EDUCATIONAL TURBULENCE

AND

NEW ZEALAND ARMY CHILDREN

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ABSTRACT

Military employment involves a high rate of geographic mobility which, it is often presumed, disadvantages service children educationally. This cross-sectional study was undertaken to empirically evaluate this presumption by comparing, in relation to educational turbulence, the academic achievement and personalities of 84 army and 130 civilian children. Relationships between parental attitudes to military and itinerant employment and the children's academic achievement were also investigated.

The Form II subjects of both sexes attended six selected schools; three predominently populated by army children and three predominently populated by civilian children. The civilian and army groups were comparable in terms of age, gender, socio-economic status, ethnicity and school environment.

Official school records provided biographic and mobility (number of schools attended) data as well as Progressive Achievement Test raw scores on the Reading Comprehension, Reading Vocabulary, Listening Comprehension and Mathematic tests. The Junior Eysenck Personality Inventory was used to measure the children's degree of extraversion-introversion and neuroticism-stability. A self administered Parent Questionnaire collected educational turbulence data in terms of mobility and the amount of short and long term absence of the father from home. Four attitude scales were constructed within the Parent Questionnaire to measure parental attitudes towards:

(a) The effects of mobility on education

(b) The effect of the service environment on the family

(c) Involvement in their children's education and

(d) Shifting the family home.

Army children were found to have experienced more than twice as much educational turbulence as the civilian children. There was no evidence however that they achieved less academically than comparable civilian children; nor did the groups differ on the personality dimensions of extraversion-introversion and neuroticism-stability. Furthermore, no strong and consistent relationships between parental attitudes measured and the children's academic achievement were found. There is however some evidence that army children whose parents believe the military environment detrimentally effects the family achieve higher academic results, most apparent in Mathematics Test performance, than those army children whose parents do not. It is suggested that compensatory efforts may be made by some army parents for the perceived deleterious effects of the service environment.

The findings are discussed in relation to previous research and the New Zealand context.

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LITERATURE REVIEW

1.1 *Introduction*

Geographic mobility is becoming an increasingly important feature of modern life. In an historically oriented review of international mobility Schaller (1972) reported that today's rate of geographic mobility exceeds that of all the great migrations in the past. Toffler (1970) described the situation in modern societies,

> As technological change roars through advanced economies outmoding whole industries and creating new ones almost overnight, millions of unskilled and semiskilled (and skilled) workers find themselves compelled to relocate...the disruption is often agonising. (pp. 87-88)

Geographic mobility usually involves residential relocation that can bring about a stressful situation in which the individual may perceive a threat that he will fail to cope with the change to a new environment, or a challenge to find a new and rewarding way of life. The extent to which an individual succumbs to the threat, is stimulated by the challenge, or vacillates between these two states depends upon a complex set of interactions between certain characteristics of the individual and his environment. Some of these will be examined in this thesis.

Geographic mobility often includes the following kinds of concomitant movement: social mobility; between classes and ethnic groups, occupational mobility; by promotion or in peripatetic employment, residential mobility; between neighbourhoods, states or countries, and economic mobility; as career success or failure and world

trends determine. These kinds of mobility are interrelated in that a change in one usually induces change in another. The aspect of geographical mobility investigated in this study is that which brings about residential change.

Some groups in modern society including labourers, civil servants, and professionals in the promotion stakes, regularly experience the disruption associated with geographic mobility and consequent residential change because of their employment. The peripatetic group in society focused upon in this study is the military community.

Geographic mobility is a fact of military life. Indeed it is one factor that differentiates military families from the community at large in most developed countries, and New Zealand is no exception. Although military families are not unique in this regard they do experience geographic mobility at frequent and sometimes erratic intervals as a condition of employment.

The New Zealand Ministry of Defence gives recognition to the problem of mobility when summarizing policy about this condition of Service in the Manual of Personnel Administration,

> The necessity for postings stems, in the main, from changes in emphasis in Service activities, releases, training requirements, promotions and the rotation of overseas posts. Every effort is made to restrict postings to the bare minimum since it is recognised that they frequently interfere with personal activities and, to a married serviceman, are disruptive to family life... Servicemen will not, therefore, be posted unless there are valid Service reasons for doing so,

> and in general this should be no more frequently than once every two to three years. (Ministry of Defence Manual of Personnel Administration, 1976, paragraph 7001)

This acknowledged disruption in the family life of servicemen has ramifications for all members of the family, whose needs sometimes conflict with the acknowledged requirements of national defence. The family members whose needs seem to be furthest removed from national defence considerations are the children. Yet, as they have the least amount of control over their living environment and assumedly less developed coping mechanisms, they are the most vulnerable to the effects of disruption.

The stresses children experience because of geographic mobility may include the move to an unfamiliar neighbourhood, a new school, new teachers, the loss of old friends and the need to make new ones. They must adjust to new school courses, methods, and social contacts. Not only must children cope with all of these stressful situations, they must do so at a time when their parents, the most stable and secure sources of support in an otherwise disrupted environment, are preoccupied solving their own problems associated with geographic mobility.

How do the children cope with this acknowledged disruption in their lives? The writer, when a military psychologist, was often confronted by parents, teachers and professionals in the helping services, whose personal experiences with service children in schools and in psychiatric clinics led them to believe that generally the children do not cope well with their peripatetic life.

The success or failure of children in coping with the stresses of geographic mobility is alleged to be manifest in their academic achievement, behaviour, and personality development. This belief has generated discussion and empirical studies that have contributed to the growth of a body of literature pertaining to childrens' success and failure in adjusting to frequent geographic mobility. That literature is reviewed below.

In the literature the terms mobility and turbulence have not been used consistently and are indeed employed interchangeably. This may be a result of the varying hypothetical constructs of the authors, the uncertainty of what variables are subsumed under each term and the differing attempts to quantify them. In an effort to alleviate this confusion the author will use the terms in the following ways except when directly quoting another author.

Mobility is used to describe residential change by the family regardless of the cause. The concept of *turbulence* is more general and is used to describe any or all of the sources of stress from change associated with a peripatetic life. These sources of stress include *mobility* and parental absences, uprooting of the family from their established home, school and social environments, the number of teachers the children have had, and losses such as that of friends, a familiar environment, and so on. Which aspect of *turbulence* is addressed is explained in each study cited.

The studies reviewed have been chosen to highlight the important factors that may be involved in any relationship between turbulence and the academic achievement of service children. It is recognised that not all stress within military life is related to turbulence.

However, as turbulence is generally considered a major source of stress in military life, and it is a feature that differentiates military from civilian employment, turbulence is treated as an important independent variable in this investigation.

Early research into the effects of mobility on children generally focused on children's academic achievement, probably because such achievement is most readily quantified. Theoretical and practical developments in the behavioural sciences later gave researchers the means to measure various aspects of children's personality development. This aspect of their development in relation to mobility then became the focus of interest when searching for empirical evidence of the effects of mobility that were intuitively suspected. Further development in the behavioural sciences, together with a perplexing situation in which inconsistent and contradictory results were often obtained, finally led researchers to consider the academic achievement of highly mobile children to be a product of complex interactions between the personal characteristics of the child and environmental situations.

The literature outlined in this review follows this general pattern of development. That is, this review moves from mobility studies of academic achievement alone, to those looking at mobility and personality development in isolation, to those taking the more eclectic approach of the 1970's.

1.2 *Turbulence and Children's Academic Achievement*

Early discussions about the relationship between "irregular schooling" and "backwardness" eventually led to some empirical studies by Burt (1937), Hill (1939), and Schonell (1942). These men documented

case studies of backwardness and identified frequent changes of school as a contributary cause of backwardness, generally taken to mean below average achievement. However in an early New Zealand study Winterbourn (1944) found the opposite. He concluded that school change was not a major factor contributing to backwardness, though he assumed that few children in New Zealand experience much school change.

In the United States Gilliland (1959) cited in McCubbin, Dahl and Hunter (1976) examined the relationship between transiency and academic achievement using an intelligence quotient (IQ) as an intervening variable. He found transient children were significantly ahead of nontransient children in mean and in total academic achievement. Furthermore an increase in IQ and the number of schools attended was accompanied by an increase in the difference of the scores for transient and nontransient children.

Williams (1961) cited in Richie (1965) studied a large group of British Service children in Germany and expanded the measure of turbulence to include the number of schools attended by each child (Gilliland's transiency) and the number of teachers the child had. He obtained measures of intelligence, and english and arithmetic attainment, and related these to the turbulence measure. Williams concluded that there was no clear relationship between number of schools or teachers and attainment on these measures at the time of the children's entry into secondary school. Nonetheless, in a survey of parents and teachers, Williams found the widespread belief that school changes were detrimental to children's educational progress.

The Central Advisory Council for Education (England) (1967, also known as the Plowden Report) in a comprehensive investigation of children and their primary schools, identified service children as a

specific problem group. The report noted that "There is evidence of serious backwardness among Army and Air Force families in areas with large service populations and high turnover of pupils and teachers" (p.60).

Turning now to North American research Kenny (1967) studied a large sample of United States military personnel he regarded typical of middleclass America, who were living in a military community in Germany. He looked for differences between military and civilian communities in the areas of mobility, intelligence, academic achievement and personal adjustment of the children. In summary Kenny found that: military rank of the father had no significant effect on adjustment of children; military children had a higher mean IQ and better school achievement record; there were fewer emotionally disturbed children in the military community, and those military children who were emotionally disturbed tended to internalize their disturbances in the form on withdrawal behaviour; and the sex ratio for disturbance was the same in military and civilian communities.

Kenny referred back to a study by Gabower (1960) who investigated behaviour problems of children from United States Navy families and noted her conclusion:

> Children in Navy families are subject to the same general conditions as are all children of the United States, but they also experience other environmental and social situations which are characteristic of Navy life. Principle among these are the many moves the family makes causing changes for the child in home, school, neighbourhood and friends, and separation of the father from the

family as necessitated by his duty assignments.

(Gabower, 1960, p.177)

It was Gabower's contention that these differences are superficial to the basic parent-child relationship, and she argued that "The behaviour of the child is more closely related to the way in which the parents deal with him than to conditions of the physical environment to which he is subjected" (p.61).

While accepting the importance of the parent-child relationship to explain the differences in adjustment of children in military and civilian communities Kenny suggested there is a more basic difference between the two types of communities. He pointed out that the military is a select group in terms of intelligence and education. Kenny supported this view with the fact that fifty percent of those eligible for the military draft in the United States were rejected mainly for reasons of intellectual or emotional defects.

Argument about the uniqueness of the military community lies beyond the scope of this thesis. Although the interested reader is referred to Janowitz (1960), Lyon and Oldaker (1967), Blockberger (1970) and Dixon (1976) for discussion of this issue.

Bourke and Naylor (1971) analysed teacher assessed educational achievement measures of Australian Army children and concluded that "For most subjects the majority of students in the majority of States (of Australia) did not differ significantly in achievement with respect to their movement category" (p.115). Life Williams (1961) Bourke and Naylor found that most parents believed changes of school harmed children's academic achievement. But they did not necessarily believe their own particular children had suffered as a result of changing schools.

Francis (1971) studied the effects of mobility on the dependent children of Servicemen in the Canadian Forces. He found that the reaction of the parents to the move and their ability to cope with the associated stresses were more important than the actual factor of mobility.

> Families of high socioeconomic status and those upwardly mobile through promotions, have often acquired the ability to adjust to new situations better than families of low socioeconomic status, and usually transmit this ability to their children. (p.21)

Francis concluded that mobility did not effect intelligence though it did have some effect on academic achievement. Furthermore he argued that academic achievement was subject more to other influence such as home and school environment and the characteristics of the child itself than to mobility. Francis postulated that the mobility factor aggravated and magnified any existing but manageable problems until they created academic difficulties. For Francis the significance of mobility is that it works indirectly.

The wide range of potentially detrimental effects that mobility might have on Service children was outlined by Manning (1972) in an Australian report, "Because of shifting, the Service dependents are at a distinct liability in both terms of education and vocational, physical, and personal and social development" (p. 12).

In a similar but more specific prescription Firth (1974), who has published several literature reviews and suggestions for dealing with the problem of turbulence in the British military and education systems, concluded "Turbulence appears in particular to handicap young children,

pupils of below average ability and attainment in cumulative skills, such as arithmetic" (p.170).

In recent years Win investigated some of the effects of mobility on Army children in New Zealand. Win (1972) studied Army children in one school and found that a group of children in Forms I and II who attended four or more schools had a higher proportion of below average achievers than a group of children who attended three or less schools. In 1974 Win again studied academic achievement and personal adjustment as assessed by teachers using a behaviour questionnaire, of 78 children at the same Army Camp school as his 1972 study. He found school or teacher change had no effect on the social adjustment or academic achievement of either army or civilian children.

It seems then, that the research about mobility and turbulence effects on academic achievement is equivocal. Bourke and Naylor (1971) aptly described the state of the research to that date.

> For twenty eight separate, well-controlled studies undertaken in Britain and the U.S.A. the results were as follows :
>
> a. five studies found mobile students had higher achievement than static students;
>
> b. eleven studies found no differences in achievement between mobile and static students; and
>
> c. twelve studies found mobile students had lower achievement than static students. (p.2)

Since then possibly the most comprehensive investigation into the effects of military turbulence on children has just been concluded. This is the study titled *Educational Turbulence Among Australian*

Servicemen's Children (ETASC) by Mackay and Spicer (1975b) which has served in part as a model for the present study.

The ETASC study was a conjoint project directed by the Australian Departments of Education and Defence, and Monash University. The aim of the study was to investigate the nature and effects of posting (military job transfer) turbulence on the education of service children and to recommend action to alleviate any disadvantages they might be found to experience.

This large scale project was cross-sectional in design. Personal history, adjustment and achievement information was collected from parents, teachers, principals, and children by means of interviews, questionnaire surveys, and a testing programme of 13,981 servicemen's children throughout Australia, Malaysia, Singapore and Papua New Guinea. The study also included a small control group of non-service children.

The conclusion of the study was that:

> There is no evidence that turbulence produces consistent and lasting effects of either a beneficial or harmful kind in any of the following areas:
>
> a. attainment in various curriculum areas
> b. interest in various curriculum areas
> c. preferences for styles of handling information
> d. social development, leisure-time activities, and attitudes to change. (Mackay & Spicer, 1975a, p.5)

The ETASC study is the most recent and comprehensive publication about the effects of turbulence on service children and this investigation is a partial replication of the ETASC work in the New Zealand context.

Additionally the present study examines parents' attitudes to mobility and to the Army, and the relationship of these attitudes to their children's academic achievement. The present study also compares the academic achievement of army children relative to a comparable civilian group in New Zealand. Specific findings of the ETASC study will be referred to throughout this thesis as they relate to aspects of the present study.

1.3 *Turbulence and Children's Personal Development*

Awareness of the relationship between turbulence and personal adjustment of children has been generated by case studies of children referred to clinics for psychological assessment. An early important study was that of Murphy and Zoobuck (1951) who studied 50 consecutive children referred to a military child guidance clinic because of school adjustment problems. They rank-ordered those factors of military life that appeared to be most stressful and found that father absence from home was the most important. Sixty four percent of the cases had family histories of father absence for over six months.

Gabower (1960) similarily used 15 US Navy children referred for psychological treatment, and included a control group of military children with no reported behaviour or psychological problems. She found that separation from the father was related to the child's behaviour problem. However, Gabower pointed out that the effects of frequency and length of separation could not be dissociated from the way the mother and father played their respective roles. Particularly important variables were their own parenting ability and what efforts, if any, they made to help the child cope with father separation.

McCubbin et al. (1976) cite a similar study by Kurlander, Leukel, Palevsky and Kohn (1961) in which military children referred to a child guidance clinic for psychological treatment had a median of six geographical moves.

Pepin (1966) examined academic achievement and personal adjustment of three groups of high school students all living in the same American community. They comprised a military mobile group, a non-military mobile group and a non-mobile group. Pepin found they did not differ in eight of eleven categories on the Mooney Problem Checklist. Although there were differences in three areas: finances, living conditions and employment; curriculum and teaching procedures; and adjustment to school work. The differences in adjustment to school work and the finding that, with regard to mobility and academic achievement, the non-mobile group scored higher on a standardized mathematics test are particularly relevant to the present investigation.

The importance of father absence for boys was evaluated by Baker, Fagen, Fischer, Janda and Cove (1967) who took various sociological and psychological measures of military families (mother, father and 5-8 year old son) before the father left, and again 6-9 months following his departure. They found increased masculine striving and poorer peer adjustment among male military children whose fathers were absent on overseas tours of duty compared to intact families.

The age of children seems an important factor when considering the influence of parents' reaction to mobility. Gonzalez (1970), reported by McCubbin et al. (1976), in case studies of military "Brats" referred for psychological help found that younger children reacted to the emotional changes in their parents rather than geographic change.

Wagner and Feletti (1974) were similarly interested in the development of New Zealand service children. They studied mobile service children and non-mobile civilian children in two schools in New Zealand and found that "frequent changes in primary schools deprive a boy of the opportunities to develop his self concept to the same level as his geographically stable peers" (p.114).

The development of self concept is in part enhanced by the security of the child's environment and as Firth (1974) has observed

"The peripatetic are thrown on their own resources; they learn to be self-contained, even detached, and lean heavily on the emotional and social relationships of the immediate family circle" (p.329).

The development of self concept, a process beyond the scope of this study, may however indirectly influence academic achievement. Leith and Davis (1972) for example, investigated the relationship between neuroticism and achievement and found that for 12-13 year old children high anxiety facilitated academic achievement. Being a curvilinear relationship high anxiety had a debilitating effect on college students. They suggest that the curvilinear relationship between anxiety and achievement is related to changes in self confidence or self concept of the students. Although it should be noted that this relationship was not observed in all studies (Child, 1964).

McCubbin and Dahl (1976) conducted a longitudinal study of prolonged family separation where fathers were Prisoners of War during the Indo-China War, and found that, "the longer the period of absence, the better the family relations of the child and the more self reliant he became" (p.141), in terms of the child's social and academic

development. The authors explain this finding which conflicts with Gabower (1959) and others by suggesting that the prolonged absence of the father placed greater demands on the children in terms of responsibility in the family unit, and self reliance leading to a sense of security and self respect.

Inbar (1977) identified a male "vulnerable age" for geographic moves. He stated "in early school years a geographical move or crisis could mean a drop in his eventual academic achievement or even his IQ" (p.28). Inbar identified the sixth to eleventh years as the male vulnerable age. His evidence was inconclusive for females. He derived this finding from analyses of Israeli and Canadian immigration and college statistics. The influence of intervening variables between mobility and achievement were unknown in his study. From the analyses conducted however Inbar did find conclusive evidence that among men and for larger interregional moves, "those who moved during the vulnerable age ended up with less schooling" (p.30).

Mackay and Spicer (1975) in the ETASC project investigated service children's personal development in terms of their attitudes about, and interest in, educational and social activities, and the personality dimensions of extraversion and neuroticism (described in Chapter 2). In accord with their findings about academic achievement, they found that turbulence appears to have no noticeable effect on student interest in curriculum areas or preference for certain styles of learning. The authors caution that this does not mean individual students have not had their interests detrimentally or beneficially effected by turbulence but that such effects are less common than supposed by teachers and parents. Younger service children were found to be more

introverted than civilian children. Overall however they concluded there was "no evidence to suggest that turbulence is a major factor influencing children's social achievement, leisure-time activities or attitudes to change" (p.86).

It seems the evidence that military children differ from civilian children in personality characteristics is weak. Nevertheless the evidence does suggest that if military children do have personality differences or special behaviour problems they are more likely to be internalized than "acted out" (Kenny, 1967, p.62).

Possible differences between army and civilian children on the personality dimensions of extraversion and neuroticism are examined in the present study. Particular attention is given to the neuroticism dimension as some studies have shown neuroticism may influence academic achievement (Eysenck and Cookson, 1969; Leith and Davis, 1972).

1.4 *Parental Influence on Children's Academic Achievement and Personal Adjustment*

The manner in which parents influence their children's educational and personal development in relation to mobility and father absence is the focus of this section. It will be shown that the readiness of parents to accept mobility is an important factor in determining how well their children cope with mobility.

One of the most significant studies in this area was that of Pedersen and Sullivan (1964) who observed that parental attitudes toward mobility were important in determining the child's ability to adjust to the move. They compared the incidence of geographic mobility in the histories of 27 emotionally disturbed military children and 30

matched normal children. While they found the actual incidence of geographical relocation was not related to the criteria of emotional disturbance, parental attitude to mobility did differentiate the groups.

> Mothers of normal children appear significantly more accepting of frequent relocation, and both mothers and fathers of normal children show a stronger identification with the military community. (p.580)

McKain (1973) studied the problems of Army families upon relocation in terms of the wife's feelings of alienation; that is, her sense of belonging to, or distance from the military community. He concluded:

> That geographic mobility and family problems associated with moving are likely to be found in the Army family in which the wife-mother feels alienated from society and the Army community. (p.20)

In Britain the Plowden Report (1967) suggested that:

> The variation in parental attidutes can account for more of the variation in children's school achievement than either the variation in home circumstances or the variation in schools. (p.33)

Although research shows the wife's acceptance of mobility can influence the capacity of the family to cope with the event; to what extent the wife-mother's attitude is related to the child's academic achievement has not, to the writer's knowledge, been investigated.

The fact that parents may convey their attitudes about education to their children was observed by Willmon (1969) who in a study of the Head Start programme in America found that parental involvement in educational programmes for young children increases their children's future academic achievement motivation.

Lopate, Flaxman, Bynum and Gordon (1970) in a review of the literature about community participation in education concluded "Educational research indicates that when parents of school children are involved in the process of education, their children are likely to achieve better" (p.148). Essentially the authors argue that parental participation in their children's education lessens the actual and imagined distance between the goals of the home and those of the school. Furthermore the children's knowledge that their parents have some control in the school's decision making enhances their sense of self worth, which is essential if they are to achieve.

Cowie (1974), however, studied differing kinds and amounts of parental involvement in a New Zealand school. He found that parental involvement had no significant effect on children's academic achievement although parents and teachers felt that active parental involvement was probably helpful for individual children. Nonetheless Cowie notes that the overseas literature reviews, particularly Sharrok (1968) and Lopate et al. (1970), generally support the claim that parental attitudes to education and involvement in education programmes do in fact influence their children's academic achievement.

What are the attitudes of New Zealand Army parents towards participation in education? Do they feel restricted in the amount or kind of participation they may have because of frequent shifts?

If so, is there a feeling of remoteness or lack of control which may effect their children's academic achievement? These questions appear to have not been asked to date and are worthy of attention.

1.5 *Summary*

The research and literature, as contradictory and inconclusive as it appears to be, has established empirically what many have assumed,

> "The military family" is influenced by a host of acute and chronic stresses related to, if not unique to, life in the military. No other large group is exposed so uniformly to the pressures of father absence and geographic mobility. (McCubbin et al., 1976, p.293)

The effects of these pressures are not yet clear. The scarcity of research on the military family up to 1960 followed by an increased awareness that the family is an important influence on the behaviour of the soldier in terms of his morale and efficiency precipitated a shotgun approach to research on the military family during the 1960's and early 1970's "The result has been a theoretical eclecticism leading toward research in breadth rather than depth: an index of it's conceptual adolescence" (McCubbin et al., 1976, p.315).

Coates and Pellegrin (1965) in their literature review complained of the inability of researchers to build upon past research and therefore contribute to a body of knowledge. While this is a problem also apparent in other research areas, research about the effects of turbulence on children has more specific problems given the complex natures of turbulence and children's development.

A fundamental problem is that of identifying and quantifying mobility and the wider concept of turbulence. Mobility may include residential, social, geographical, occupational, educational or income movement and it's significance may be influenced by other factors such as whether it is "forced" mobility, the time it occurs in relation to other events, the rate, the amount, etc. Turbulence may be any stress associated with change, which is again influenced by a multiplicity of factors such as the characteristics of the individual, and of the family unit, the old and new environments, institutional compensation for disruption, and so on.

This confusion about the kinds of turbulence, the "major methodological problem of isolating one variable, mobility, within the unresolved nature/nuture controversy" (Firth, 1972, p.58), and the complications of differentially quantifying degrees of turbulence, all contribute to the present situation of contradictory findings, and make efforts to generalize about the effects of mobility or turbulence difficult.

In addition to the difficulty of identifying and quantifying turbulence most studies are subject to the following general criticisms outlined by McCubbin et al. (1976). Many of the investigations were not set out to test specific hypotheses and ended up as broad clinical observation studies with untested common sense assumptions. Some of the studies employ restricted samples from available local populations that may not necessarily be representative, which seems to be a feature of some of the New Zealand work.

In terms of relating turbulence to children's educational and personal development the confounding of many intervening variables, including the individual characteristics of the child such as age, sex, general ability, personality, and the environmental influences of the home, school and social scenes, have created methodological and conceptual confusion.

There is however general agreement about two points made or assumed consistently in the literature. The first is that the military, while not unique in this respect, is a social institution that subjects it's members to a turbulent environment in a more consistent and uniform manner than many other social institutions. The second is that the complex relationship between turbulence and achievement is not fully understood. Yet as Firth (1972) observed "The findings differ but no authority disputes that frequent changes of school, home and neighbourhood carry a significant risk of educational retardation and emotional maladjustment" (p.60).

These two conditions were the primary inducements to undertake the present investigation. It was also thought that the actual findings reported in the literature from which these concepts derive could not necessarily be applied to the New Zealand scene. Furthermore while the New Zealand data is thin, the overseas data, as illustrated in this review, does not allow definitive statements to be made about the effects of the military environment on children in any country. Finally the varying service conditions and cultural differences between countries make generalizations to the New Zealand context suspect.

Mackay and Spicer (1975) proposed a list of the main factors thought to influence the educational and personal development of mobile children. These include:

a. certain attributes of the child; for example general ability, and personality, particularly the degrees of extraversion and neuroticism

b. certain aspects of the child's school experiences, such as the number of school and teacher changes

c. certain attitudes of the parents; for example their willingness to cope with difficulties that arise and the degree of their concern for the child's education

d. certain aspects of the child's home background, such as the socio-economic level of the home, frequency and duration of father absence from home.

This list has formed the basis of the present investigation into the effects of turbulence on the academic achievement and personalities of children of New Zealand Army soldiers.

Several studies cited in this review have also suggested that parent's attitudes may influence their children's academic achievement. Accordingly the present study has drawn on the general findings and suggestions of earlier studies in looking for any relationships between army parents' attitudes toward mobility, the Army "system", education, and their children's academic achievement.

The basic questions put in this thesis are: Do army children experience more mobility than comparable civilian children? Are their fathers absent from home more often and for longer periods than those

of civilian children? Do they achieve any differently than civilian children at school? Are they any more extraverted or neurotic than civilian children? If there are any differences between army and comparable civilian children in these respects, are the differences related to the amount of turbulence experienced? And finally, is there an important relationship between parent's attitudes to certain features of the military environment and perpipatetic life and their children's academic achievement?

Chapter 2 describes the procedures by which answers to these questions were sought.

CHAPTER 2

METHODOLOGY

The purpose of this study has been to compare the academic achievement of army (children of New Zealand Army soldiers) and civilian children, with a view to investigating some of the possible effects of turbulence on army children's academic achievement.

A longitudinal, or pre-test/post-test design would best allow measurement of the effects of different amounts of turbulence on academic achievement while controlling important intervening variables. This investigation is, however, cross-sectional in design, given the restrictions of time and finance. Cross-sectional studies have inherent limitations that warrant the following considerations when interpreting the results: the observed differences may have been present before the experience of turbulence, and they may not necessarily be a result of turbulence itself but of factors related to turbulence. The steps taken to mitigate the effect of these limitations are described in this Chapter. Of more consequence is the fact that the aim of this study is to describe the present level of academic achievement of army children in relation to comparable civilian children having regard for the turbulence factor. It is thought the steps taken to mitigate the inherent limitations of cross-sectional studies together with the emphasis on describing the relative academic achievement of army children ensure that the above mentioned limitations do not detract from the present study.

2.1 *Hypotheses*

1. Army children experience more mobility than civilian children.
2. Army children experience more father absence than civilian children.

3. There is no significant difference in performance between civilian and army children on each of the following Progressive Achievement Tests (PAT):

   3a. Reading Comprehension (RC)

   3b. Reading Vocabulary (RV)

   3c. Listening Comprehension (LC)

   3d. Mathematics (M)

   3e. composite linguistic skills (CLS)

4. There is no significant relationship between children's achievement on the PAT and parents' attitudes as measured by the Parent Questionnaire. The attitudes measured are:

   4a. attitude about the effects of mobility on education (scale 1)

   4b. attitude about the general effects of the service environment on the family (scale 2)

   4c. attitude towards parental involvement in their child's education (scale 3)

   4d. attitude toward shifting the family home (scale 4)

5. There are no differences between army and civilian children in the personality dimensions of:

   5a. extraversion - introversion, and

   5b. neuroticism - stability

   as measured by the Junior Eysenck Personality Inventory (JEPI).

2.2 *The Sample*

The sample is a quota sample (Garnder, 1976, p.92) based on the subject attributes of age, sex, and class level.

The sample consisted of 130 male and 88 female New Zealand school children attending Form II during 1977. This class level was chosen because of the general uniformity of core curriculum within primary schools. Furthermore, given the age range (10.7 to 13.4 years and a mean of 12.4 years) one may assume the children are not generally undergoing adolescent turmoil that may influence the outcomes of a study of this kind.

The children were all of those in the Form II classes of six schools. These schools were selected on a comparative basis (Gardner, 1976, p.96) so that each pair contained one school predominantly populated by army children with some civilian children (Camp school) and one school predominantly populated by civilian children with some army children (country school). One pair of Camp and country schools was near a provincial centre in the North Island, another pair served North Island rural catchment areas, and a third pair was located near a South Island provincial centre. The schools were also paired on the basis of approximately equal size of school enrolment.

"Army" or "Camp" schools are those located within Army Camps and serve service personnel in the main but also other civilian people like farmers, technicians, etc. in the surrounding rural area. The schools are entirely staffed and administered by civilians as they are State schools.

A description of the sample characteristics is included at the end of this Chapter.

2.3 *Variable Descriptions*

Mobility. The operational definition of mobility is, *the number of schools attended by each child.* This simple index was taken from the E19/22 cards (New Zealand Department of Education, n.d.) and substantiated through the Parent Questionnaire data. No account was taken of the reason for the change of school, or the time of change in terms of the child's age, or school term.

Father absence. The operational definition of absence is, *the amount of short and long term absence of the father from the home.* It is a condition of employment in the army that soldier/fathers be available for, and sometimes on duty 24 hours a day, 7 days a week. This fact of service employment is considered a major difference between army and civilian employment.

Absence of the mother from the home may be equally or more important to some children than the absence of their father. While this characteristic of home life is important to children it was not measured as this investigation focuses on absence because of employment, and there are no soldier/mothers employed in the New Zealand Army.

Mackay and Spicer (1975) found that parents could reliably recall long term absence over a period of five years and short term absence over three years (p.13). Accordingly the following two measures of turbulence were taken:

Long term absence = total number of months of father absence from the home in the five years 1972 to 1976.

Short term absence = sum of the absence category numbers for the three years 1974 to 1976.

The short term absence categories were:

(1) 0 - 50 days [1]

(2) 51 - 100 days

(3) 101 - 150 days

(4) 151 - 200 days

(5) more than 200 days

No account was taken of the recency of absence since the aim is to measure the general long term effects of turbulence and these are measures of the average amount of absence over recent years.

Socio-economic status (SES). Socio-economic status was measured by the Revised Socio-economic Index for New Zealand (Elley and Irving, 1972). This six point scale is based on median educational level and median income. It pertains to over five hundred occupations in New Zealand.

Ethnic identity. The index of ethnic identity was as simple as the measurement. All subjects, regardless of their physically apparent race, were asked to indicate whether they were "Maori", "Pakeha", or other on the front page of the JEPI.

Note. [1]This category should have been 1 - 50 days. The error was not corrected before the Parent Questionnaire went to print. However Service requirements make it a certainty that no serviceman would have chosen category 1 to indicate 0 days absent in any one year.

The issue of ethnicity is however more complex. Attempts to identify race and "Maoriness" range from cultural affiliation indexes to biological-come-blood measures. St. George (1977) in review of the New Zealand literature on ethnicity concluded that:

> The literature and research on this issue appears then to favour the use of a criterion of self-identification when making distinctions between the ethnic and cultural groups of Maori and European in the New Zealand population. (p.147)

The children in the present study had no difficulty choosing an ethnic identification when asked simply, "Are you a Maori, a European, or other?" The ability of children to make this choice was observed by Vaughan (1964a, 1964b, and in a replication by Awatere, 1972), who studied the development of ethnic awareness and found that children of the age levels in this study were able to make a choice of ethnic identity, in terms of their community and those with whom they are most involved.

2.4 *Measuring Instruments*

Progressive Achievement Tests. The PAT were used to measure the dependent variable, academic achievement (Hypotheses 3 and 4). This test group consisted of Reading Comprehension (RC), Reading Vocabulary (RV), Listening Comprehension (LC) and Mathematics (M) tests.

The PAT are a series of standardized achievement tests developed specially for use in New Zealand schools. They were specifically designed to provide measures of academic achievement level. The test developers actively involved specialists from various fields within the education

system. Particular emphasis was placed on the content validity of the tests as they were designed to reflect the curriculum content and objectives in each subject area. Consultation with the New Zealand Council for Educational Research confirmed that the tests were ideally suited to measure academic achievement for this study.[2] A brief description of these multiple choice, paper and pencil tests follows.

a. Reading Comprehension Test (Elley and Reid, 1969). This test provides levels of difficulty of reading material that a pupil can read with adequate comprehension. The test measures both factual and inferential comprehension of prose material with approximately equal proportions of items tapping these domains.

b. Reading Vocabulary Test (Elley and Reid, 1969). This test provides vocabulary levels that denote the number of common words the pupil understands.

c. Listening Comprehension Test (Elley and Reid, 1971). This test provides measures of simple recall skills and inferential comprehension, with approximately the same proportion of items in each area.

d. Mathematics (Reid and Hughes, 1974). This is an omnibus test emphasizing power rather than speed. It measures the following skills and abilities; recall of memorized information, computation, understanding of mathematical concepts, processes

Note. [2] Personal communication with P. Jackson, Test Development Officer, New Zealand Council for Educational Research, 18 January 1977.

and terms, and application of mathematical knowledge to unfamiliar situations.

In addition to the high content validity of this group of tests as measures of educational achievement, they also have the advantages of a standard administration, marking and scoring procedure and the availability of New Zealand national norms.

Investigations similar to the present study have sometimes suffered in terms of reliability and validity because of the variety of attainment tests used to measure different kinds of knowledge by various means. The use of the PAT group overcomes many of these difficulties. Ample and satisfactory empirical data on the reliability and validity of these tests is available in the respective Manuals.

An investigation of the marking reliability of the PAT by Hughes (1977) uncovered an error percentage rate for schools of around 20%. Hughes remarked 2046 test papers of 682 Form II pupils. Although this is an alarmingly high error rate (one expects about 5%) Hughes pointed out that the errors are usually slight and that the test sophisticated teacher would not likely misinterpret a pupil's achievement level because of a slight marking error.

An independent measure of "intelligence" was not taken for this study. Setting aside the arguments about the validity of such measures, it is important to be aware that the PAT correlate highly with other verbal abilities tests. Since schools today seem largely concerned with the development of verbal skills, the author thought measures of verbal abilities are appropriate indicators of potential for development of verbal skills, hence academic achievement, rather than non-verbal

performance measures.

The PAT Teacher's Manuals indicate PAT correlate with general ability tests in the order of .50 to .80 for pupils in approximately the same class level as those in this study, as shown in Table 1.

Reid and Hughes (1974) conducted a factor analysis of the PAT group and found that the tests have a large general ability component, although they point out that each of the Reading and Listening Comprehension tests provides information about a different aspect of a child's verbal ability (p.15).

Given these strong correlations a separate measure of general ability was considered redundant, and the use of a so-called independent measure of general ability using a performance, or non-verbal scale was thought inappropriate given the verbal abilities component of the criterion measures.

Junior Eysenck Personality Inventory (JEPI). A sample JEPI is in Appendix F. Past research by Teitz (1942), Pedersen and Sullivan (1964), Wooster and Harris (1972), Wagner and Feletti (1974) and others, together with parent and teacher interviews conducted in New Zealand at the preliminary stage of this study, suggest that mobile children may experience personality or behaviour problems related to turbulence. Although the evidence is equivocal about overall beneficial and detrimental effects of turbulence, attention is often focused on behaviour described by Eysenck as characteristic of the personality dimensions of extraversion and neuroticism. Eysenck describes these two dimensions as follows:

TABLE 1

Correlations Between PAT and Abilities Tests

PAT	Other abilities tests	r
RC	Otis Intermediate A	.79
	Jenkins Intermediate Non-verbal	.63
RV	Otis Intermediate A	.83
LC	ACER Word Knowledge C	.45
	ACER Reading for Meaning	.58
	Otis Intermediate B	.47
M	ACER: Test of Reasoning in Maths	.73

> Extraversion is characterized by sociability, activity, optimism, outgoing and impulsive behaviour etc., while introversion is characterized by unsociable, passive, quiet, thoughtful and reserved behaviour. Similarly with respect to neuroticism, the unstable person is moody, touchy, anxious, restless, rigid, while the stable person is calm, carefree, easy-going, reliable, and so forth. (Eysenck, 1965, p.3)

The JEPI was used in the present investigation to measure extraversion and neuroticism as in the ETASC study. The JEPI was derived from the Eysenck Personality Inventory (Eysenck and Eysenck, 1964). High scores on the extraversion, neuroticism and lie scales indicate extraverted and neurotic behaviour and increased lie telling, while lower scores on these scales indicate behaviour tending toward introversion, stability, and honesty respectively.

The JEPI is a particularly appropriate measure of these personality dimensions for this New Zealand study because it has been standardized for New Zealand conditions with separate norms for Maori and European children (Bowler and Leitch, 1972).

The Parent Questionnaire. The self-administered Parent Questionnaire is in Appendix A. It is a descriptive survey (Gardner, 1976, p.6) adapted from the following three instruments that were pre-tested, piloted and used in the ETASC study: (a) family questionnaire (b) history of child sheet (c) teacher questionnaire. The items chosen for the Parent Questionnaire were changed as necessary to fit the New Zealand context. Other items were developed specifically for this investigation.

The kinds of information collected are:

1. biographic and demographic data such as the number of siblings, serviceman's rank,
2. certain attributes of the children like sex and ethnicity,
3. mobility data such as the number of schools attended and the number of shifts of the family home,
4. other turbulence measures based on the amount of absence from home of the father,
5. attitudinal data such as parent's attitudes towards certain aspects of the military and education.

The advantages and disadvantages of self administered questionnaires versus interview techniques have been discussed by Oppenheim (1966), Gardner (1976), and Selltiz, Wrightsman, and Cook (1976). Those advantages of the questionnaire technique specific to this thesis are briefly: (a) guaranteed anonimity of respondents (b) standard questions and categories for reply (c) lack of interviewer error in recording answers (d) limited interviewer bias in asking questions (e) convenience to respondent allowing time for considered answers and (f) cost. The disadvantages include: (a) incomplete data on the total sample (b) inflexibility of coverage and (c) limited qualitative depth of answers. These and other practical considerations caused the investigator to adopt the questionnaire survey technique.

Questionnaire design and analysis of the kinds of information listed in 1 to 4 above is relatively straightforward and described in the standard texts on questionnaire design noted above.

However attitude measurement is more difficult, principally because of the complex nature of attitudes and the difficulty of establishing the reliability and validity of the measurements. A central problem is that of determining what would be the appropriate criteria of validity measures of complex attitudes. This difficulty explains for Ferguson (1957) why when attempts are made to establish the reliability and validity of attitude scales he finds there is "more measurement than validation" (p.237).

This investigator was interested in respondent reported knowledge, perceptions and attitudes. The author regards an attitude as something more stable than fluctuating opinion, yet less rigid than say, a religious belief. That is, for the purposes of this study an attitude is regarded as "a tendency to respond to people, institutions or events either positively or negatively." (Chaplin, 1974, p.42) To measure the direction and relative strength of parent's attitudes, four attitude scales were constructed within the Parent Questionnaire.

These attitude scales (Hypotheses 4a-4d and their derivatives 6a-6d) contained in the Parent Questionnaire are:

Scale 1 - attitude about the effects of mobility on education. (Items: 13, 14, 25, 28, 29, 30)

Scale 2 - attitude about the general effects of the Service environment on the family. This scale was administered to the army sample only. Experience in the military environment was necessary to meaningfully answer the items in this scale. (Items: 16, 18, 22, 23, 24, 51 to 58)

Scale 3 - attitude towards parental involvement in their child's education. (Items: 32, 33, 34, 36, 37, 46, 49, 50)

Scale 4 - attitude towards shifting the family home. (Items: 38, 39, 40, 42, 43, 48, 49)

These scales, with a complete listing of all questions included in each, are in Appendix B.

The attitude scales are summated scales with items pooled on the basis of their logical relationship to the target attitude. They follow the Likert scale format but are not Likert scales in that they have not been item analysed to determine which items best discriminate between high and low scorers, or the internal consistency of each scale.

The types of items used in the Parent Questionnaire are: fixed alternative (e.g. 1, 2, 5) free answer (e.g. 3, 6) itemized rating scales (e.g. 13, 14) ranking (e.g. 19, 20) rating (e.g. 42 to 58) closed (e.g. 21, 35) multiple choice (e.g. 32, 33, 34) open ended (e.g. 59).

Analyses to statistically determine the unidimentionality of the attitude scales as well as the overall content, construct, convergent and discriminant validity of the questionnaire may be carried out at a later date if the instrument is refined for further application. The limitations on validity given the developmental nature of the questionnaire are fully recognized.

Selltiz et al. (1976), pp. 399-432 have discussed some of the advantages, disadvantages, and requirements of the types of items used that were considered when constructing the Parent Questionnaire.

The rating items (e.g. 42 to 58) were phrased so that agreement may in one case indicate a positive attitude and in another case a negative attitude. This manner of posing questions together with inverting the layout of response categories (e.g. 15 to 18) was adopted to diminish the influence of any acquiescent response set.

The unavoidable use of negatively connoted words such as "turbulence" and the expressed intention of the study as outlined on the Parent Questionnaire introduction page, may have induced some respondents to emphasize the negative.

In an effort to alleviate any effects of this demand characteristic, and possible interviewer error or bias effects already diminished by the self-administered questionnaire technique (Gardner, 1976, p.83; Selltiz et al., 1976, p.295), emotionally loaded words were avoided and items were either positively or negatively phrased at random throughout the questionnaire.

The errors of central tendency were dealt with in the case of rating scales (e.g. 42 to 58) by placing the neutral response category to the extreme right. Additionally, several items encouraged discrimination between a neutral response, a "don't know" and a "not applicable" by providing separate response categories (e.g. 13, 14, 16).

The Parent Questionnaire was developed from an item pool of over 240 items derived from the above named Australian instruments and the author's experiences as a military psychologist. The questionnaire drafts were scrutinized by several panels which consisted of: (a) 18 Army parents, (b) 3 Army Education Officers, (c) 4 civilian teachers teaching in army schools, (d) 3 civilian teachers teaching mobile

civilian children, (e) 6 adolescent army children who had experienced mobility in the military environment, (f) 3 computer specialists, and (g) 2 printing experts. Eventually 59 items that provided the best actual return of usable data, dross rate, with satisfactory coverage of the topic and face validity, were selected.

The constructive criticism offered by the panels focused on the following points: (a) questions about ethnicity, (b) ethical and practical concerns about the anonymity of respondents, (c) ambiguity of items and type of response categories, (d) layout, (e) applicability of certain items to some subsets of the sample, (f) coding, (g) theoretical constructs and argument about the inclusion and exclusion of items.

2.5 *Data Collection*

School data. The E19/22 school record cards provided biographic data, attainment measures and teachers' ratings of the child's personality. The information used from these records was the pupil's full name, address, sex, age, number of schools attended and the parents' name and occupation. This information was cross checked with the questionnaire data.

Teacher assessed attainment and personality ratings were not analysed because they are regarded by the author as less reliable than the PAT and JEPI measures respectively. Bunce and Calvert (1974) studied the E19/22 records of Form II pupils in four Dunedin schools. They found evidence that substantiates the author's view that such data was unsuitable for the present study because of the dubious reliability and validity of the data (p.50).

Progressive Achievement Tests. The PAT group had been administered in all schools during February-March 1977 as part of the regular assessment programme. Results were taken directly from school records in raw score, age and percentile form during April-May 1977. The principals of each school either personally administered and scored the Tests or supervised the procedure to enhance the uniformity of administration and scoring.

Junior Eysenck Personality Inventory. The JEPI was administered according to the standard precedure during May 1977 to class groups in five schools by the same trained teacher experienced in administering and marking the JEPI. In the case of one school in the South Island the class teacher administered the Inventory. The scoring of all answer sheets was checked by the researcher for accuracy.

Parent Questionnaire. The questionnaire was distributed to parents by the School Principals via the Form II children. They were later returned to the Principal for collection by the researcher. Those families that had moved before the questionnaires were distributed were mailed a questionnaire if a forwarding address was obtainable.

Data processing. All data was prepared for processing on the Massey University Burroughs B6700 computer. Analyses were based on statistical routines available in the Statistical Package for the Social Sciences (Nie, Hull, Jenkins & Bent, 1975).

2.6 *Data Transformations*

The PAT raw scores were transformed to standard scores with a mean of 50 and a standard deviation of 10. This linear transformation gave all PAT raw scores a common base while retaining the distribution's

form, and hence the individuals' relative positions on the distribution, for meaningful comparison of test scores (Magnusson, 1966, pp. 232-234). This technique, together with the reasonably normal distribution of the raw scores, allowed combination of the data to form a composite linguistic skills (CLS) measure. This measure was created through the simple unweighted combination of the Reading Comprehension, Reading Vocabulary and Listening Comprehension standard scores.

Some of the questionnaire items allowed more discrimination among responses than others. For example the seven point itemized rating scales (e.g. 13, 14) compared with the five point rating scales (e.g. 15, 16); and the forced choice items (e.g. 22, 23) compared with those that allow differentiation between a genuinely neutral response, indecision, and a lack of information (e.g. 13, 16). Because of these variations the items included in the construction of the attitude scales were coded to a common base for each of the four attitude scales.

The distinction between missing values and "not applicable" was preserved where appropriate throughout the analyses.

2.7 *Sample Characteristics*

Age. The age range of the sample was 10 years 8 months to 13 years 5 months. The mean and median age was 12 years 5 months with a mode of 12 years 6 months. The army and civilian subsets had similar age ranges and did not differ in mean age.

Ethnic group. The sample contained 53 Maoris, 155 Europeans, one "other", and 12 subjects whose ethnicity was unknown. Table 2 shows the civilian and army subset breakdown by the two main ethnic groups.

TABLE 2

Percentages of Maoris and Europeans in

Army and Civilian Subsets of the Total Sample

	Civilian		Army	
	N	%	N	%
Maori	23	18	30	38
European	106	82	49	62

It is apparent the army subset has a higher proportion of Maoris than the civilian subset. This was expected because approximately 25% of the Army population is Maori, which is a higher proportion than that in the general population.

Gender. Table 3 illustrates that the number of male and female children in the army sample is about equal while in the civilian sample there are more males than females.

TABLE 3

Percentages of Males and Females in

Army and Civilian Subsets of the Total Sample

	Civilian		Army	
	N	%	N	%
Male	84	65	43	51
Female	46	35	41	49

Socio-economic status (SES). The mean, median and mode SES of the total sample is Elley and Irving classification 4. The civilian sample mode is 3, while the army sample mode is 4 which indicates a lower socio-economic status for the army sample. This is because the Elley and Irving scale classifies all Other Ranks as 4 and does not discriminate between skilled and semi-skilled occupations within the Army Other Rank structure as it does for civilian occupations. Consequently the variance among army SES ratings is much less that the variance among civilian ratings. Furthermore there is a much higher proportion of Other Ranks (SES 4) than Officers (SES 2) in the Army population thereby lowering the mean SES classification.

The difference in SES between army and civilian samples was statistically significant at $p < .001$ ($\chi^2 = 29.11$; $df = 1$; Kendall's Tau B = 38; $p < .001$). The significant difference is regarded as an artifact of the Elley and Irving scale which does not adequately differentiate among Other Ranks as noted above.

The Parent Questionnaire response rate. For the combined sample 66% (155) of the questionnaires were completed and returned. Of the 222 questionnaires distributed 43 were not returned or returned "address unknown", 22 were returned but not completed, and 2 families had been posted overseas. Of the 130 questionnaires sent to civilians 69% were returned completed and 78% of the 81 questionnaires sent to soldiers were returned completed.

The low response rate from questionnaire surveys is notorious, usually ranging from 15 to 50 percent (Gardner, 1976, p.84). This fact together with the difficulty of maintaining contact with subjects

in a study of highly mobile people made the high response rate for this questionnaire remarkable.

In discussing the sample characteristics it may be appropriate to comment upon some characteristics of survey data collected in the manner of the Parent Questionnaire. A concern about survey data is that possible differences between respondents and non-respondents may effect the validity of the data.

The unusually high response rate for the questionnaire alleviates this concern to some extent. It is possible however that negative experiences or attitudes may have induced some parents to decline response for fear of a lack of confidentiality, and perhaps, reprisal. Alternatively some respondents may have seized the opportunity to record somewhat biased views. Conversely some parents with agreeable experiences or positive feelings may not have been sufficiently stimulated to reply. While the questionnaire return figures do not indicate that any particular group is disproportionately represented, it is recognized that any possible differences between respondents and non-respondents may effect the validity of the results.

Nonetheless the author considers that the generally even distribution of responses to each item, and the high overall response rate that does not appear to weight unnaturally any particular segment of the sample, support the use of the Parent Questionnaire data with a reasonable degree of confidence.

CHAPTER 3

RESULTS

In analysing the data use has been made of the student's *t* statistic when comparing differences between group means unless otherwise stated. Before applying the *t* test an initial check was made on the homogeneity of the sample variances for each comparison. As a result either the pooled or the separate variance estimate was employed as appropriate for the calculation of *t* in the manner described in Nie et al. (1975, pp. 268-270).

When applying statistical tests of significance to the data presented the confidence level has been set at $p < .05$.

Throughout the text the term "significant" will be used to indicate statistical significance. Psychologically meaningful or important findings will be called "important".

It is recognised that there is some debate about the appropriate use of the *t*-test. The debate seems to focus on the requirement of a normally distributed variable, how the sample size effects the *t* statistic and the fact that multiple use of the *t*-test may generate "significant" probability estimates by chance.

Nevertheless it is also true that statisticians consider the *t* statistic to be exceptionally robust. It has been argued that there are relatively few types of distributions of scores where the use of this statistic would result in misleading probability estimates (Hardyck and Petrinovich, 1976, p. 118). Baker, Hardyck and Petrinovich (1966) further point out that "probabilities estimated from the *t*

distribution are little affected by the kind of measurement scale used" (p. 308).

The author takes the view that use of the student's t is appropriate where the intention is to compare two independent groups of subjects using group mean scores on individual Progressive Achievement Tests.

Where it was necessary to consider relationships between particular variables the Pearson Product Moment correlation coefficient has been derived unless otherwise stated. Although breakdowns such as the civilian-army dichotomy are of a binary nature suggesting the use of a point bi-serial correlation coefficient, Nei et al. (1975) argue that "any dichotomy can be treated as though it were an interval level measure and in some cases even a ratio level variable" (p. 5). This special case for dichotomies was invoked for the application of the Pearson technique.

A series of multiple regression analyses were conducted to assess the unique and relative contributions of the turbulence and other independent variables in accounting for the variance in academic achievement among the army and civilian samples.

3.1 *Hypothesis 1*

The hypothesis was that army children experience more mobility than civilian children. Measures of central tendency were calculated and these are reported in Table 4.

TABLE 4

Number of Schools Attended by Civilian (N = 130) and Army (N = 84) Children

	M	Mdn	Mode
Civilian	2.15	1.43	1.00
Army	3.89	3.97	4.00

TABLE 5

Statistical Test of Significant Difference Between Mean Number of Schools for Army and Civilian Children

	M	SD	t	p
Civilian	2.15	1.84		
			6.22	$<.001$
Army	3.89	.54		

Table 4 shows that army children experience about twice as much mobility as civilian children. A one tailed t-test of statistical significance, reported in Table 5, yielded a p of $<.001$. Accordingly the hypothesis was accepted. The army children attended significantly more schools than the civilian children.

3.2 *Hypothesis 2*

The hypothesis was that army children experience more father absence than civilian children. Father absence was categorized into short and long term absence from home and was operationally defined in Chapter 2. Table 6 shows that in terms of the measures applied army children experienced more short and long term absence of their fathers from home. The observed difference is highly significant, $p < .001$. Accordingly the hypothesis is accepted. The army children did experience significantly more father absence from home than civilian children.

TABLE 6

Amount of Father Absence for Civilian

(N = 90) and Army (N = 63) Children

Group	M	SD	t	p
Short Term Absence Category				
Civilian	1.8	2.6	5.86	<.001
Army	4.3	2.7		
Long Term Absence in Months				
Civilian	1.3	5.5	4.82	<.001
Army	5.9	6.2		

TABLE 7

Correlations Between Types of Turbulence for Civilian

(N = 90), Army (N = 63) and the Total Sample of Children (N = 153)

	Short Term Absence	Long Term Absence
Civilian		
Mobility	.13	.22*
Army		
Mobility	.16	.12
Total Sample		
Mobility	.27**	.28**

* $p < .05$.

** $p < .01$.

The relationship between each kind of father absence and mobility was also examined. Table 7 indicates that there is a small positive relationship between each kind of turbulence for the total sample of children and between mobility and long term absence for the civilian sample.

As there were significant differences in the amount of turbulence experienced by army and civilian children, as shown in Tables 5 and 6, the relationship between turbulence and PAT scores was examined. This is reported in Table 8.

The reader should note that the predominance of inverse correlations in Table 8 is a function of the preferred values for the independent and dependent variables. That is, the preferred values for the mobility and absence measures are low but the preferred values for PAT performance are high.

The relationships are generally in the expected direction and indicate that as the amount of turbulence increases the PAT standard scores decrease. At the risk of implying inappropriate inferences from non-significant data it is interesting to note that for the army sample only, PAT performance increases as the number of schools attended increases. The data in Table 8 however must be interpreted as showing no significant relationships between the turbulence measures and PAT standard scores.

TABLE 8

Correlations Between Turbulence and PAT Standard Scores for Civilian (N = 90), Army (N = 63) and the Total Sample of Children (N = 153)

	RC	RV	LC	M	CLS
Civilian[a]					
Mobility	-.08	-.03	-.14	-.03	-.10
Short Term Absence	-.15	-.16	-.09	-.12	-.15
Long Term Absence	-.20	-.14	-.11	-.13	-.17
Army[b]					
Mobility	.15	.18	.10	.22	.16
Short Term Absence	-.12	-.06	-.13	-.02	-.12
Long Term Absence	-.05	-.14	-.01	-.05	-.07
Total Sample[c]					
Mobility	.05	.11	-.03	.06	.04
Short Term Absence	-.07	-.04	-.11	-.07	-.08
Long Term Absence	-.08	-.08	-.06	-.09	-.08

Note. [a] Values beyond .21 are significant at $p < .05$; two tailed test.

[b] Values beyond .25 are significant at $p < .05$; two tailed test.

[c] Values beyond .20 are significant at $p < .05$; two tailed test.

3.3 *Hypotheses 3*

These hypotheses related to the academic achievement of army and civilian children. The null hypotheses tested were that there is no significant difference in performance between civilian and army children on each of the following Progressive Achievement Tests:

3a. Reading Comprehension (RC)

3b. Reading Vocabulary (RV)

3c. Listening Comprehension (LC)

3d. Mathematics (M)

3e. composite linguistic skills (CLS; the summated standard scores in 3a, 3b, and 3c).

The mean standard scores of the civilian and army groups were calculated for each Test measure to test these hypotheses.

TABLE 9

Summary Statistics of PAT Standard Scores for Civilian (N = 130) and Army (N = 88) Children

	Civilian		Army			
Test	M	SD	M	SD	t	p
RC	48.1	10.6	50.6	10.8	-1.74	NS
RV	47.6	10.1	50.9	11.8	-2.21	<.05
LC	48.7	10.6	47.6	14.2	0.61[a]	NS
M	48.5	10.9	49.1	11.0	-0.40	NS
CLS	48.1	9.5	49.7	10.9	-1.09	NS

Note. [a] Separate variance estimate was used.

Table 9 illustrates that the army children scored slightly higher on all but the Listening Comprehension Test. However the only significant difference is on the Reading Vocabulary Test where army children scored 3.3 standard score points higher than civilian children ($p < .05$).

The null hypotheses 3a, 3c, 3d, and 3e are therefore accepted. That is to say there is no significant difference in academic achievement between army and civilian children on these tests of Reading Comprehension, Listening Comprehension, Mathematics and the composite linguistic skills measure. The null hypothesis 3b is however rejected. Army children scored significantly higher than civilian children on the Reading Vocabulary Test.

3.4 *Hypotheses 4*

These hypotheses had to do with parent's attitudes measured by the Parent Questionnaire. In brief it was hypothesized that there would be no significant relationship between parent's attitudes toward the Army, shifting, and involvement in education, and their child's academic achievement on the PAT. The parent's attitudes were measured by four attitude scales that have already been described in Chapter 2. The attitude scales used to test hypotheses 4a to 4d are:

scale 1 = attitude about the effects of mobility on education (used to test hypothesis 4a)

scale 2 = attitude about the general effects of the Service environment on the family (used to test hypothesis 4b for the army sample only)

scale 3 = attitude of parents toward involvement in their child's education (used to test hypothesis 4c)

scale 4 = attitude of the family towards shifting (used to test hypothesis 4d)

The relationships between each of these attitude scales and the PAT standard scores for civilian, army and combined samples are presented in Table 10. As a high value on the attitude scales indicates a positive attitude, the preferred values for both the scales and the PAT scores are high.

TABLE 10

Correlations Between Attitude Scales and PAT Standard Scores for Civilian (N = 90), Army (N = 63) and Total Sample Children (N = 153)

Group	RC	RV	LC	M	CLS
Civilian[a]					
Scale 1	-.07	.02	-.01	.02	-.03
Scale 2	not administered to the civilian sample				
Scale 3	-.01	-.05	-.08	-.01	-.05
Scale 4	.13	.16	.13	.07	.15
Army[b]					
Scale 1	-.03	.07	-.14	-.03	-.05
Scale 2	-.20	-.14	-.26*	-.29*	-.23
Scale 3	.00	-.03	.23	-.07	.09
Scale 4	-.24	-.21	.07	-.26*	-.13
Total Sample[c]					
Scale 1	-.03	.07	-.08	.00	-.02
Scale 2					
Scale 3	.02	-.01	.06	-.03	.03
Scale 4	.02	.05	.08	-.06	.06

Note. [a]Values beyond .21 are significant at $p < .05$; two tailed test.

[b]Values beyond .25 are significant at $p < .05$; two tailed test.

[c]Values beyond .20 are significant at $p < .05$; two tailed test.

Inspection of Table 10 shows that on the whole few strong and significant relationships emerge. However scale 2 does have a significant inverse relationship with the Listening Comprehension and Mathematics Tests for the army sample only. It seems that as parent's attitudes about the effects of the Service environment on the family deteriorate as army children's performance on the Listening Comprehension and Mathematics Tests increases. Likewise, for the army sample, it seems that the more negative the parent's attitude about shifting the better their child's performance on the Mathematics Test.

The null hypotheses 4a to 4d are supported for each of the PAT measures for the civilian and combined samples. That is, no significant relationships were found between civilian parent's attitudes as measured by the Parent Questionnaire and their children's PAT performance.

The army sample, however, produced different results as explained above. The null hypotheses 4a and 4c are accepted for each of the test measures. Null hypothesis 4b is also accepted for the Reading Comprehension, Reading Vocabulary Tests and the combined linguistic skills measure but is not accepted for the Listening Comprehension and Mathematics Tests. Similarly the null hypothesis 4d is accepted for the Reading Comprehension, Reading Vocabulary, Listening Comprehension Tests and the combined linguistic skills measure but is not accepted for the Mathematics Test.

Regarding the significant correlations which led to the non-support of some of the above null hypotheses it should be noted that the actual values of the coefficients are not high. Certainly not of the order, in the author's opinion, to claim the discovery of important relationships. This fact, together with the notion that correlation does

not imply casuality, will be considered when discussing the importance of these results in Chapter 4.

3.5 *Hypothesis 5*

The null hypothesis was of no difference between army and civilian children on the personality dimensions of extraversion and neuroticism as measured on the Junior Eysenck Personality Inventory.

Table 11 indicates that there is no significant difference on the personality dimensions of extraversion, neuroticism or the lie scale measured by the JEPI between civilian and army children. Accordingly the null hypothesis is accepted.

TABLE 11

Summary Statistics for JEPI Scores of Civilian (N = 124) and Army (N = 75) Children

		M	SD	t	p
Extraversion	Civilian	16.9	3.3	.81[a]	NS
	Army	16.4	5.0		
Neuroticism	Civilian	12.8	4.9	-.63	NS
	Army	13.2	5.0		
Lie	Civilian	2.5	2.2	-.52	NS
	Army	2.6	1.9		

Note. [a]Separate variance estimate was used.

3.6 *Extreme attitudes.* Few significant relationships were found between the four parent attitudes measured on the Parent Questionnaire and children's PAT performance. Although among the army sample there were some weak but significant correlations. As this investigation focuses on army children it was thought a closer examination of the army sample might prove useful in understanding any relationships between army parents attitudes and their children's PAT performance.

When considering possible relationships between complex attitudes and performance it is sometimes helpful to examine extreme manifestations of the attitudes thought to relate to performance. As a study of mild depression might benefit from a study of suicide, the examination of attitude-performance relationships might benefit from a study of extreme attitudes. In an effort to magnify any attitude-performance relationships the army, civilian, and combined samples were polarized along the dimensions of the four attitude scales measured by the Parent Questionnaire. A brief description of the polarization technique follows.

The items included in each of the original scales were coded so that the most negative response received the lowest numerical value, a neutral or indifferent response received the middle numerical value and the most positive response received the highest numerical value for that individual item. All items were coded for these analyses to a common base so that each contributed equally to the summated score for each attitude scale.

The extreme attitude groups were made up of children whose parent's attitudes recorded a summated score equal to or greater than one standard deviation from the mean of each scale. That is, any score greater than or

equal to one standard deviation below the mean of that scale constituted a negative attitude and any score greater than or equal to one standard deviation above the mean constituted a positive attitude on that scale.

This technique of identifying extreme attitude groups assumes the items employ interval measures. Such an assumption is not uncommon for this type of scale where the respondent's position on a scale of favourable-unfavourable attitude towards an object or idea is calculated from the mean score of the items comprising that scale (Selltiz et al., 1976, pp.414-415). The use of the median measure, based on a more cautious assumption that the scale intervals are not actually equal, would have required a non-quantitative identification of extreme attitude groups.

The above procedure of identifying extreme attitude groups was applied to the army and civilian samples as well as to the combined sample. The extreme attitude groups presented in Tables 12 to 15 were identified using the means and standard deviations of the combined sample. Analyses using the means and standard deviations of each of the civilian and army samples produced no different results. Summary statistics of extreme groups computed from the civilian and army samples for each of the four attitude scales are reported in Appendix C.

Mean PAT standard scores were examined for differences between children whose parents held extreme positive or extreme negative attitudes on each of the four scales contained in the Parent Questionnaire. Some marked differences in PAT standard scores were observed between extreme attitude groups. This observation generated the null hypotheses 6a to 6d.

The null hypotheses were that children whose parents hold extreme negative attitudes did not achieve differently on the PAT than children whose parents hold extreme positive attitudes. The scales used to test these hypotheses are the same as those used to test the null hypotheses 4a to 4d.

Tables 12 to 15 report in the following manner the summary statistics derived from testing hypotheses 6a to 6d.

scale 1 = attitude about the effects of mobility on education (used to test hypothesis 6a: Table 12)

scale 2 = attitude about the general effects of the Service environment on the family (used to test hypothesis 6b: Table 13)

scale 3 = attitude of parents toward involvement in their child's education (used to test hypothesis 6c: Table 14)

scale 4 = attitude of the family towards shifting (used to test hypothesis 6d: Table 15)

The reader will recall that Table 10 showed there were few strong and significant relationships in the correlational data between the attitude scales and PAT standard scores. The data in Tables 12, 14 and 15 further illustrate that even holding extreme attitudes about the effects of mobility on education, involvement in education and about shifting does not appear to differentiate the children's PAT standard scores. Accordingly the null hypotheses 6a, 6c and 6d are accepted. That is, children whose parents hold extreme negative attitudes towards these issues do not achieve significantly different PAT results than

children whose parents hold these attitudes in the extreme positive.

Table 13, which concerns only the army sample, shows the PAT mean standard scores of children whose parents hold extreme views about the effects of the Service environment on the family (scale 2). There is no significant difference in achievement between extreme attitude groups for the Reading Comprehension, Reading Vocabulary, Listening Comprehension and composite linguistic skills measure. It appears however that children whose parents hold extreme negative attitudes on scale 2 scored significantly higher on the Mathematics Test than the children of parents with extreme positive attitudes on scale 2. The trend in mean group standard scores is in the direction of higher performance for the extreme negative attitude group on scale 2.

The null hypothesis 6b is accepted for the PATs of Reading Comprehension, Reading Vocabulary, Listening Comprehension, and the composite linguistic skills measure. Null hypothesis 6b is not however accepted for the Mathematics Test. This unexpected finding of significantly higher Mathematics Test performance for the army group of children whose parents hold an extreme negative attitude about the effects of the Service environment on the family will be discussed when drawing conclusions about the entire attitude - performance section of the study.

TABLE 12

Summary PAT Statistics for Civilian (N = 24) Army (N = 20) and Combined Sample (N = 44) Children Whose Parents Hold Extreme Attitudes About the Effects of Mobility on Education (Scale 1)

	Negative Attitude		Positive Attitude			
Group	M	SD	M	SD	t	p
Civilian						
RC	49.8	12.7	45.5	10.1	.92	NS
RV	48.7	8.6	50.1	11.2	-.36	NS
LC	50.1	8.8	49.6	11.9	.12	NS
M	47.9	10.1	51.4	6.8	-.96	NS
CLS	49.5	9.2	48.4	9.6	.30	NS
Army						
RC	51.9	16.2	48.2	11.6	.53	NS
RV	49.2	17.6	50.6	12.3	-.19	NS
LC	55.8	14.2	44.0	17.2	1.25	NS
M	49.7	13.7	48.3	11.8	.20	NS
CLS	52.3	14.4	47.6	12.2	.67	NS
Total Sample						
RC	50.3	13.1	47.1	10.9	.89	NS
RV	48.8	10.7	50.4	11.6	-.47	NS
LC	51.5	10.1	46.3	15.3	1.23	NS
M	48.3	10.6	49.6	10.0	-.39	NS
CLS	50.2	10.2	47.9	11.0	.68	NS

TABLE 13

Summary PAT Statistics for Army (N = 31) Children Whose Parents Hold Extreme Attitudes About the Effects of the Service Environment on the Family (Scale 2)

	Negative Attitude		Positive Attitude			
	M	SD	M	SD	t	p
Army						
RC	56.5	13.3	48.7	11.0	1.65	NS
RV	54.8	15.0	50.0	12.0	.92	NS
LC	56.6	12.8	44.4	15.6	2.00	NS
M	57.0	11.9	45.1	10.9	2.61	**
CLS	56.0	12.3	47.7	11.4	1.74	NS

** $p < .01$.

TABLE 14

Summary PAT Statistics for Civilian (N = 27) Army (N = 23) and Combined Sample (N = 50) Children Whose Parents Hold Extreme Attitudes About Involvement in Their Child's Education (Scale 3)

	Negative Attitude		Positive Attitude			
Group	M	SD	M	SD	t	p
Civilian						
RC	49.8	11.9	48.8	13.9	.19	NS
RV	51.4	11.1	48.0	11.5	.71	NS
LC	49.3	12.6	46.7	11.4	.49	NS
M	50.2	11.4	48.8	13.1	.28	NS
CLS	50.1	10.8	47.8	12.0	.49	NS
Army						
RC	50.3	10.0	49.3	9.1	.25	NS
RV	53.0	10.5	50.6	10.3	.52	NS
LC	48.4	10.2	53.2	13.1	-.89	NS
M	47.9	9.4	44.9	8.8	.76	NS
CLS	50.6	9.8	51.0	9.6	-.11	NS
Total Sample						
RC	50.0	11.2	49.1	10.6	.28	NS
RV	51.8	10.7	49.7	10.5	.70	NS
LC	49.0	11.8	50.9	12.7	-.56	NS
M	49.5	10.7	46.3	10.4	1.09	NS
CLS	50.3	10.3	50.0	10.4	.12	NS

TABLE 15

Summary PAT Statistics for Civilian (N = 16) Army (N = 25) and Combined Sample (N =41) Children Whose Parents Hold Extreme Attitudes About Shifting the Family Home (Scale 4)

	Negative Attitude		Positive Attitude			
Group	M	SD	M	SD	t	p
Civilian						
RC	44.5	12.4	53.3	10.0	.80	NS
RV	47.3	10.6	52.1	13.1	-.74	NS
LC	47.9	12.3	52.0	12.6	-.58	NS
M	48.6	12.1	53.5	10.9	-.72	NS
CLS	46.6	9.9	52.4	11.8	-.99	NS
Army						
RC	54.7	12.0	49.7	12.2	.82	NS
RV	58.0	12.3	51.8	12.6	.33	NS
LC	46.3	18.8	49.3	13.9	-.41	NS
M	54.3	13.2	48.0	12.3	1.01	NS
CLS	53.0	9.3	50.3	12.2	.46	NS
Total Sample						
RC	47.5	12.8	50.3	11.8	-.72	NS
RV	50.4	11.8	51.8	12.4	-.36	NS
LC	47.4	13.5	49.8	13.5	-.54	NS
M	50.2	12.3	48.9	12.1	.36	NS
CLS	48.5	9.9	50.6	11.9	-.62	NS

3.7 *Other Findings Arising From a Study of the Data*

The major purpose of this study has been to compare some aspects of the academic achievement of army children with comparable civilian children in relation to turbulence and parental attitudes. In addition to the findings presented a number of other interesting comparisons can be drawn from the existing data.

Table 9 showed that army children achieved higher PAT results on all but the Listening Comprehension Test. While only the Reading Vocabulary Test difference in favour of the army children was significant this trend posed some interesting questions. European children are known to achieve better school results than Maori children (Mitchell, 1970; Harker, 1971; Bray & Hill, 1973; St. George, 1977). Knowing there was a higher proportion of Maoris in the army sample than in the civilian sample (Table 2) one might have expected the trend in PAT results to be in the direction opposite to that found. Do army Maoris achieve better PAT results than civilian Maoris? Do army Europeans do better on the PAT than civilian Europeans?

The data presented in Table 16 shows that army Maoris attended significantly more schools than civilian Maoris; approximately twice as many. In terms of PAT performance army Maoris achieved higher standard scores than civilian Maoris on all of the PAT but the difference in group mean standard scores is significant for only the Reading Comprehension and the Mathematics Tests. There is no significant difference in JEPI scores although army Maoris were slightly more extraverted and neurotic than the civilian Maoris.

TABLE 16

Summary Statistics of Civilian Maori (N = 23) and Army Maori (N = 30) Children

Variable	M	SD	t	p
Number of Schools				
Civilian Maori	2.3	1.8	-2.90	**
Army Maori	4.1	2.6		
Reading Comprehension				
Civilian Maori	44.7	10.2	-2.10	*
Army Maori	50.4	9.5		
Reading Vocabulary				
Civilian Maori	43.6	10.8	-1.63	NS
Army Maori	48.4	10.2		
Listening Comprehension				
Civilian Maori	44.1	10.6	-1.06	NS
Army Maori	47.1	10.2		
Mathematics				
Civilian Maori	44.2	7.4	-1.97	*
Army Maori	48.3	7.6		
Extraversion				
Civilian Maori	16.5	2.8	- .79	NS
Army Maori	17.3	4.1		
Neuroticism				
Civilian Maori	12.1	4.5	-1.95	NS
Army Maori	14.5	4.4		
Lie				
Civilian Maori	3.5	2.4	1.74	NS[a]
Army Maori	2.5	1.5		

Note. [a]Separate variance estimate was used.

* $p < .05$.

** $p < .01$.

TABLE 17

Summary Statistics of Civilian European (N = 106) and Army European (N = 48) Children

Variable	M	SD	t	p
Number of Schools				
Civilian European	2.1	1.9	-4.39	***
Army European	3.5	1.5		
Reading Comprehension				
Civilian European	48.8	10.6	-1.80	NS
Army European	52.1	11.0		
Reading Vocabulary				
Civilian European	48.4	9.9	-2.92	***
Army European	53.7	11.6		
Listening Comprehension				
Civilian European	49.7	10.4	- .25	NS[a]
Army European	50.3	14.9		
Mathematics				
Civilian European	49.3	11.4	- .67	NS
Army European	50.7	11.8		
Extraversion				
Civilian European	17.1	3.4	1.49	NS[a]
Army European	15.7	5.6		
Neuroticism				
Civilian European	12.9	5.0	.66	NS
Army European	12.3	5.3		
Lie				
Civilian European	2.9	2.0	- .99	NS
Army European	3.2	1.9		

Note. [a]Separate variance estimate was used.

*** $p < .001$.

Table 17 follows the same trend observed in Table 16. That is, for the European subset army children attended more schools and achieved higher PAT results than civilian children. The significant differences occur on the number of schools attended and Reading Vocabulary variables. The JEPI variables do not have any significant differences.

As one might have expected from previous New Zealand research noted above, differences were found between Maori and European samples regardless of their civilian-army categorization.

Table 18 shows the differences between Maori and European children. Maori children attended significantly more schools than European children and European children tended to achieve higher PAT standard scores than Maori children, with significant differences on the Reading Vocabulary, Listening Comprehension and Mathematics Tests.

TABLE 18

Summary Statistics for Maori (N = 53) and European (N = 155) Children for the Combined Sample

Variable	M	SD	t	p
Number of Schools				
Maori	3.3	2.5	2.02	*[a]
European	2.6	1.9		
Reading Comprehension				
Maori	47.5	10.4	-1.37	NS
European	49.9	10.8		
Reading Vocabulary				
Maori	45.9	10.9	-2.45	*
European	50.1	10.7		
Listening Comprehension				
Maori	45.3	10.9	-2.49	**
European	49.9	12.0		
Mathematics				
Maori	46.2	8.0	-2.48	**[a]
European	49.8	11.5		
Extraversion				
Maori	17.0	3.5	.49	NS
European	16.7	4.2		
Neuroticism				
Maori	13.6	4.6	1.11	NS
European	12.7	5.1		
Lie				
Maori	2.6	2.1	.45	NS
European	2.5	2.1		

Note. [a] Separate variance estimate was used.

* $p < .05$.

** $p < .01$.

Gender While no hypotheses were specifically formulated to address male-female differences in academic achievement or personality, certain studies have suggested that the military environment may effect boys and girls differently (Baker et al., 1967; Wagner and Feletti, 1974; McCubbin and Dahl, 1976). Accordingly the sample was examined for male-female differences on some variables.

The data presented in Table 19 indicates there is no significant difference between groups of male and female children on any of the PAT measures nor on the extraversion or lie scales. There is however a significant difference between the sexes on the neuroticism scale. The female mean score is comparable with the New Zealand standardization by Bowler and Leitch (1972) but the male score is not. The males in this study scored below the New Zealand mean score on the neuroticism scale.

Separate mean scores for the sexes are reported in British and New Zealand standardizations of the JEPI. The interested reader is directed to the tables of summary statistics for males and females in this study reported in Appendix D.

TABLE 19

Summary Statistics for Boys (N = 130) and Girls (N = 88)

on Various Dimensions

Variable	Male		Female			
	M	SD	M	SD	t	p
Reading Comprehension	48.6	10.9	49.1	10.4	-.37	NS
Reading Vocabulary	48.1	10.9	49.5	11.1	-.92	NS
Listening Comprehension	49.3	11.4	46.2	13.2	1.86	NS
Mathematics	48.3	11.3	48.2	10.3	.04	NS
Extraversion	17.0	3.5	16.2	4.8	1.27[a]	NS
Neuroticism	12.0	4.7	14.4	5.1	-3.39	***
Lie	2.3	2.0	2.9	2.2	-1.94	NS

Note. [a] Separate variance estimate was used.

*** $p < .001$.

3.8 *Multiple Regression Analyses*

The data presented so far have shown that there are no major differences in academic achievement, nor on the personality dimensions of extraversion and neuroticism, between comparable groups of civilian and army children. Although the army children experienced more turbulence than the civilian children.

Comparisons of data subsets subsequent to testing the initial hypotheses suggested that while Europeans generally performed better on the PAT than Maoris, both Maori and European army children achieved higher PAT standard scores than their civilian counterparts. It seemed that both ethnicity and the civilian-army variables may have been implicated with PAT performance. Such characteristics, together with the imbalance of the total sample in terms of gender and ethnicity (see Tables 2 and 3), caused some concern about the possible effect of these variables on the validity of the results of the civilian-army comparisons undertaken thus far.

Multiple regression methods as described in Kerlinger and Pedhazur (1973) were therefore employed to address questions arising from such concerns about the actual importance of the civilian-army variable and the extent of it's contribution to the variation in PAT performance relative to other factors.

Multiple regression is a general statistical technique by which the relationship between a dependent variable and a set of independent variables may be analysed. The application of the step-wise multiple regression technique enabled analyses of the collective and separate contributions of several independent variables to variation in the

dependent variable - PAT performance. The relative importance of the independent variables as "explanations" of the variance was ascertained.

The data already presented, together with research cited earlier, suggest that the factors most pertinent to academic achievement and measured in this study, are: (a) the civilian-army category (b) number of schools attended (c) amount of short and (d) long term absence of the father from home (e) ethnicity and (f) gender. These variables as defined in Chapter 2 were included in the regression analyses.

The matrix of correlation coefficients between PAT standard scores and the six independent variables is reported in Table 20. The significant relationships shown in Table 20 have been noted earlier.

Multiple regression analyses of the Reading Vocabulary, Reading Comprehension and Mathematics Tests are reported in Tables 21, 22, and 23 respectively. Multiple regression analysis on the Listening Comprehension Test is not reported in the text because neither the collective nor separate contributions of the independent variables to variation in the criterion or dependent variable was sufficiently large to warrant further detailed consideration.

In evaluating the contribution and relative importance of the independent variables the reader's attention is directed to the columns in Tables 21 to 23 titled "Zero Order Variance accounted for" and "Variance accounted for when entered last". The first column reports the squared zero order correlation coefficient which indicates the proportion of variance accounted for in the criterion variable by each of the

TABLE 20

Matrix of Correlation Coefficients Between PAT Standard Scores and Several Independent Variables (N = 139)

		1	2	3	4	5	6	7	8	9	10
1.	Reading Comprehension	1.00									
2.	Reading Vocabulary	.78**									
3.	Listening Comprehension	.60**	.61**								
4.	Mathematics	.61**	.64**	.46*							
5.	Gender	.06	.08	-.05	.03						
6.	Ethnic Group	.09	.13	.15	.17	-.09					
7.	Civilian-Army	.17	.17	-.02	.02	.16	-.23*				
8.	Number of Schools	.07	.10	-.04	.06	.11	-.10	.29**			
9.	Long Term Absence	-.08	-.10	-.09	-.08	.05	-.18	.33**	.27**		
10.	Short Term Absence	-.06	-.06	-.13	-.08	.11	-.01	.42**	.25**	.59**	1.00

Note. * Values beyond .20 are significant at $p < .05$; two tailed test.

** Values beyond .24 are significant at $p < .01$; two tailed test.

TABLE 21

Multiple Regression Analyses - Reading Vocabulary

Criterion - Reading Vocabulary Standard Score

Multiple Correlation Coefficient (R) = .32

$r^2 = .10$

F Ratio = 2.44*

Variable	Beta	F to delete	Zero Order Variance accounted for	Variance[1] accounted for when entered last
Civilian-Army	.26	7.30	.03	.05**
Ethnic Group	.19	4.58	.02	.03*
Short Term Absence	-.13	1.47	.00	.01
Number of Schools	.10	1.23	.01	.01
Long Term Absence	-.11	1.00	.01	.01
Gender	.06	.46	.01	.00

*$p < .05$.

**$p < .01$.

Note. [1]"Variance accounted for when variable X is entered last can be calculated from the sum of squares of the variable when entered last (SS_{xi}), divided by the total sum of squares (SS_y). SS_{xi} can be calculated by multiplying F to delete (F_{del}) from the last step in a stepwise analysis, by the mean square of the residual (θ^2). Hence: variance accounted for when entered last

$$= \frac{F_{del}\theta^2}{SS_y}$$

This is equivalent to R^2 with X entered last, minus R^2 without X, from the previous step (Kerlinger and Pedhazur, 1973, pp. 290-295)" (Harker, 1976, p.62).

independent variables. The second column reports the amount of variance accounted for by the independent variable after interactions with other independent variables have been semi-partialled out of the regression analysis. This column indicates the unique contribution made by each independent variable after controlling for any indirect effects made through the covariance of one independent variable with the other independent variables.

Inspection of Table 21 shows that the multiple correlation coefficient for the Reading Vocabulary Test is significant. None of the zero order correlation coefficients for the six independent variables reached significance. The variables civilian-army and ethnic group do however make significant direct contributions to the variance in Reading Vocabulary standard scores when account is taken of the other intervening variables. The fact that the variance accounted for when these two variables are entered last is more than the zero order variance accounted for, suggests that the other independent variables tend to mask out the unique contributions of the civilian-army and ethnicity variables to the variation in Reading Vocabulary standard scores. The civilian-army variable was found to account for 5% of the variance, and ethnicity 3% of the variance in Reading Vocabulary standard scores. Although specification error cannot be overlooked in this type of analysis the major factors thought to be operating on PAT performance have been included.

This analysis shows that both the civilian-army and ethnicity variables were found to have a significant effect on Reading Vocabulary standard scores, while gender and the three turbulence variables did not.

The importance of the direct contributions of the civilian-army and ethnicity variables however, is minor in explaining the variance in Reading Vocabulary standard scores, since most of the variance remains unaccounted for.

Table 22 shows the multiple regression coefficient on the Reading Comprehension standard scores was not significant. Furthermore, none of the independent variables reached significance collectively or separately in accounting for the variance in Reading Comprehension standard scores except the civilian-army variable, when the effects of the other factors were semi-partialled out of the regression analysis. The civilian-army variable made a significant direct contribution to the variance in Reading Comprehension standard scores although the amount of variance accounted for was too small for much importance to be attached to the contribution of that dichotomy.

TABLE 22

Multiple Regression Analyses - Reading Comprehension

Criterion - Reading Comprehension Standard Score

Multiple Correlation Coefficient (R) - .28

r^2 = .08

F Ration = 1.83 (NS)

Variable	Beta	F to delete	Zero Order Variance accounted for	Variance accounted for when entered last
Civilian-Army	.26	7.27	.03	.05**
Short Term Absence	-.15	1.77	.00	.01
Ethnic Group	.14	2.67	.01	.02
Long Term Absence	-.07	.39	.01	.00
Number of Schools	.05	.37	.01	.00
Gender	.03	.20	.00	.00

**$p < .01$.

TABLE 23

Multiple Regression Analyses - Mathematics

Criterion - Mathematics Standard Score

Multiple Correlation Coefficient (R) = .24

r^2 = .06

F Ratio = 1.29 (NS)

Variable	Beta	F to delete	Zero Order Variance accounted for	Variance accounted for when entered last
Ethnic Group	.20	4.97	.03	.03*
Number of Schools	.10	.99	.00	.01
Short Term Absence	-.13	1.36	.01	.01
Civilian-Army	.10	1.04	.00	.01
Gender	.04	.19	.00	.00
Long Term Absence	-.03	.06	.01	.00

*$p < .05$.

The data presented in Table 23 similarly shows that the multiple regression correlation coefficient on the Mathematics Test was not significant and that except for the ethnicity variable none of the other independent variables made significant collective or separate contributions to the variance in criterion variable. The ethnic group variable did make a significant but very minor direct contribution to the variance in Mathematics standard scores.

The data presented in Tables 21 to 23 show that the independent variables entered into these regression analyses are of little practical importance in determining PAT performance. The ethnicity variable made a small but unique contribution to the variance in Reading Vocabulary and Mathematics Test performance. Given that the civilian-army dichotomy is central to this investigation the multiple regression analyses undertaken were useful in demonstrating the unique contribution of the civilian-army variable to the variance in Reading Vocabulary and Reading Comprehension Tests when the effects of the other intervening variables are accounted for.

CHAPTER 4

DISCUSSION AND CONCLUSION

The fundamental question posed for this research concerns the concomitant effects - beneficial and detrimental - of servicemen's pursuit of military careers on their children's educational success. Military careers involve certain conditions of service that intrude into a serviceman's family life; particularly a high rate of geographic mobility. That is to say, employment in the New Zealand army introduces through postings a degree of mobility not normally experienced in the pursuit of civilian careers. And it is often presumed that mobility places service children at a disadvantage educationally. It has also been suggested that parental attitudes to the service environment, and adaptations to service conditions, may have a bearing on children's ability to cope with mobility.

This cross-sectional study represents an attempt to empirically evaluate these propositions. The following is a discussion of children's academic achievement levels in relation to certain biographic characteristics of the children, educational turbulence, and parental attitudes to certain features of military and itinerant employment.

Since the focus of this study has been army and civilian academic achievement differences, samples of Form II army and civilian children, having comparable biographic characteristics and being schooled under similar circumstances, were compared.

When mobility rates and the amount of father absence experienced by army and civilian children were examined it was found that army children experienced approximately twice as much turbulence as the civilian

children (Tables 4, 5, and 6).

As this kind of turbulence is a prominent feature of service life the above finding was expected and it is consistent with most research in the U.S.A., Canada, Britain, New Zealand and Australia (Gabower, 1960; Francis, 1971; Firth, 1972, 1973; Win, 1972, 1974; Mackay and Spicer, 1975 respectively). It is clear that turbulence is a fact of life for army children in New Zealand.

The criterion variable - academic achievement - was examined next. Comparisons of group performance on the Reading Comprehension, Listening Comprehension and Mathematics tests (Table 9) showed there were no significant differences in educational attainment within these domains between army and civilian children. It was found however that the army children achieved significantly higher results on the Reading Vocabulary test.

Previous research in this field, when considered on the whole tends to generate equivocal conclusions about the effects of turbulence on academic achievement as noted in Chapter 1. However as the recent studies by Win (1974) and Mackay and Spicer (1975) are most pertinent to the present investigation it should be noted that neither reported evidence of detrimental effects of turbulence on the educational attainment of service children. The findings of this study are again consistent with these recent and comparable studies.

It is interesting to note that, their higher degree of turbulence not withstanding, army children did not achieve a lower level of academic achievement than their less turbulent civilian peers.

It is possible that the difference in the amount of turbulence each group experienced was not sufficient to differentiate them academically. It could also be that the relative homogeneity of New Zealand's education system makes it easier for both the system and the children to cope with mobility. That is, the New Zealand education system is relatively homogeneous compared for example to those of Australia, United States and Canada in that it does not have individual state or provincial systems within the national system. Furthermore because New Zealand service establishments are within urban and rural state school catchment areas there are no exclusively military schools. An exception is the New Zealand Forces School in Singapore where the dramatic change in school environment is moderated by the employment of New Zealand teachers; and this change does not normally occur more than once during a child's school years, if at all. The relative homogeneity of New Zealand schools may lessen the amount of adjustment required of children given the uniform curricula and similar school environments and it may tend to simplify administrative procedures on school transfer.

The possibility that the army children's higher Reading Vocabulary test achievement is spurious, or an artifact of the data or sample selection, cannot be overlooked. The author was reliant upon school collected raw data which may have been subject to some systematic error in test administration or marking of a data subset. However, while recognition is given to the risks of infering trends from data that do not meet set levels of statistical significance, the fact that army children did tend to perform better on three of the four criterion measures does lend weight to the conclusion that the more mobile army children did if anything perform better on these measures of

academic achievement.

Apart from the supposition that a homogeneous school system may facilitate children's coping with turbulence, the fact that army children are members of a somewhat select community may explain their significantly higher achievement on the Reading Vocabulary test and the non-significant trend on the other measures.

The soldier/fathers of these children were selected for service upon criteria purported to exclude from service that segment of the population that is intellectually, educationally, medically or socially unsound. While the reliability and validity of the complex selection process is indeterminate, the latest twelve month recruiting statistics (New Zealand Ministry of Defence, 1977) report that fifty percent of Regular Army applicants were rejected, primarily for the above reasons.

This selectivity, together with the modern military's emphasis on education and specialized training which pervades the environment in which the children are educated, suggests to the author reasons why army children achieved as well and better academically than their comparable but less turbulent civilian peers.

Turning now to the attitudinal data the reader may recall that the four parental attitudes measured were related to each group of children's academic performance. It was found that none of the four civilian parental attitudes were significantly related to their children's academic achievement (Table 10). Similarly army parents attitudes about (a) the effects of mobility on education, and (b) involvement in their children's education were not significantly related to their

children's academic achievement.

Army children's Mathematics and Listening Comprehension test results were however inversely related to their parent's attitudes about the effects of the service environment on the family. Their performance on these tests increased as their parent's attitude about service environmental effects on the family became more negative. Another significant inverse relationship was observed between army children's performance on the Mathematics test and their parent's attitude towards shifting the family home. Army children's Mathematics scores increased as their parent's attitude towards shifting also became more negative.

These relationships are not strong. Nevertheless since the consequences of parental attitudes may be more apparent when the attitudes are extreme, and as the relationships were in the direction opposite to that expected, the author felt constrained to further examine those relationships. Each sample of children was therefore subdivided according to whether their parents held extreme positive or extreme negative attitudes (Tables 12 to 15). For the four attitude scales and for both groups of children (except scale 2 which did not apply to the civilian sample) the only differentiation of Progressive Achievement Test scores occurred in the army sample. Those army children whose parents held an extreme negative attitude about the effect of the service environment on the family performed significantly better on the Mathematics test than army children whose parents held this attitude in the extreme positive. A non-significant trend in the data is that army children whose parents held this attitude in the extreme negative scored better on all the academic achievement measures (Table 13).

This significant finding supports the earlier one of an inverse relationship between army parents attitudes about service environmental effects and their children's Mathematics test performance. The data may be of no great moment given the uncertainties of attitude measurement. Nevertheless because this inverse relationship was observed in both analyses it may be of some consequence.

One possible explanation may lie in compensatory action of parents that may be implicated with some children's higher academic achievement. Anecdotal evidence observed by the author whilst a military psychologist indicates that some parents who believe the service environment detrimentally effects their family attempt to compensate their children for the perceived deleterious effects.

In terms of children's education compensation may include (a) extra tuition in the cumulative subjects like mathematics where discrepancies in curricula may have immediate consequences (b) ensuring the children's school records arrive at the new school with the child (c) increased contact with school administrators and teachers (d) taking an active role in school activities (e) awareness of their child's adjustment to a new school. These kinds of educational compensation may also be supplied by the children's teachers. While such compensation may not itself cause increased academic achievement it may mitigate some deleterious effects of turbulence. Research by Lopate et al. (1970) and Cowie (1974) has shown that such compensation is conducive to children's academic success.

The other two inverse relationships observed in the army sample are not considered to be of sufficient strength to suggest the uncovering of any important relationships; particularly as the extremes of those attitudes did not significantly differentiate the children academically.

The original hypotheses that gave rise to the preceeding discussion concerned the relations between parental attitudes towards certain aspects of military and intinerant employment and children's academic achievement. Overall the findings suggest that, with one possible exception, there is no evidence of any consistent or strong relationships between the parental attitudes measured and children's academic achievement.

The possible exception concerns the higher academic achievement of army children whose parents perceive deleterious effects of the service environment on the family. It is conjectured that such parents may compensate their children, to an indeterminate effect, for any perceived educational disadvantages.

The hypothesis that army children are not different from civilian children in behaviour that is characteristic of the personality traits of extraversion - introversion and neuroticism - stability was sustained. No important differences were found between the two groups along these personality dimensions (Table 11). This finding is consistent with that of Mackay and Spicer (1975) regarding Australian service children. Since no difference was found, the relationship between the children's degree of extraversion and neuroticism and their academic achievement was not investigated.

In the course of the study it became apparent that the data could also be used to investigate a number of related but subsiduary questions. The results of further analyses are now discussed.

A comparison of ethnic group performances on the academic achievement measures was undertaken because (a) any ethnic group performance differences may have effected the outcome of civilian-army group comparisons given the ethnic imbalance of the samples (Table 3) (b) it was of interest to determine if within these selected samples ethnic group performance differences conformed to national data, and finally to look, albeit briefly, at comparative performances of ethnic groups from civilian and army backgrounds.

These comparisons showed that European children achieved higher Progressive Achievement Test results than Maori children (Table 18); a finding that conforms to the national data. But, interestingly, it was found that army Maori children achieved significantly higher Reading Comprehension and Mathematics test results than civilian Maori children (Table 16). Also army Europeans achieved significantly higher Reading Vocabulaty test results than civilian Europeans (Table 17).

These findings suggested that both the civilian-army and ~ethnicity variables may have had some independent or conjoint influence on the children's academic achievement. To investigate this possibility multiple regression analyses were employed to consider the independent effects of the following variables on academic achievement:
(a) mobility (b) short and (c) long term absence of the father (d) gender (e) ethnicity and (f) the civilian-army category.

The specified variables were weak in accounting for the variance in academic performance although the civilian-army and ethnicity variables did make independent, albeit minimal, contributions (Tables 21 to 23). The large amount of unexplained variance may be attributed to other unspecified variables or to individual differences in performance on the dependent measures. It seems that the higher achievement of army Maoris over civilian Maoris may be attributed to their membership in the somewhat select army sample, as previously explained.

Overall how far one can generalize these findings is a difficult question. It is necessary to note however that the army sample data pertains to children whose fathers work in three of the four main Army Camps in New Zealand. While the representativeness of the sample is unknown, the sample characteristics suggest that it is not markedly different from the army population. Accordingly it seems reasonable to venture the suggestion that the findings would reflect the situation, in relation to the comparative educational data, of army and civilian children at the level studied.

The fact that the concern of this study was the effects of turbulence manifest in children's academic achievement after seven or eight years of schooling should however be emphasised. It is possible that some children may have been advantaged or disadvantaged quite significantly in the short term by stable or turbulent schooling. But any advantage or disadvantage experienced was not observed in their academic performance at the Form II level. Furthermore group turbulence and performance measures were compared. Thus any marked

consequences individual children may have experienced because of their relatively stable or turbulent schooling are not necessarily made apparent by this investigation.

In short, when considering the findings of this study it should be emphasised that some individual children may have been beneficially or detrimentally effected by relatively stable or turbulent school experiences either in the short term or in the long term. Detection particularly of detrimental consequences of turbulence, and their remediation, in the case of the individual child remains a task and a challenge for the sensitive teacher and parents, hopefully with the assistance of the employing authority whose conditions of work may possibly be a contributing factor.

Perhaps it should also be noted that in speaking about service life it cannot be assumed that this study, bearing as it does upon peace-time Army personnel, necessarily reflects the situation in the Navy or Air Force establishments, nor in the Armed Forces during time of war.

4.1 *Summary of Conclusions*

In summary the conclusions of this study are:

(a) Army children experience more turbulence than comparable civilian children.

(b) There is no evidence that army children achieve less academically than their comparable but less turbulent civilian peers.

(c) There is no evidence of consistent and strong relationships between parents' attitudes to military and peripatetic employment, and their children's academic achievement. Although there remains the suggestion that army children whose parents believe strongly that the service environment is detrimental to family life, achieve better Mathematics test results than children whose parents hold a strongly favourable attitude about military environmental effects on the family.

(d) Army and civilian children do not differ in behavioural traits characteristic of the extraversion - introversion and neuroticism - stability personality dimensions.

Hopefully these findings may be of interest to those specifically interested in the education of service children, and more generally to educators working with increasingly mobile populations.

The results of this study may also induce those parents and teachers who believe service children are educationally disadvantaged to reassess individual cases of inadequate academic performance. A re-assessment in view of the above may affirm that a particular child has been disadvantaged educationally by a turbulent schooling; or it may generate alternate and possibly more valid explanations for inadequate academic achievement. Accurate assessment of the reasons for poor achievement can only facilitate the development of effective remedial action.

APPENDIX A

Linton 819 Extension 429

Field Psychologist
Headquarters
Manawatu, Wanganui and
Taranaki Army Area
LINTON CAMP

June 1977

DO CHILDREN WHO SHIFT HOME AND SCHOOLS FREQUENTLY DO BETTER OR WORSE AT SCHOOL THAN CHILDREN WHO DON'T?

This question is of interest to people whose work requires them to shift frequently, thereby causing their children to change schools frequently.

Servicemen and mobile civilian groups have a special interest in this question.

As a psychologist I am undertaking research to identify some possible effects frequent changes of home and school may have on mobile children's education.

The conclusions of this study will be made available to the Army and to the Department of Education.

In order to measure some of the factors related to the above I would appreciate your assistance by completing the enclosed questionnaire.

The questions relate mainly to your child who is presently in Form II.

To obtain accurate and reliable information your own views and experiences are most important. However the findings reported will be about groups of children and not about any individual child or family. All information in this questionnaire will be treated as

STRICTLY CONFIDENTIAL.

The number on your questionnaire gives me a record of having received your reply. Outside of myself, no one will have access to the completed questionnaires or know who completed them. When the study is finished the questionnaires will be destroyed as classified waste.

The responsibility for the project is entirely my own. The study has the approval and assistance of Massey University, the Board of Education and your school principal.

If you have any questions about the questionnaire or the project I will be pleased to answer them. I may be contacted at the above address.

Thank you very much for your efforts and co-operation.

Sincerely,

D. Art Kewin

D. A. KEWIN B.A. RNZAEC
Captain

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CODE NUMBER

PARENT QUESTIONNAIRE

PART A

This questionnaire should be completed by the Serviceman/father and his wife (for civilians the father and wife). If this is not possible it may be completed by either party. Please indicate with a ☑ who is completing the questionnaire.

1. Serviceman/father alone ☐ Wife alone ☐ Jointly ☐

2. Rank of Serviceman/father
   Soldier ☐
   Officer ☐
   Civilian ☐

3. Occupation _____

4. This questionnaire is mainly about your child who is now in Form II. Please print his/her name in the space provided.

   _____ _____

5. The child in Form II was:

First born	Second born	Third born	Fourth born	Fifth born	Sixth born	Seventh born	Eighth born	Nineth born	Tenth born

6. How many children in this family are living at home? ____

PART B

7. To the best of your knowledge, how many schools has this child attended (for more than one week) including from commencement (Primmer I) and this year? ____

8. To the best of your knowledge, how many teachers (for more than one week) has this child had since Primmer I? ____

9. To the best of your knowledge, how many times has your family shifted the family home since the child in Form II started Primmer I? ____

10. What is the total number of times you have shifted the family home? (for any reason). ____

-2- Please complete the following questions about the serviceman/ father's long term and short term absences from the home.

11. Long-term absences of serviceman or father

'Long-term absence' means any continuous absence from the family for a period longer than one month. Write in the Total number of months absent for each year for the past five years (0 to 12, to the nearest month).

If no long-term absences, write 0

Total Number of Months in 1976	
Total Number of Months in 1975	
Total Number of Months in 1974	
Total Number of Months in 1973	
Total Number of Months in 1972	

12. Short-term absences of serviceman or father

'Short-term absence' means any absence from the family for a period between 1 day and 30 days at a time (i.e. absences less than one month at a time.) Count over-night duties.

As it may be impossible to recall these periods exactly, estimate the total time that the serviceman or father was absent for short-terms in each of the years, 1974, 1975 and 1976.

For each of the three years, write the absence category in the box provided.

Total Absences	Absence Category
0 to 50 days	1
51 to 100 days	2
101 to 150 days	3
151 to 200 days	4
more than 200 days	5

Year	Absence Category
1976	
1975	
1974	

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PART C 13. Which one of the following statements best describes your opinion of the effects of mobility (regular postings or shifting home because of father's job) on the PERSONAL DEVELOPMENT of your child in Form II?

(Place ☑ in the appropriate box).

Beneficial with few, if any, harmful effects	
Mainly beneficial, but some harmful effects	
Mainly harmful, but some beneficial effects	
Harmful with few, if any, beneficial effects	
Some beneficial and some harmful effects, but they tend to balance out	
No effects	
Undecided as to the effects	

14. Which of the following statements best describes your opinion of the effects of SCHOOL CHANGES on the EDUCATIONAL DEVELOPMENT of your child in Form II?

(Place ☑ in the appropriate box).

Beneficial with few, if any, harmful effects	
Mainly beneficial, but some harmful effects	
Mainly harmful, but some beneficial effects	
Harmful, with few, if any, beneficial effects	
Some beneficial and some harmful effects, but they tend to balance out	
No effects	
Undecided as to the effects	

15. What are the prospects for EDUCATIONAL SUCCESS for your child in general compared to other children's prospects?

(Place ☑ in the appropriate box).

YOUR CHILD IN FORM II

Much worse	
Worse	
About the same	
Better	
Much better	

-4- 16. What are the prospects for EDUCATIONAL SUCCESS for service children in general compared to other children's prospects?

(Place ☑ in the appropriate box).

Civilians please write N/A for this part.

SERVICE CHILDREN IN GENERAL

Much better	☐
Better	☐
About the same	☐
Worse	☐
Much worse	☐

17. What are the prospects for SUCCESS in ADULT LIFE for your child in general compared to other children's prospects?

(Place ☑ in the appropriate box).

YOUR CHILD IN FORM II

Much better	☐
Better	☐
About the same	☐
Worse	☐
Much worse	☐

18. What are the prospects for SUCCESS in ADULT LIFE for service children in general as compared to other children's prospects?

(Place ☑ in the appropriate box).

Civilians please write N/A for this part.

SERVICE CHILDREN IN GENERAL

Much worse	☐
Worse	☐
About the same	☐
Better	☐
Much better	☐

-5- 19. Below is a list of areas in which problems are commonly reported by service families. Rank them from 1 to 10 to show your opinion of the importance of these to your family, where 1 is the most important and 10 is the least important.

Civilians please write N/A for this part.

Level of salaries and allowances	
Frequency of father absence from home	
Frequency of postings	
Standard of housing	
Career opportunities for serving member	
Social opportunities for parents	
Educational opportunities for children	
Employment opportunities for wives	
Isolation of Army Camps	
Social opportunities for children	

20. Below is a list of areas in which problems are commonly reported by itinerant people. Rank them from 1 to 10 to show your opinion of the importance of these to your family, where 1 is the most important and 10 is the least important.

Servicemen/ please write N/A for this part.

Level of salaries and allowances	
Frequency of father absence from home	
Frequency of shifts of family home because of job	
Standard of housing	
Career opportunities for the father	
Social opportunities for parents	
Educational opportunities for children	
Employment opportunities for wives	
Family living in remote areas	
Social opportunities for children	

-6-

21. All families have difficulties sometimes, and possibly more so when the husband is away. In the past 12 months have you experienced any difficulties of the following kinds: (Tick those that apply)

Financial	
Families illness	
Children's behaviour	
Accommodation	
Loneliness	
Transport	
Problems with your marriage	
Resettlement	
Children's education	
Other	

22. The quality of the education the child in Form II has received since you have been in the Service has been: (Place ☑ in the appropriate box).

Civilians please go to question 25.

Highly satisfactory	
Satisfactory	
Unsatisfactory	
Highly unsatisfactory	

23. The educational performance of this child since you have been in the Service has been: (Place ☑ in the appropriate box).

Highly satisfactory	
Satisfactory	
Unsatisfactory	
Highly unsatisfactory	

24. In general, how successful are servicemen's children in coping with a change of school?

Highly successful	
Successful	
Unsuccessful	
Highly unsuccessful	
No opinion	

-7- 25. In general, how successful is <u>your child</u> in coping with a change of school?

- Highly successful ☐
- Successful ☐
- Unsuccessful ☐
- Highly unsuccessful ☐
- No opinion ☐

26. Does your child seem to do better at school with male or female teachers?

Male ☐ Female ☐ No difference ☐

27. Does your child, say he or she prefers male or female teachers?

Male ☐ Female ☐ No preference ☐

<u>Specific Effects of the Last Move Only</u>

Questions 28-30 refer to the effects of the <u>last change of schools only</u>. Please indicate any change you noticed for the child in Form II by placing a ☑ against the appropriate response.

28. On arrival at the new school, the child's interest in school:

- increased ☐
- decreased ☐
- was not noticeably affected ☐

29. On arrival at the new school, the child's schoolwork:

- improved ☐
- deteriorated ☐
- was not noticeably affected ☐

30. On arrival at the new school, this child:

- made friend's easily ☐
- found it difficult to make friends, but made friends eventually ☐
- did not succeed in making friends ☐

-8- 31. Below are five things that might harm children's education. Rate them from 1 to 5, where 1 is the one most likely to harm and 5 is the one least likely to harm children's education.

Child change school	
Child absent from school for four weeks with a minor illness	
Father's committments outside of work mean his absence from home between the hours of 4.00-10.00pm (1600-2200)	
Child's teacher absent for four weeks and replaced by temporary teachers	
Father's shift work requires his absence from home between the hours of 4.00-10.00pm (1600-2200)	

PART E 32. How often has the child's father had personal contact (by telephone or in person) with this child's teacher or school principal about this child, since Primmer I

Never	Once a School Year	Once a School Term	Once a Month	Once a Week

33. How often has the child's mother or guardian had personal contact (by telephone or in person) with this child's teacher or school principal about this child, since Primmer I

Never	Once a School Year	Once a School Term	Once a Month	Once a Week

34. Since this child has been in school who has arranged <u>most</u> of the contacts you have had with his/her teacher or Principal? (If you have had no contact please write N/A for this question.)

serviceman or father	
mother	
principal	
teacher	
other	

-9- 35. Was the main reason for the contact to discuss:

the methods of instruction	
the aims and objectives of the school	
the way children are put into classes	
the methods of assessing pupils	
your child's behaviour in school	
your child's academic achievement (grades, standing in class, etc.)	

36. The serviceman/father helps this child with homework:

Never	Once a Month	Once a Week	Daily	At Exam Time

37. The child's mother (or guardian) helps this child with homework:

Never	Once a Month	Once a Week	Daily	At Exam Time

PART F 38. In contemplating your next posting or family shift does the serviceman/father generally:

look forward to it and plan with enthusiasm	accept it as a fact of life	dread the event	refuse to shift again

39. In contemplating your next posting or family shift does your wife generally:

look forward to it and plan with enthusiasm	accept it as a fact of life	dread the event	refuse to shift again

40. Do your children generally:

look forward to it and plan with enthusiasm	accept it as a fact of life	dread the event	refuse to shift again

-10- 41. Below is a list of concerns some people have about shifting the family home. Please rank them in order of importance for your family, (1 being the most important).

financial costs incurred	
purchasing of own home at new location	
leaving own home at old location	
moving into camp	
availability of service or pool house	
changing child's school	
making child find new friends	
establishing a new social life for parents	
promotion	
new job	
inconvenience of moving	
moving out of camp	
establishing family in a new community	

Please indicate your answer with a ☑.

These questions are about your entire family, including all of your children. Be frank and give your personal views regardless of what you think others may think. The answer that first comes to mind is the best one so do not labour over any questions. There are no right or wrong answers. Civilians please do only questions 42-50 as the others are specific to Service people.

	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE	HAVE NO OPINION
42. Regular postings (family shifts because of job) are necessary for advancement at work					
43. Shifting family home every 2-3 years is harmful to the social development of our family					
44. The serviceman/father adjusts to new communities easily					
45. The serviceman/father's wife adjusts to a new community easily					

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	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE	HAVE NO OPINION
46. It is my wife's job to look after our children's schooling					
47. My childrens' behaviour is better when I am at home than when I am away from home					
48. Shifting our home every 2-3 years makes it too difficult to get involved in community activities					
49. Shifting our home every 2-3 years makes it too difficult to get involved in school activities/ committees					
50. Doing well at school is the best way for my children to succeed in life					
51. In general Service children wear their father's rank at school					
52. Living in Military Camps restricts the serviceman/ father social activities					
53. Living in a Military Camp restricts my wife's social activities					
54. Living in a Military Camp restricts my children's social activities					
55. It is easier for my wife and I to make friends with military people than civilian people					
56. My wife prefers civilian friends, to military friends					
57. I prefer to have my family living in Camp rather than civilian accommodation					
58. Living in a Service environment encourages our children to do well at school					

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-12- 59. If there is any information you wish to add about mobility and your children's education please do so here. If any additional comment applies to or is an explanation of a particular question please indicate the number of that question beside your comment.

QUESTION

Once again, thank you for your effort and assistance. I look forward to receiving your completed questionnaire in the enclosed self addressed envelope.

APPENDIX B

Scale 1

Parents attitude about the effects of mobility on education.

Answer categories may be learned by reference to Appendix A since each question is numbered as in the Parent Questionnaire.

13. Which one of the following statements best describes your opinion of the effects of mobility (regular postings or shifting home because of father's job) on the PERSONAL DEVELOPMENT of your child in Form II?

14. Which of the following statements best describes your opinion of the effects of SCHOOL CHANGES on the EDUCATIONAL DEVELOPMENT of your child in Form II?

25. In general, how successful is *your child* in coping with a change of school?

Specific Effects of the Last Move Only

Questions 28-30 refer to the effects of the *last change of schools only*. Please indicate any change you noticed for the child in Form II by placing a ☑ against the appropriate response.

28. On arrival at the new school, the child's interest in school:

29. On arrival at the new school, the child's schoolwork:

30. On arrival at the new school, this child:

APPENDIX B

Scale 2

Parent's attitudes about the effects of the service environment on the family.

16. What are the prospects for EDUCATIONAL SUCCESS for service children in general compared to other children's prospects?
18. What are the prospects for SUCCESS in ADULT LIFE for service children in general as compared to other children's prospects?
22. The quality of the education the child in Form II has received since you have been in the Service has been:
23. The educational performance of this child since you have been in the Service has been:
24. In general, how successful are servicemen's children in coping with a change of school?
51. In general Service children wear their father's rank at school.
52. Living in Military Camps restricts the serviceman/father's social activities.
53. Living in a Military Camp restricts my wife's social activities.
54. Living in a Military Camp restricts my children's social activities.
55. It is easier for my wife and I to make friends with military people than civilian people.
56. My wife prefers civilian friends, to military friends.
57. I prefer to have my family living in Camp rather than civilian accommodation.
58. Living in a Service environment encourages our children to do well at school.

APPENDIX B

Scale 3

Parent's attitude towards involvement in their child's education.

32. How often has the child's father had personal contact (by telephone or in person) with this child's teacher or school principal about this child, since Primmer I?
33. How often has the child's mother or guardian had personal contact (by telephone or in person) with this child's teacher or school principal about this child, since Primmer I?
34. Since this child has been in school who has arranged *most* of the contacts you have had with his/her teacher or Principal? (If you have had no contact please write N/A for this question.)
36. The serviceman/father helps this child with homework:
37. The child's mother (or guardian) helps this child with homework:
46. It is my wife's job to look after our children's schooling.
49. Shifting our home every 2-3 years makes it too difficult to get involved in school activities/committees.
50. Doing well at school is the best way for my children to succeed in life.

APPENDIX B

Scale 4

Parent's attitude towards shifting the family home.

38. In contemplating your next posting or family shift does the serviceman/father generally:

39. In contemplating your next posting or family shift does your wife generally:

40. Do your children generally:

42. Regular postings (Family shifts because of job) are necessary for advancement at work.

43. Shifting family home every 2-3 years is harmful to the social development of our family.

48. Shifting our home every 2-3 years makes it too difficult to get involved in community activities.

49. Shifting your home every 2-3 years makes it too difficult to get involved in school activities.

APPENDIX C

Table A

Summary Statistics of Extreme Groups for the Attitude Scales for Civilian (N = 90) and Army (N = 63) and Total Sample (N = 153) Children

Group	N of Subjects in Extreme Groups	M	SD
Civilian			
Scale 1	24	12.6	2.2
Scale 2	4	39.4	1.5
Scale 3	27	24.3	3.3
Scale 4	16	21.7	4.3
Army			
Scale 1	20	13.6	2.4
Scale 2	31	43.3	5.0
Scale 3	23	25.6	3.2
Scale 4	25	25.5	4.7
Total Sample			
Scale 1	44	13.0	2.3
Scale 2	35	41.0	3.9
Scale 3	50	24.8	3.3
Scale 4	41	23.3	4.8

Note: Extreme groups were determined by Total Sample M and SD.

APPENDIX C

Table B

Summary Statistics of Extreme Attitude Groups Determined by Parameters of Each Group of Civilian (N = 90), Army (N = 63) and Total Sample (N = 153)

Children

Group	N of Subjects in Extreme Groups	M	SD
Civilian			
Scale 1	27	12.6	2.2
Scale 2	10	39.4	1.5
Scale 3	34	24.3	3.3
Scale 4	27	21.7	4.3
Army			
Scale 1	21	13.6	2.4
Scale 2	21	43.3	5.0
Scale 3	22	25.6	3.2
Scale 4	19	25.5	4.7
Total Sample			
Scale 1	44	13.0	2.3
Scale 2	35	41.0	3.9
Scale 3	50	24.8	3.3
Scale 4	41	23.3	4.8

APPENDIX D

Table C

Summary Statistics for JEPI Scores for Males

Group	N	M	SD	NZ MEANS M	NZ MEANS SD
		EXTRAVERSION			
Maori	30	16.8	3.1	16.0	2.8
European	91	17.1	3.7	17.4	3.0
Civilian	82	17.3	2.7		
Army	39	16.4	4.8		
		NEUROTICISM			
Maori	30	12.4	4.4	15.6	3.8
European	91	11.9	4.8	13.3	5.1
Civilian	82	11.8	4.7		
Army	39	12.5	4.8		
		LIE			
Maori	30	2.5	2.0	2.4	2.0
European	91	2.2	2.0	2.3	1.5
Civilian	82	2.3	2.0		
Army	39	2.3	2.0		

APPENDIX D

Table D

Summary Statistics for JEPI Scores for Females

Group	N	M	SD	NZ MEANS M	NZ MEANS SD
		EXTRAVERSION			
Maori	24	17.2	4.1	15.9	2.9
European	53	15.9	5.0	16.9	3.1
Civilian	42	16.1	4.2		
Army	36	16.3	5.4		
		NEUROTICISM			
Maori	24	15.1	4.4	14.6	5.7
European	53	14.0	5.4	12.8	5.1
Civilian	42	14.7	4.9		
Army	36	14.0	5.3		
		LIE			
Maori	24	2.8	2.3	3.2	2.8
European	53	2.9	2.2	2.7	1.6
Civilian	42	2.9	2.5		
Army	36	2.9	1.8		

APPENDIX E

Table E

Multiple Regression Analyses - Listening Comprehension

Criterion - Listening Comprehension Score

Multiple Correlation Coefficient (R) = .22

r^2 = .05

F Ratio = 1.08 (NS)

Variable	Beta	F to delete	Zero Order Variance accounted for	Variance accounted for when entered last
Ethnic Group	.17	3.48	.02	.02
Short term Absence	-.18	2.49	.02	.02
Civilian/ Army	.10	.98	.00	.01
Gender	-.03	.13	.00	.00
Long Term Absence	.02	.04	.01	.00
Number of Schools	-.01	.02	.00	.00

APPENDIX E

Table F

Multiple Regression Analyses - Neuroticism

Criterion - Neurotic Score

Multiple Correlation Coefficient (R) = .25

r^2 = .06

F Ratio = 1.46 (NS)

Variable	Beta	F to delete	Zero Order Variance accounted for	Variance accounted for when entered last
Gender	1.62	3.28	.03	.02
Ethnic Group	-1.31	1.65	.02	.01
Number of Schools	.27	1.22	.02	.01
Civilian/ Army	- .93	.83	.00	.01
Long Term Absence	.08	.85	.01	.01
Short Term Absence	- .03	.03	.00	.00

APPENDIX F

JUNIOR EYSENCK PERSONALITY INVENTORY

by Sybil B. G. Eysenck

NAME .....

AGE..... SEX.....

E= ☐ N= ☐ L= ☐

Instructions

Here are some questions about the way you behave, feel and act. After each question is a space for answering "YES" or "NO".

Try to decide whether "YES" or "NO" is your usual way of acting or feeling. Put a ruler or a sheet of paper under each question and then put a cross in the circle under the column headed "YES" or "NO". Work quickly, and don't spend too much time over any question. Be sure not to leave out any questions.

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E ○ N ○ L ○

REMEMBER TO ANSWER EACH QUESTION

		YES	NO
1.	Do you like plenty of excitement going on around you?	○	○
2.	Do you often need kind friends to cheer you up?	○	○
3.	Do you nearly always have a quick answer when people talk to you?	○	○
4.	Do you sometimes get cross?	○	○
5.	Are you moody?	○	○
6.	Would you rather be alone instead of meeting other children?	○	○
7.	Do ideas run through your head so that you cannot sleep?	○	○
8.	Do you always do as you are told at once?	○	○
9.	Do you like practical jokes?	○	○
10.	Do you ever feel "just miserable" for no good reason?	○	○
11.	Are you rather lively?	○	○
12.	Have you ever broken any rules at school?	○	○
13.	Do lots of things annoy you?	○	○
14.	Do you like doing things where you have to act quickly?	○	○
15.	Do you worry about awful things that might happen?	○	○
16.	Can you always keep every secret?	○	○
17.	Can you get a party going?	○	○
18.	Do you get thumping in your heart?	○	○
19.	When you make new friends do you usually make the first move?	○	○
20.	Have you ever told a lie?	○	○
21.	Are you easily hurt when people find fault with you or the work you do?	○	○
22.	Do you like telling jokes or funny stories to your friends?	○	○
23.	Do you often feel tired for no good reason?	○	○
24.	Do you always finish your homework before you play?	○	○
25.	Are you usually happy and cheerful?	○	○
26.	Are you touchy about some things?	○	○
27.	Do you like mixing with other children?	○	○
28.	Do you say your prayers every night?	○	○
29.	Do you have "dizzy turns"?	○	○

		YES	NO
30.	Do you like playing pranks on others?	○	○
31.	Do you often feel fed-up?	○	○
32.	Do you sometimes boast a little?	○	○
33.	Are you mostly quiet when you are with others?	○	○
34.	Do you sometimes get so restless that you cannot sit in a chair long?	○	○
35.	Do you often make up your mind to do things suddenly?	○	○
36.	Are you always quiet in class, even when the teacher is out of the room?	○	○
37.	Do you have many frightening dreams?	○	○
38.	Can you usually let yourself go and enjoy yourself at a gay party?	○	○
39.	Are your feelings rather easily hurt?	○	○
40.	Have you ever said anything bad or nasty about anyone?	○	○
41.	Would you call yourself happy-go-lucky?	○	○
42.	Do you worry for a long while if you feel you have made a fool of yourself?	○	○
43.	Do you often like a rough and tumble game?	○	○
44.	Do you always eat everything you are given at meals?	○	○
45.	Do you find it very hard to take no for an answer?	○	○
46.	Do you like going out a lot?	○	○
47.	Do you sometimes feel life is just not worth living?	○	○
48.	Have you ever been cheeky to your parents?	○	○
49.	Do other people think of you as being very lively?	○	○
50.	Does your mind often wander off when you are doing a job?	○	○
51.	Would you rather sit and watch than play at parties?	○	○
52.	Do you find it hard to get to sleep at nights because you are worrying about things?	○	○
53.	Do you usually feel fairly sure you can do the things you have to?	○	○
54.	Do you often feel lonely?	○	○
55.	Are you shy of speaking first when you meet new people?	○	○
56.	Do you often make up your mind when it is too late?	○	○
57.	When children shout at you, do you shout back?	○	○
58.	Do you sometimes feel specially cheerful and at other times sad without any good reason?	○	○
59.	Do you find it hard to really enjoy yourself at a lively party?	○	○
60.	Do you often get into trouble because you do things without thinking first?	○	○

PLEASE CHECK TO SEE THAT YOU HAVE ANSWERED *ALL* THE QUESTIONS

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