	3 levels
11.	Parents Encourage Reading.	3 levels
14.	Books in Home.	2 levels
15.	Hours Reading for Pleasure.	3 levels

Correlations

	10.	11.	14.	15.
10.		.2525	.1849	.1689
11.			.0851	.2620
14.				.1830
15.				

Variable generation rule

Addition of scores.

10. + 11. + 14. + 15. = Home Literacy (Raw Score)

Missing data was omitted.

Home Literacy = Recode Home Literacy (Raw Score)

4,5=1/6=2/7=3/8, 9, 10, 11=4/Missing data = 9.

This grouping produced approximate quartiles.

Home Literacy was recoded to allow high scores

reflect high literacy:

4=1/3=2/2=3/1=4

3. English Use

Generated by a combination of primary variables.

23. Speak English - Father 4 levels

24. Speak English - Mother 4 levels

Correlation 23. by 24. = 0.91

Variable generation rule (English Use-Raw Score)

23. values		1	2	3	4	MD
24. values	1	1	2	9	9	9
	2	2	2	3	9	9
	3	9	3	3	4	9
	4	9	9	4	4	9
	MD	9	9	9	9	9

English Use values were only assigned to cases where the responses of the father and mother were the same or in adjacent categories. Others assigned as missing data (MD=9)

English Use = Recode English Use (Raw Score)

1, 2=1/3=2/4=3/MD=9

4. Migrancy

Generated by a combination of information available from primary variables.

21.	Ethnic Origin - Father	4 levels
22.	Ethnic Origin - Mother	4 levels
20.	Country of Birth - Self	7 levels
19.	Years in Australia (Raw Score)	2 levels

5. Family Size (Reverse)

Recode of primary variable

16.	Number of Siblings	5 levels
-----	--------------------	----------

Variable generation rule

$$1 = 5/2 = 4/3 = 3/4 = 2/5 = 1/M.D. = 9$$

This reversed variable was developed to obtain positive correlations in the regression analyses.

APPENDIX 4

INTERCORRELATION, INTERACTION AND INTERPRETATION

a) Intercorrelation between factors

The examination of non-manipulative variables in a non-experimental design presents difficulties which are evident in these analyses.

Non-experimental data of this type is likely to result in unequal cell frequencies with a non-orthogonal design. When this occurs, it is because the main effects are not independent of each other. As well, interaction effects will not be independent of the main effects.

(Winer, 1971) Table 11 illustrates significant intercorrelation between main effects related to Hypothesis 3.

Examination of non-experimental data in terms of a classical experimental design may result in a difference between the component sum of squares and the joint additive sum of squares. The sums of squares recorded in Table 11 illustrates this discrepancy and bear witness to the non-orthogonality of the data.

The classical approach, as employed in the above analysis, may cause difficulty distinguishing significant main effects because each factor receives credit only for the incremental sum of squares that it adds to the effects of the other factors. Using such data, the relative significance of English Use, Home Literacy and Parents' Interest cannot be clarified. The summary tables (Tables 7b, c & d) indicate several significant interactions associated with family practices.

b) Interaction

Table 7(c), English Use, records a significant interaction between Ethnic Origin and Sex. Western European boys report a greater degree of English Use than do the girls, while no such difference is recorded among the Southern European group. This may reflect the difference between the home environments experienced by boys and girls. As girls are more likely to spend time inside the home than boys, and in home situations where the mother would be likely to converse in the native tongue, they would perceive their parents as employing the native tongue to a greater extent than boys. Such differences would be less evident amongst the Southern European population who have largely persisted with the native tongue than amongst the Western European group who have been more willing to adopt English for use at home. (Appendix 3, Table XXVIII).

Table 7(b) records a significant interaction between Ethnic Origin and Father's Occupation in relation to Parents' Interest scores. Graphical representation indicates a complicated situation in which Parents' Interest follows separate patterns within ethnic groups and varies widely in relation to occupation. Because of this interaction, comparison of Parents' Interest scores in relation to ethnic origin is not attempted. It should also be noted that difference in Parents' Interest scores were not reflected in a significant difference in achievement or verbal ability.

c) Interpretation

A factorial "experiment" of this type has limited interpretive power. From the data presented, it may be concluded that differences in school achievement and verbal ability are significantly related to the degree of English use at home and, in addition, that differences in school achievement and verbal ability are significantly related to comparative ethnic origin. It cannot be concluded that such relationships are causal, particularly as factors associated with the home environment have exhibited considerable inter-correlation.

a) Comparison of Sums of Squares associated with Table 5(a) & (b)

Source of variation	Dependent Variable	
	Science 1972	Word Knowledge 1972
Additive model: SS A;B.C.D	765.35	4068.44
Main effects:		
A:SS =SS -SS A.BCD A,B,C,D B,C,D	151.26	1264.56
B:SS =SS -SS B.ACD A,B,C,D A,C,D	19.20	150.83
C:SS =SS -SS C.ABD A,B,C,D A,B,D	24.42	159.57
D:SS =SS -SS D.ABC A,B,C,D A,B,C	517.41	2109.13
(Main effects) ²	712.29	3684.09
(\sum Main effects) ² - \sum (Main effects) ²	53.06	384.35

b) Intercorrelations among Main Effects associated with Table 5(a) & (b)

Coefficient significance	A.	B.	C.	D.
A. Father's Occupation	1.000	.0965	.0717	.2267 p < .005
B. Parents' Interest		1.000	.3615 p < .001	.1726 p < .05
C. Home Literacy			1.000	.0596
D. English Use				1.000

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