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THE ACQUISITION OF ENGLISH AS A SECOND LANGUAGE BY
YOUNG TOKELAU CHILDREN LIVING IN NEW ZEALAND

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ABSTRACT

Young Tokelau children living in New Zealand are members of one of the smallest linguistic minorities in the country. Many speak the Tokelau language at home, and so their first sustained contact with the English language comes when they enter the school system at the age of five.

The research reported in this study was designed to investigate two questions associated with the language education of these children during their first two years at school: (a) is it desirable to discourage continued use of the Tokelau language, and (b) how should the schools approach the task of teaching the children English?

The English language skills, both formal and functional, of Tokelau children aged five and seven were investigated. Tests were constructed to assess control of English vocabulary and structure and ability to communicate in English with peers and with teachers. Two groups of native speakers of English, each the same age as the Tokelau groups, were also tested.

The results indicate that the English language skills of the Tokelau children are not as well developed as those of native speakers of the same age, both when they enter school and after two years of consistent contact with English. The relevance of questions concerning their language education is thus established. Correlations between ratings of Tokelau language skills and scores obtained on the measures of English language skills indicate that, in general, the continued use of the Tokelau language has little effect on the

acquisition of English as a second language. The data, however, suggests that there is some relation between the ability to speak Tokelau and both the acquisition of English vocabulary and the efficiency of communication between five year old inter-ethnic pairs in which Tokelauans are the speakers and native-speakers of English are the listeners. These results are considered within the framework of the diglossic relations that exist between English and Tokelau in New Zealand.

A detailed examination of the scores obtained on the English language measures by both Tokelau speakers and native speakers of English indicates that the sequence and process of second language acquisition is substantially the same as that of first language acquisition. There is little evidence of transference by the Tokelau speakers from their knowledge of their native languages to the task of understanding English. This is seen as tentative support for the experiential approach currently followed in New Zealand infant rooms. There is however some indication that early help with English vocabulary may be useful.

The significance of these results is considered in the light of information derived from three studies that were complementary to the main research. These studies covered such areas as the relation between home language use and the development of second language skills, factors contributing to communicative success, and the implications of the research for language testing. Some recommendations for the language education of young Tokelau children are offered.

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Introduction

Children brought up in an immigrant community whose home language is not the language of the school are faced with the necessity of acquiring the school language. In New Zealand, the Tokelauans form a minority group who use Tokelau extensively as home and community language. When the children enter school at five this is generally their first consistent exposure to English. This study investigated the second language skills of these children at school entry and two years later following two years of schooling in English, and was designed to answer two questions about their language education: (a) is it desirable to discourage continued use of the Tokelau language, and (b) how should the schools approach the task of teaching the children? To answer these questions an investigation was made of the control of both formal and functional aspects of English by Tokelau children aged five and seven for whom English was a second language. Aspects of their language background were also studied in an attempt to identify the relation between home language use and the development of English language skills.

Chapter 1

THE TOKELAU ISLANDERS¹

1.1. Migration patterns

The migration of the Tokelau² Islanders from their islands is part of the wider phenomenon of migration from the other Pacific Islands, from Samoa, the Cook Islands, Niue, Tonga and Fiji. Pacific Island migration has in general taken place since World War II, but migration from the Tokelaus dates from the 1960s and is taking place at an increasing rate³. The New Zealand Government-sponsored resettlement programme commenced in 1966 following a disastrous typhoon in the islands. There are now more Tokelauans living in New Zealand than in the islands. Figures obtained from the Tokelau Census conducted by the Epidemiology Unit at Wellington Hospital as part of the Tokelau Islands Migrant Study put the population of Tokelauans over 15 years of age in 1973 at 1014 living in New Zealand, and at 753 living in the islands. In 1971, the total Island population was 877. These figures give an indication of the rate of migration in recent years. The

1. For much of the information in this chapter I am indebted to David Boardman of the Department of Sociology, Victoria University of Wellington, both through personal communication and his article, 'Tokelau Islanders at home and in New Zealand' (Boardman, 1972). Many Tokelau friends have also supplied first hand information.

2. At present the conventions for the use of the terms Tokelau and Tokelauan as attributive adjectives in New Zealand English are uncertain. However in some collocations the use is clear, e.g. the Islands are the Tokelau Islands. On this analogy the attributive form used in this study is consistently Tokelau e.g. The Tokelau children. Tokelauan is reserved for the predicative use of the adjective and also for the name of the people when used as a noun e.g. Tokelauans.

3. There are recent indications that migration from the islands is declining. It is uncertain whether this applies to the Tokelaus since they are still fully administered by New Zealand but migration from the Cook Islands and from Niue declined between 1974 and 1975 (New Zealand Department of Statistics, 1976).

majority of Tokelau migrants have settled in the Wellington area. Table 1 shows the distribution by age and place of residence of the population in New Zealand in early 1973.

Table 1 Tokelauans in New Zealand in early 1973

	under 15	over 15	total
Greater Wellington area	567	620	1187
Auckland	221	226	447
Rotorua - Taupo	122	120	242
Other areas	37	48	85
	<hr/>	<hr/>	<hr/>
New Zealand total	947	1014	1961

Most of the families settled in the Rotorua - Taupo area on the Government resettlement scheme choose to move to the urban areas after the expiry of their bond, most of these to Wellington. These figures support an earlier account by Woolf (1969). In his analysis of migratory patterns Woolf found that the Pacific Islanders were the most highly urbanized group in New Zealand society.

1.2. Life in the Tokelaus

Geographic description

The Tokelau group of islands comprises three atolls, Fakaofu, Nukunonu and Atafu situated in tropical latitudes some 300 miles north of Western Samoa. They are coral atolls, each consisting of a number of reef-bound islets, encircling a central lagoon. The islets range in length from 100 yards to 4 miles and are rarely more than 150 yards wide from ocean to lagoon side. The highest point above sea-level is about 15 feet, and the total land area for all three atolls is about

4 square miles, with one village on each atoll. The atolls are isolated from each other and similarly they are isolated from other Pacific Island groups. A New Zealand government vessel chartered from Samoa calls at the islands once every three months. Flights by government chartered planes are more frequent.

Economy

The economy is largely subsistence: most of the labour consists of the cultivation of root-plants, taro and pulaka and coconut, or fishing for a variety of fish and seafood from the ocean and the lagoons. Since trading is infrequent money rarely changes hands in the daily life of the Islanders.

Language

The Islanders have a common language with dialectal variants between the different atolls. The language is generally classified as belonging to the Samoic group (Biggs, 1971), and is closest in structure to the language spoken in the Ellice Islands. The first missions to the Tokelaus came from Samoa during the last century and most of the Protestant pastors working in the Tokelaus are Samoans (Boardman, 1974). The language of the church is Samoan and the Bible is translated into Samoan only. All external communications and trading are carried out through Samoa, and relations between the Tokelaus and Samoa are very close (Hooper and Huntsman, 1972). All trading is conducted in the Samoan language, there being little or no inter-atoll trading.

Samoan is therefore a prestige language, a language of wider communication, and patterns of use within the Tokelau community of the Samoan and Tokelau languages have many of the characteristics of diglossia. Tokelauans frequently use Samoan

verb forms and phonology seemingly unawares. Although a careful analysis of Tokelau speech may reveal systematic and meaningful variation between Tokelau and Samoan forms (cf. Sankoff, 1972) such variation is more probably most accurately accounted for as a phenomenon associated with language change. The older people speak a language which the community acknowledges as closer to the older Tokelau language.

Traditional values

In traditional Tokelau communities age is the final authority; it is also wisdom. This leads to patterns of child-rearing that are very different from those customarily found in New Zealand homes, (cf. Ritchie, 1970). Writing of Nukunonu in 1969 Barris (1971) says that it was a society where 'children have traditionally known their place and kept in it, where a questioning mind is not actively encouraged' (p.31).

Education

Education is officially up to Form 2, but few children reach the standard that New Zealand children of this age group do. Early education uses Tokelau as the medium of instruction, but English is introduced very rapidly. Discipline is strict and learning is mechanistic: David Boardman reports hearing children reciting 'I see a pus, a pig red pus' - no attempt having been made to adapt the teaching material to the cultural context. Immigrants recently arrived in this country cannot be expected to command a functional knowledge of English and their level of literacy is very low.

As there is no secondary or tertiary education provided in the Tokelaus, scholarships are awarded for study at these levels in

Western Samoa, Fiji or New Zealand. The New Zealand Department of Maori and Island Affairs reported in 1974 that there were 3 qualified New Zealand teaching couples on the Islands, 31 trained Tokelau teachers, and 12 teacher aides (New Zealand. Department of Maori and Island Affairs, 1974).

Educational aspirations

Tokelau adults generally have the reputation for being eager to acquire educational status according to New Zealand standards. The late Ross Fraser reported that as long ago as 1940 when contact between the Islands and New Zealand was minimal, the Islanders expressed a strong desire for their children to receive their education in New Zealand and the 1974 Department of Maori and Island Affairs Report stated that attendance was close to 100%, 'Parents being most enthusiastic in supporting the schools' (p.43). Certainly education is the stated motive for migration for many of those who have recently arrived in New Zealand.

1.3. Life in New Zealand

Population characteristics

The Tokelau population in New Zealand is a very young one. Table 1 shows the distribution by age and it can be seen that nearly 50% of the population are under 15 years of age. In 1973, 205 pre-school children were examined by the medical staff of the Epidemiology Unit in the Wellington area. This figure represents around 40% of the under 15 Tokelauan population, and is a further indication of the youth of the population.

Settlement

When a migrant from the Tokelaus arrives in this country he will want to stay near his relatives. Most Tokelauans in New Zealand live

in state housing areas, in Porirua in Wellington and Otara in Auckland, but these areas are very large and the Tokelauans are only a very small proportion of the total population. So although many have quite close contact with the other Tokelauans the whole group forms a very small minority and one which is thrown into very close contact with non-Tokelauans. Cohesiveness within the group in Porirua, and to a lesser extent in Otara, contributes to the maintenance of traditional values which are under severe stress following migration (Hooper and Huntsman, 1974).

The average socio-economic level is lower than the average Pakeha level, and there is little variability. However this levelling does not reflect variations in social status within the Tokelau community itself, variations which originated in the Tokelaus prior to migration. For example, a number of men, fathers of children in the sample, were school teachers, a much respected position in the Islands. In New Zealand their qualifications are not accepted and they often work at manual jobs in industry like less well-educated Tokelauans. They still have status within the Tokelau community, but this status is not reflected in a socio-economic description of the population.

Language use

Many of the Tokelau households in this country consist of three generations living under one roof. Often both parents are at work, and the children are in the charge of the grandparents. The language of the home is frequently Tokelau. Generally the grandparents know very little English even after some years residence in this country, so the Tokelau language is a necessity to include them. Tokelauans, both Roman Catholics and Protestants, worship with

4. The term Pakeha is a term current in New Zealand English which refers to New Zealanders of predominantly European descent.

Samoans and use the Samoan language in their religious services. The language of the dominant culture is English.

The Tokelau language in written form

The Tokelau language has been used increasingly in a written form since the period of contact with Western civilization. In the Islands education for the first three years of schooling is in Tokelau with the use of English gradually increasing. In New Zealand there is a growing number of circulars issued by government departments, political parties, churches etc. to the Tokelau community in their own language, and personal correspondence between Tokelauans, especially about Tokelau business, is by no means unusual. There is however no agreement on spelling conventions, but this does not appear to cause difficulties. Almost certainly most educated Tokelau adults who can speak Tokelau can also read Tokelau.

Education in New Zealand

Since the Tokelau community in New Zealand is a minority group which makes considerable use of its own language many of their children learn Tokelau as a first language and so their first major and sustained contact with English comes when they enter school at the age of five. It is generally assumed that a good command of English is essential for the children to benefit from their education and it is the responsibility of the school to provide suitable conditions for the Tokelau children to acquire English as a second language. The need for insights into the nature of these conditions was the motivating reason for the research reported in this thesis.

1.4. Questions

The research was not designed to test any explicitly formulated hypotheses. Rather answers were sought to two basic questions that concern the language education of young Tokelau children. Firstly, what effect does first language maintenance have on second language acquisition, and is it necessary to discourage continued use of the first language in order to establish conditions that may be conducive to learning English as a second language in New Zealand? Secondly, how should English as a second language be taught to young children? There have been many suggestions in answer to this question. Where the children are part of a linguistic minority it is sometimes suggested that they need no instruction, and that daily contact with native speakers of the majority language is sufficient to ensure language learning. Alternatively a more formal approach has been advocated by those who have looked to the plethora of methods which have been advocated for teaching foreign languages to adults, and which have been adapted for use with children.

1.5. The approach

It has been suggested (Kennedy, 1973) that an appropriate approach to formulating answers to policy questions concerning the language education of children is to shift the focus from the discussion of teaching techniques on to the learner himself. So this study centres on the Tokelau children themselves. The aim is to investigate their learning of English as a second language and to use the information obtained to suggest answers to the two questions that are the basis of the research.

To answer the first question it will be necessary first to assess the English language skills of the children both at school

entry and later after a period of time at school, and then to determine whether the development of these skills is affected by their knowledge of Tokelau. We also need information about the language learning process. This necessitates a more detailed investigation. Information is required that will enable an assessment to be made of the extent to which second language acquisition is a process similar to that of first language acquisition. If it can be shown that second language acquisition is largely characterised by specific instances of transfer, either of structure or of strategy, then it might be inadvisable to encourage language maintenance. If, on the other hand, second language acquisition is characterised by a creative response to the input that is similar to first language acquisition then it is likely that the second language learner, ceteris paribus, should be able to approach his task with a confidence and a certainty of success that matches that of the first language learner and language maintenance need not be discouraged. These are extreme positions, but they do identify possible relations between acquisition process and the value of first language maintenance.

While the implications for pedagogy that can be derived from information on the language learning process are in the early stages of formation, the broad outlines are clear (cf. Macnamara, 1973). It appears that if transference is identified then techniques that seek to reinforce new language patterns will be justified. If second language learning is shown to be a process parallel to that of first language acquisition then language learning can be most profitably assisted by providing input similar to that of first

language acquisition, and a habit formation/suppression approach cannot be justified.

These two questions are of course only relevant to the language education of young Tokelau children, if it is established that they are less proficient in English than Pakeha⁴ children of the same age. Accordingly the research calls for an initial assessment of the English language skills of the Tokelau children. §3, §4 and §5 outline the procedures that were used to make this assessment and the results are reported in §6.1. The data from these assessment measures is further analysed for information on the effect of maintenance of the Tokelau language (§6.2) and for information on the processes of second language acquisition (§6.3). The literature review in §2, covers the most significant contributions to the understanding of the effects of first language maintenance on second language acquisition and of the processes of acquisition of a second language. There is also discussion of some of the difficulties associated with the design of studies investigating these areas and with the interpretation of their findings.

1.6. Complementary studies

The design of the study and the research instruments devised enabled the investigation of additional factors that are each relevant to the interpretation of the results in the main study. These cover diverse fields and are discussed under three separate

4. The term Pakeha is a term current in New Zealand English which refers to New Zealanders of predominantly European descent.

headings: the sociolinguistic background of Tokelau children, factors associated with successful communication, and implications for language testing. Literature relevant to these areas is reported and discussed in §7, where the results are given.

The Sociolinguistic background of Tokelau children

While this research is focussed on the acquisition of the English language skills of the Tokelau children and, as outlined in §3, a range of skills was investigated, such an approach represents a limited perspective for the formulation of policy on language education. In particular, more information is required on the sociolinguistic background of the Tokelau children, their first language skills and their home language background. Accordingly the questionnaire was extended to obtain this information (§3.6).

Factors associated with communication success

Perhaps the most important use of language is to communicate with other people, and successful communication is a priority aim for a child acquiring a second language. An understanding of the factors that are, for Tokelau children, associated with successful communication is useful in the formulation of language education policies. To identify some of these factors exploratory analyses were undertaken of reaction times, communicative style and errors in speech.

Implications for language testing

Many teachers find difficulty in assessing the English language skills of their young pupils and the call for tests is strong. There are many problems involved in the development of tests for use by teachers. Fundamental among these is the need to be quite

clear about what aspect of language knowledge the test investigates and, where comparisons with native speakers are being made, the effect of cross-cultural variables. The design of the study enabled some preliminary, but useful observations to be made on these points.

Chapter 2

EARLY CHILDHOOD ACQUISITION OF A SECOND LANGUAGE

2.1. Effect of first language maintenance

There is little direct evidence contributing to an understanding of the effect of first language maintenance on second language learning. Some indications can be found in studies investigating the effects of bilingualism on the development of language skills (in one or other, or both languages), but these do not all point in the same direction, and furthermore their conclusions require some qualification.

Although results are conflicting the weight of the evidence suggests that continued first language maintenance impedes second language learning. Reviews of the literature (Darcy, 1953, 1963; Macnamara, 1966) indicate that the proficiency of the second language learner is unlikely to match that of the native speaking child. Macnamara specifically investigated the 'balanced' bilingualism hypothesis and concluded that it could not be sustained: proficiency in one language was generally offset by deficiency in the other. It is possible that where there is a gap at school entry between the skills of second language learners and of native speakers, this gap widens as the children grow older (Natalicio and Natalicio, 1971), and the findings of Brown and Brown (1970) suggest this is directly attributable to first language maintenance. On the other hand, the findings of Peal and Lambert (1962) suggest that second language learning can proceed with efficiency while the first language is maintained. In addition, the evaluation studies of French and Spanish 'Immersion'

programmes (Lambert and Tucker, 1972; Bruck, Lambert and Tucker, 1974; Cohen, 1974), in which French or Spanish is used as the medium of instruction for English speaking children, show that second language learning can proceed with efficiency while the first language is maintained although they do not investigate whether learning would be more efficient if use of the first language was discouraged.

Although the weight of the evidence seems not to favour first language maintenance, most of the discussion has been ideologically based (Benton, 1973), and underlying assumptions about the value of bilingualism and the relative status of the two languages ^{effect} the design and interpretation of many of the studies.

Fishman (1972) has suggested the value of looking at the relative status of the languages known to an individual in relation to the functions of those languages in the wider speech community. The H (high) language (or variety) is considered to reflect certain prestige values (for example, government) within the speech community, whereas the L (low) language is considered to reflect the values of intimacy and the home. This distinction provides a framework for a discussion of queries about the design and interpretation of studies investigating the value of first language maintenance.

Design queries

The language of education is commonly the H language in a bilingual diglossic speech community and so it follows that research into the value of maintenance of a first (L) language generally focusses on the development of skills in the H language. However the relative status and function of the two languages is rarely taken into account in the design of this research.

The second language skills of the subjects of studies that point to the disadvantages of first language maintenance are commonly compared to the skills of monolingual children by the use of standardized tests. However standardized tests are designed for use on a population that is comparable in all major respects of the normalization sample, and in studies with bilingual children there are frequently fundamental differences of both culture and language that totally invalidate their use (Fishman et al., 1964) and which can produce scores that completely misrepresent the language abilities of the children (Sigel and Perry, 1968).¹

Cultural bias in tests can apply to a wide range of phenomena. Test designers have traditionally been aware of the importance of choosing artifacts and representations that are relevant to the population for which the test is designed. This concern motivated the production of the English version of the Peabody Picture Vocabulary Test (Brimer and Dunn, 1962) with drawings more representative of English culture than the American originals. More recently and more locally Perry has been attempting some interesting work in the development of tests for Cook Island children using such indigenous materials as shells and coconuts (cf. New Zealand Council for Educational Research, 1974). The aim is to match the materials to the children so that difficulties in responding to the materials do not influence the scores. Clearly if this aim is effectively accomplished the test will be unsuitable for cross-cultural research.

1. A discussion of the situational variables which may effect the validity of cross-cultural research is given in §5.1.

There are also less perceptible sources of cultural bias. In particular children from different social and ethnic groups have been shown to respond differently to different classes of test materials. Taylor (1972) illustrates this vividly when he reports that in the Pacific Islands many children appear to experience difficulty in the interpretation of pictorial representations. A study by Sigel, Anderson and Shapiro (1966) suggested that, while middle and lower class children in the United States may each be able to label pictures correctly, lower class children experience greater difficulty in drawing inferences from them. In an attempt to by-pass these problems some investigators have suggested that the use of formal geometric designs would produce a culture fair test (Plaister, 1967; St George, 1971). However there are no grounds for assuming that abstract figures are not culturally specific. Pilot work for the present study suggested the reverse. It is in fact likely that culture fair tests are a chimera (Anastasi and Cordova, 1953). This evidence then clearly indicates that studies which do not attempt to take account of cultural diversity in their design will invariably produce results that favour one of the groups.

Differences in language background can also effect performance on standardized tests. Where the performance of non-native speakers is compared with that of native speakers it is generally to be expected that the scores of the non-native speakers should be lower and the question asked is, by how much? When standardized tests are used for this purpose, the scores obtained by the non-native speakers are compared with norms that have been established on monolingual speakers, and this procedure introduces a bias

that is both subtle and extremely damaging. A basic principle followed in the development of standardized tests is that the items be arranged in order of difficulty. This is necessary as the score is calculated from the point in the test at which the subject has incorrectly performed on a specified number of items. Should the order of difficulty for the research sample vary from that of the standardization sample the cut-off point may be reached too soon and the score thus artificially depressed. There is some evidence that this is a factor that contributes to the lower scores generally obtained by children from linguistic minorities on standardized tests. This point can best be illustrated by a consideration of the results of some cross-cultural studies using the Peabody Picture Vocabulary Test (PPVT) (Dunn, 1965). The PPVT was standardized in 1958 on a population of 4,012 white children living in and around Nashville Tennessee, and John and Horner (1971) report that the raw scores have been widely used as a measure of vocabulary knowledge in the evaluation of bilingual education programmes in the United States. However the work of Benton (1966) suggests that this is not a valid use for the test. He administered List B to groups of European and Maori children living in Otara in Auckland and found that the order of difficulty of the items for both ethnic groups did not present the smooth curve that the PPVT presupposes and that it did not present for the standardization sample. Furthermore, the order of difficulty of the items experienced by the two groups differed markedly from each other indicating that it is sensitive to the linguistic background of the children. Hickey (1972) suggests that it may be possible to isolate a linguistically identifiable

set of items that vary in difficulty for monolingual and bilingual children.

Interpretation queries

Design problems, of course, affect interpretation. The scores that non-native speakers obtain on standardized tests designed for use with monolingual speakers of the H language are not only likely to be depressed, but the common interpretation of such scores as evidence that they know less of the language than do native speakers fails to take into account the basic principles of test design. The assumption behind such an interpretation is that the items included in the test represent a fair sampling from the whole language. This is never the case since the principles of test design demand that items be selected on the basis of their value in discriminating between members of the target population and not on the basis of any criterion of language knowledge.

However the relative functions and status of the second language learner's two languages have consequences that are both less specific and less tangible. The common use of the H language in schools reflects the fact that education is an activity primarily associated with public and prestigious values and these contrast sharply with the more intimate values associated with the use of the L language in the home. Most of the children who were the subjects of studies reviewed by Darcy (1953; 1963) and Macnamara (1966) and others, the results of which seem to point to the inadvisability of continued bilingualism, were immigrant children whose home language was not shared by the monolingual

speakers of the H language, whereas the children who were the subjects of the Peal and Lambert (1962) study and who participated in the Immersion programme (Lambert and Tucker, 1972; Bruck, Lambert and Tucker, 1974; Cohen, 1974) were native speakers of a prestige language functioning as an H language.

It is not clear just why the status of the first language relative to the second should be related to the language learning success of young children. It may be that there is a conflict in values for the immigrant children in that the connotations of intimacy which may be associated for them with the use of their native language are not shared and are not valued by the wider community (Turner, 1974). It is possible therefore that their lack of success in acquiring a second language can be attributed to this conflict in values rather than to the consequences of first language maintenance. No such conflict existed for the subjects of the Peal and Lambert study or the Immersion programme children.

2.2. The process of second language acquisition

A young child acquires his first language in a way that is fundamentally different from the way he learns to read or write. These skills are learnt by instruction and without lessons they would not be learnt. All human children from whatever language background, and unless they are exceptionally abnormal, begin to speak about the same time, and they all follow a similar developmental pattern (Slobin, 1973). In this respect language acquisition is a fundamental human characteristic. But the particular language that is acquired is of course that of the culture in which the child lives and acquisition proceeds by the interaction of the child with the environment. As acquisition progresses the child's interaction with his environment plays an

increasingly significant role. In his account of the development of native language skills beyond the early years, Carroll (1971) discusses the interaction of hereditary and environmental factors, and he concludes that:

Language development involves a large number of different competences and skills, in each of which there may be a different rate of growth dependent upon a combination of hereditary, constitutional and environmental factors. (p.148)

Because second language learning takes place, by definition, after first language acquisition, the process has been more readily identified with the learning of other skills such as reading and writing, and the concepts of learning theory have been applied to the development of instructional materials. Since the learner of a second language is older, the nature of his task is regarded as basically very different from that of an infant learning his first language. However it is the same language for both first and second learners and the goals of language learning too are the same. They include, among others, the ability to understand and to produce original and meaningful sentences that conform to the rules of the language (Chomsky, 1965).

Such considerations have led many investigators to shift the focus of their research from an emphasis on Contrastive Analysis for the development of instructional materials (cf. Lado, 1964) on to the learner, so as to find out how the second language learner approaches his task, and whether or not the process is in fact different from first language acquisition. A number of studies have either set out to answer these questions directly or have provided data which are significant in these respects. Such data focusses either on characteristics of the learner, his age and stage of cognitive development or on the process of second language

acquisition. The following discussion will deal with the most significant studies in this area.

The learner

Studies of child acquisition of a second language are generally agreed that older children learn at a faster rate than younger children (Tits, 1948; Kenyeres and Kenyeres, 1948; Ravem, 1968; Ervin-Tripp, 1974). Ervin-Tripp suggests that this is due to the more advanced cognitive development of the older child and to his wider experience in the use of human language. The same observation was also made by Tits in her account of the learning of French by M, a six year old refugee from Spain. She reported that M's well established ability to reproduce sounds aided acquisition of French. The child was apparently actively searching for regularities in the new language since her previous experience had taught her this aspect of human language: 'Elle a déjà adopté un ordre syntaxique rudimentaire, comme elle est capable de faire dans sa langue maternelle' (p.21).

The process

Investigation into the processes of second language acquisition requires an analysis of the language skills of the children. To find out whether the learner is responding to the input data in the creative way that characterizes first language acquisition or whether he is learning a new skill as he would learn to read, it is necessary to compare data from second language learners with data on first language acquisition by monolingual children. If a child acquires a second language as he learns another new skill, the learning process will be affected by previous learning and

his development in the second language will be characterized by transference (on specific linguistic variables) from the first language. If the acquisition of a second language is comparable to the acquisition of a first language there will be no evidence of transference and the sequence of acquisition will be similar for both native speakers and second language learners.

Although there are a number of studies that attempt to characterize second language acquisition there is no conclusive evidence to support either position. There are three questions that require attention in the interpretation of these studies: the kind of comparison that is made, the skill that is investigated, and the kind of linguistic variable that forms the focus of the study.

Comparisons of data from second language learners with data from monolingual speakers have varied according to whether the monolingual speaker is an infant acquiring a first language or a child of the same age as the second language learner. The first approach is to examine errors in the produced speech of children who are learning a second language and compare them with data on errors produced by very young children in the acquisition of a first language. The results are inconclusive. The work of Milon (1974) and Ravem (1968) was specifically in the field of negation, and Ravem also studied the acquisition of interrogative structures. Ravem found evidence of transference from the mother tongue in his study of questions but they both found that the sequence of acquisition in negation was similar to that reported in the mother tongue studies (cf. Brown, 1973). A similar

conclusion was reached by Ervin-Tripp (1974) who studied the acquisition of semantic assignments of noun phrases. Detailed comparisons of data from second language learners with that of young monolingual children were not explicitly made by Kenyeres and Kenyeres (1948), Tits (1948), Price (1968) and Dato (1971). However each of these investigators offer general comparisons. Price reports that 4½ year old English speaking children learning Welsh in a bilingual school at Penparcau made few errors that could be traced directly to structural differences between the two languages. Dato studied the acquisition of Spanish by 5½ and 6½ year old children of English residents in Madrid, and commented on the 'significant similarities in the order of occurrence of certain underlying structures and functions' (p.32) between the learners and native speakers of Spanish acquiring their first language. However Kenyeres and Kenyeres report that their six year old daughter Eva, whose first language was Hungarian, learnt French as a second language in a sequence very different from first language acquisition: 'Eva ne passe pas par les stades de développement caractéristique pour l'acquisition de la langue maternelle' and 'l'acquisition prend son appui sur la langue maternelle' (p.356). Similar comments were made by Tits.

Although neither of these investigators make explicit comparisons it is possible to compare their data with other accounts of the early speech of monolinguals. Kenyeres and Kenyeres, in their discussion of the acquisition of question forms, refer to Eva's failure to invert subject and verb saying that 'l'ordre des mots

accuse une influence du hongrois' (p.356). This same failure is a common error in the acquisition of English as a first language (Brown, 1968) and is also reported by Grégoire (1947) in the speech of children learning French as a first language. It is unlikely therefore that Eva's errors can be unambiguously attributed to transference from her first language. Similar comparisons can be made with the data recorded by Tits. For example, M learnt the emphatic forms moi and toi before je and tu. This is exactly the order of acquisition of pronouns in French reported by Grégoire. It would appear that both these investigators felt that it was more likely that the second language errors made by the children they observed could be attributed to transference from their first language than to difficulties common to all learners of the language whether as a first language or as a second language. Such assumptions are, at least, questionable.

An alternative approach is to compare aspects of the language skills of children acquiring a second language with data on the same skills from a group of monolingual children of the same age. As with studies using data from early language acquisition, the findings of investigators using this approach are conflicting. Clay (1971a; 1974), Kessler (1972), Carrow (1971) and Cook (1973) all reported results that support the hypothesis that second language acquisition is characterized by a creative response to the input that is similar to first language acquisition. Young's findings (Young, 1971) do not support this notion and those of Politzer and Ramirez (1973) suggest both positions.

It is widely recognised that in second language acquisition

comprehension skills develop ahead of the ability to produce accurately. Indeed the second language learner characteristically produces a number of errors in his speech. Analysis of these has sought to identify the source. In studies of the acquisition of a second language by young children Dulay and Burt (1974a), Ravem (1968) and Clay (1974) each report that errors in the speech of second language learners identify the process as similar to that of first language acquisition. However Politzer and Ramirez (1973) traced many of the English errors made by children who were native speakers of Spanish to specific structural points of Spanish.

The same confusion is found in studies of second language comprehension, although miscomprehensions themselves are clearly less obvious than speech errors: Carrow (1971), Kessler (1972) and Cook (1973) all conclude that the process of second language acquisition is the same as the process of first language acquisition but Young's (1971) study of the acquisition of comparatives suggests that categories acquired in the course of first language acquisition affect the process of second language acquisition. It would appear then that studies of both production and comprehension provide evidence for both the acceptance and the rejection of the hypothesis that the process of second language acquisition is the same as the process of first language acquisition. It is of course possible that the hypothesis can be neither supported or rejected and that second language acquisition has characteristics that are both similar to and distinct from first language acquisition.

Studies of second language acquisition differ also according to the linguistic variable investigated. In fact they vary

considerably and in a manner that makes interpretation of the findings very difficult. But some common factors are discernible.

The diffuseness of the discussion can be attributed both to the wide range of variables studied and to the implications for the interpretation of the results that the choice of variable holds. Carroll (1961), in a discussion of the discrete point approach to language testing, warned of both the importance and the difficulty of selecting variables on a principled basis in order that sound generalizations may be made. However a number of studies in this field have selected a small group of variables and, on the basis of these, conclusions about the nature and character of second language learning have been drawn. Clay (1974) studied the acquisition of morphophonemic rules, and Dulay and Burt (1974a) performed an error analysis on twelve functor morphemes. Ravem (1968), Milon (1974), and Huang (1971)² studied the acquisition of negation and in addition, Ravem studied questions. Young (1971) studied comparatives and Cook (1973) studied the acquisition of complement structures. In interpreting the results of each of these studies the question is raised as to how far performance on these variables is representative of potential performance on any other linguistic variable, and consequently, it must be asked whether conclusions based on these results hold for second language learners in general.

Neither has the question of the generalizability of results been faced up to by those who claim to have tested for a variety of structures. Carrow (1971) and Clay (1971a) studied a range of

2. Reported in Ervin-Tripp (1974).

linguistic variables, but these were not selected on any principled basis and so it is impossible to generalize from them. Kessler (1971) based her selection on a contrastive analysis of English and Italian. She tested for comprehension of thirteen structures shared by the two languages along with one Italian specific one and two English specific ones. Clearly, in this case, the selection depends upon a similarity in structure of the two languages and such an approach would not be possible for languages which belong to different language groups and which are more divergent in structure. The findings are therefore very limited. Similarly the error analysis performed by Politzer and Ramirez (1973) includes only those structures in which errors actually occurred. This is also, in effect, selective (Schachter, 1974).

However, when the studies are considered in groups, some trends emerge from a closer consideration of the linguistic variables, and these may point to a possible characterization of second language acquisition and provide some evidence of strategies followed by the child.

In the earlier discussion of the data from monolingual children used for comparisons, it was noted that the group of studies that used data from children who were the same age as the second language learners produced conflicting results. It is possible that the source of this discrepancy lies in the type of linguistic variable under investigation. Studies supporting the hypothesis that second language acquisition is a creative process similar to first language acquisition all investigated the acquisition of discrete linguistic variables, and to do this they all used highly structured experimental tasks, Clay (1974) used a Berko-type (Berko, 1958) production task; Cook (1973) and Clay (1971a) used

a structured imitation task; and Carrow (1971), Kessler (1971) and Cook (1973) all used comprehension tasks that were also structured to test for understanding of discrete linguistic variables. The studies of Young (1971) and of Politzer and Ramirez (1973) differed from these. Young was investigating the acquisition of semantic variables using a conceptual category approach and Politzer and Ramirez used data from spontaneous speech rather than from a structured test situation. In a study of the acquisition of comparatives, Young found that the conceptual categories of the first language accurately predicted difficulties experienced in the comprehension of second language structures within the same conceptual field. His study then suggests that first language experience with conceptual categories leads to a sequence of second language acquisition different from that of mother tongue speakers. Politzer and Ramirez used data from the spontaneous English speech of children whose native language was Spanish, from kindergarten to Grade 3. An error analysis was performed on this data and they concluded that the major (but not the sole) source of errors appeared to be Spanish influence. This conclusion may in part be attributable to the fact that this was spontaneous speech and not a highly structured test situation. In ordinary communication, the requirement on the speaker to speak meaningfully is high. Young's study has shown that semantic concepts developed in the first language carry over to second language acquisition, and hence in a situation where meaning requirements are high, first language transference may also be high. This explanation would also account for the comments on their informal observations made by Kenyeres and Kenyeres and by Tits. Thus it appears that those studies which are highly

structured and which test for acquisition of a series of discrete syntactic variables indicate that first and second language acquisition are similar but that those which focus more on the semantics of second language acquisition do not support this.

Further analysis of the linguistic variables that form the focus of these studies indicate something of the strategies that children acquiring a second language may follow. Ervin-Tripp (1974) has suggested two kinds of strategy, semantic and syntactic. The evidence is very tentative, and in the case of the semantic strategies, only very loosely suggestive.

In her study of the acquisition of French as a second language by English speaking children aged 4-9 years, Ervin-Tripp investigated the development of semantic categories. She noted that the children soon learnt the relation between order and meaning. Having learnt to interpret the morphological information that marks the passive construction in English as evidence that the first noun phrase in the sentence is the object and not the agent of the verb, they could not at first interpret similar morphological information in French. They reverted to the strategy they had earlier followed when they first learnt English and which French children follow when learning French, and they systematically interpreted the first noun phrase as actor regardless of the sentence it was in. A similar dependence on the order of noun phrases was noticed when the acquisition of the indirect object construction was studied. Ervin-Tripp's children regularly interpreted the first noun phrase following the verb as the direct object and ignored the preposition which, in French, marks the indirect object and which is obligatory whether it immediately follows the verb or not. Again, this is a semantic strategy commonly

followed by young children acquiring French or English as a first language.

It seems likely from these findings that children learning a second language do develop a strategy based on the relation between order and meaning. However the rules of clause analysis in English and French are the same as regards these elements, and so Ervin-Tripp's findings cannot be regarded as conclusive evidence that the strategies are the same for both first and second language acquisition. In order to be sure that the strategies followed by learners of a second language are not the result of strategies already acquired in the first language, the two languages studied would need to differ in the appropriate rules.

Perception of the relation between order and meaning may then develop into a strategy followed by the second language learner. This is fundamentally a semantic strategy. Ervin-Tripp also suggests that second language learners may develop syntactic strategies based upon differential rule simplicity between the first and second languages. These relate to semantically empty morphemes (e.g. do-support) and certain order rules. She says:

In formulating simple order rules children sometimes draw upon mother tongue formulations if (a) there is some second language support for the rule or (b) the mother tongue rule is simpler. (p. 121)

In support of this claim, she cites the evidence of Ravem (1968). Ravem's son, Rune, employed the English order rule for negation because it was simpler than the Norwegian and did not differentiate between the modal and the main verb of the sentence but always put the negator before the main element of the verb phrase. However

Rune retained the Norwegian question inversion rule for main verbs at first, because it was simpler, and did not require the application of a do - support rule. He produced such utterances as like you food? and climb you? Rule simplicity then is advanced as a second language learning strategy. It should be noted that, if this suggestion of Ervin-Tripp's is correct, this proposed syntactic strategy involves the learner in a comparison between the rules of the two languages and is therefore specific to second language learning.

The evidence therefore is tentative rather than conclusive, and suggests that there are both similarities and differences between first and second language acquisition. The differences appear most evident when semantic variables are studied, but children develop semantic strategies which may be similar in both languages. These differences have, in fact, a common source in that the expectation that language is meaningful appears to apply to the deep structure level first. Young's (1971) study showed that bilingual children appeared to be operating a single semantic system and they had difficulty with the surface forms of comparatives in the second language where these differed from the first language. Ervin-Tripp's (1974) work indicated an early grasp of the deep structure case relation of noun phrases. There is evidence in both these cases of the expectation of second language learners that there is a common underlying structure of both first and second language.

2.3. Summary

This account has indicated that three factors are of significance in the design of studies to investigate the acquisition of a second language. Firstly, the construction of the research instruments;

secondly, the importance of carefully matching native speakers and second language learners on all relevant variables; and thirdly, the need for an understanding of the nature of cultural diversity and how this may effect the validity of the research. These factors are further discussed in chapters §3, §4 and §5 where the procedures adopted in the present research are outlined.

Chapter 3

THE PRESENT STUDY: INVESTIGATION PROCEDURES

3.1. The model

The approach taken in this research to questions concerning the language education of Tokelau children (§1.5.) called, in the first place, for an assessment of their English language skills both at school entry and after a period of time in school.

Results of this assessment were to be examined ^{1.}both for evidence of a relation between second language skills and ^{1st}first language acquisition.

Where a general assessment of language skills is aimed at, it is important that the variables should be selected on a principled basis so that sound generalizations can be drawn (Carroll, 1961). It is therefore essential to adopt a model that adequately represents human language, and which can act as a base for the selection of the variables. Human language is, as many writers have argued, both a social and a communicative activity (Jakobson, 1973). One model of language that attempts to account for this diversity is that developed by Halliday (1961, 1967-68, 1970a, 1970b, 1973). This represents an integrated approach to the description of language and is an appropriate model for the present study. To reflect the central emphases of the Hallidayan model, research instruments were designed to investigate control of the ideational function of language (knowledge of vocabulary and structure) and of the interpersonal function (communication skills).

The most direct method of assessing vocabulary and structural knowledge is to test for comprehension of discrete vocabulary and

structural variables. This is also the most appropriate way for a test designed for use with preliterate children. An outline of the literature relevant to the testing of both these areas and to the investigation of functional language skills is given in the next three sections of this chapter. There follows also an account of the procedures followed in the construction of research instruments for use in this study.

Many of the points raised in this chapter are applicable to both first and second language acquisition. However, a particular problem associated with a study of second language acquisition is the need to be certain that the language in question (in this case English) is not in fact the child's first¹ language. Accordingly, in this research, the children's knowledge of Tokelau or Samoan, was investigated. An account of the investigation procedures is given in §3.5.

3.2. The investigation of vocabulary knowledge

Lexical facility in a language implies a skill in manipulating lexical items for effect and in understanding of a range of meaningful subtleties in the lexical choices of others. However a major component in the early stages of the acquisition of a second language is the learning of a vocabulary for communication (Lado, 1964), and the knowledge of the referential use of words is a central aspect of such word knowledge.

The methodological problems associated with the estimation of size of a child's vocabulary by any method is an old problem.

1. For a discussion on the use of the terms 'first language' and 'second language' see §7.1.1.

A number of different investigators over the past eighty years, using a variety of methods, have made widely different estimates of the average vocabulary for the same age groups (Lorge and Chall, 1963). There are a number of possible sources for this variation. Most significant among them are: problems associated with the nature of the experimental task; questions surrounding the definition of a 'word'; and procedures for sampling items for the tests.

One very likely source of discrepancy between these estimates is the procedure for testing. What do we mean when we say a person knows a word? Do we mean that they understand it when someone else says it, or that they can use it appropriately themselves? It is important to be clear about which skill is being measured by a particular test. There are basically two techniques for estimating vocabulary size corresponding to these two skills. There are tests requiring subjects to recognize one referent out of a number of alternatives, either pictures or word lists, and there are tests designed to measure the ability to define a word and to use it in a sentence. Although research into vocabulary testing shows there is a positive correlation between these methods of testing, there is sufficient evidence to indicate that definitional and use criteria of word knowledge produce lower vocabulary estimates than recognitional criteria (Dale, 1956).

A further source of these discrepancies lies in the sense of the term 'word' that is used. Are we to count plurals, comparatives, adjectives and adverbial suffixes (square, squarely) and so on as single lexemes or as different words? Should names of people and places be included? Should cases of polysemy including 'dead' metaphors be regarded as more than one item (he went for a

run; he had a run of bad luck)? All these are methodological questions which control the resulting estimate.

In all estimations of vocabulary size it is necessary to adopt a sampling procedure since it is quite obviously not possible to test all the words in the language. Another possible source of the variation in the estimates noted above is that there are two sharply contrasting sampling methods; the dictionary sampling method, and the frequency sampling methods. Both procedures limit the total number of words with which a subject can be accredited. In the dictionary sampling method the limit is a function of the size of the dictionary and of the dictionary's definition of a word. In the frequency sampling method, the limit is the number of words tallied, so that the maximum vocabulary is a function of the count. For example, for the Thorndike - Lorge (1938) 30,000 List, it is 30,000 words.

Tests that are based on frequency counts have an advantage over dictionary based measures in that the words included in the former are ones which there are some grounds to expect have actually occurred in the child's linguistic experience, whereas a random sampling from a dictionary could lead to an item being constructed to test a word which the child is unlikely ever to have heard and which he may never hear. There is good evidence that high frequency words are more likely to be known (Lorge and Chall, 1963; Savin, 1963; Ritterman and Talley, 1972), and so tests can be constructed in groups of items representing decreasing levels of frequency and increasing levels of difficulty. In this way the usual practice of standardized tests can be followed and the easier items be presented at the beginning of the test, but unlike standardized tests, the scores are criterion - referenced rather

than norm referenced

than norm - referenced.

3.2.1 Procedures

In the development of a research instrument to investigate vocabulary knowledge full note was taken of all the points raised in this discussion of the literature. Additional factors to be considered related to the children who were the subjects of the research, in particular their age and their status as members of a linguistic and cultural minority.

Method: Since the subjects of the test were preliterate children, a picture identification task was considered most appropriate. Each child was required to identify which picture of four identified the referent of a spoken word. Each item consists of four pictures, one the referent and three distractors all of the same type as the referent. For example, if the verb sweep is the item, represented by a picture of a girl sweeping, the distractors are each pictures of someone doing something. Similarly if the item is an object, say bag, distractors are also pictures of objects. Pilot work indicated the need to avoid distractors for which the English word is phonologically similar to the item being tested.

Sampling procedures: To be certain that items included in the test were those which young children living in New Zealand might be expected to know, a base was established from a frequency count. From this a sample was drawn. The most sophisticated frequency count of the vocabulary of young children is that of Rinsland (1945). Rinsland constructed from a variety of written and spoken materials a frequency count of the vocabulary of American children classified according to grade level. The lists give detailed information of the frequency of each word, and classify the items into groups

of 100 for the first 1,000 most frequent, and in groups of 500 for the rest. The Rinsland lists are very comprehensive and enter as separate items each morphologically variant form. Because morphological information was investigated as part of the structure section of the study, all groups of morphologically related items were considered as single lexemes. Words whose meaning is primarily perceived as structural, namely articles, verbal auxiliaries, prepositions etc. were excluded as these too were included in the base of the structure test. To take into account both the findings of Hickey (1972) and the construction of the verbal group in the Tokelau language², all verbs were used in the root form (run) rather than the participle form (running). The potential familiarity of the words for New Zealand children was checked for by comparing the list with Arvidson (1970), which is based on a frequency count of the written work of New Zealand school children. The classification for frequency is not as rigorous as that of Rinsland so was not suitable for use as a base from which to draw the original sample.

The test was organized, as are the Rinsland lists, in groups of items of decreasing frequency, and hence of increasing difficulty, and it was intended to cover the range of difficulty experienced by the children who were to be the subjects of the study. Initially the base was established by using the grade 1 list. This extends as far as the second half of the third 1,000. Pilot work showed that the difficulty level of the seven year old children was not reached by words in this frequency group and so a further base was

2. In the Tokelau language changes of tense and mood are indicated by the use of verbal particles and the root form does not change. Thus the English: John is digging becomes the Tokelau: Ko Ioane e keli, and John will dig becomes Ko Ioane ka keli. The verbal noun digging (as in 'digging is hard work') is also keli. For a further discussion on this point see Tuia (1974), p.7.

constructed from words in the fourth 1,000 from the grade 3 list³. These words were also checked for duplication with the higher frequency lists of grade I and duplicates were removed.

After the removal of non-base forms, words not current among New Zealand children and duplications, the totals were:

Level 1	1st 1,000	473 words
Level 2	2nd 1,000	472 words
Level 3	3rd 1,000	270 words
Level 4	4th 1,000	110 words

The smaller totals in the low frequency levels can be attributed to the fact that at these levels, many of the words occurring in the Rinsland list were absent from Arvidson, indicating a high percentage of culturally specific items. This was not evident in the high frequency levels (cf. Whiteman, 1972).

Test construction: The test was constructed by drawing a random sample of 15 items from each frequency level. Extensive pilot work was conducted to check the assumptions of this procedure and the validity of its use with Tokelau children (see Appendix I). Six practice items were included. The final form of the test consisting of 60 items is given in Appendix II.

Test materials: For the pilot work, the materials for each of the items consisted of photocopies of drawings or of sketches made by the investigator or her friends. The items that were included in the final test were redrawn by professional artists. They are

3. The grade 2 list, like the grade 1 list, extended only to the second half of the 3rd 1,000.

line drawings and no significant alterations were made to the items. The aim was to make them homogenous in character and culturally appropriate.

Test instructions: The following instructions were used with each child:

We're going to look at some pictures. You see there are four pictures on each page. I shall say the name of one picture and I want you to put your finger on that picture. Let's try. Show me the table, show me the bread. Now let's look at this page. Show me 'feather', show me 'chimney'. (Turn over) Show me 'eat', show me 'sit'. (Turn over) 'Wash'. (Turn over) 'Flower'. (Turn over) 'Bird'. (The test was begun at this point without further comment).

3.3 The investigation of structural knowledge

The investigation of structural knowledge in the field of first language acquisition has contributed much to the development of techniques for use in studies of second language acquisition. In first language testing, techniques for testing comprehension are further advanced than techniques for testing production. In part this is a response to the hypothesis produced by Chomsky (1964) on the relation between comprehension and linguistic competence, and part it is because comprehension tests enable more precise observations to be made. In the design of comprehension tests, it is possible to control both the test situation and the linguistic variables which constitute the input and so knowledge of particular linguistic variables can be studied. It is much harder to control this input in the investigation of productive skills.

It is necessary to control the input variables to be certain that a correct response can only be achieved by knowledge of the target variable. Although techniques for the investigation of first language comprehension are among the most sophisticated available (cf. Kennedy, 1970c), this is, in practice a very hard requirement to meet. In the first place there are methodological problems; and in the second place, such control involves a number of assumptions about the nature of comprehension.

Methodological problems arise from the diversity of the input variables involved. A correct response could be attributable to a number of other skills such as knowledge of the lexical items used or control of the paralinguistic features of intonation. Situational variables, notably the arrangement of test materials, may also be responsible. Conversely an incorrect response may not be the result of a failure to understand the structural variables under investigation, but may, in fact, be attributable either to these variables or to a number of other factors. Among these are defects in motor skills, such as hearing or vision (in cases where the subject is required to identify referents), excessive strain on short term memory capacity, the speed of the presentation of the stimulus and even inferential capabilities (the child may be able to understand the utterance but fail to process the information required to make the appropriate response).

However, control of these variables involves assumptions about the nature of comprehension that are somewhat questionable. This is primarily because they necessitate an oversimplification, for these variables, both linguistic and situational frequently facilitate comprehension in natural situations, where participants never have to rely on an isolated structural clue. Language is a highly

integrated system of knowledge and skills and comprehension in natural situations is a very complex operation involving the knowledge and skills of both speaker and listener(s), and also interaction between these participants and the situation.

Jakobson (1973) has emphasised that 'natural language is context sensitive' (p.51) and understanding a verbal message involves the perception of the nature of the interaction. Understanding is itself a little understood activity and there have been few studies that have attempted to identify these aspects of both the situation (including participants) and the verbal message which affect such understanding (Kennedy, 1974). A few have been identified in experimental situations. However, the possibilities for interaction between them in reality are very numerous (cf. §5.1).

A test of comprehension of structural variables is then but one aspect of the highly integrated system that the subject controls. Structural knowledge is, however, a very important component of the linguistic system. Neisser (1967), in his discussion of the work of Halle and Stevens (1959), proposed an analysis-by-synthesis model of cognition in which the creativity of the effort required by the perceiver is stressed. The model emphasises both the complexity of language and the contribution of syntactic principles to the process of synthesis. The investigation of structural knowledge is then a restricted but significant component of the subject's linguistic knowledge.

Many of the points to be considered in the design of tests of comprehension of structural knowledge are similar to those associated with the design of vocabulary tests. Of particular significance is the selection of the variables and the nature of the experimental task.

As already noted, it is important in the development of any language test to follow a principled procedure for the selection of the linguistic variables. The nature of this procedure determines the validity of any generalization that may be made from the results (Carroll, 1961). It is particularly hard to adhere to this requirement in the construction of tests of structural knowledge (Spolsky, 1968), and this requirement has been generally ignored by investigators into the acquisition of a second language by young children (cf. §2.2).

To establish a sampling procedure it is necessary to set up a base from which to sample. For structure tests this cannot be achieved by compiling a list for the range of structural types is infinity and can only be described abstractly by use of a model incorporating recursive rules of some type. It is proposed in this study that a base can be established by selecting a model of grammar which incorporates this recursiveness. This model is then matched with a study of the frequencies of different structural types in actual use. In this way it is possible to list structures to form a base by a procedure that takes account of both the theoretical requirements of recursiveness and the practical requirement of limiting the number of structures included in the test. In effect the frequency study is in itself the principle for sampling from the model. Details of the procedure followed are outlined in the next section.

Experimental tasks used in the investigation of ability to comprehend language structure vary according to whether they require the subject to imitate the stimulus or to identify the referent of the stimulus. Some investigators have argued that the ability to imitate the stimulus sentence is indicative of comprehension abilities (Menyuk, 1963; Slobin and Welsh, 1967). There are

however a number of variables which affect the validity of this approach: the length of the stimulus (Fraser et al., 1963); the grammaticality of the utterance (Menyuk, 1963); the dialect of the child (Labov, 1969) and the age of the child (Menyuk, 1963). There are moreover doubts about how the responses might be scored. Berdan (1974) has suggested that the linguistic code of the investigator may affect his linguistic perception and hence his scoring of the responses. Imitation is easier than referent identification or production (Fraser et al., 1963; but cf. Clark, Hutcheson and vanBuren, 1974), so estimates of structural knowledge using an imitation task are likely to be relatively high.

Tasks requiring identification of the referent of the stimulus are typically of two kinds. Either the subject is presented with a picture and asked to respond 'yes' or 'no' according to whether the picture represents the stimulus, or he is asked to identify, usually by pointing or pressing a button, which of two or more pictures or sets of test materials is the referent. Gaer (1969) and Turner and Rommetveit (1967) are among those who have required their subjects to make yes/no responses, but the technique has a number of difficulties. It is more suitable for use with linguistic variables that can be clearly represented (e.g. the passive), than it is for those which cannot (e.g. questions). There is the additional difficulty, pointed out by Gaer herself, that in the case of negative stimuli the results may have been affected by the plausibility of the sentence. The more implausible the sentence the easier is the negation (Wason, 1965).

Referent identification as a technique for the investigation of structural knowledge was developed by Fraser et al. (1963), and has since been used by a number of investigators including Hatch (1969),

Osser et al. (1969), Carrow (1968), Kennedy (1970a). Where pictures are used, the structures they can be used to test for are limited to those which can be pictorially represented. Some investigators have studied a wider range of variables by using as test materials non-pictorial objects or groups of objects from which the subject is required to select the one that corresponds to the stimulus (cf. Herriot, 1969; C. Chomsky, 1970). By using both pictures and objects it is possible to include a wide range of structural variables.

3.3.1. Procedures

Experimental task: To enable the test to include a wide range of linguistic variables it was decided to use as the experimental task, referent identification. Both pictures and three dimensional objects were used as referents.

Sampling procedure: To establish a base from which to draw a sample of structural variables representative of the range of structures of English, a model of English grammar was matched with data from frequency studies.

The model of English grammar selected was the Scale and Category model developed by Halliday (Halliday, 1961). This describes the grammar in terms of the concepts of structure and system, and it provides a surface structure taxonomy which is more readily related to frequency data than is a model of underlying structure. In order to ensure that a range of English structures, in terms of the model, was covered, variables were selected from each of the levels of sentence, clause, group, word and morpheme.

The variables were selected by matching this model with frequency data from the findings of McEldowney (1966). The intention was to select from McEldowney the most frequent and least frequent structures and systems from each of the levels of sentence, clause, group, word and morpheme. Since the data in McEldowney's study gives no information of morpheme frequencies, the selection of variables at this level is based on the work of Berko (1958), who also used a frequency base. The variables identified by this procedure were checked against data in accounts of the language used in classrooms. An outline of these frequency studies is given below, together with an account of the matching procedures that were followed.

The McEldowney study describes the range and frequency of structures in the written language of twelve year old New Zealand children. Although data from this source would appear to be inappropriate in a study of the aural comprehension of young children, calculations from the data of O'Donnell et al. (1967) indicate that the frequencies of structures in the written language of twelve year olds correlate very highly with the frequencies of the structures in the spoken language of six year olds (see Appendix III). The present study accepts the implications of these findings, and accordingly the McEldowney frequencies have been adopted.⁴

Berko (1958) investigated the internalized knowledge of the morphemic rules of English of children aged five and one half years

4. The O'Donnell et al. study was not suitable for use in the selection of variables for this study because the taxonomy is limited owing to the specialized aim of the study. Furthermore their analysis of the internal structure of the main clause is not sufficiently detailed.

to seven years. Basing her selection on the grade 1 Rinsland (1945) list, she isolated the most frequent morphological structures. The selection of morphemic variables in this study is based on her findings. The least frequent morphemes are irregular formations (e.g. sheep) which form a specialized aspect of word knowledge, and have therefore been omitted from consideration at the level of morphemic structure.

There are only two studies of the language used in New Zealand classrooms, neither of which are really relevant to the present study. (Nuthall and Lawrence, 1965; Donaldson, 1971). Of these, the study of Nuthall and Lawrence is the most useful for this study: they give an account of verbal strategies in the classroom, and include some data on the language used by teachers; whereas Donaldson's study focusses merely on the intonation patterns used by teachers.

Structural variables were selected by matching data from these studies with the Halliday model according to the procedures outlined above. There were however, five categories of variables that were omitted from the final test and one additional one was included.

1. Low frequency systems operating at group, clause and sentence level were excluded because of a mismatch between the frequency data and the model. The data in McEldowney is described in terms of an Immediate Constituent analysis and there is some difficulty in relating her data to the Scale and Category model at this point. However, since the concepts of structure and system are inter-related, each structure being the realization of systemic choices at a lower level of analysis, low frequency clause and group systems variables were considered at the level of sentence and clause structure

respectively.

2. Variables representing primarily vocabulary knowledge were omitted because this aspect was adequately covered in the vocabulary test. This category includes all structures operating at word level. Other items omitted on this basis were all nominal group structures. These were much, half and all other adjectives.

3. Variables which pilot work identified as readily comprehensible by Polynesian children of this age were omitted. These were the occurring in nominal group structure and imperatives occurring at clause level.

4. The fourth category comprises those variables for which no testing procedure suitable for use with young children and which adequately controlled the other linguistic variables could be devised. These were when, it-explication and because. When occurred in clause structure and would require consideration of a range of possibilities and an extended verbal response. It was thought that this would introduce the complicating factor of the child's ability to reason the response, and to verbalize it too. It-explication and because both occurred at sentence level and they defied ingenuity.

5. The fifth category comprises those variables for which there was insufficient data in McEldowney for a selection to be made. These were the inter-personal systems operating at verbal group level. The most frequent of which is the system of modality (modal auxiliaries), and as Halliday (1971) has shown this is a very intricate system involving a number of different lexical items and expressing a closely networked variety of meanings of possibility and

probability. Since these are all included by McEldowney in the single category of Indicators, with no information on their meanings, it was not possible to include them in the present study.

6. Additional variables were included to take into account a specific limitation of the McEldowney study. Because her work was based on written narrative material, it was inadequate in the information it provided about interpersonal systems operating at clause level. The findings of both Nuthall and Lawrence (1965) and of Donaldson (1971) demonstrate that imperatives and questions, both of which are structurally manifested functions of language defining the relationship of the principal participants in a speech event, are frequently used in New Zealand classrooms. Since imperatives are early acquisitions, they were omitted (cf. 4 above), but a variety of question types were included. These were selected on the evidence of Nuthall and Lawrence.

Structural variables included in the test

Verbal group structure

1. Conjoined verb phrase

(Peter shot and killed the lion)

Group systems

2. Singular	(the boy)
3. Plural	(the boys)
4. Possessive	(the man's hat)
5. Past	(the boy jumped)
6. Present	(the boy jumps)
7. Negative	(the girl is not sitting)
8. Passive and negative ⁵	(the girl is not hit by the truck)

5. Passive in conjunction with the positive verb form is considered at clause level.

Clause structure

9. Infinitival complement with direct object
(the boy wants the dog to play)
10. Infinitival complement with no direct object
(the boy wants to play)
11. Participial complement with direct object ?
(the boy likes the dog playing)
12. Participial complement with no direct object
(the boy likes playing)
13. Subject - verb - direct object - to indirect object
(Peter gave the book to Jane)
14. Subject - verb - indirect object - direct object
(Peter gave Jane the book)

Clause systems

15. Active (Peter hits Jane)
16. Passive (Jane is hit by Peter)
17. Who⁶ (Who is eating a bun?)
18. What⁶ (What is standing on the table?)
19. Who questioning Agent, active
(Who is hitting the dog?)
20. Who questioning Object, active
(Who is the dog biting?)
21. Who questioning Locative, active⁷
(Who is John giving the bun to?)

6. These items tested comprehension of the animacy [+/- human] distinction.

7. This is the indirect object construction. Since the question forms were being investigated in conjunction with the locative (cf. Nos., 24 and 28), the term locative is preferred.

22. What questioning Agent, active
(What is pushing the car?)
23. What questioning Object, active
(What is the car pushing?)
24. What questioning Locative, active
(What is the boy putting the toy in?)
25. What questioning verb, active
(What is the boy doing?)
26. Which questioning Agent, active
(Which boy is playing with the toy?)
27. Which questioning Object, active
(Which bun is the boy eating?)
28. Which questioning Locative, active
(Which box is the boy putting the toy in?)
29. Where, active
(Where is the boy putting the toy?)
30. Who questioning Agent, passive
(Who is the dog being hit by?)
31. Who questioning Object, passive
(Who is being chased by the tiger?)
32. What questioning Agent, passive
(What is the hunter being chased by?)
33. What questioning Object, passive
(What is being eaten by the dog?)
34. Which questioning Agent, passive
(Which boy is the dog being whipped by?)
35. Which questioning Object, passive
(Which dog is being whipped by the boy?)
36. Yes/No questions, active - Yes
(Is the boy hitting the dog? - Yes)

37. Yes/No questions, active - No
(Is the boy hitting the dog? - No)
38. Yes/No questions, passive - Yes
(Is the dog being hit by the boy? - Yes)
39. Yes/No questions, passive - No
(Is the dog being hit by the boy? - No)

Sentence structure

40. If - main clause (true) (If the dog is hit he will bite)
41. If - main clause (false)
42. If not - main clause (true) (If the dog is not fed he will bite)
43. If not - main clause (false)
44. Main clause - if (true) (The dog will bite if he is hit)
45. Main clause - if (false)
46. Main clause - if not (true) (The dog will bite if he is not fed)
47. Main clause - if not (false)
48. Embedding $\emptyset$ (I know the girl Paul loved)
49. Embedding that (I know the girl that Paul loved)

Test construction: In the construction of the test primary consideration was given to the development of suitable techniques. Five different sets of materials were found to be appropriate and so there were five groups of variables (see below). Within each group the order of presentation was randomized. Two forms were constructed, the second presenting the variables in the reverse order of the first. This was to minimize the effect of set. They are referred to as Form A and Form B⁸. Cultural factors relevant to the presentation

8. The complete test is given in Appendix V.

of the stimulus, the length of the test and the choice of the test materials are discussed in §5, where an account of the procedures adopted on these points is also given.

Test materials

Group I: (Variables 1, 15, 16, 17, 18, 48, 49) A toy petrol station with appropriate models.

Group II: (Variables 4, 9, 10, 11, 12, 13, 14) Soft toys and wooden dolls.

Group III: (Variables 19-39) Wooden dolls and appropriate model toys.

Group IV: (Variables 40-47) Small wicker basket, large blue painted shoe box and toys and sweets as appropriate.

Group V: (Variables 2, 3, 5, 6, 7, 8) Binary choice pictorial material, especially prepared for the test.

Control of linguistic variables: A basic consideration on the selection of linguistic forms for the construction of the items was that the vocabulary and non-criterial structures should be known to the children. These were initially selected by reference to Arvidson (1970)⁹, and McEldowney (1966) respectively, and confirmed during the course of pilot work. Pre-test routines were carried out for each child to check these assumptions and to ensure that he could identify the materials in the test by the items used.

9. There was only one item included in the test which was not in Arvidson. This was 'tanker' referring to an articulated tanker. Its inclusion was justified on the grounds that it commanded a high interest level among the children. Children identified by the pre-test routine as unfamiliar with the term were taught it quite easily.

Response identification: To ensure that a correct response could not occur without comprehension, all active and passive items, whether alone or in construction with the negative or question forms and all possessives, were reversible (Turner and Rommetveit, 1967).

Instructions: The aims of the practice items were to familiarize the children with the materials, to establish the English words used in the test, and to introduce and establish the form make ... as the form of instructions.

Here are some toys. Can you see the Show me the ... (and so on until the English word used in the test had been correctly identified for each of the toys). Now we're going to play a game with them. Look, I will make the car drive onto the roof. Can you make the car drive onto the roof? (pause) Can you make the truck drive onto the roof? (pause) Make the man go into the garage. (pause) Now I want you to make 'the car goes into the garage'. (pause) Make 'the car goes into the garage'.

Similar procedures were followed for all groups requiring the manipulation of toys (I-IV).

With the pictorial items (group V), the aim was to establish show me stimulus as the form of the instructions.

Here are some pictures of children (Look at the first ones and talk about what the children are doing and so on). Can you show me the girl with the big hat? (pause) (turn over). Now can you show me 'the boy plays with the truck' (pause). Show me 'the girl plays with the doll'.

An extended pilot study: When the precise form of the items and the test situation had been established in the light of experience

gained during the early pilot work, an extended pilot study was run to check the assumptions on which the test was constructed and to obtain reliability data. This is reported in detail in Appendix IV. Reliability estimates were judged to be sufficiently high for the test to proceed with confidence. The final form of the test is given in Appendix V.

3.4 The investigation of functional language skills

The design of the present study, which aimed to assess language skills, called for some measure of communication skills to be made (cf. §3). Communication is clearly a very complex operation, the effectiveness of which can be influenced by a very large number of variables both linguistic and non-linguistic. However, a central factor in any communication concerns the participants involved and therefore it was decided to investigate aspects of the communicative abilities of Tokelau children with two groups of people with whom they are in regular contact in the school situation: their peers and their teachers. Peer group contact is generally a large part of a child's interaction in the school, and so it is on aspects of peer group communication that this study focusses.

Probably the most sophisticated experimental technique developed for ^{the} investigation ^{of} communication skills requires children to communicate about objects (or arrays of objects) when separated visually from each other by a screen (cf. Glucksberg, Krauss and Weisberg, 1966; Glucksberg and Krauss, 1967; Kraus and Rotter, 1968). This technique allows communication to be regarded as a two way activity, as a function of both speaker and listener skills, and it was decided to use it in this study. Previous studies which have used this technique with children are discussed in the following section.

Ability to communicate with teachers was investigated along one dimension only: teachers were asked to assess, by means of a simple rating procedure, the ability of the Tokelau children to speak and understand English. Literature appropriate to the development and interpretation of rating procedures is also discussed.

3.4.1 Communication with children

The experimental task used in this study was developed by Glucksberg and his associates in a series of studies with monolingual children. The exact nature of the experimental task that was used by this group of investigators varied from experiment to experiment, but in each case the experimental equipment consisted of a series of blocks. On each face of the blocks was stamped one of six novel (abstract) designs, one design only being used on each block. In each experiment the abilities of the subjects to communicate with each other about these blocks was investigated in a situation in which the children could not see each other, being separated by a screen across a table.

This experimental task has been used to investigate the effect of a number of variables on the ability to communicate. Glucksberg, Krauss and Weisberg (1966), Glucksberg and Krauss (1967) and Kraus and Rotter (1968) have all found that communication efficiency improves with age. All the studies investigating the effect of differences in socio-economic status agree that middle class children perform better than lower class children (Ruth, 1966; Krauss and Rotter, 1968; Heider, 1969), and Baldwin, McFarlane and Garvey, (1971) found that white children performed better than black children. Also the results of a study by Reynolds and Lambert (1969) suggest that there is no difference between the performance of bilingual children and that of children who are monolingual in either language.

These studies have shown that the communication task can be used to identify the effect of group membership of both speakers and listeners on communicative efficiency. This approach to the investigation of communication skills is particularly appropriate for the present study which is cross-cultural. In this study, the experiment was designed to allow the communicative efficiency of Tokelau children in both intra-ethnic (with other Tokelau children) and inter-ethnic (with Pakeha children) situations to be contrasted with that of Pakeha children in the same corresponding situations. In this way the comparative efficiency of both intra-ethnic and inter-ethnic communication could be investigated.

This technique has also a diagnostic value which was followed up as one of the complementary studies. Analysis of the transcripts of the communication task can provide evidence of the characteristics of the communicative style commonly used by different groups of children, and of the significance of communicative style as a factor in determining the success of communication both within and between groups of children. Previous research on this topic is discussed in §7.2.2.

3.4.1.1 Procedures

To investigate functional control of languages an experimental situation was established which minimized the opportunities of the participants to make use of situational information and other forms of non-verbal communication. In this way their ability to use language became the focus of the study.

The situation which most regularly relies on specifically language skills for communication to be effective is that of a telephone conversation, in which the participants are dependent solely on linguistic means of communication. It was not possible

to set up an experimental situation using an actual telephone situation, however, the experimental situation used in the communication task developed by Glucksberg and his associates does preserve the essential feature: the requirement to rely on linguistic means of communication. Two children were seated at opposite ends of a table and their view of each other was blocked by a hardboard screen which stood on three blocks. The children were required to perform a number of communication tasks and measurement was a function of each pair of children.

Experimental tasks: To relate the task to natural communication the materials selected were real toys. In this way the communications were more realistic than in situations in which novel abstract shapes are used and they required the manipulation of speech forms which the children could be expected to use in everyday situations. Several pilot runs were necessary to identify tasks that were suitable for use with five year old and seven year old children. In fact pilot work indicated that the abilities of the children to perform tasks of this nature developed considerably over these two years, and it was very difficult to identify tasks that were suitable for use with both these age groups. The form of the task that was finally decided upon was thought to stretch the abilities of the younger children while not being too easy for the older ones. The speaker was required to give the listener instructions on how to identify one object or picture out of a series of objects of pictures. Pilot work enabled four tasks to be identified:

1. Each child was shown an identical set of nine different playing cards taken from a children's pack. The speaker was required to tell the listener about two of the cards in turn so that the listener could identify them.

2. Each child was shown a set of four dolls. The two sets were identical except that one doll in each set had no match in the other. The dolls were all the same size and style but differed from each other in hair style and colour, in dress style and colour and two in each set had on only one shoe. The speaker had to tell the listener about two of the dolls in turn so that the listener could identify them.

3. Each child was shown an identical set of six pictures taken from a comic strip book of Walt Disney's Snow White and the Seven Dwarfs. They showed pictures of Snow White with the queen, both beautiful and disguised as a witch, and with the huntsman and the seven dwarfs. Again the speaker was required to tell the listener about two of these, in turn, so that they could be identified.

4. Each child was shown a set of four cars. The sets were identical except that one car in each set had no match in the other. They were plastic cars around five inches long and in a variety of bright colours. The speaker was required to describe two of them, in turn, for the listener to identify.

Participants: Pairs of children were matched for age and sex, and ethnicity was a dependent variable. This section of the study was only carried out in schools where there were two Tokelau children of the same age and sex. Whenever two such children were found a series of four test presentations were made to a communication group consisting of two Tokelau children and the two Pakeha children who were identified as matches of the Tokelau children according to procedures outlined in §4.2. The structure of each communication group was as follows:

1. Two Tokelau children, T1 and T2
2. Two Pakeha children, P1 and P2
3. T1 and P1
4. T2 and P2

Presentation of the experimental tasks: The experimental tasks were presented to the first and third pair in each communication group by Mrs Savelio, the Tokelau research assistant (cf. §5.2.1), and to the second and fourth pair by the writer. In this way the variable of the ethnic group of the presenter of the task was controlled for. In each case the other member of the research team operated the tape recorder.

Familiarity: This section of the study was conducted in each school after the comprehension tests in that school had been completed. The writer and her assistant were therefore known to all the children involved. In most cases the children also knew each other, but in larger schools when children of the same age were in different classes this was often not the case. It was not possible to control for this.

Roles: In each pair, each child had two turns at being the speaker and two at being the listener. The speaker on the two items of the first task became the listener for the two items of the second task and vice versa. In the third pair in each communication group, in which the items were presented by Mrs Savelio, the Tokelau child was the first speaker, and in the fourth pair in which the items were presented by the writer, the Pakeha child was the first speaker.

Rotation of tasks: The tasks were presented to the communication groups in rotation: group 1 received order one; group 2 received order two, and so on. In this way any differential in the difficulty

of the tasks was controlled for. The six orders were:

	order 1	order 2	order 3	order 4	order 5	order 6
T1 and T2	tasks	tasks	tasks	tasks	tasks	tasks
P1 and P2	1 & 2	3 & 4	1 & 3	2 & 4	1 & 4	2 & 3
T1 and P1	tasks	tasks	tasks	tasks	tasks	tasks
T2 and P2	3 & 4	1 & 2	2 & 4	1 & 3	2 & 3	1 & 4

Instructions: The children were introduced to the task as a game and the lengthy familiarization period formed a teaching situation so that they could experientially grasp the nature of the task. Some of the items for familiarization required the speaker to give instructions to the listener: for example, instructions for the building of a model with blocks or the drawing of a particular picture. In these cases the children gave the instructions then ran round the other side to compare the structures or the drawing. This caused considerable amusement and generally some time was spent on these practice items in order to familiarize the children with the experimental situation and to relax them so that in most cases they were talking quite freely after a little while. Practice items similar to those used in the experimental tasks were also included.

In the presentation of the experimental tasks children were told to: 'Tell him about this one, so he can find one too'. There were times, especially with the five year olds pairs, when it was necessary to supplement this with 'He can't find it yet. Tell him some more about it'. This was generally sufficient.

Language: Although the ability to use the English language for communicative purposes was the focus of this investigation, it was readily apparent that, where one Tokelau speaker was communicating with another Tokelau speaker, this was a totally artificial requirement and their attempts to use English were often marked by switches into their own language (cf. §7.1.4.2. b). Clearly participant

variables have a strong effect on language choice. It was decided therefore to welcome any choice by these children to play the game in their own language. Accordingly, the focus of interest in this section of the study shifts from the specific question of the ability to use English on to the more general skill of ability to use language to effect communication.

Measurement: Each pair was scored on each item of each task. A correct score was entered if the toy or picture was correctly identified by the listener. A zero score was entered if the object or toy was incorrectly identified. If the listener identified it wrongly the speaker was told and encouraged to elaborate upon his description. If it was apparent that no communication was going to be made the presentation was discontinued 60 seconds after the instructions were concluded. This was felt to be necessary as a longer failure could discomfort the children. But if the pair were making good progress on the task, they were encouraged to proceed until it was completed. In each case the time taken on each item was recorded, and a tape recording was made of the complete exchange.

3.4.2. Communication with teachers

Ratings made by teachers of childrens' language skills are of necessity a very ^{an}direct approach to the assessment of those skills. This is primarily because of the many variables associated with the teacher that can affect the ratings. Two of these are particularly significant: firstly, the length of time the teacher has known the child and the degree of contact between them in that time, and secondly, variation in the interpretations made by the teachers of the child's linguistic performance.

Difficulties associated with the control of the length of

time a teacher has known a child, and the degree of contact in that time, have led to a general failure to consider this factor in the design of studies using a rating procedure. Yet clearly, if a teacher has only taught a child for a short time, she has had little experience of his language abilities to base this rating on. This would appear to be a fundamental problem with the work of Spolsky (1968), where the children involved six year olds and new entrants in the school. Lewis (1959) working in Wales, used this procedure with older children, but it is not clear how long the teachers had known the children. However his study did show that the teachers were not familiar with the home language background of the children, and were not aware that some children came from homes where both Welsh and English were used (this was measured by the Hoffman Bilingual Schedule, Hoffman, 1934).

Children's linguistic performance in class can be dependent on a variety of factors ranging from general adjustment difficulties to specific differences in sociolinguistic norms operating in the culture of the home and the culture of the school (cf. Philips, 1970). Where a child is from a linguistic minority it is only too easy for the teacher to interpret quietness as indicative of a poor command of English. There is a suggestion that this occurs in New Zealand schools (New Zealand. Department of Education, 1971). Where a child is experiencing such non-linguistic difficulties, and it is unlikely that an investigator can ever be certain that a child from a linguistic minority is not, teachers' estimates of language skills cannot be valid.

However, although ratings made by teachers may be invalid as a measure of the child's linguistic abilities, they may be of use in obtaining some insight into the efficiency of communication between teacher and child. The linguistic performance of the young

child in the classroom is always in interaction with others, often with the teacher. Thus the teacher is both participant and observer. The possibility of regarding ratings as a measure of communication efficiency is suggested by the findings of Lewis (1959). Lewis reports that teachers tended to think that children whom the Hoffman Bilingual Schedule identified as from homes where both Welsh and English were spoken were predominantly Welsh speakers when, in fact, it was highly probable that they could speak both English and Welsh. The measures are gross, and undoubtedly mask considerable variation, but it would appear that the response of the bilingual children to their teachers in the classroom situations was to be very quiet, and thus their English language abilities were not apparent. The interest of these findings lies primarily in the insights they offer both of the ability of the teachers to communicate with children whose native language is not that of the class and of the children's ability to respond. It was thus more a measure of mutual communication efficiency than an objective measure of ability. It is therefore appropriate to use teachers' ratings to investigate the abilities of Tokelau children to use English in the classroom to communicate with their teachers.

3.4.2.1. Procedures

Teachers were asked to rate the separate abilities of the children to speak and understand English on the following scale:

Fluently	5
Well	4
Moderately	3
A little	2
Not at all	1

In each case the teachers were asked to use as their criterion 'the ability to use English to learn in an English language classroom'. The complete rating scale is given in Appendix VI.

It was not possible, in this study, to achieve any control over how long the teacher had known the child. However, since no child was seen within a month of their date of entry into school (cf. §4.1), some minimum degree of uniformity was gained.

Since Lewis's (1959) study had suggested the relevance of information on the familiarity of the teachers with the language background of the children, the teachers were asked to identify the child's first language. The results are reported in §7.1.4.

3.5 Investigation of Tokelau language skills

The initial identification of Tokelau children as subjects of this investigation was on the basis of the self-identification of the parents with the Tokelau community (cf. §4.1). In the experience of the writer, gained from acquaintance with members of the Tokelau community before the investigation was begun, such identification does not necessarily predict a knowledge of Tokelau on the part of the children. The theoretical focus of the study was on the second language skills of the children, and so it was important to obtain reliable data on their Tokelau language skills. The possibility of constructing a test of Tokelau language skills along lines similar to the tests of English language skills was considered but had to be rejected because there was no possibility of obtaining a reliable control group of monolingual children in order to isolate developmental factors: it is quite unrealistic to suppose that five and seven year old Tokelau children living in New Zealand know no English and the results of this study supported this. It was not therefore possible to design the study with

parallel language tests. Instead three separate ratings of the children's Tokelau (or Samoan) language skills were obtained, from their teachers, from their mothers and from Mrs Savelio, the Tokelau research assistant (cf. §5.2.1).

Since it was necessary to visit the homes of the children to obtain a rating from the mothers, it was decided to include the request for this rating in the administration of a brief interview schedule. This interview schedule was designed to investigate aspects of the language background of the children in an attempt both to document their home language experience and to identify some aspects of the relation between home language use and the development of second language skills¹⁰. It was not, however, the central focus of the study. An account of the development of the interview schedule is given below (§3.6).

3.5.1 Ratings of Tokelau language skills by teachers

Teachers were asked to name the child's mother tongue as part of the investigation of communication skills. They were also asked to rate their abilities to speak and understand that language on the following five point scale:¹¹

Fluently	5
Well	4
Moderately	3
A little	2
Not at all	1
Don't know	6

10. It is recognised that the underlying assumption of correlational linguistics, 'that language and society constitute different kinds of reality' (Blom and Gumperz, 1972, p.432), entails an essentially limited approach to the study of linguistic behaviour (cf. Blom and Gumperz, 1972; Pride, 1973; 1974), and the investigations of the present study are only intended to be exploratory. It is hoped that the findings will suggest possible lines for future research.

11. The complete form that the teachers were asked to complete is given in Appendix VI.

In most cases the teachers had no first hand knowledge of the native language abilities of the child, but they were encouraged to consult anyone they thought could help them to supply the information accurately. In some cases an elder sibling was asked. It was, however, necessary to give the teachers the option of saying that they did not know. In this way one potential source of invalid data was bypassed, although this remained the least satisfactory of the Tokelau language ratings.

3.5.2 by Parents

Mother's were asked as part of the interview schedule described below (§3.6) to say whether their child could speak Tokelau

Well	1
A little	2
Understand but not speak	3
Not at all	4

It was not possible to obtain independent ratings on speaking and understanding skills because for most of the mothers the term speak (tautala) included understanding, and it was in the course of the discussion that the appropriateness of a three rating would emerge. If the child spoke Samoan at all, the same categories were used and recorded.

3.5.3 by the Tokelau research assistant

The rating of the Tokelau research assistant, Mrs Savelio, was also made on a five point scale and was based on a short interview with each child.

The basic pattern of this interview consisted of a schedule of instructions and conversational topics which were drawn up by Mrs Savelio, the writer and a number of other interested Tokelauans. The exact form of the items was established after pilot work conducted

by Mrs Savelio. The schedule was similar in many respects to that used by Clay (1971b) in assessing Samoan language skills, and a Tokelau version of this schedule was subsequently produced. In her report on the use of her schedule, Clay noted the need to establish a gentle and undemanding tone. She noted that the imperative forms were rather sharp and that the children needed coaxing to handle them. The schedule drawn up for the present study endeavoured to avoid this impression in both its content and its administration. The conversational questions covered topics relating to home, church, school and peer group activities, and the children were encouraged to talk further on any or all of these topics if they showed willing.¹²

Administration of the schedule was adjusted, if necessary, to the needs of the child. If any child quite obviously did not understand any Tokelau the schedule was not continued beyond the first two or three items. Although in many cases additional material was inserted in response to answers given by the child to previous questions, the ratings were made by Mrs Savelio on the basis of replies to the items in the schedule. Her criterion was her knowledge of the standard of Tokelau used by children of five and seven years old who live in the Tokelau Islands. In the great majority of cases all the items in the schedule were included and the language of the response was noted on the schedules.¹³ This made it easier for Mrs Savelio to be consistent in her ratings. The interviews were recorded and Mrs Savelio listened to them

12. The complete Tokelau schedule is given in Appendix VII.

13. The only exception was two cases in which the father of the child was not living at home and questions relating to the father were omitted.

immediately afterwards when she was making her ratings.

The instructions, if understood, could be followed by a non-verbal response thus enabling Mrs Savelio to distinguish between comprehension and speaking skills. Many of the children were obviously very excited at being given the opportunity to speak Tokelau at school, and Mrs Savelio reported little difficulty in eliciting Tokelau speech from those children who knew the language. Mrs Savelio is also fluent in Samoan and all of the children were tried on some of the schedule questions in Samoan. If they responded the schedule was continued in Samoan.

3.6 The interview schedule

The interview schedule aimed to obtain information that would (a) contribute to an understanding of the home language experience of the children, (b) enable the relation between home language experience and the development of second language skills to be investigated, and (c) make a preliminary investigation of a number of factors which are generally thought to affect second language acquisition. A number of variables, both sociolinguistic and demographic were identified which, it was felt, would provide information that would contribute to these aims. These were selected by the writer on the basis of both her own experience with the Tokelau community and on the experience of teachers and others working with Tokelauans themselves.¹⁴

3.6.1 Sociolinguistic variables

1. Mother's / father's first language.
2. Language usually used by mother / father to the child at home.

14. The complete interview schedule is given in Appendix VIII.

3. Mother's / father's self-ratings of own relative abilities in English and Tokelau ("Do you speak English or Tokelau best?").
4. Mother's language choice for her child ("Do you want to speak Tokelau well when he's grown up?").
5. Mother's attempts to speak English to her child.
6. Mother's attempts to correct her child's English.

3.6.2 Demographic variables

7. Child's place of birth.
8. Child's date of arrival in New Zealand.
9. Attendance at pre-school.
10. Number of schools attended.
11. Presence of a television at home.
12. Hours spent watching television.
13. Number of children in the family.
14. Place in the family.
15. Mother's / father's date of birth.
16. Mother's / father's place of birth.
17. Place where mother / father spent early childhood.
18. Does the mother work?
19. Presence of books in the home.

3.6.3 The interviews

The interviews were conducted by the writer in the homes of the mothers of the children in the sample. The mothers had been notified in advance by a letter explaining the aims and organization of the study quite simply and asking for their co-operation. The letter was in Tokelau and in English. The Tokelau version was printed first so as to encourage those women who could not

read English (see Appendix IX).

The interviews were conducted in either Tokelau or English, whichever the mother concerned preferred. The writer was not fluent in Tokelau but had acquired some conversational skills and had also received help from a native speaker of Tokelau in translating the questions appropriately into Tokelau. Approximately half the interviews were conducted in Tokelau and there were very few instances where communication was difficult. Of course there is always the possibility that not all the difficulties were noticed. But most of the women were obviously delighted to find a Pakeha who could speak their language, however falteringly, and the loss in communication efficiency was more than made up by the gain in goodwill. The interviews generally lasted about forty minutes, but frequently the writer was invited to spend longer in the houses talking about the family, looking at photographs etc. There was the invariable cup of tea. The experience was most pleasant, and much additional and unstructured information was offered.

Chapter 4

THE PRESENT STUDY: SUBJECTS

The first concern in the selection of Tokelau subjects for this study was to be sure that they were, in fact, Tokelauan. The next step was to identify two particular groups of Tokelau children: those who had just entered school, and those who had attended school for two years. Once they had been identified a control group of native speakers of English was established.

The discussion on the design of studies using standardized tests pointed to the need for care in the identification of samples in studies involving comparison of the language abilities of second language learners with those of native speakers. While age is generally taken into account, socio-economic and ethnic variables are rarely considered. It was pointed out (§2.1) that the validity of any study which does not match subjects on all relevant variables is seriously in doubt. Accordingly, in the present study care was taken to establish a control group which was as nearly as possible the match of the Tokelau subjects. The procedures for identifying both Tokelau and control subjects are outlined below.

4.1 Tokelau subjects

The five year age level was chosen because five is the age of entry into the school system in New Zealand, and so, for many of these children, the beginning of their first sustained contact with the English language. Hence, it should be possible to trace in a detailed investigation some of the features that characterize the acquisition of a second language by children of this age. The seven year old age group was selected to provide data on the effects of two years of English language schooling on the language skills of Tokelau children. No child had received any instruction in English

as a second language. It is recognized, however, that the data from the two sets of children is only comparable if it is assumed that the five year olds of the study will develop in the same way as the present seven year olds have done. This assumption can only be tentatively made.

Five year old and seven year old Tokelau children were identified from the census data compiled by the team of the Epidemiology Unit at Wellington Hospital since 1968. All contacts have been followed up very thoroughly, and there is good reason to believe that the data includes all Tokelauans resident in the Islands and New Zealand. The Migrant Study included all those with half or more Tokelau blood.

Initially, the names and addresses of all children born on or between 1 January 1966 and 31 December 1968 were recorded. Then children who turned five on or between 1 February 1973 (the approximate date of the beginning of the school year) and 30 September 1973 (the end of the month in which the field work began) were identified. Because there were fewer seven year old children than five year old children, the age range for the seven year olds was widened to include all children turning seven on or between 1 February 1973 and 31 December 1973. A check on the Migrant Study census data was included in the interview schedule for the parents of each of these children.¹

At this stage an additional criterion for inclusion on the study was introduced: only the children of parents who identified with the

1. No child was tested until at least one month after the date of his entry into school.

local Tokelau community and who were happy for their children to be part of a study of Tokelauans were included. This was necessary because the census data from the Migrant Study was based on the proportion of Tokelau blood, and this did not always reflect the ethnic assignments the people made about themselves. One child from the Wellington area and seven from the Auckland area were dropped from the sample because their parents did not identify themselves as Tokelauans. All were the children of marriages with Samoans and furthermore in a number of cases in Auckland the Tokelauan identity of the parents of Tokelau ancestry was in doubt since many of them had come to New Zealand from Samoa and had not resided in the Tokelaus for a large part of their lives. It would hardly be realistic to include these children in a study of Tokelau children. A number of the children came from mixed marriage homes, often with Samoans but a few with Maoris and Pakehas. However, these parents all fulfilled the criterion of being content for their children to be identified as Tokelauans. No attempt was made to interview or test the six children who were living in the South Island. They were scattered between Blenheim and Dunedin, and their families could not have easily associated with any Tokelau community. Two of the children had since returned to the Islands and two had not started school when the field work was conducted. All the children identified in this way were subsequently located and an investigation was made of their language abilities. In fact then, 100% coverage was obtained of Tokelau children born between the specified sets of dates, who fulfilled the required criterion of 'Tokelauness', and who were attending school in the North Island of New Zealand during September, October and November 1973. Table 2 shows the distribution

by age and locality of the final sample.

Table 2 Distribution by age and locality of Tokelau children
fulfilling sample criteria

	<u>5 years</u>	<u>7 years</u>	<u>total</u>
Wellington	39	44	83
Auckland	8	4	12
Rotorua	5	2	7
	<u>52</u>	<u>50</u>	<u>102</u>

4.2 Control group

In a study of the second language skills of young children it is important to identify those aspects which are developmental. For this purpose a control group was established: for every Tokelau child who had been identified as a member of the sample group, a Pakeha child was selected and tested at the same time. The control group children were matched with the sample group on the following variables: speech community (socio-economic status) sex, age, ethnicity, school experience.

Speech community (socio-economic status): As stated above, it is impossible to match meaningfully children with such diverse backgrounds as Tokelau and Pakeha (cf. §1.3.2). However, it was thought important that the control group be comprised of children with whom it is possible to compare the Tokelau children, so that those aspects of the Tokelau children's knowledge of English which are also characteristic of monolingual children at these two age levels might be identified.

To effect such a comparison meaningfully it is important that the control group children be members of the same (English language) speech community as the sample children. Accordingly each child from the control group was from the same school as the

corresponding child in the Tokelau sample. Although this procedure in no way constituted an accurate match for socio-economic status, the catchment area of each of the schools can reasonably be assumed to be relatively homogenous in this respect. A list of the schools concerned is given in Appendix X. A note of the parental occupation of the control group children as entered on the school record card was taken, but this information is too imprecise for any classificatory use.

Sex: Each child selected for the control group was of the same sex as the corresponding child in the Tokelau sample.

Age: Each control group child was selected on the basis of age match with the corresponding Tokelau child according to the following principles: the progress card of each child of the same sex and in the same class as each Tokelau child was examined, and the child with the birthday nearest to the sample child's was selected.

In the first instance, any child with a birthday in the same month was identified. If there were none, the records were examined for a child with a birthday in the following month. If there was again no child in this category, the records were further examined for a child with a birthday in the month preceeding the sample child's.

The next step was to look for a child with a birthday in the second month following the sample child's. This procedure was followed to within four months on either side of the Tokelau child's birth date. If there were none in the same class, the cards of children from a parallel class were examined, and the child with the nearest birth date was selected according to these same principles. In a few cases it was impossible to follow this procedure as carefully as was intended because for some reason the progress cards were not available. However, using additional school records, close approximations were

made in these instances, and the two ethnic groups were closely matched for age at each age level (Table 3).

Table 3 Mean age in years and months at each age level

	<u>5 years</u>	<u>7 years</u>
Tokelau	5.5	7.1
Pakeha	5.4	7.1

Ethnic group: It was intended to include only children of European origin in the control group, but in areas of high Polynesian settlement this was not possible for the chances of finding a European child who fulfilled the age criterion were much reduced. Since the purpose of identifying and testing a control group was the isolation of developmental factors by comparison with a group of monolingual speakers, the important variable in this case was that the control group should in fact be monolingual speakers of English. Accordingly no children with any background from any of the other Island groups were considered, and only children with half or less Maori parenthood (according to the school records) were included, and in every case a check was made with the teachers as to their monolingual status. It is recognized that neither of these procedures is infallible, but the use of them both makes it less likely that errors were made.

School experience: The decision to select children whose birth dates ranged over four months on either side of each sample child's birth date, and who came from the same class (rather than simply the child in the same school with the nearest birth date), meant that, as far as possible each pair of children were comparable as regards their recent school experience.

The control group children were identified on the variables

outlined above. The possibility of matching on intelligence was also considered. The assumption behind the construction of many tests of General Intelligence is that intelligence consists of a number of separate abilities among which language skills traditionally comprise a significant part. Such a concept provides no basis for the matching of two groups, one of which cannot be presupposed to be fluent in English. Consideration was given to the possibility of obtaining a measure of non-verbal intelligence from a test such as the Raven Progressive Matrices (Raven, 1956), which it is claimed, is culturally neutral. However, for reasons similar to those outlined in §2.1 with reference to standardized test of verbal knowledge, it would be inappropriate to use a standardized test of general intelligence in cross-cultural research (William, 1971). It is furthermore possible that in such situations non-verbal tests are even less appropriate than verbal tests since it is not possible to use the raw scores as is sometimes done with the PPVT (John and Horner, 1971). Kennedy (1970b) has shown that the language used in the instructions for non-verbal tests is frequently more complex than monolingual children can be expected to process and, as William (1971) points out, to alter the language of instruction for one group makes it impossible to compare their performance with that of the standardization sample. Pilot work on the selection of materials for the assessment of linguistic abilities indicated that young Polynesian children have difficulty in handling a variety of shapes (circles, squares, triangles etc.). In view of these difficulties, and since the main focus was on the language skills of the Tokelau children not their intelligence, it was decided to make no further attempt to match the two groups on General Intelligence.

4.3 Identification of Children for whom English is a Second Language

All the children identified by the procedures outlined in §4.1 and §4.2 were tested. In the analysis for the investigation of the effects of first language maintenance on second language acquisition, the scores of all the children were considered. However, in the analysis of evidence of the process of language acquisition only the scores of the children for whom English was a second language (ESL) were considered. These were identified, according to the ratings made by Mrs Savelio (cf. §3.5.3), as the children who had scored 'moderate' or better on her ratings of knowledge of Tokelau.

When the scores of the ESL children were considered the control group consisted of only those Pakeha children who were the matches of the ESL children. The two ethnic groups thus remained matched in the manner outlined in the previous section.

Chapter 5

PROBLEMS ASSOCIATED WITH CROSS-CULTURAL LANGUAGE TESTING

Problems associated with the construction of language tests for cross-cultural research were discussed in §2.1. The discussion in this chapter outlines some of the major research findings into the effect of variables associated with the administration of such tests. There follows too, a report on the procedures adopted in the present study.

5.1 Literature

There are many situational factors relevant to cross-cultural testing that, if disregarded, may result in artificially depressed scores for children from linguistic minorities. Fishman et al. (1964) suggest the following: poor skills in test taking, a disruptive level of anxiety, lowered motivation to perform well, less concern with speed, poor understanding of test instructions, unfamiliarity with the format of the test, and poor rapport with the examiner. The following comments will apply specifically to research on the effect of such variables on the testing of children in a second language. Most of the research evidence relates to cross-cultural intelligence testing (cf. Severson and Guest, 1970), but, since the test situations set up for intelligence testing have many features in common with the test situations established for the testing of linguistic skills, we can consider the findings of at least potential relevance to this study.

5.1.1 Rapport with the tester

There is an extensive literature on the effect the ethnicity of the tester has on the scores obtained by ethnically variant groups in intelligence tests (cf. the review of Watson, 1972). The findings generally support the view that the ethnicity of the examiner is a

variable that should be controlled for in cross-cultural studies. In the area of specifically linguistic research, Labov (1969) has described an informal interview situation in which the language output of a young negro boy increased markedly when a negro interviewer replaced a white interviewer.

5.1.2 Anxiety level

Labov's comments suggest that the anxiety level of the child may be related to the ethnicity of the examiner. Where the tester is from the same ethnic group as the child, the anxiety level is lower than if they are from different ethnic groups. But there is evidence that even where the tester and the child are from the same ethnic group, minority group children may be particularly uneasy in the testing situation. However, Zigler (1973) has shown that greater familiarity with both the test and the testing situation may reduce the high anxiety level of lower class children.

5.1.3 Test instructions

It is clearly crucial that children being tested should understand any instructions they are given. There are, however, a number of variables that can affect a child's understanding of test instructions. Kennedy (1970b) has noted the effect the grammatical complexity of the instructions could have on the ability of any child to understand them. In the case of second language learners, it is self-evident that instructions should be given in whichever language the child is most proficient. Even when the proficiency of the second language learner is equal to that of native speakers, if the subjects are from different language backgrounds, intelligibility is likely to be impaired (Brown, 1968).

5.1.4 Speed

While the focus of this research is on the proficiency that Tokelau children have acquired, performance factors (cf. Chomsky, 1965) that may differentiate between second language learners and native speakers may be crucial in determining communication efficiency. Research into the reaction times of bilingual subjects suggests that speed of processing is a significant performance factor, and one that may affect the validity of cross-cultural language tests.

Studies in techniques for the measurement of language dominance in adults indicates that there is a relation between speed of processing and the facility a subject has in handling a language. Two techniques have been developed for the investigation of this hypothesis. Firstly, measurement can be made of the time taken by a subject to respond to a stimulus (reaction time), and secondly, measurement can be made of the time subjects take to translate from one language to other (translation time).

Results of studies using the reaction time technique generally suggest that the subjects who score higher in proficiency tests take less time to make their response (Johnson, 1953; Lambert, Havelka and Gardener, 1959; but cf. Macnamara, 1969), however, results of studies using the translation time technique are clearly conflicting: Treisman's (1963) work demonstrates the relation between speed and proficiency, but the findings of Lambert, Havelka and Gardener (1959) do not. The source of this conflict can be traced directly to design difficulties. The design of such experiments requires the investigator to be sure that the items for translation are of equal difficulty in both languages for 'balanced' bilinguals, but, since 'balanced' bilingualism is a rare and possibly only a theoretical construct (Fishman, 1967), this requirement would be hard to obtain.

Furthermore, it is likely that the relative frequencies of the words and structures in the two languages would affect translation speeds, for there are no grounds for supposing that frequency remains constant from one language to another.

The relation between speed of processing and language control can only be reliably investigated by the reaction time technique and the use of this technique has demonstrated the existence of such a relation. This relation has strong implications for the design and use of language tests. In particular, it points to the appropriateness of speed tests for use in research on second language acquisition. Where tests with a speed condition are used to compare the language skills of second language learners with those of native speakers, it is to be expected that the children who are less proficient (the second language learners) will score a larger number of errors than the native speakers and the test will not therefore give a reliable indication of what the second language learners know. This is, in fact, confirmed by research evidence on the use of standardized tests with a speed condition both with adults (Knapp, 1960) and with children (Morgan, 1957)¹. It is therefore clear that where a test is to be used to investigate knowledge of a second language, children must not be pressured by a stringent speed condition, and, furthermore, a measure of the reaction times of both the second language learners and the native speakers would give an additional indication of the second learners' control of the language.

5.2 Procedures

In the light of previous research into cross-cultural language

1. Reported in Darcy (1963).

testing, extensive pilot work was conducted to investigate a number of aspects of the test situation in order to establish testing

consistent and approximately the same rate. In every case, both investigators were present; one was testing and the other recording reaction times when these were taken (cf. §5.2.6).

These procedures, designed to control for variation attributable to the ethnic group of the tester, also provided data that enabled a subsequent study to be made of the effect this variable might actually have of the scores of both Tokelau and Pakeha children (cf. §7.3.2.3).

5.2.2 Test instructions

It is clearly important in the administration of any test that the subject should understand the test instructions, but the administration of a language test to non-native speakers requires additional care. Mrs Savelio was available to give the instructions for the test in Tokelau, should this be welcomed by the child. If this occurred, the pre-test routine could be carried out entirely in Tokelau with the exception of the identification of the test materials by the English vocabulary items included in the test and the practice items. In fact, the pre-test routine, when carried out in Tokelau, gradually increased in English content so that the child was completely prepared for the presentation of the test items in English when the scoring commenced.

5.2.3 Presentation of the stimuli

In any test of aural comprehension, it is important that there be uniformity in the presentation of the stimuli. Two pilot runs were conducted to investigate the feasibility of using a tape recorder, but a number of problems were encountered which indicated that this procedure may be invalid for use in cross-cultural language testing (see Appendix XI), and so it was decided to

present the stimuli 'live'.

Although it is usual in a test of this nature to present the stimuli twice, pilot work indicated that a third time was necessary on occasions: in a test designed to measure comprehension, it is important that sufficient opportunity be given for a correct response to be made if, in fact, one is forthcoming.

5.2.4 Test materials for the comprehension study

In the construction of the test care was taken to select materials which Polynesian children would respond to easily. The writer was aware that many of the homes of Polynesian children living in New Zealand do not contain many toys, and so, to give the children ample opportunity to familiarize themselves with the test materials, toys which they would enjoy manipulating and handling themselves were selected. In pre-test sessions care was taken to ensure that the children were familiar with all the test materials.

The cultural and sexual implications of the choice of materials was also taken into account. Two of the sections of the test used toys that represented a service station with cars and trucks etc. It was hoped that the familiarity of the Tokelau children with these objects as part of the culture of the streets would help to focus their interest. This appeared to be so.

Following the cultural conditioning prevalent in New Zealand society (cf. Begg, 1970) it was likely that toys relating to a service station would produce a sex bias in favour of the boys. Although this did not appear to be the case, materials for some other sections of the test were explicitly chosen to relate more to the interests of girls, for example: dolls and soft toys. However Polynesian children of both sexes enjoyed both kinds of toys,

especially if encouraged to handle them themselves.

Toys were the preferred type of test materials. However, there were a number of variables that could not be tested in this way, and for these pictorial material was provided. Among these were all the vocabulary and six of the structural variables (group V, §3.3.1). For these, pictures were especially drawn having particular regard to their suitability for use in a multicultural New Zealand setting. Both Polynesian and Pakeha children figured in the drawings, and all the objects and settings could be readily recognisable by children living in this country.

5.2.5 Length of the test

Information on the desirable length of the test was obtained during the pilot work. It was decided to test in two sessions. The first session comprised the vocabulary test and groups I and II of the structural variables, and the second comprised groups III, IV and V of the structural variables (cf. §3.3.1). In each of the sessions all Form A items were presented before Form B items and so there were two blocks for each set of variables. The complete test is given in Appendix V. Each session lasted approximately thirty minutes, allowing around ten minutes for establishing rapport. For some children, more time was necessary.

5.2.6 Reaction times

To investigate the relation between second language knowledge and speed of processing an exploratory study of reaction times was carried out.

Variables suitable for the recording of reaction times were those with a single response point. These required the child to either point to something or to place a toy in something. Items requiring the child to manipulate toys were not suitable for recording reaction

times since the approach of individual children varied. Accordingly, reaction times were recorded on the second section of the test only.

A number of methods of recording the data were piloted and it was found that the most suitable was to make a tape-recording of the entire session and to indicate the moment of response by a sharp tap on the microphone with a pencil. This was made by the writer when the research assistant was testing, and by the research assistant when the writer was testing. The times, measuring from the beginning of the last morpheme of the first presentation of the stimulus to the tap on the microphone, were subsequently taken with the stop watch by the writer. This was the least obtrusive method, and it was also the most accurate since it was possible to check and recheck the data after the testing session was finished.

Chapter 6

RESULTS: THE MAIN STUDY

The presentation of the results in this chapter is designed to obtain information that will enable the formulation of answers to the two questions that were the motivation for this research: the effect of first language maintenance on the acquisition of English as a second language by young Tokelau children and the identification of suitable pedagogical procedures for the instruction of these children in English as a second language. As was outlined in §1.5 it is necessary first to establish the relevance of these questions for the language education of the Tokelau children by assessing whether or not their level of knowledge of English is lower than that of native speakers of English. The results of this initial assessment are given in §6.1.

The analyses of the data from these assessment measures that are reported in subsequent sections of this chapter are directed towards obtaining information that will enable answers to the two motivating questions to be proposed. §6.2 investigates the effect of first language maintenance and §6.3 examines the data for evidence of the process of second language acquisition.

Statistical analysis: The data obtained in the vocabulary and structure sections of the study were highly skewed. All scores were therefore transformed and all analyses performed on the transformed scores. A full account of the rationale behind this decision and an account of the transformation used is given in

Appendix XII,¹ where an account of the terminology used is also given.

Sex distribution: There was no control in the selection of subjects over the sex distribution of the Tokelau sample. Among the five year olds, there were 24 boys and 28 girls, and among the seven year olds, there were 28 boys and 22 girls. χ^2 tests were calculated on the scores obtained by children in each age group and in each ethnic group on both the vocabulary and the structure sections of the test (see Appendix XIV). All values were found to be non-significant and so in the following account of the results the scores of boys and girls are not differentiated.

6.1 Assessment of English language skills

6.1.1 Comprehension

Tokelau children at both five and seven years of age perform at a significantly lower level than do Pakeha children of the same age on tests of ability to understand a range of vocabulary and structure variables (Table 4). Means and standard deviations on raw scores are given in Appendix XV.

Table 4 Vocabulary and structure scores (proportions correct):
transformed means and z-values

	Vocabulary		Structure	
	5 years	7 years	5 years	7 years
Tokelauans	18.41	105.22	44.20	166.17
Pakehas	87.34	170.79	141.50	229.77
z	13.30***	8.96***	14.27***	7.26***

***p<.001

1. The raw scores of all the variables, both separately and totalled, are given in Appendix XIII together with both t-values (calculated from raw scores) and z-values (calculated from transformed scores) of the differences between the scores obtained by each ethnic group at each age level.

The scores of the seven year old Tokelau children of these tests are slightly in advance of those of five year old Pakeha children. The z-values of the differences between the total scores of these two groups are vocabulary: 2.96 and structure: 3.14. Both are significant at the .01 level. This level of significant is thus noticeably lower than any of the differences between the two ethnic groups reported in Table 4. This indicates that the level of attainment reached by the seven year old Tokelau children is only slightly higher than the level reached by the five year old Pakeha children. They are therefore nearly two years behind on the skills measured by the tests.

6.1.2 Communication skills

Of the two communication measures that were obtained, communication, with peers and communication with teachers, only the first enabled a comparison to be made between the two ethnic groups. No teacher's ratings were obtained for the Pakeha control group and so no results of these ratings are reported in this section.

6.1.2.1 The communication task

Scores obtained on both intra-ethnic and inter-ethnic communication were examined for evidence of the efficiency of each communication situation.

Language choice: Some pairs of Tokelau children chose to use their native language in intra-ethnic communication. However, since this choice had no significant effect on the communicative efficiency of the pair, the results are combined in this analysis unless otherwise indicated. A full account of both the language choice and the effect

of the choice on the scores is given in §7.1.4.2b.

Treatment of scores: To investigate the relation between the scores of the speaker and the scores of the listener an analysis of variance was performed on the scores of the five year old children in which the two values of each of the speaker and the listener variables were ethnic group, either Tokelau or Pakeha. A significant ($p < .05$) interaction was obtained between the variables of speaker and listener (Appendix XVI). This result indicates that it is unrealistic to attempt to separate out the effects of speaker and listener variables, and so all the scores reported are those obtained by pairs of children.

The data: The interest and enjoyment of the children in this task was very evident. Some idea of this can be gained from the sample transcripts which are presented in Appendix XVII and also from the discussion of communicative skills in §7.2.2.1. It is strongly recommended at this point that the reader refer to these.

6.1.2.1a Intra-ethnic communication

Communication between pairs of Tokelau children and between pairs of Pakeha children at both the five and the seven year age level is equally efficient (Table 5).

Table 5 Intra-ethnic communication scores: means
deviations and t-values²

	5 years		7 years	
	M	SD	M	SD
T → T	1.59	.66	1.91	.38
P → P	1.55	.51	1.97	.16
t	.26		.89	

2. In all tables reporting results of the communication task, Tokelau is abbreviated to T, Pakeha to P, and → indicates the direction of the communication. E.g. T → P would indicate that a Tokelau child was speaking to a Pakeha listener.

6.1.2.1b Inter-ethnic communication

The difference between the communicative efficiency of five year old pairs and of pairs in which the roles were reversed reached the 5% level of significance. There was no difference between the two situations at the seven year old level (Table 6).

Table 6 Inter-ethnic communication scores: means
deviations and t-values

	M	SD	M	SD
T → P	1.0	.82	1.84	.44
P → T	1.46	.74	1.91	.29
t	1.96*		.09	

*p<.05

6.1.2.1c Differences between intra-ethnic and inter-ethnic communication

At the five year old level, communication between two Tokelau children is more efficient than communication in inter-ethnic situations in which a Tokelau child is the speaker and a Pakeha the listener. No other differences in communicative efficiency were found between the two types of communication situation (Table 7).

Table 7 Differences between communication scores in intra-
ethnic and inter-ethnic communication: t-values

	5 years	7 years
	t	t
Tokelau speakers (T → T)		
(T → P)	2.63*	.91
Pakeha speakers (P → P)		
(P → T)	.47	1.51

* p<.05

6.1.3 Summary of scores

The results of the assessment measures used clearly show that Tokelau children have difficulty in understanding English vocabulary and structure. However, they experience no evident difficulty in using their language to perform a communication task. The only exception is found in one type of inter-ethnic communication, that between five year olds (T → P) which is noticeably less successful than the other communication situations. The data was further examined to find out whether differences between the scores of the two groups could be attributed to first language maintenance (§6.2), and to find evidence of the process of second language acquisition (§6.3).

6.2 Effect of knowledge of the Tokelau language

To find out whether maintenance of a first language affected the development of English language skills, the scores of the Tokelau children whose native language was English and the scores of the Tokelau children whose native language was not English were compared. Comparisons were also made between the rate of development between the ages of five and seven of both Tokelau and Pakeha children. If the Tokelau children showed a rate of development that was slower than the Pakehas this would be interpreted as evidence of an inhibiting effect of first language maintenance; an equal rate of development provides no evidence either way; an increased rate of growth is evidence that Tokelau children can be expected to reach, eventually, the level of the Pakehas.

6.2.1 Comprehension

6.2.1.1 Effect on scores

There is very little evidence of any effect of a knowledge of Tokelau

on performance on the vocabulary and structure sections of the study, and what evidence there is suggests that the effect is greatest at the five year age level and is noticeably reduced in the following two years.

To assess the effect of first language maintenance, the scores of all the Tokelau children were considered. Initially they were identified either as native speakers of English or as non-native speakers of English on the basis of the ratings made by the Tokelau research assistant (cf. §3.1.5.3). Those who scored moderately or above in ability to either speak or understand either Tokelau or Samoan were regarded as non-native speakers of English (cf. §4.3). Z-values of the difference between the scores of the two groups on both measures were non-significant (vocabulary: .20; structure: .13) and there were no significant interactions between the variables of first language and age.

This measure involves the categorising of the children either as Tokelau speakers or as non-Tokelau speakers and was necessarily very gross. It was decided therefore to test this further by calculating the correlation co-efficients between the Tokelau speakers ratings (both speaking and understanding) and the comprehension scores (Table 8).

Table 8 Correlations between comprehension scores and
Tokelau language ratings

		5 years	7 years
		r	r
Vocabulary:	Tokelau speaking	-.28*	-.37**
	Tokelau understanding	-.34*	-.15
Structure:	Tokelau speaking	-.42**	-.21
	Tokelau understanding	-.29*	-.33*

*p<.05; **p<.01

Negative correlations indicate that there is some association between Tokelau language abilities and lower scores on the test. Although these correlations were all negative only two reached the 1% level of significance, and the association between the two measures is generally more marked at the five year old level than at the seven year old level. It appears however, that the ability to speak Tokelau may hinder the acquisition of English vocabulary.

6.1.2.2 Effect on rate of development

To assess the effect of first language maintenance on the rate of development of English language skills of the Tokelau children, the scores of the Tokelau speakers at each age level were compared with the scores of their Pakeha matches.

Children from both ethnic groups showed a significant age development between the ages of five and seven on each of the vocabulary and structure measures (Table 9).

Table 9 Differences between the scores obtained by five and by seven year old children on the comprehension tests: z-values

	Tokelauans	Pakehas
Vocabulary	14.96****	7.47****
Structure	16.99****	10.42****

****p<.001

An analysis of variation was performed on the scores obtained by both ethnic groups on the vocabulary and structure measures (the means are shown in Table 4). The results indicated a significant interaction on the structure scores ($z = 3.04$; $p < .01$), but none on the vocabulary scores ($z = .38$; ns). The graph of the interaction (Fig. 1) shows that, although the structure score of

Fig. 1 Interactions between ethnic group and age on the comprehension tests

the seven year old Tokelau children is significantly below that of their Pakeha age mates, the development rate of the Tokelau children on this measure is the fastest of those shown.

6.2.2 Communication skills

6.2.2.1 With peers

6.2.2.1a Effect on scores

To investigate the effect of knowledge of Tokelau only the scores of English speaking Tokelau pairs were considered.

Knowledge of Tokelau affected the efficiency of five year old children in inter-ethnic communication. No effect was evident in intra-ethnic communication at this age level. At the seven year age level no effect at all was evident.

Correlations were calculated between the ratings of ability to speak Tokelau and scores obtained by Tokelau children at both age levels and in both intra- and inter-ethnic communication (Table 10).

Table 10 Correlations between communication scores and Tokelau speaking ability

	5 years	7 years
Intra-ethnic	-.19	-.10
Inter-ethnic	-.51**	-.27

** $p < .01$

Knowledge of Tokelau clearly had no effect on the abilities of the older children, but the significant co-efficient ($p < .01$) obtained by the younger children in inter-ethnic communication reflects the lower score obtained by these children on this condition (cf. Table 6).

6.2.2.1b Effect on rate of development

There was a significant development in communicative efficiency between the five and seven year age levels. This development was evident in all types of communication pair (Table 11).

Table 11 Differences between communication scores obtained by
five and by seven year old children in different types of
communication setting: t-values

	t
T → T	2.62**
P → P	4.53***
T → P	5.23***
P → T	2.74**

** $p < .01$; *** $p < .001$

The greatest growth is evident in inter-ethnic pairs in which Tokelau children are speakers. This reflects the fact that there are no evident differences in inter-ethnic communication at the seven year old age level whereas there are at the five year level. Any difficulties experienced in inter-ethnic communication settings with Tokelau speakers and Pakeha listeners at this age level are not evident two years later.

6.2.2.2 With teachers

The concept of communication as at least a two-way activity has been stressed in the design of the peer group communication task. The same concepts apply to the teachers' ratings, although only one

direction was measured. Estimates made by the teachers were regarded as evidence of the effectiveness of communication in the classroom between the Tokelau child and the teacher. Clearly a variety of factors could affect the teachers' estimates, but, it is argued, this is only of concern where they are regarded as evidence of the child's skills alone (cf. §3.4.2).

Some idea of one of these factors, the familiarity of the teacher with the language background of the child, is reported in §7.1.4, and the comparison of the rating with scores on the vocabulary and structure tests gives an indication of the strategies adopted by the teachers. These are reported in §7.3.1.1b.

6.2.2.2a Effect on ratings

There is a clear relation between ability to speak and understand Tokelau and teachers' estimates of the corresponding skills in English. χ^2 s were calculated between the teachers' English estimates and the Tokelau estimates made by Mrs Savelio (Table 12). The full tables for each calculation are given in Appendix XVIII.

Table 12 Relation between Tokelau language skills and teachers' ratings of English language skills

	5 years	7 years
	χ^2	χ^2
Speaking	35.40***	18.16**
Understanding	17.02**	15.30**

** $p < .01$; *** $p < .001$

The results indicated a strong association between the two measures. Clearly the ability to speak Tokelau means that a child is less likely to impress his teacher with his English language skills.

Although this association is significant at both age levels it is more marked at the five year level. When the estimates of the

two age groups are compared, it is evident that the teachers observed an improvement over this period. Their estimates are higher for the seven year old children than for the five year olds. χ^2 values of the differences between the two age groups are 7.24 for speaking ($p < .05$), and 9.29 for understanding ($p < .05$). Full tables are given in Appendix XVIII.

6.2.3 Summary and discussion

6.2.3.1 Summary

1. These results provide considerable evidence of the effect that knowledge of Tokelau has on the English language skills of Tokelau children when they first enter school. The levels obtained by the five year olds on the comprehension tests were not only significantly lower than those of their Pakeha age mates, but their scores correlated negatively with their knowledge of the Tokelau language. This effect was noticeably reduced in the older Tokelau children.
2. Tokelau children who were speakers of Tokelau showed a rate of development in the acquisition of English structure that was greater than that of their Pakeha age mates. However, their acquisition of vocabulary was proceeding at a similar rate. This is then evidence that the ability to use Tokelau does not impede the rapid acquisition of English structure, but does indicate that the rate of vocabulary acquisition is no faster than that of native speakers. These findings indicate that the Tokelau speakers would, given time, attain the level of the Pakehas on structural knowledge, but probably not on vocabulary knowledge.
3. There is some evidence that the Tokelau language abilities of the younger children impede their ability to effect communication with

Pakeha children of the same age. However, it must be emphasised that scores on the communication task reflect the abilities of both speaker and listener. The possibility that the relative difficulties of the younger children result from a form of sociolinguistic interference is discussed at length in the next section (§6.2.3.2).

4. Teachers clearly relate the English language skills of the Tokelau children to their knowledge of the Tokelau language. However, the association is less marked in the older children. In the discussion that follows, these findings are interpreted in the light of further evidence on the teachers' relations with the children (cf. §7.1.4).

6.2.3.2 Discussion

The findings reported in this section suggest that while knowledge of the Tokelau language may affect the English language skills of the younger Tokelau children, this effect is substantially reduced by the seven year level. Continued first language maintenance is not therefore incompatible with the acquisition of a second language, and there are no indications that the gap between the English language abilities of Tokelau and Pakeha children is widening. On the contrary, there are a number of indications that it is narrowing. In the following discussion the contribution of these findings to the study of the effects of first language maintenance will be discussed. Where relevant, the discussion will be amplified by background information reported in §7.

The evidence of this research tends not to support the reviews of Darcy (1953; 1963) and Macnamara (1966). They both conclude that the findings of the studies that they review suggest that the proficiency of the second language learner is rarely likely to match that of the native speaker, and consequently that first language

maintenance is likely to impede second language acquisition. Neither does the present research confirm the findings of both Brown and Brown (1970), and Natalicio and Natalicio (1970), who suggest that the gap between the abilities of second language learners and native speakers widens as the children grow older. On the contrary these findings tend to support those of Peal and Lambert (1962) and of the Immersion studies in the United States and Canada.

The choice is, however, not necessarily a binary one. The general tendency of the findings of this study to support those of the St. Lambert Immersion experiment (Lambert and Tucker, 1972) is no more than an indication of the general direction of the results. This becomes clear when a closer comparison between the present research and the Immersion programmes is attempted. An exact comparison is not possible, but it would seem that the progress made by the Tokelau children in their acquisition of English is slower than the acquisition of French by the children in the Immersion programmes. Lambert and Tucker report that in some aspects of French language skills the performance of the experimental children (native speakers of English) at the end of grade 2 was comparable to that of the children who were native speakers of French. However, the seven year old Tokelau speaking children who participated in this research were clearly nearly two years behind native speakers in the development of English language skills (§6.1.1).

There are of course many similarities between the Immersion programmes as conducted by Lambert and Tucker and by Cohen (cf. Cohen, 1974) and the school programmes in which the older children who were the subjects of this study had participated. In both the second language was the medium of instruction in all curriculum areas, and

no formal instruction in its form and use was offered. Why then is the success rate not as marked in the case of the Tokelauans? It was suggested in §2.1 that a significant criterion for language learning success is the status in the wider community of the first language relative to the second language, and it is on this dimension that the present study differs most noticeably from the evaluation studies of the Immersion programmes. The first language of the children who participated in the Immersion studies was in each case a dominant language in the wider speech community.

While there was, of course, no way in which this study could separate out the effects of first language status on the acquisition of vocabulary and structure in a second language, the findings of both sections of the investigation into communication skills suggest that this is a factor which differentiates this study from the Immersion programmes.

When young Tokelau children communicate with Pakehas, either their peers or their teachers, they experience difficulties that are not evident in any other communication situation investigated in this study. But such difficulties are not those of the Tokelau children alone. They are shared by Pakeha children, for the reciprocal nature of communication suggests that in each case both speaker and listener variables are relevant factors.

The two way nature of the peer group communication task precluded the possibility of separating speaker effects from listener effects with any reliability. However, in inter-ethnic communication the effect of language status is evident on both these roles. As speakers, many young Tokelau children were obliged to use a language that was for them a second choice (§7.1.4.2a). While the use of a second language is a familiar event for the

Tokelau children, it would appear that the sharing of a first language by speaker and listener could be a significant factor in determining communicative efficiency (Upshur, 1973). The effect of two speaker variables, aspects of communicative style and the occurrence of errors, was investigated in an exploratory analysis and found to be insignificant (§7.2.2 and §7.2.3), but the possibility that other speaker variables are significant cannot be ruled out. The imbalance in the status of Tokelau and English means that as listeners in inter-ethnic communication young Pakeha[?] children face a problem that the Tokelau children do not. Because the Tokelauans are a linguistic minority, the Pakeha children are likely to be less experienced in listening to their speech than the Tokelauans are at listening to the speech of the majority group, the Pakehas. This relative lack of familiarity with the voice of the speaker from a different language background is likely to effect the ability of the Pakeha listeners to understand the speaker in inter-ethnic situations (Brown, 1968; Brodkey, 1972).

The contribution of both speaker and listener must also be taken into account when the ability of Tokelau children to communicate with their teachers is considered. The English language skills of the children would appear to be the basis for the teachers' estimates. However, correlations between these estimates and scores obtained on the vocabulary and structure tests (§7.3.1.1b) suggest that the estimates were not altogether valid, particularly for children performing in the middle range. Clearly these ratings are not based solely on linguistic behaviour but rather, as suggested in §3.4.2, they provide an indication of the efficiency of communication between teacher and child in such a way that the contribution of either participant cannot be separately considered.

However, a few insights into other possible sources of the teachers' estimates are possible. The relation between them and the language background of the children (§6.2.2.2a) suggest that the teachers regarded language background as an important factor. However, further evidence reported in §7.1.4.1 makes it clear that the teachers had very little information on this point; they tended to underestimate the number who spoke English as a first language. The source is probably to be found in both the exceptionally quiet classroom behaviour of most Tokelau children, which is, interpreted as evidence of limited skill in English, and in a form of ethnic stereotyping, possibly based on the physical characteristics of the child (cf. Williams, Whitehead and Miller, 1971). These two suggestions underline the significance that the minority group status of the children's language may have on the teachers' estimates and the dual effect of the relative status of the two languages is clear: as minority group children the Tokelauans lack confidence, and because they are a minority, the teachers are unfamiliar with their background.

Differences in the relative status of the two languages are therefore likely to constitute a crucial difference between the present study and studies that have evaluated Immersion programmes and the evidence discussed above suggests that it is these differences that account for the lower level of achievement of the Tokelau children. However, notwithstanding these difficulties, the present study provides considerable evidence of successful acquisition of English as a second language by young Tokelau children. They are making significant progress in all the variables studied. While this provides some possible basis for optimism as regards the appropriateness of standard classroom procedures for the acquisition of English as a second language in the first two years of primary

school, there are two factors that suggest a need for caution: the general standard of the English language skills of the Tokelau children during their first two years at school, and their comparatively slow rate of vocabulary acquisition.

In the first place the Tokelau children, while progressing rapidly in the acquisition of English language skills, are performing at a level that is nearly two years behind their Pakeha age-mates when they are seven (§6.1.1). This is a critical period for school learning in that the first two to three years of schooling is the time when primary emphasis is placed on the acquisition of the literacy skills that are to play a major role in their future education. It is precisely at this period of their education that the disadvantage of the Tokelau children in English is likely to be at its greatest.

The fact that Tokelau children, during their first two years at school, are not approaching the level of vocabulary knowledge of native speakers (§6.2.1.2) is a further cause for concern. There was no evidence in this study that a prediction that their performance would eventually match that of Pakeha children of the same age could be made with any confidence. Although the relation between vocabulary knowledge and educational achievement was not explored in this study, it is quite possible that as the factual content of school curricula increases, this lack may prove to be a critical handicap and one which could, in fact, widen the gap between the general performance of the Tokelau children and the Pakeha children.

It would appear then that the findings reported in this chapter suggest that where use of the first language is continued second language acquisition can proceed with reasonable success. However there are at least two reasons why this conclusion does

not predict continued success in school. In this respect it is by no means in conflict with the studies reviewed by Darcy and Macnamara. However, there is an important difference between these earlier studies and the present study. The motivating reason for them was the assessment of the relation between bilingualism and educational achievement. It was noted in §2.1 that many of these studies used standardized tests of verbal ability and that there were some problems in both the interpretation and the design of such studies that made it scarcely surprising that they should conclude that monolingualism alone is conducive to school success. These include both linguistic and cultural factors.³ In contrast, this study set out to measure not educational achievement but language acquisition, and it shows that success in this area in the early school years is substantial. There may, as has been discussed, be a strong connection between educational achievement and both a particular difficulty (slow vocabulary development) and the particular time that the difficulty is experienced (the first two years). But, in that the acquisition of a second language is not impeded by continued use of the first language, general educational difficulties consequent to language difficulties cannot be attributed to first language maintenance. There is therefore no evidence in this

3. Linguistic and cultural factors were carefully taken into account in this study, and, while it is not possible to be entirely certain that the measures adopted were wholly successful, the progress in second language acquisition reported in this section is indicative that these factors have, for the most part, been overcome. Further evidence of the appropriateness of the research instruments and of the procedures adopted is presented in §7.3.

study that discouragement of first language maintenance would improve the level of general educational achievement. Rather, the findings suggest particular areas to which pedagogical efforts could be directed, namely later literacy instruction and functional vocabulary development, for those who begin school less skilled in the language of the school than native speakers. These points will be developed further when the pedagogical implications of the study are discussed in §8.2.2.

6.3 The process of second language acquisition

The results reported above (§6.1.1) indicate that the Tokelau children achieve lower scores on the comprehension tests than do their Pakeha age mates. Clearly they have had less experience in English than the Pakeha children, but it is the aim of this section to discover to what extent this problem can be attributed to any specific learning and disability that may be caused by their knowledge of Tokelau. Accordingly the scores of children of each ethnic group were contrasted for evidence of learning processes that could be attributed to specific details of the language experience of the Tokelau children. Evidence of transference is evidence of the effect of first language knowledge on second language acquisition. Because the analysis required consideration of discrete linguistic variables, only data from the vocabulary and structure tests could be included in this section.

6.3.1 The process of vocabulary acquisition

The initial analysis of the vocabulary scores for evidence of the language learning process was based on comparisons of the order of difficulty of the items as experienced by each of the four groups who participated in the study. To identify sources of the differences between the groups, the data was analysed from three

additional perspectives. These were: frequency, parts of speech and domain of acquisition. Analysis in each of the last three areas was either partially or totally based on analysis of the following lists which were constructed from the scores reported in Appendix XIII.

1. Items on which the scores of the two five year old groups differed.
2. Items on which the scores of the two seven year old groups differed.
3. Items on which the scores of the five year old Tokelauans differed from the scores of the seven year old Tokelauans.
4. Items on which the scores of the five year old Pakehas differed from the scores of the seven year old Pakehas.

In each case only items on which the significance level of the differences (z-values) between the scores of the two groups was greater than .01 were considered. These lists of items are given in Appendix XIX.

6.3.1.1 Comparative order of difficulty

To investigate whether there were any differences between the difficulty order of items experienced by each group of children (Appendix XX Lists i-iv) rank-order inter-correlations between the difficulty order lists for both ethnic groups and both age groups were calculated (Table 13).

Table 13 Inter-correlations of the vocabulary items ranged
in order of difficulty

		Tokelauans		Pakehas	
		5 years	7 years	5 years	7 years
		r	r	r	r
Tokelauans:	5 years	-	.87	.84	-
	7 years	-	-	-	.83
Pakehas:	5 years	-	-	-	.85
	7 years	-	-	-	-

All the lists correlated highly and there were no statistical differences between the correlations, indicating that the difficulty order of items in the vocabulary test was the same for each group of children.

6.3.1.2 Frequency

6.3.1.2a Ethnic differences at five and seven

At the five year level the scores of Tokelau and Pakeha children are most clearly differentiated by items in the higher frequency levels (levels 1 and 2) but at the seven year level, the two ethnic groups are most clearly differentiated by items in the lower frequency levels (levels 3 and 4) (Table 14).

Table 14 Number of items on which the scores of Tokelau and
Pakeha children differed significantly

Frequency levels	5 years	7 years
1 and 2	11	0
3 and 4	4	8

$$\chi^2 = 10.85; p < .001$$

The low number of low frequency items differentiating between the two groups at the five years age level indicate that both

Tokelauans and Pakehas found these items relatively difficult. By contrast, at the seven year age level it is the high frequency items that do not distinguish between the two groups. Clearly both Tokelauans and Pakehas found these items equally easy.

6.3.1.2b Evidence of age development

The performance of Tokelau children between the ages of five and seven improved most noticeably on the high frequency words; Pakeha children showed the greatest development on the lower frequency words.

Evidence for this finding came from two sources; from an analysis of variation between the scores obtained by each group on each frequency level, and from a comparison of the frequency levels from which the items that differentiated between the two age levels for each ethnic group were drawn.

Although the analysis of variation on the vocabulary test as a whole produced no ethnic group by age interaction, when a separate analysis of each frequency level was calculated significant second order interactions were identified at level 1 ($z = 2.16$; $p < .05$) and level 3 ($z = 2.92$; $p < .01$). An inspection of the means (Table 15) shows that the interaction at level 1 is attributable to the fact that

Table 15 Total scores (proportions correct) obtained on each frequency level: transformed means

	Tokelau		Pakeha	
	5 years	7 years	5 years	7 years
Level 1	17.53	40.90	41.07	53.03
Level 2	16.17	42.51	37.51	62.55
Level 3	-1.90	16.34	8.50	37.64
Level 4	-13.40	5.47	.28	17.57

there is a greater difference between the scores of the Tokelau children at each age level than there is between the scores of the two Pakeha groups. However, the interaction at level 3 is due to a reversed situation and the greatest difference is between the scores of the two Pakeha groups. Evidently improvement during the first two years at school is most significant on level 1 for the Tokelauans and on level 3 for the Pakehas.

This same tendency can be seen from a comparison of the frequency levels from which items that differentiated at each age level between the scores of the Tokelau children and between the scores of the Pakeha children were drawn (Table 16).

Table 16 Number of items on which Tokelau and Pakeha children showed age development

Frequency levels	Tokelau	Pakeha
1 and 2	15	2
3 and 4	12	10

$$\chi^2 = 3.65; \text{ ns}$$

The Tokelau groups appeared to show more age development on high frequency items than on low frequency items whereas the Pakeha children appeared to show more age development on the low frequency items than on high frequency items. The χ^2 value (3.65) is .19 less than that required for p to be less than .05.

6.3.1.2c Difficulty jumps

Tokelau children from both age levels and five year old Pakeha children find that the greatest jump in difficulty level between words from successive frequency levels occurs between the higher frequency levels (2 - 3), whereas for seven year old Pakeha children the greatest jump is between the low frequency levels (3 - 4).

Differences between the transformed means obtained on each

frequency level by each group of children were tested for significance (Table 17).

Table 17 Differences between scores obtained on items from four frequency levels: z-values

		1 - 2	1 - 3	1 - 4	2 - 3	2 - 4	3 - 4
Tokelau:	5 years	.54	8.72***	13.66***	8.04***	13.08***	5.84***
	7 years	.43	7.68***	12.02***	7.99***	12.22***	4.74***
Pakeha:	5 years	.99	10.54***	13.63***	10.43***	13.98***	4.24***
	7 years	1.91	3.71***	9.71***	5.46***	10.95***	6.61***

*** $p < .001$

There were no significant differences between the scores obtained on the first two frequency levels for any of the four groups of children involved. This indicates that words from these two frequency levels are likely to be of equal difficulty for all these children. However, there were highly significant differences between each of the other pairs of frequency levels for each group of children. The highest for each group, except the seven year old Pakehas, were the differences between the first and fourth frequency levels. Also for each of the groups, except the seven year old Pakehas, the differences between the second and third level were greater than that between the third and fourth level. However, for older Pakeha children, whose performance over the whole test was the best, the largest jump in difficulty level between successive levels came between the third and fourth frequency levels. This reflects the finding reported above (§6.3.1.2b) that Pakeha children show a significantly greater age development on the third level than do Tokelau children.

6.3.1.3 Parts of speech

The performance on the test of the five year old Tokelau children is

distinguished from that of the five year old Pakeha children more by noun items than by verb items. The situation is reversed by the seven year old level (Table 18).

Table 18 Number of nouns which distinguish between Tokelauans and Pakehas expressed as a percentage of the total number of nouns and verbs in the test

	5 years	7 years
Nouns	28	10
Verbs	17	17

$$\chi^2 = 4.33; p < .05$$

This variation probably reflects variation between the two age levels reported in §6.3.1.2b. At the younger age level the two ethnic groups were distinguished more by the easy items than the difficult ones while the reverse occurred at the seven year level. Verbs were harder for all children than the nouns (nouns: proportion correct = .77; verbs: proportion correct = .63; $t = 2.18$; $df = 45$; $p < .05$), and so it would appear that the five year old children tended to find the verb items equally difficult, and they are distinguished mainly by the noun items. At the seven year level all children tended to find the noun items equally easy and it was mainly the verbs that distinguished between them. However, a comparison of the scores obtained by the Tokelauans aged five and seven indicate that they were making progress on these items ($t = 2.37$; $p < .05$).

No ethnic differences were found between scores obtained on nouns and on verbs. Clearly the linguistic category of verb did not present particular difficulty for the Tokelau children that the findings of Hickey (1972) suggest (cf. §2.1). Possibly this can be attributed to the procedure adopted in this study of using

stem forms instead of participial forms (-ing) (cf. §3.2.1).

6.3.1.4 Domain of acquisition

Five year old Tokelau children perform less well than Pakeha children of the same age on items that relate to the home environment. The distinction is not evident at the seven year age level.

A number of the items that distinguish between the two ethnic groups at the five year level (Appendix XIX, Table i) are words that Pakeha children could be expected to have learnt in the home environment. These include rope, woman, bag, build, brush, tent, dream, groceries, tap, saucepan and possibly worm. It was not possible to detect a similar group among the items that distinguished between the two ethnic groups at the seven year old level (Appendix XIX, Table ii), but an inspection of Appendix XIX, Table iii shows that the older Tokelauans are more familiar with domestic vocabulary than are the younger Tokelauans. The Tokelauans show an age development on 13 home related items (rope, woman, break, bag, brush, tent, mirror, dream, rug, groceries, tap, measles, crawl). Only two of the words that the Pakehas show an age development on (Appendix XIX, Table iv) are in this category (break, measles).

The research was not conducted to investigate differences between the two ethnic groups in the acquisition of vocabulary relating to the home environment, and these results are no more than tentative. They do suggest, however, that young Tokelau children are not learning these items before they enter school, but that they have no difficulty in acquiring them during the two years following school entry. The fact that Tokelau is the home language for these children (they had all been identified as Tokelau speakers), and that the younger children had had few opportunities to learn the English vocabulary relating to this domain is clearly a major factor contributing to this

finding. On the other hand the home words are also generally the easier (higher frequency) words, and these have been shown to differentiate most clearly between the two ethnic groups at the younger age level (cf. §6.3.1.2b). The finding reported in this section is therefore possibly only another aspect of a general tendency.

6.3.2 The process of structure acquisition

The analyses reported in this section were undertaken to identify the extent to which transference operates in second language acquisition. To ensure that the results would be reasonably generalizable, the variables investigated in the study were selected because they were considered representative of the range of English structure. They were not selected to facilitate the identification of transference. In this respect these analyses have many of the characteristics of a post hoc approach to the data. This is not unintentional. The first aim was to conduct a carefully generalizable study rather than a neat but unrepresentative one.

In the first place the data ^{were} was examined for evidence of any difference in the order of acquisition. The variables were then looked at in greater detail. The form of the structure test was established by the isolation of a number of discrete linguistic variables on frequency principles. Most of these variables formed groups operating at different levels of grammatical structure, and the analysis was conducted on these groups:

1. Question form, voice and case (Variables no. 19, 20, 22, 23, 26, 27, 30, 31, 32, 33, 34, 35)
2. Polarity and voice (Variables no. 7, 8, 15, 16)
3. Voice and answer form (Variables no. 36 - 39)

4. Complement form and presence or absence of direct object
(Variables no. 9 - 13)
 5. Embedding (Variables no. 48, 49)
 6. Indirect Object form (Variables no. 13, 14)
 7. Position of conditional, polarity and truth value (Variables
no. 40 - 47)
 8. Number (Variables no. 2, 3)
 9. Tense (Variables no. 5, 6)
 10. Question form (Variables no. 17, 18)
 11. Question form with locative (Variables no. 21, 24, 28, 29)
- and the following formed part of no structurally linked groups:
12. What questioning verb, active (Variable no. 25)
 13. Conjoined verb phrase (Variable no. 1)
 14. Possessive (Variable no. 4)

Two statistical approaches were considered, although they were not both used in every case.

1. The scores on the groups of variables were analysed by a logistic factorial analysis of variation (cf. Appendix XII).
2. Lists were constructed of items differentiating at the 1% level between the scores of different groups of children, and reference was made to these lists when appropriate.
 - (a) Items on which the scores of the two five year old groups differed
 - (b) Items on which the scores of the two seven year old groups differed

- (c) Items on which the scores of the five year old Tokelauans differed from the scores of the seven year old Tokelauans
- (d) Items on which the scores of the five year old Pakehas differed from the scores of the seven year old Pakehas

The complete lists are given in Appendix XIX, (Tables v - viii).

Transference from first language knowledge is only identifiable at structure points on which first and second language differ. This analysis identified cases of transference that were both positive and negative. There were also a few in which the source of the difficulty was in doubt. Where structures are similar in the two languages it is not possible to identify transference. On several of the groups of variables looked at in this section the relative difficulty of the items appeared to be the same for children from both ethnic groups and there was no clear evidence of transference.

6.3.2.1 Comparative order of difficulty

To investigate whether there were any differences between the difficulty order of items experienced by each group of children (Appendix XX, Tables v - viii) rank-order inter-correlations between the difficulty order lists were calculated (Table 19).

Table 19 Inter-correlations of the structure items ranged in order of difficulty

		Tokelauans		Pakehas	
		5 years	7 years	5 years	7 years
Tokelauans:	5 years	-	.83	.78	-
	7 years	-	-	-	.84
Pakehas:	5 years	-	-	-	.90
	7 years	-	-	-	-

All the lists correlated highly and there were no statistical differences between the correlations, indicating that the difficulty order of items in the structure test was the same for each group of children.

6.3.2.2 Positive transference

6.3.2.2a Voice and case in questions

Tokelau children show some positive transference from their first language in the acquisition of questions in the passive on the objective case.

An analysis of variation was performed on the variables in group 1 and the results are shown in Table 20.⁴

Table 20 Standardized logistical factorial contrasts of variables of ethnic group, age, voice and case

		Z
Main effects:	Ethnic group (A)	10.39***
	Age (B)	12.46***
	Voice (C)	17.77***
	Case (D)	7.50***
Interactions:	A x B	.89
	A x C	2.49*
	A x D	3.80***
	B x C	4.68***
	B x D	1.45
	C x D	9.93***
	A x B x C	1.01
	A x B x D	1.08
	A x C x D	3.90***
	B x C x D	3.90***
	A x B x C x D	.03

* $p < .05$; *** $p < .001$

In order to examine further the interaction between ethnic group, voice and case, the transformed means of the scores obtained by each ethnic group on each combination of the variables in this

4. Differences between question forms are discussed in §6.3.2.5.

group were inspected (Table 21).

Table 21 Voice and case scores (proportions correct) obtained
by each ethnic group: transformed means

	Active		Passive	
	Agentive	Objective	Agentive	Objective
Tokelauans	12.49	16.91	-5.01	-23.44
Pakehas	36.68	41.47	24.52	-23.06

Passive sentences questioning the objective case are relatively harder for the Pakeha children than they are for the Tokelau children. On the other hand, passive sentences questioning the agentive are much harder for the Tokelauans than for the Pakehas. This interaction is shown in Fig. 2.

Fig. 2 Interaction between variables of ethnic group, voice and
case

A probable explanation for this finding lies in the difference between the two languages as regards the usual ordering of agentive and objective forms. In English the usual order is for the agentive to occur initially in the active voice ("the boy chases the girl"). However, in Tokelau there are a number of optional transformations that alter the order of these elements while preserving the meaning of the sentence; the most usual order is action - object - agent.

Thus the unmarked form of the English sentence 'the boy chases the girl' would be 'e tuli te teine ē te tama' (lit. is chasing the girl (obj) by the boy (agt)) in which the objective precedes the agentive.⁵ When a noun phrase in an English sentence is questioned, the questioning form always occurs in the sentence initial position, regardless of whether the sentence is in the active or the passive. Therefore the relative order of agent - object for active sentences and object - agent for passive sentences is reversed when the object of an active sentence and the agent of a passive sentence is questioned:

	<u>case</u> <u>questioned</u>	<u>voice</u>	<u>order</u>
(a) The boy chases the girl	-	active	agent - object
(b) Who chased the girl?	agent	active	agent - object
(c) Who did the boy chase?	object	active	object - agent
(d) The girl was chased by the boy	-	passive	object - agent
(e) Who was the girl chased by?	agent	passive	agent - object
(f) Who was chased by the boy?	object	passive	object - agent

Means reported in Table 21 indicate that the reversal of the cases makes little difference of comprehension for either Tokelau or Pakeha children when the voice is active ((b) or (c) in the above examples). However, the Pakeha children found passive/object questions (f) considerably harder than passive/agent questions (e). In the former the order of cases is object - agent and in the latter the order is agent - object. The same differential in difficulty level did not exist for the Tokelau children.

5. There are some indications that the agent-verb-object order in English is becoming more common in Tokelau. Undoubtedly this is due to the influence of English.

This analysis points to the very real possibility that the structure of their own language has enabled the Tokelau children to close the gap on this very difficult combination of linguistic variables of questions in the passive voice questioning the objective case. The assumption therefore is that had they not had this previous linguistic experience of the varying order of case relations in the sentence their score would have been even lower than it was on this combination of variables. It would naturally be desirable to test this hypothesis further with children of differing linguistic backgrounds.

The fact that there was no ethnic group by age by voice by case interaction (Table 20) would indicate that the transference outlined above occurs equally at both age levels. However, there are some indications that the effect is more marked at the five year old age level than at the seven year old age level. The z-values of the difference between the transformed means of the scores obtained by the two groups of five year old on passive/object items ($z = 1.44$; transformed means: Tokelauans, -5.03; Pakehas -6.80) was noticeably higher than the z-value of the difference between the transformed means of the scores obtained by the two groups of seven year olds (.85). The transformed means were: Tokelauans -5.78; Pakehas -4.47. Both, however, were non-significant. Possibly the effect of knowledge and use of Tokelau is stronger for the younger children than it is for the older children who have had more exposure to English and whose pattern of acquisition, although behind that of their Pakeha age-mates, follows the same sequence. Consequently, although their experience of English is such that the older Tokelau children perform better than the younger Tokelau children on passive/object items, they still find them very difficult.

6.3.2.2b Polarity and voice

The difference between the scores obtained by Tokelau and Pakeha children on passive items was significantly less than the difference between the scores obtained by the two groups on active items. The ethnic group by voice interaction was significant (Table 22) and the means are reported in Table 23⁶. Fig. 3 illustrates the interaction.

Table 22 Standardized logistic factorial contrasts of variables of ethnic group, age, voice and polarity

		Z
Main effects:	Ethnic group (A)	5.35***
	Age (B)	4.38***
	Voice (C)	11.64***
	Polarity (D)	.15
Interactions:	A x B	1.30
	A x C	2.93**
	A x D	.32
	B x C	5.30***
	E x D	1.95
	C x D	10.72***
	A x B x C	.50
	A x C x D	1.23
** p<.01; *** p<.001		

Table 23 Voice scores (proportions correct) obtained by each ethnic group: transformed means

	Active	Passive
Tokelauans	11.26	-8.57
Pakeha	30.13	-3.07

It is likely that the explanation for this is similar to that

6. The interaction between voice and polarity does not distinguish between the two ethnic groups and it will be discussed in §6.3.2.5a.

advanced for transference on questions in the passive on the object. The experience that the Tokelau children have with their own language has accustomed them to structures in which object noun phrases precede agent noun phrases and hence the English passive is relatively easier for them than for Pakeha children. This finding does, however, contrast with that reported in §6.3.2.5b in which it

Fig. 3 Interaction between variables of ethnic group and case

is shown that there is no evidence of transference when the passive is used in Yes/No questions. The variables with which the passive is combined can clearly affect the operation of transference. The point will be further discussed in §6.3.2.5b.

6.3.2.3 Negative transference

6.3.2.3a Number

Analysis of the variables of ethnic group, age and number showed that there was no ethnic by number interaction (Table 24). However, an

Table 24 Standardized logistic factorial contrasts of variables of ethnic group, age and number

	Z
Main effects: Ethnic group (A)	2.32*
Age (B)	7.93***
Number (C)	4.00***
Interactions: A x B	.74
A x C	1.21
B x C	1.63

* $p < .05$; *** $p < .001$

analysis of the differences between the means obtained by each ethnic group on each of the number variables suggests that the plural was noticeably harder for the Tokelau children than for the Pakehas. The z-value of differences between the scores obtained by the Tokelauans on these variables was 3.89 ($p < .001$), while the difference between the score obtained by the Pakehas just failed to reach the 5% level of significance.

A possible explanation for the difficulty that all the children experienced with plurals lies in the notion of markedness. In English, if the number of a noun is irrelevant, it is morphologically identified as singular. On the other hand the plural morpheme uniquely marks plurality. It is therefore the marked form which is likely to cause more difficulty.

However, Tokelau children experience greater difficulty than the Pakehas on plural items. A likely source of their particular difficulty lies in the fact that in Tokelau plurality is indicated by a particle preceding the noun and not, as in English, by a suffix. It is therefore possible that children with first language knowledge of Tokelau could find this morpheme hard to identify in English. The fact that the difference between the two ethnic groups at the five year old level ($z = 2.72$; $p < .01$) is more marked than at the seven year level ($z = 2.21$; $p < .05$) supports this suggestion, for in §6.3.2.2a transference was shown to be more noticeable in the scores of the younger children.

An additional difficulty for Tokelau children is that number, in the pronominal system of their language, is a three-way contrast of singular, dual and plural (cf. Tuia, 1974, p.11), and hence there is no exact parallel with English. Each of the pictures that were the stimuli to test comprehension of the plural showed representations of two boys (dogs, sheep, etc.). It is possible that the Tokelau

children interpreted these as duals, and as such specifically not plurals.

6.3.2.3b Tense

Tokelau children show negative transference on items testing comprehension of the past tense.

The interaction between ethnic group and tense was clearly significant (Table 25). An inspection of the means (Table 26) indicates that this interaction can be attributed to the fact that the

Table 25 Standardized logistic factorial contrasts of variables
of ethnic group, age and tense

		Z
Main effects:	Ethnic group (A)	2.96**
	Age (B)	7.03***
	Tense (C)	3.53***
Interactions:	A x B	1.23
	A x C	2.38**
	B x C	1.69
	A x B x C	1.25

** $p < .01$; *** $p < .001$

Table 26 Tense scores (proportions correct) obtained by each ethnic
group: transformed means

	Present	Past
Tokelauans	16.63	15.52
Pakehas	17.65	25.08

Tokelau children found items testing both the present and the past equally hard, whereas the Pakeha children found that past tense items were easier than present tense items. If the two variables had presented an equal difficulty to children from both ethnic groups we would expect the Tokelau children to find the past tense items easier than they did. The past tense was therefore particularly

difficult for the Tokelauans.

Although there was no ethnic group by age interaction an analysis of the differences between the means obtained by each ethnic group at each age level suggests that the relative difficulty experienced by the Tokelau children on the past tense is more marked at the five year age level than it is at the seven year age level. At the five year level the scores obtained on the past tense items by the Tokelau children were significantly lower than those of their Pakeha age-mates ($z = 6.14$; $p < .001$). However, there was no difference at the seven year age level ($z = 1.10$; ns).

It is possible that the explanation for the difficulty experienced by the younger Tokelau children on these items is similar to the explanation advanced for their performance on the number variables. In English, both tense forms involve final bound inflectional morphemes, whereas in Tokelau tense is indicated by particles placed before the verb stem (cf. Tuia, 1974, p.7). It is therefore likely that children who are native speakers of Tokelau have difficulty in perceiving and/or comprehending the final bound morphemes that mark the English tenses.

6.3.2.4 Possible transference

6.3.2.4a Indirect object

Tokelau children show possible positive transference on items testing comprehension of the indirect object with to and possible negative transference on items testing comprehension of the indirect object without to.

The presence or absence of to was a significant main effect variable (Table 27). An inspection of the means (Table 28) indicates

Table 27 Standardized logistic factorial contrasts of variables
of ethnic group, age and indirect object form

		z
Main effect:	Ethnic group (A)	2.28*
	Age (B)	1.34
	Indirect object form (C)	5.26***
Interactions:	A x B	1.09
	A x C	1.63
	B x C	1.02
	A x B x C	.24

* $p < .05$; *** $p < .001$

Table 28 Indirect object scores (proportions correct):
transformed means and z-values

		Tokelauans	Pakehas	z
with <u>to</u> :	5 years	3.28	4.10	.83
	7 years	4.40	3.96	.45
	z	1.19	.14	
without <u>to</u> :	5 years	.32	2.20	2.70**
	7 years	1.56	3.04	1.93
	z	1.87	1.05	

** $p < .01$

that the form without to was more difficult for each group of children.

There were no significant first order interactions. However, calculation of z-values between transformed means (Table 28) indicates some trends. The clearly significant z-values of the differences between the scores of the two ethnic groups at the younger level on forms without to ($z = 2.70$) suggests that the younger Tokelauans found this form exceptionally hard. On the other hand the insignificant differences between the scores of the two ethnic groups at both age levels on forms with to suggest that for the Tokelau children, who generally scored below the Pakehas, this was an easy form.

It is possible that the explanation for this atypical pattern of responses lies in the Tokelau structures with which the Tokelau children would be familiar. There is in Tokelau only one structure to express the indirect object. This uses the preposition ki, and it is very similar to the English structure with to (cf. Tuia, 1974, p.35). The familiarity of the Tokelau children with this structure probably reinforced their acquisition of the English structure with to. On the other hand, the fact that there is no Tokelau structure parallel to the English form without to makes this variable relatively harder for the Tokelauans than for the Pakehas.

6.3.2.4b 'Who' and 'What' as indicators of an +/- human distinction

The lower scores obtained by Tokelau children on who and what items may be due to negative transference, or they may reflect the typically lower scores obtained by Tokelau children on the test as a whole.

The interaction between ethnic group and question form (Table 29) was highly significant. An inspection of the means (Table 30).

Table 29 Standardized logistic factorial constrasts of variables
ethnic group, age and question form

		Z
Main effects:	Ethnic group (A)	2.69**
	Age (B)	4.40***
	Question (C)	18.11***
Interactions:	A x B	.19
	A x C	6.58***
	B x C	2.26*
	A x B x C	.46

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 30 Scores (proportions correct) obtained on 'who' and 'what'
by each ethnic group: transformed means

	Who	What
Tokelauans	7.48	.69
Pakehas	12.23	1.23

shows that this is attributable to the comparatively greater difficulty experienced by the Tokelau children of the forms with who.

A comparison of the Tokelau and English structures provides a possible explanation for the relative difficulty of who items for the Tokelau children. Although the interrogative pronouns in the Tokelau language carry the same +/- human distinction as English ('Ko ai ki latou?': 'Who are they?': 'Ko he a tena?': 'What is this?'. cf. Tuia, 1974, p.24), it is a distinction that is not made elsewhere in the morphology of the language. It is therefore possible that Tokelau children do not recognize that who uniquely represents +/- human. The implication of this explanation is not that the Tokelau children are understanding who as representing something non-human but that they are failing to perceive that +human is uniquely represented by this item.

On the other hand the difficulty may be one that is common to both first and second language learners and the differences in the scores may simply reflect the fact that the Tokelauans are typically lower scorers on the test than Pakehas. It is possible too that the distinction in animacy is one that is not easily recognized by all learners of English in the early stages, because it is a distinction of presupposition rather than assertion. Questions asking who or what performed some action are not usually to be understood as requests for information on whether or not the agent is human. Rather information of the agent's identity is sought. The focus of these items was therefore possibly unrealistic.

6.3.2.4c Possessive

The lower scores obtained by the Tokelau children on the possessive may be due to negative transference or they may reflect the typically lower scores obtained by the Tokelau children on the test as a whole.

The scores of the Tokelau children differed significantly from the scores of the Pakehas ($z = 2.09$; $p < .05$). However, difficulty with this item was not confined to the Tokelau children. All the five year olds found it significantly harder than the seven year olds ($z = 4.31$; $p < .001$). The pattern of score variance on this item is typical of that observed on a number of variables, and indicates that the Tokelau children are later in acquiring the possessive.

There is a possibility that the later acquisition of this structure by the Tokelauans may be due to transference. The Tokelau language signals possession by a preposition and not by a final bound morpheme (cf. Tuia, 1974, p.16) as in the English structure under investigation in this test. It may therefore be that the Tokelau children are less experienced at responding to such structures. Although this explanation is essentially the same as that advanced for number and tense variables, there is no way to be sure that it applies in this case. Pakeha children show exactly the same progression of difficulty and similar differences have been found where there is no possibility of transference (cf. §6.3.2.5).

6.3.2.5 No evidence of transference

6.3.2.5a Polarity and voice

Children from both ethnic groups found active sentences easier in the affirmative than in the negative, and passive sentences easier in the negative than the affirmative.

There was no significant ethnic group by voice by polarity

interaction (Table 22) indicating that the relative difficulty of these items was the same for children from both ethnic groups. Whereas the characteristic order of noun phrases in the Tokelau language suggests that the passive should be comparatively easier for the Tokelau children than for the Pakeha children (cf. §6.3.2.2a), the negative structure is similar in the two languages ('Ko ia kua he hau': 'He has not come'). This suggests that the source of the difficulty of these items relative to each other is to be found in the interaction of the two linguistic variables.

The voice by polarity interaction was clearly significant ($p < .01$) (Table 22) and an inspection of the means (Table 31) indicates the direction of the interaction. The graph in Fig. 4 shows the differing effect that polarity changes have on active and passive sentences.

Table 31 Voice and polarity scores (proportions correct):
 transformed means

	Active	Passive
Affirmative	33.07	-17.86
Negative	8.32	6.22

Fig. 4 Interaction between variables of voice and polarity

A likely explanation can be found in an examination of the differing effects of negation on active and passive sentences. In

active/negative structures ('The boy isn't pushing the girl') the verb is negated. Clark and Chase (1972) have suggested that a sentence of this type contains two propositions, 'the boy is pushing the girl' and 'it is false', with the first proposition embedded in the second as 'that the boy is pushing the girl is false'. They suggest that in the linguistic processing of a sentence of this type two operations are involved (in a test situation there is a third involving the comparison of the processed sentence with the stimulus). In the linguistic processing therefore there are two opportunities for error. However, in processing passive/negative sentences ('the girl isn't pushed by the boy') it is possible that the child can ignore both the negative and the passive markers, which individually are harder for all the children, and process the sentence as if it were 'the girl pushes the boy', where the noun phrases are in the same relative order as the stimulus sentence. If this is in fact the processing strategy a correct response would, in this test situation, be achieved.

6.3.2.5b Voice and yes/no questions

The formation of yes/no questions in both Tokelau and English is marked by the use of a rising intonation contour. Although such questions are also generally marked syntactically in English, but not in Tokelau, by the inversion of the subject and the first auxiliary, this does not appear to constitute a particular difficulty for the Tokelau children in the understanding of question forms. No child failed to make a response on any of the combinations of linguistic variables in this group, and this is a clear indication that all children understood the structure and were able to give an appropriate but not necessarily correct response. However, there were, on both active and passive items, more wrong responses to

questions requiring a negative answer. Clearly all the children tended to reply yes when they were in doubt.

On structures combining these two linguistic variables the most difficult combination for both ethnic groups was that of passive and negative. The interaction between voice and answer forms was clearly significant (Table 32) and an inspection of the means (Table 33) indicates the direction of the interaction. Passive questions were harder than active questions, and questions requiring a negative answer were harder than those requiring a positive answer. Passive/negative was the most difficult combination.

The interactions between age and answer form (means in Table 34)

Table 32 Standardized logistic factorial contrasts of variables
of ethnic group, age, voice and answer

		Z
Main effects:	Ethnic group (A)	1.48
	Age (B)	4.91***
	Voice (C)	8.21***
	Answer (D)	8.10***
Interactions:	A x B	.08
	A x C	.23
	A x D	4.10***
	B x C	3.22***
	B x D	5.48***
	C x D	2.94**
	A x B x C	.32
	A x B x D	.18
	A x C x D	.38
	B x C x D	1.72
	** p<.01; *** p<.001	

Table 33 Voice and answer form scores (proportions correct):
transformed means

	Yes	No
Active	28.58	17.01
Passive	16.77	-7.85

Table 34 Answer form scores (proportions correct) obtained by
each age level: transformed means

	Yes	No
5 years	23.27	-6.99
7 years	22.01	16.15

Table 35 Answers form scores (proportions correct) obtained by
each ethnic group: transformed means

	Yes	No
Tokelauans	25.55	-1.64
Pakehas	19.72	10.80

and between ethnic group and answer form (means in Table 35) show that the younger children of both ethnic groups, and Tokelau children of both age levels, found questions requiring a negative answer particularly hard and, as has already been shown, this difficulty was particularly evident on questions in the passive.

Tables 34 and 35 also show that the younger children and the Tokelau children both scored relatively high on questions requiring an affirmative answer. It is unlikely that they found these items easier than the older children and the Pakeha children respectively. A more probable explanation lies in the tendency noted earlier to make affirmative answers when in doubt. On affirmative questions the older children and the Pakeha children had a more realistic choice between a yes or a no answer. They were therefore more likely to make errors.

This tendency interacts with the other linguistic variable involved (voice) to produce a result that is at variance with those recorded earlier (§6.3.2.2.a and b) in the presentation of evidence for positive transfer. There it was noted that Tokelau children found passive items relatively easier than Pakeha children, and it was suggested that the explanation was probably to be found in their previous linguistic experience. However, there was no ethnic group by voice interaction on yes/no questions (Table 32). Children from both ethnic groups experienced the same relative difficulty between passive and active items. It would appear, however, that the tendency to make an affirmative reply, which was stronger among the Tokelauans than among the Pakehas meant that passive questions requiring a negative answer were relatively harder for the Tokelau children than they were for the Pakeha children and so cancelled out any transfer effect that may be operating on the passive variable. The interaction between the variables of answer form and ethnic group on passive items was clearly significant ($z = 3.10$; $p < .01$) and the means are reported in Table 36. Fig. 5 makes the direction of the interaction clear.

Table 36 Scores (proportions correct) obtained on passive questions
by each ethnic group: transformed

	Yes	No
Tokelauans	10.54	-6.95
Pakehas	7.26	-1.11

Fig. 5 Interaction between variables of ethnic group and answer
on passive questions

This interaction of the effects of transfer on one variable with a difficulty that is common to all learners on another points to the inadvisability of global statements about transference on separate variables. Clearly there are some cases where knowledge of the Tokelau language acts to the advantage of the Tokelau children and they find the passive easier than they might otherwise. But the passive never occurs in isolation and the operation of this advantage depends upon the other linguistic variables in the construction.

These results indicate that Tokelau children are behind Pakeha children at both age levels in their acquisition of English question forms. The non-significant interaction between ethnic group, age and question form would appear to indicate that they may not be making the same progress on these variables as on the test as a whole. However, these results are confounded by the greater tendency of the Tokelau children to make an affirmative reply whatever the question, and performance on questions requiring a negative is alone a true indication of age development (Table 37).

Table 37 Scores (proportions correct) obtained on questions requiring a negative answer: transformed means

	5 years	7 years
Tokelauans	-26.89	5.34
Pakehas	-.12	10.82

The ethnic group by age interaction on these items is highly significant ($z = 6.01$; $p < .01$) showing that Tokelau children are rapidly approaching the level of the Pakeha children.

6.3.2.5c Complement form and direct object

There was no significant difference evident between the difficulty level of infinitival and participial complements. However, the

presence or absence of a direct object was a highly significant main effect variable (Table 38). For all children the presence of a direct object ('the mother likes the girl sitting') made the sentence harder to understand than if there was no direct order ('the girl likes sitting').

Table 38 Standardized logistic factorial contrasts of variables of ethnic group, age, complement form and direct object

			Z
Main effects:	Ethnic group	(A)	1.86
	Age	(B)	3.13**
	Complement form	(C)	1.04
	Direct object	(D)	6.82***
Interactions:	A x B		1.65
	A x C		.59
	A x D		.70
	B x C		.03
	B x D		2.86**
	C x D		.23
	A x B x D		1.21

** $p < .01$; *** $p < .001$

This interaction between age and direct object (means in Table 39) is doubtless attributable to a ceiling effect: both age groups understood items without a direct object nearly perfectly. The untransformed means over the four trials were for the five year olds 3.94, and for the seven year olds 3.96.

Table 39 Direct object scores (proportions correct) obtained by each age level: transformed means

	with direct object	without direct object
5 years	21.63	55.03
7 years	42.29	55.96

These results support the hypothesis that sentences that make

the deep structure explicit are easier to understand than those that do not (Fodor and Garrett, 1966). The fact that the rules for the formation of complement structures in Tokelau are similar to the English rules makes it impossible to tell whether previous experience of its operation in Tokelau is being transferred to the task of processing English complement structures.

6.3.2.5d Embedding

The two embedding constructions in the test were those with that ('the dog that is in the truck is black') and those without that ('the dog in the truck is black'). All the children found the forms with that easier to understand (mean raw score (proportion correct): .65) than forms without that (mean raw score (proportion correct): .52). The analysis of variation (Table 40) showed that the main effect variable of embedding was highly significant.

Table 40 Standardized logistic factorial contrasts of variables of ethnic group, age and embedding

		z
Main effects:	Ethnic group (A)	.64
	Age (B)	1.23
	Embedding (C)	3.55***
Interactions:	A x B	1.02
	A x C	1.09
	B x C	1.05
	*** p<.001	

In English, the that form is a low frequency item (cf. McElldowney, 1966, p.203) and similarly in Tokelau the relative pronouns are frequently omitted (cf. Tuia, 1974, p.34). The fact that Tokelau children find structures with that easier than structures in which the relative pronoun has been omitted suggests that the Fodor and Garrett (1966) hypothesis (that sentences in which the deep structure is explicitly marked are easier to understand) applies to both first

and second language learners of English and is a stronger explanation for sequence of acquisition than is frequency.

6.3.2.5e Conditionals

All the children found that the polarity and position of the conditional clause made no difference to ease of comprehension. However, younger children from both ethnic groups found conditionals harder than older children, and Tokelau children at both age levels found conditionals harder than Pakeha children did.

The analysis of variation (Table 41) indicated that polarity and position of the main clause were non-significant variables. Truth value was highly significant: all children found the false condition in which a correct response required that the instruction in the main clause (e.g. 'if it is a sweet, put it in the basket') be disobeyed, much harder than the true condition in which the instructions had to be obeyed.

Undoubtedly the number of errors made on the false condition is an indication of the difficulty experienced by the children on the conditional. It was possible to make a correct response to the true items by simply obeying the imperative without moderating the response according to information in the conditional clause. This was not possible under the false condition where the imperative had to be explicitly disobeyed for the response to be correct. Therefore scores on the false condition are a more accurate estimate of comprehension of the conditional.

This suggestion is supported by the interactions between age and truth value, and between ethnic group and truth value (means

Table 41 Standardized logistic factorial contrasts of variables
of ethnic group, age, position of the conditional
clause, polarity and truth value

		z
Main effects:	Ethnic group (A)	7.24***
	Age (B)	7.34***
	Polarity (C)	1.32
	Truth value (D)	21.62***
	Position of Conditional (E)	.97
Interactions:	A x B	1.19
	A x C	.51
	A x D	10.49***
	A x E	.12
	B x C	.37
	B x D	5.48***
	B x E	.68
	C x D	.01
	C x E	.64
	D x E	2.15*
	A x B x D	1.45

* $p < .05$; *** $p < .001$

in Tables 42 and 43). On the truth condition the scores of the five year olds from both ethnic groups were only slightly below the scores

Table 42 Truth condition scores (proportions correct) obtained by
each age level: transformed means

	5 years	7 years
True	72.28	79.43
False	-30.80	18.17

Table 43 Truth condition scores (proportions correct) obtained by
each ethnic group: transformed means

	Tokelauans	Pakehas
True	81.96	69.65
False	-39.73	27.46

of the seven year olds and the scores of the Tokelau children of both ages exceeded the scores of the Pakehas. On the other hand, on the false condition, younger children from both ethnic groups and Tokelau children of both ages scored significantly lower than older children and Pakeha children respectively. It is unlikely that the younger children and the Tokelauans scored relatively higher on the true condition because they found it easier than the other children. Rather they obtained a correct response by obeying the imperative. This approach produced an incorrect response on the false condition in which a correct response required that the imperative be disobeyed. Further evidence that an imperative - obeying strategy was followed by the younger children and the Tokelau children is given in §7.3.1.3 where the use of reaction time data to assess the validity of individual items is discussed.

These results indicate that Tokelau children of both age levels experience greater difficulty on conditionals than do their Pakeha age mates. The non-significant interaction between ethnic group, age and truth value indicates that they may not be making the same progress on conditionals as was evident on the test as a whole. The similarity between conditional structures in the two languages makes the definite identification of transference impossible.

6.3.2.5f Conjoined verb phrase

Although there was a non-significant ethnic group by age interaction the pattern of variation observed on this item is typical of that

observed on the test as a whole. The Tokelau children were rapidly approaching the level of the Pakeha children (Table 44).

Table 44 Conjoined verb phrase scores (proportions correct):
transformed means and z values

	5 years	7 years	z
Tokelauans	4.58	7.13	1.76
Pakehas	6.64	7.67	.63
z	1.56	.31	

6.3.2.5g Question forms

Questions figured prominently in the selection of variables for this study, and the relative difficulty of the different forms was investigated in conjunction with a number of other linguistic variables. These are set out in Table 45.

Table 45 Combinations of question forms with other linguistic
variables

	who	what	which	where
(a) voice/case (agent, object)	x	x	x	
(b) locative	x	x	x	x
(c) verb		x		
(d) animacy distinction	x	x		

The linguistic function of question forms is primarily to indicate that the utterance is a request for information (the interpersonal function) which is further specified in the rest of the sentence. Any response that offers information, whether correctly or incorrectly, can be assumed to be indicative of comprehension of the question form itself. On the other hand a failure to make a response could well indicate a difficulty with the information (ideational) carrying level of the utterance. The difficulties associated with the testing of children's understanding of the

functional significance of question forms are manifest, and this study in no way attempted such an investigation. Rather, the focus in each of the groups (a) - (c) in Table 45 was on the ability to understand the structures at the information carrying level of the sentence when they occurred in syntactic questions. Items with different question forms were included in order to find out whether, in any of the groups, any one question form was a source of greater difficulty than the others. However, the study of who and what (Table 39; group d) focusses on the question forms themselves in that the aim is to find out whether children understand the +/-human distinction between these forms. Results of group (d) are reported in §6.3.2.4b.

Statistical note: The statistical procedures followed in the analysis of the structural scores required all data to be binary. In each of the groups (a) and (b) more than two question forms were involved. So, to test for differences between them, each pair was initially investigated separately. Results on both these suggested that some of the question forms could be combined for further analysis in ways that are indicated below.

Questions with voice and case (agent and object)

On items testing comprehension of questions in conjunction with voice and case variables, each group of children found forms with who and what equally difficult. Which forms were harder than who or what for all groups of children (Table 46).

Table 46 Differences between question forms (agent and object):
z-values

	Tokelauans		Pakehas	
	5 years	7 years	5 years	7 years
who/what	.14	.39	.03	1.68
who/which	6.05***	3.41***	2.52**	4.33***
what/which	6.05***	2.79**	2.47**	2.44**

** $p < .01$; *** $p < .001$

The fact that there was no difference between who and what forms was confirmed by a separate analysis ($z = .63$; ns), and these two forms were combined for further analysis.

Both ethnic groups found which forms harder than who or what forms, and there was a non-significant difference in the degree of comparative difficulty experienced (ethnic group by question form: $z = 1.94$; ns). This figure, while non-significant, was not low enough to rule out the possibility that differences between the two ethnic groups on these question forms could not have interacted with the other linguistic variables to affect the difference between the two ethnic groups reported in §6.3.2.2a. To test for this possibility, the third order interaction of question form, voice, case and ethnic group was calculated. This was clearly non-significant ($z = .83$).

Which items then cause greater difficulty than who or what items for all groups of children on all combinations of voice and case variables. This can doubtless be attributed to the fact that questions with who or what asked for a response that identified either the whole agent or the whole object of the verb ('Who is pushing the boy?; Who is the girl pushing?'). On the other hand questions with which asked for a response that required this step in the processing, and, in addition, the identification of a particular

agent of a particular object ('Which girl is pushing the boy?'). Clearly this is an additional processing step, and hence a source for further error.

Questions with the locative

Investigation of the differences between each of the question forms used with the locative showed no significant differences (Table 47).

Table 47 Differences between question forms (locative):

	<u>z-values</u>			
	Tokelauans		Pakehas	
	5 years	7 years	5 years	7 years
who/what	.41	.59	.37	.00
who/which	1.91	1.05	.69	.59
who/where	.17	.00	1.26	.59
what/which	1.49	1.61	.31	.59
what/where	.24	.59	.88	.59
which/where	1.74	1.05	.58	.00

However, the z-values of the differences between the scores obtained by both five and seven year old Tokelauans on combinations including which were generally higher than any other difference. It would appear from this data that the Tokelau children were experiencing greater difficulty on the which items than the Pakehas.

The difference between which and the other forms combined was non-significant ($z = .14$), and further analysis showed that the interaction between ethnic group and question form (which/who, what, where) was also non-significant ($z = 1.06$).

The difficulty associated with which appears to depend on the case of the noun phrase that is being questioned. With the agentive and objective cases which is more difficult than with the locative case. With each of these cases the child had to identify a group of objects

and select the one referred to, but on the agentive and objective cases the choice was further complicated by the semantic reversibility of the agent and object nouns. A choice of either noun made sense even if it did not fit the facts. (Which car is pushing the truck?). Identification of the group of objects from which a choice had to be made was much simpler on where questions. In these, a correct response involved identifying the place in which the object was put and no other group of referents formed plausible answers. This finding points to the importance of considering linguistic variables in combination, and underlines again the need for caution in making global statements about the difficulty level of separate variables.

'What' and the verb phrase

What is the only possible question form with the verb phrase and so no comparisons with other question forms were possible. However, by comparing its use in conjunction with other linguistic variables, it was clear that no particular difficulty on the verbal use was experienced by any one group of children (Table 48).

Table 48 Differences between the use of 'what' with the verb phrase and with other linguistic variables: z-values

	Tokelauans		Pakehas	
	5 years	7 years	5 years	7 years
locative	.54	.00	31	.59
agent/active	4.47***	4.74***	4.01***	2.92**
agent/passive	5.70***	5.26***	5.11***	3.17**
object/active	2.51**	2.41**	3.12**	.89
object/passive	6.80***	7.00***	7.65***	7.52***
** p<.01; *** p<.001				

In all the cases in which the difference was significant, the locative was the easier structure.

The non-significant difference between the verbal use and use with the object active for the seven year old Pakehas can be attributed to the fact that scores by this group on object/active forms were very high.

6.3.3 Summary and discussion

6.3.3.1 Summary

1. Results reported in §6.3.1 show that the process of vocabulary acquisition for both native speakers and second language learners is very similar. The order of acquisition is substantially the same for all children, and both groups experience similar difficulties with low frequency items and with non-noun items. The only apparent differences relate to the acquisition of vocabulary relating to the home environment. When they first enter school Tokelau children are noticeably less familiar with vocabulary from this domain than are Pakeha children of the same age.
2. In the acquisition of structural knowledge in English as a second language by Tokelau children there is no evidence of transference from the first language on the majority of the linguistic variables that were investigated. However positive transference was identified on some combinations of variables involving the passive, and negative transference was noted on some structures involving final bound morphemes and the animacy distinction between who and what. There were a number of cases in which it was not possible to be certain whether or not transference was operating. In particular, it was shown that transference may operate in some combinations of linguistic variables but not in others.

6.3.3.2 Discussion

The analysis reported in this chapter was undertaken to discover

the extent to which the process of second language acquisition resembles either the process of acquiring a first language or the learning of a new skill in which previously learnt (linguistic) knowledge affects subsequent (second language) behaviour. The results have shown that second language acquisition is a complex process, which although largely resembling first language acquisition, cannot be unambiguously assigned to either category. In this respect, the study reflects the inconclusive state of research into this question (§2.2). However, the same inconclusiveness suggests that the question itself is far too simplistic to be meaningful. This indicates, therefore, that rather than attempting to measure the results (by adding up, as it were, variables in two columns) in order to assign the process to one of the two categories, a consideration of the nature of second language acquisition would enable a clearer categorization of the second language process. The following discussion looks at the information provided by this research on the acquisition of structural and vocabulary knowledge in an attempt to clarify the nature of the process. In particular, it focusses in the contributions, both helpful and unhelpful that first language knowledge can make to second language acquisition.

6.3.3.2a Structural variables

To clarify the nature of the relation between first language knowledge and second language acquisition, this discussion focusses on the operation of transference. In particular, information on three points is sought: firstly, to what extent is transference from a first language either helpful or disadvantageous to second language acquisition; secondly, does the incidence of transference provide information of the development of strategies for comprehension of a second language, and what is the relation of such strategies to

those followed in the acquisition of a first language; and thirdly, what is the relation between transference in comprehension and transference in production?

The usefulness of transference

The analysis of results reported in this section identified both positive and negative transference from first language knowledge to second language acquisition. While the literature on second language learning abounds in discussion of negative transference (error analysis) (cf. Richards, 1974) it contains few comments on positive transference and these are wholly dismissive. The passing remarks of Wolff (1967) and Richards (1971) are typical in this respect. It would therefore appear surprising that any positive transference at all was identified in this study.

Transference of knowledge of one language to acquisition of another is indicative of attempts by the learner to capitalize on his previous linguistic experience by attempting to either perceive or construct the second language in terms of categories he is already familiar with. Any strategies, whether of perception or production, that attempt such transference are only likely to be helpful where the categories of the two languages closely match each other. It is only in situations in which they are not comparable that transference can be unambiguously identified. Where there are differences between the two languages it is clearly unlikely that experience in any language other than the target language will be of greater value than experience in the target language itself.

Related to the present study, this means that it is unlikely that early experience in the Tokelau language could equip a child to understand English better than experience in English. Hence the only instances where this experience does appear to be helpful, and where positive

transference is evidenced, are on variables that are both very infrequent and very difficult. In this study passive questions on the objective case and passive statements regardless of polarity fall into this category. Both these combinations are extremely difficult for children from both ethnic groups, but the findings suggest that expectations about the order of the noun phrases within the sentence which Tokelau children have derived from their own language, facilitate their efforts to understand these English structures.

The range of variables investigated in this study demonstrates that, contrary to previous hunches, positive transference is quite possible, and suggests that the reason why it has gone largely unnoticed is that it can only operate on very low frequency variables. By contrast, negative transference is identified on high frequency, easy structures, and it is very noticeable. It has therefore been generally regarded as a significant factor in second language acquisition. Of course, it is the low frequency of the variables that evidence positive transference that makes such transference of comparatively little consequence in second language acquisition.

Strategies for second language acquisition

The review of the literature in §2.2 suggested that although the second language learner may develop a strategy for the acquisition of syntactic variables that necessitates a comparison of the structure of the language he is learning with that of the language he already knows, the expectation that language is meaningful, which has already been established in first language acquisition, is most likely to cause transference on semantic variables.

Syntactic variables were defined as variables involving either the addition of empty morphemes (e.g. do - support) or the ordering

of items, and none of the structures investigated in this study were syntactic in this very narrow sense. The test was of ability to comprehend a number of variables, and in this respect all the variables involved meaning. The majority of these showed no evidence of transference. However, the variables on which transference was identified, combinations including the passive and possibly indirect object constructions, involved the association of semantic roles with the position of the noun phrases in the sentence.

This finding confirms Ervin-Tripp's (1974) suggestion (based on Bever, 1970) that children develop strategies based on the relation between order and meaning. But it conflicts with her suggestion that the same strategy operates when a language is learnt as a second language as operates when the same language is learnt as a first language. However, Ervin-Tripp based her observations on the comprehension strategies of an English speaking child learning French as a second language, and it is not possible for her to be certain that the child is not making use of a strategy derived from his knowledge of English as a first language simply because the rules of clause structure are similar in the two languages. In the present study the rules of clause structure are not similar in the two languages (cf. §6.3.2.2a) and so the findings are evidence that children do use strategies developed from first language experience in the processing of second language structures. Strategy transference may then be a feature of second language acquisition.

The other instances of transfer noted in this study may have a similar source and point to similar conclusions. It was suggested in §6.3.2.3 that transference on structures involving final bound morphemes could be attributed to morphological differences between

Tokelau and English. In English, information on certain grammatical categories is carried by final bound morphemes: in Tokelau, the same information is carried by particles that precede the root form. If transference is, in fact, effective in these cases, the source of the particular difficulty experienced by the Tokelau children is in one respect at least very similar to that noted for the semantic roles of noun phrases. Transference on combinations of passive variables involved an expectation that the order of noun phrases in the second language would be the same as that the children were already familiar with in their first language. Similarly it is possible that transference on the number and tense variables results from the expectation that the end of a word carries no meaningful elements. This expectation is essentially based on the order of the morphemes. Both kinds of transference concern the relative ordering of structures in the first and second languages, and appear to indicate that expectations about order can be identified as a strategy that the second language learner adopts to relate his previous linguistic experience to the task of acquiring a second language.

The order strategy proposed in this study involves comparison of the first language and the second language and, therefore, it is peculiar to second language learners. The operation of this derived strategy in second language acquisition suggests that strategies which, it has been proposed, are universal for first language acquisition (Slobin, 1973), do not operate in second language acquisition. The strategy (his term is 'operating principle') that Slobin proposed that is most relevant to this study is "Pay attention to the end of words" (p.191). He cites evidence from studies of the first language acquisition of a number of different

languages that suggest that children learn grammatical categories earlier when they are conveyed by post-fixes than when they are conveyed by prefixes. But a child whose first language is Tokelau has learnt to expect that information on grammatical categories will precede the root, and the evidence of this study suggests that he will apply to the second language structures a strategy that is based on these expectations rather than the universal one of the type proposed by Slobin.

Relation between comprehension and production

In attempting to identify the process of second language acquisition, this study focussed on the development of comprehension skills. However, the occurrence of errors in the speech of the second language learner is a more evident and certainly a more readily observable phenomenon. The following note on the relation between the operation of transference in comprehension and production is offered as a preliminary perspective on the question in the light of this research.

The implications that evidence on the operation of transference in comprehension may have for the operation of transference in production depends upon the relation between the two skills in second language learning. The distinction between them is commonly so great that Naiman (1974) has proposed that two grammars must exist in order to account for such divergence - a comprehension grammar and a production grammar. The former generally approximates to that of a native speaker more closely than the latter.

The postulation of separate grammars implies that the principles that control speech perception are not the same as those that control speech production. However, in his discussion of the processing of speech in monolinguals, Neisser (1967) has proposed

that the same principles govern both modes, and that control of the same syntactic rules is central to the operation of both skills. This implies a close association between the operation of the two skills, but does not explain the delay in the acquisition of productive ability in the second language learner.

Tarone (1974) has outlined an adaption of Neisser's model to account for this delay. She proposed that the second language learner operates only one grammar but that there are, as in Neisser's model, two stages of perceptual processing. The first stage is a preliminary analysis which, relying heavily on perceptual strategies, extracts the basic semantic elements in order to permit a meaning hypothesis to be formed, and the second involves a more detailed analysis in terms of the rules for the second language which have been learnt. Tarone suggests that the first stage, which affects comprehension, precedes the second stage, necessary for accurate production, because it makes use of strategies which are universal.

While this model may well reflect accurately a number of aspects of second language perception, there are two problems that question its power to explain the delay in productive accuracy in the second language. These relate to the identification of the two stages, and the universality of the strategies that Tarone assigns to the first stage. In the first place the model appears to imply a sequential relation between comprehension and production which was not intended by Neisser. It consequently implies that control of syntactic rules is necessary only for production. However, Neisser demonstrated by reference to a wide range of research the centrality of syntactic principles to both skills. Indeed, some of the first stage strategies that Tarone proposes depend for their operation upon knowledge of syntactic principles. The operation of strategies for relating syntactic units to semantic categories

necessitates the operation of syntactic rules to identify the units concerned, and whether the operation of these rules *is* typical of the scanning activities that Neisser proposes for the first stage is in doubt. Tarone has in fact, adapted Neisser's model of perception as a model of acquisition, and the discrepancies mean that she does not, as she claims, explain the delay between production and comprehension.

Tarone suggests that the strategies that operate in the first stage do so because they are universal. By universal she appears to mean applicable to both first and second language processing. However, this study has shown that, in the early stages of learning a second language, strategies for relating semantic roles to noun phrases that are developed in the course of first language acquisition also operate on second language structures. They are not therefore universal in this sense. This is further evidence that such strategies operate also at the second stage of perception and are not restricted, as Tarone suggests, to the first stage.

Whatever the difficulties associated with Tarone's adaption of Neisser's model to account for the delay between comprehension and production, she does, like Neisser argue for a close association between the two skills. It would appear, then, that transference in comprehension may predict errors in production, and that the variables on which transference operates in comprehension are likely to remain sources for errors in speech for longer than variables on which no transference is evident. Research on the relation between the two is necessary to identify not only the extent of the delay but also the reasons for it, and its function in the acquisition of a second language.

6.3.3.2b Vocabulary variables

The vocabulary test that was developed for use in the present study was primarily designed to assess the rate of acquisition, and it necessarily provides a rather gross measure of the vocabulary knowledge of the Tokelau children. More detailed analysis was undertaken to look for evidence of transference, and this was identified on only one rather limited group of variables. It is clearly possible that the test did not provide any opportunity for any further identification of transference, and indeed the investigations of Lambert and his associates into the social psychology of bilingualism suggest that very few bilinguals are able to keep the semantic system (as charted by word association studies) of their two languages apart (Lambert, 1969). It is not clear however, whether the acquisition of a second language is characterized by the same interdependencies as those Lambert identified in bilinguals. This is an interesting and important topic to which the data of this study can make no contribution.

Although the extent of lexical transference is not made clear by this study, the findings suggest a relation between domain of acquisition and vocabulary knowledge. The scores of the Tokelau children are lower on items associated with the home. Although this difficulty is probably associated with the general difficulty experienced by the younger Tokelau children on high frequency items, results from the interview schedule (reported in §7.1.2) make it clear that the use of English in Tokelau homes is very limited. Indeed it was an underlying belief in the relation between sociolinguistic factors and language acquisition that motivated

the study of the language background of the Tokelau children that accompanied the main study.

The extent to which this comparative difficulty constitutes a handicap for the Tokelau children depends upon their need for domestic vocabulary in situations in which English is used. They have no need for this vocabulary at home, and it is only likely to be used at school in literacy contexts. Differentiation in language skills according to habitual domains of usage is by no means uncommon in bilingual communities (Cooper, 1968; Cooper and Greenfield, 1968), and, in this case it does not persist for long, for the difficulty is not observable in the scores of the seven year old Tokelauans. It cannot therefore be regarded as a serious disability. The association does however have implications for the design of cross-cultural language tests and these are discussed in §7.3.2.1b.

Chapter 7

COMPLEMENTARY STUDIES

The design of this research and the instruments devised enabled the investigation of additional factors that are each relevant to the interpretation of the results of the main study (reported in §6). These factors take into account the fact that the Tokelau children are acquiring English in a particular sociolinguistic context, the possibility of obtaining insights into appropriate teaching procedures from a study of some factors associated with successful communication and the fact that, because language testing is an entrenched activity in language education, there is a need for insights into the development and use of language tests, particularly in cross-cultural contexts.

Information for these complementary studies was obtained from the interview schedules the teachers' ratings, the reaction time data and the transcripts of the communication task. This information, taken in conjunction with the scores on the comprehension and communication studies, provides valuable, if somewhat anecdotal comment on the Tokelau children, some factors associated with communication success, and the implications of this study for further second language research with young children.

7.1 The Sociolinguistic background of Tokelau children

Information about the Tokelau children obtained from the interview schedule and the teachers' ratings was analysed for evidence of their first language skills, their home language experience (including some demographic factors), and the language relations between home and school. Much of this information is descriptive in nature, but further analysis reveals some interesting facts about

patterns of bilingualism, about attitudes to the English and Tokelau languages, and about the effects of sociolinguistic and demographic variables on the development of both first and second language skills. It also provides some evidence of the language gap between home and school.

7.1.1 First language skills

The notion that any one language is a first language for children who are raised in a bilingual environment is questionable. The results reported in this chapter make it clear that around 80% of the children spoke or understood Tokelau or Samoan 'moderately' or better (§7.1.1.1), and the results reported in §6 indicate that all the children had some familiarity with English when they entered school. However, the data does not indicate whether acquisition of these languages was concurrent or whether one preceded the other, and indeed, for the purposes of this research it makes very little difference. The assumptions behind the use, in this study, of the terms 'first language' and 'second language' are that any language other than English known to a Tokelau child entering school at five years of age is his first language.¹

Estimates of the first language abilities were made by the parents of the Tokelau children and by Mrs Savelio (the Tokelau research assistant). Teachers were also asked to make an estimate, but their knowledge of the children's first language was so limited (§7.1.4) that their measures were discounted. Analysis of the

1. It is of course possible, using this definition of the term 'first' language, for a child to have two first languages.

ratings made by parents and Mrs Savelio point to three major findings.

7.1.1.1 Tokelau language skills

The scales used by the parents (Table 49) and the research assistant (Table 50) differed somewhat from each other. It was necessary to use different names for the categories in each.

Mrs Savelio used the conventional five point scale (cf. §3.5.3) with no trouble, but the parents found these terms somewhat bald,

Table 49 Mothers' estimates of their children's abilities in languages other than English²

	5 years %	7 years %
Speaks Tokelau	53	60
A few words only (Tok.)	10	16
Only understands Tok.	2	10
No Tokelau or Samoan	8	6
Speaks only Samoan	10	4
A few words only (Sam.)	6	-
Only understands Sam.	6	2
Samoan and a little Tok.	4	2
A few words Sam. and Tok.	2	-

Table 50 Research assistant's ratings of children's Tokelau language skills

	5 years		7 years	
	Speaking %	Understanding %	Speaking %	Understanding %
Very good	21	17	26	20
Good	21	17	26	28
Moderate	10	31	22	24
A little	12	12	6	18
Not at all	37	23	20	10

2. Where columns do not total 100 this is the result of rounding.

and it was easier for them to identify the categories when the tables were expanded to such phrases as 'only a few words' or 'understands only'. Often a rating would be assigned by the writer following discussion with the mother (cf. §3.5.2).

Despite these differences, the χ^2 value of the measure of association between the ratings made by Mrs Savelio and the ratings made by the parents were highly significant ($\chi^2 = 71.69$; $p < .001$).

The abilities of the seven year old Tokelau children to speak and understand Tokelau are greater than those of five year old children. The ratings made by the parents (Table 49) and the ratings made by Mrs Savelio (Table 50) both indicate the marked superiority of the older children in Tokelau language skills. There are more five year olds than seven year olds who neither speak or understand Tokelau. It is unlikely that the greater ability of the seven year olds indicates an improvement over the two year span. Rather it reflects a difference in the language background of the two age groups. The proportion of Tokelau speaking parents was greater in the seven year age group. Parents of the younger children included a number of Samoan speakers. (§7.1.2.1).

7.1.1.2 Active and passive bilingualism

When the scores obtained on the ratings made by Mrs Savelio in ability to speak and understand Tokelau are collapsed into two categories 'moderate' or better and 'a little' or 'none at all' (Table 51) it can be seen that the relation between these two skills is noticeably different at each age level. In the older group, the percentages of children who both speak and understand Tokelau

Table 51 Tokelau language skills: percentage of children who spoke and understood Tokelau moderately or better

	5 years	7 years
	%	%
Speaking	52	74
Understanding	65	72

are similar. However, in the younger group the percentage of children speaking Tokelau is considerably lower than the percentage understanding it. Apparently more seven year olds can both speak and understand Tokelau and can therefore be said to be actively bilingual³, whereas the scores obtained by the younger children reveal a wide incidence of passive bilingualism (the ability to understand but not speak).

While it is possible to attach a significance to this difference between the two age groups and claim that the lower Tokelau language skills of the younger children are evidence of language shift, they can be more appropriately regarded as a consequence of differences between the sociolinguistic background of the two groups. The background of the younger children was more markedly Samoan than that of the older children (cf. §7.1.2.1). It is quite probable that the difference reflects a population difference which it was not possible to check out before hand.

7.1.1.3 Samoan language skills

The ratings of Samoan language skills made by the parents (Table 49) and by Mrs Savelio (Table 52) indicate that there are very few young Tokelau children who are speakers of Samoan. The fact that there are noticeably more five year old Samoan speakers is probably a reflection of the fact that a comparatively large number of the

3. Results reported in §6 indicate that all the Tokelau children knew some English.

Table 52 Research assistant ratings of children's Samoan
language skills

	5 years		7 years	
	Speaking %	Understanding %	Speaking %	Understanding %
Very good	2	2	2	2
Good	6	2	-	-
Moderate	9	15	4	6
A little	6	8	2	6
Not at all	77	73	92	86

younger children have Samoan speaking mothers (cf. §7.1.2.1).

Very few of the children could speak and understand Samoan. In view of the fact that Tokelau adults generally speak good Samoan this was felt to be surprising. The general explanation for this given by the mothers, was that in New Zealand, the Samoans form a separate linguistic minority and the second language learnt by children who speak Tokelau at home is English. There is then, for Tokelau children, no community support for Samoan. The only reports of children speaking both these languages describe them as speaking mainly Samoan and only 'a little bit' of Tokelau. Evidently when one parent speaks Samoan and the other Tokelau, the child tends to be more proficient in Samoan. This is clearly because almost every Tokelau adult speaks Samoan but very few Samoan adults speak Tokelau.

7.1.2. Home language experience

The interview schedule contained questions relating to a number of aspects of the home language experience of the children. Analysis of the data enabled observations to be made on the first language of the parents and on their attitudes to the use of both English and Tokelau in the home. The effect of home language experience on the

development of skills in both languages was also investigated.

7.1.2.1 Parents' first language

The number of parents of the seven year old Tokelau children who claimed that Tokelau was their first language was noticeably larger than the number of parents of the younger children making this claim (Table 53). In fact 27% of the younger children had Samoan mothers, and this is reflected in the first language skills

Table 53 Parents' first language⁴

	5 years		7 years	
	Mother	Father	Mother	Father
	%	%	%	%
English	8	8	4	6
Tokelau	64	83	84	88
Samoan	27	6	8	2
Maori	2	-	2	-
Other P.I.	-	-	2	-

of their children (cf. §7.1.1). Clearly the children in the older age group come from a more evidently Tokelauan background than the children in the younger group.

7.1.2.2 Attitudes to English

There is some evidence that Tokelau parents who feel themselves to be less proficient in English than Tokelau are prepared nevertheless to use English with their children.

The parents⁵ were asked which language they considered to be

4. In each of the five year old and seven year old groups, 4% of the children had no father.

5. The mothers answered on behalf of the fathers unless the fathers were also present.

their best (Table 54) and which language they normally used with their children at home (Table 55).

Table 54 Parents' best language

	5 years		7 years	
	Mother	Father	Mother	Father
	%	%	%	%
English	10	13	6	8
Tokelau	54	64	82	80
Samoan	25	6	8	2
Tokelau/Samoan	4	2	-	2
English/Samoan	-	2	-	2
English/Tokelau	8	8	-	2
English/Maori	-	-	2	-
Maori/Tokelau/Ellice	-	2	2	-

Table 55 Parents' home language use

	5 years		7 years	
	Mother	Father	Mother	Father
	%	%	%	%
English	19	23	16	28
Tokelau	58	52	66	60
Samoan	21	15	10	2
Tokelau/Samoan	-	-	4	-
English/Samoan	2	4	-	4
English/Tokelau	-	2	4	2

When the two tables are compared it can be seen that the number of parents who claim that English is their best language is much less than the number who report using English at home (Table 56).

Table 56 Number of parents who reported speaking English best expressed as a percentage of the number of parents who reported using English in the home

	5 years	7 years
Mother	50	38
Father	58	29

Clearly many parents are using English with their children even when this is not the language in which they consider themselves to be most proficient. They are aware, it would seem, that English is the language that provides the key to educational and economic success in New Zealand society.

To find out the more overt response that Tokelau mothers make to this pressure they were asked whether they attempted either to speak English to their children or to correct their English (Table 57).

Table 57 Attempts by Tokelau mothers to speak English to their children and to correct their children's English

	5 years %	7 years %
Attempts to speak English	52	46
Attempts to correct English	42	36

As with all self-report data the responses cannot be taken as fact, but rather as indicative of hopes and aspirations. In this case responses to these questions can be interpreted as an indication of what the mothers would like to think they ought to do, rather than what they actually do. Table 57 shows that a considerable number were aware of the importance of English, and were prepared to try to meet the English language needs of their children. In fact, the number of mothers who made this attempt was considerably larger than the number who reported using English in the home (Table 55).

Table 54 gives an indication of how competent the mothers felt they were to meet these needs, and a comparison of Tables 54 and 57 yields a measure of the tension that the mothers felt between the pressure to speak English and their own confidence in their ability to respond to that pressure. This measure was obtained by expressing the number of those mothers who reported attempting to speak English to their children as a percentage of the number who reported that English was not their best language. 68% of the mothers of five year olds and 49% of the mothers of seven year olds felt little or no confidence in their English language skills but said they were prepared to try to speak English with their children. These pressures are evidence of the considerable linguistic insecurity that the pressure to learn English can bring.

7.1.2.3 Attitudes to Tokelau

To investigate the attitudes of Tokelau mothers towards their native language, they were asked whether they wanted their children to be able to speak Tokelau (or Samoan etc.) when they were grown up (Table 58).

Table 58 Mothers' language preferences for their children when adult

	5 years	7 years
	%	%
English only	12	14
Tokelau	66	68
Samoan	4	-
Tokelau/Samoan	6	-
Tokelau/Maori	2	-
Not worried	4	12
Not applicable (Mother English and/or Maori speaking)	8	6

The mothers generally expressed positive attitudes towards

the continued use of Tokelau by their children. They all wanted their children to be able to speak English well, but only 12% of the mothers of the younger children and 14% of the mothers of the older children wanted their children to be monolingual in English.

Mothers who did not want their children to be bilingual considered that identification with the Tokelau community would retard progress in the Pakeha world. They furthermore doubted whether their child could cope adequately with two languages, and clearly thought that learning Tokelau as a child, which is essential if they are to speak it as an adult, might impair their educational progress.

Mothers who wanted their children to be able to speak Tokelau frequently expressed this desire very strongly. They would say "It's my language", "It's the language of my people" and so forth. They generally equated the continued use of the Tokelau language by the next generation with the continued existence of the Tokelau people as an identifiably separate culture. In this context they often referred nostalgically to life back in the Tokelaus, expressing the desire that their children should feel that that is where they belong culturally. Of course, a knowledge of Tokelau is essential for participation in Tokelau Island life. Results reported in §7.1.2.2 suggested that Tokelau parents are strongly aware of the importance of English. However, results reported in this section suggest that they would be reluctant to see pressure from the English language lead to a downgrading or eventual loss of their own language.

7.1.2.4 Effect of home language experience on English and Tokelau language skills

7.1.2.4a Effect on English language skills

The language background (first language, best language) of the mothers

has a possible effect on the ability of the Tokelau children to understand the vocabulary and structure of English. Neither the language background of the fathers or the language usage of either parent had any effect.

An analysis of variation between the variables associated with the home language experience of the children and the scores obtained on the vocabulary and structure measures⁶ indicated that the first language of the mother had a possibly significant effect on both the vocabulary ($z = 2.11$; $p < .05$) and structure ($z = 2.12$; $p < .05$). The language the mothers thought they spoke best had a possibly significant effect on structure scores only ($z = 2.09$; $p < .05$)⁷. Analysis of all other variables, including the use of English by Tokelau - speaking parents produced non-significant results (Appendix XXI).

These results demonstrate that where the first language of the mother is English the scores of the children on the vocabulary and structure scores is significantly better than if the mother's first language is not English. The fact that no such relation existed between the father's first language and the children's scores suggests that the English language development of Tokelau children is less affected by their fathers than by their mothers. This is scarcely surprising since most young Tokelau children are cared for by their mothers while their fathers work.

Taken in conjunction with this data on the effect of the

6. Since the vocabulary and structure scores were binary data, the logistic factorial model for the analysis of binary data (Appendix XII) was used. The sociolinguistic data were reduced to binary form, English and non-English. Only the significance of main effect variables was investigated because some cell numbers became unacceptably low when first order interactions were considered.

7. The interaction between the language the mother thought she spoke best and vocabulary scores was significant at the 10% level.

parents' first languages, the non-significant relation between the language usage of either parent and scores obtained on the two comprehension measures demonstrates the futility of persuading non-English speaking parents to use English in the home.

7.1.2.4b Effect on Tokelau language skills

Variables associated with the language abilities and usage of the Tokelau parents were analysed by the χ^2 test with the ratings made by the Tokelau research assistant of the childrens' ability to speak and understand Tokelau (Table 59).⁸

Table 59 χ^2 values of the association between language background and Tokelau language skills

	Tokelau Speaking		Tokelau Understanding	
	5 years	7 years	5 years	7 years
Mothers' first language	25.26***	14.26**	22.29***	20.07***
Mothers' language usage	38.70***	20.26***	34.50***	19.00***
Fathers' first language	6.86	6.91	6.00	5.73
Fathers' language usage	30.82***	21.36***	24.03***	21.41***
Mothers' language choice for child	29.71***	5.06	30.06***	3.83

** $p < .01$; *** $p < .001$

The language background of the mothers and the language usage of both parents has a highly significant effect on the ability of the children to speak and understand Tokelau. However, the fathers' language background was a non-significant variable. A possible explanation for this may lie in a slight tendency on the part of fathers whose first language is not English to use English

8. Full Tables are given in Appendix XXII.

at home (Table 55).

7.1.3 Effect of demographic variables

None of the demographic variables investigated (place of birth, parents' place of birth, pre-school attendance, number of schools attended, family structure, presence of television, and books in the home) had any observable effect on scores obtained by Tokelau children in either vocabulary or the structure test.⁹ Full results, together with tables showing the percentage results of each of the variables are given in Appendix XXIII.

The fact that the Standard Deviations of the scores obtained by each group on each of the vocabulary and structure tests (Appendix XV) indicates that the scores of each of them were relatively homogenous on these variables. It is therefore unlikely that the acquisition of English by any individual child was particularly affected by any of these variables. However, this investigation was, intentionally, only a preliminary one, and it is therefore possible that the variable categories were too gross to show significant results. In addition the difficulties of separating out the effects of each variable (and possibly of others not studied) are very great, and a more tightly planned study designed specifically to investigate these questions is necessary.

7.1.4 Language relations between home and school

Children from a linguistic minority who receive their schooling in a second language have little opportunity to use their own language in New Zealand schools. The role of the native language, if any,

9. In order to keep the numbers in each cell at an acceptable level, only the main effects of each of the variables with each of the scores were considered. The logistic factorial model was used.

is seen clearly as that of the home language only, so there is, for these children, a marked difference in the language experience of the home and of the school.

In this situation the transition between home and school can be very abrupt. Current concern with the education of minority group children has stressed that familiarity on the part of the teacher with the child's language background can play an important part in easing this transition. This study enabled a partial investigation to be made on the extent to which such a strategy is followed. Familiarity with home language experience entails a knowledge of which is the child's first language. Teachers were asked to identify this language and the results were compared with the rating made by the Tokelau research assistant.

Another approach to the reduction of transition problems is to introduce use of the native language into the school so the break is not so marked. It is an approach widely advocated in the development of bilingual programmes in the United States. The communication task provided an opportunity to explore the readiness and ability of the Tokelau children to use their language in a school situation.

7.1.4.1 Teachers' familiarity with home language experience

The familiarity of teachers with the home language experience of the Tokelau children is very limited. Many teachers were not aware when the child's first language was English, and showed a noticeable tendency to underestimate the number of English speakers (Table 60).

Table 60 Percentage estimates by teachers and by the research assistant of the numbers of Tokelau children for whom English is a first language

	5 years %	7 years %
Teachers	7	4
Research assistant	21	20

A possible explanation for this is that many Tokelau children are extremely quiet in the school room, and this is interpreted by their teachers as evidence that English is not their first language (cf. §6.2.3.2).

7.1.4.2 The use of Tokelau in a school-oriented task

The communication task developed for use in this study was in many respects the type of task that young children are given in school. It had a considerable game element (the presence of the screen induced much interest and fascination) but there was also a fairly specific requirement: to describe a particular object or picture.

In the task Tokelau speaking pairs were given the option of using their own language if they wished. There was no pressure on them one way or another although it was necessary in all cases to make this option very clear to the children. The number who chose to use Tokelau provides an indication of their readiness to use their language in a school situation, and a comparison of their scores with those obtained by Tokelau children who used English provides an indication of their ability to use it for this purpose. Finally a brief description of code-switching by the Tokelau-speakers points to the linguistic tension that these children are experiencing.

7.1.4.2a Readiness to use Tokelau

Five year old Tokelau children show more readiness to use their own

language than seven year old Tokelau children (Table 61).

Table 61 Tokelau -speaking pairs electing to use English
and Tokelau

	5 years %	7 years %
Tokelau	83	30
English	17	70

$$\chi^2 = 57.16; p < .001$$

This is clear evidence that the expectations of the schools are that children should speak English. The seven year olds are more aware of these expectations than the new entrants, although their Tokelau language skills are superior (cf. §7.1.1).

7.1.4.2b Ability to use Tokelau

The communicative efficiency of the five year old Tokelau speakers who chose to use their own language was comparable to that of Tokelau pairs who spoke English (Table 62).

Table 62 Intra-ethnic communication scores obtained by five year
old Tokelau children using Tokelau and English:
Number, means, standard deviations and t-values

	N	M	SD	t
Tokelau	5	1.50	.71	.57
English	6	1.67	.65	

The Ns were very small but the t-value is sufficiently low for this conclusion to be made with some confidence. The number of Tokelau -speaking pairs at the seven year old level was not high enough (3) for analysis of their scores to be made.

7.1.4.2c Code - switching

The transcripts of the communication task show a few instances in which pairs of Tokelau children who had elected to use Tokelau make use of English words and phrases. Sometimes these were phonologically unassimilated but with the appropriate Tokelau grammatical markers as ko white, and sometimes they were partially assimilated as in te blooming (brooming; i.e. sweeping) which shows a productive use of the -ing morpheme. These are clearly instances in which the speaker could not think of the Tokelau word and so used the English. In fact, colour terms frequently fell into this category. The converse occurred only once as in an orange kofu (dress) and in fact this was the signal for the pair to switch and the rest of the exchange was substantially in Tokelau. A transcript of this exchange and of others in Tokelau is given in Appendix XVII.

The pairs who chose to use Tokelau had to make a positive choice to do so and in a number of cases there was initial hesitation. In some of these code - switching caused by a lexical gap in English would precipitate a complete switch to Tokelau as in an orange kofu. It appeared that the children were not familiar with the use of Tokelau in school, and a decision to use their own language was not easily made.

7.1.5 An overview

The overall picture of the Tokelau children that is given by the information reported in this section is consistent with the general description given in §1 of a community which, having recently migrated, is still relatively culturally homogenous and which still knows and is still making wide use of their own language. However, it is a community, which is under considerable linguistic pressure from the dominant language English.

Such pressure, when it takes the form of persuading parents to use English with their children at home, is not necessary for the evidence suggests a diminishing relation between knowledge of Tokelau and the development of English language skills, and clearly shows that the use of English by mothers who were not fluent in English has no effect on the development of English language skills. There was no evidence of any relation between the demographic variables studied and progress in the acquisition of English.

In school, English is firmly entrenched as the language of education, even to the extent that teachers are not generally willing to find out about any other languages that the children they teach might know. The strength of this expectation appears to increase with the length of time the child is in school. Five year old Tokelau-speaking children are willing, despite some initial difficulties involved in making the choice, to use their language when they are given the opportunity. Seven year olds are noticeably less willing. When they choose to use Tokelau the ability of the younger children is equal to that of the children who used English. The implications of these findings for the language education of Tokelau children are taken up in §8.

7.2 Factors associated with communication success

The main section of this research was designed to measure aspects of the English language skills of Tokelau children who were learning English as a second language. In order that the maximum pedagogical value may be derived from the study this section looks at the relation between these measures and factors that contribute to success on them. The hope is that further suggestions for the construction of suitable approaches to the language education of

Tokelau children may be identified. This analysis therefore entails a consideration of the scores reported in §6 in the light of additional information.

It was found possible to investigate three potential factors: reaction times, communicative style and errors in speech. These investigations are essentially post hoc, and in many cases it would seem that they raise more questions than they answer. It was however felt, that in the context of cross-cultural research and in the light of the established need for young Tokelauan children to learn English, any insights into the topic would be useful.

7.2.1 Reaction times

Reaction time data was recorded to provide an additional perspective on the control of English by both Tokelau children and Pakeha children. Accordingly the data was analysed for evidence of differences between the two ethnic groups. In addition the relation between response time and accuracy and the direction of that relation has implications, which are outlined below, for the successful operation of communication between the two ethnic groups.

The relation between response time and accuracy may be in one of two directions. Either reaction time is the underlying explanatory variable of score difference (Kagan, 1966), or differences in the difficulty level of items is the explanatory variable of the reaction times (Kennedy, 1970a). These two relations will be referred to as the reaction time relation and the difficulty level relation respectively.

The two relations predict a different association between reaction time and score. Correlations supporting the reaction time relation will be positive, indicating that rapid responses are more

likely to produce low scores than more considered responses. On the other hand, a difficulty level relation is indicated by negative correlations, because rapid responses occur when the items are relatively easy and scores are high.

There were, however, variations between the two testing situations that could also affect any relation observed in this study. The comprehension test was conducted in a very carefully structured test situation. It was made clear to the children that there was opportunity to make only one response and no subsequent ones were either invited or scored. Of course, if any were offered the child was not actively penalized in any way, but they were discounted. Responses in this situation were therefore constrained. By contrast, responses on the communication task were relatively unconstrained. Listeners were free to respond by any verbal means they chose as part of the joint efforts of the pair to achieve communication. If early errors were made they were only scored when it was clear that both children were themselves satisfied that they were correct. Otherwise such errors were regarded as an integral part of the communication process.

The constrained situation of the comprehension tests encourages the child to delay reaction on a difficult item until he has had sufficient time to process it. It is therefore anticipated that the difficulty level relation holds in such situations. On the other hand, the comparative freedom of the unconstrained situation of the communication task possibly encourages the child to persist in the task in order to achieve accuracy, so where more time is taken scores will be higher. Where participants fail to allow themselves enough time errors will be made. In such situations it was expected that communicative tempo would be the basis of

communication success, and that the reaction time relation would hold.

However, the cross-cultural aspect of the present study further complicates these predictions. Barrett (1975) has suggested that the characteristics of the test situation may produce different responses in children from different ethnic groups. In a study of the relation between reaction times and accuracy on the PPVT under different testing conditions she reports that Maori children made more errors under rigid testing conditions than they did when the atmosphere was more relaxed and than Pakeha children did under similar rigid conditions. Barrett suggested that the explanation for this was that the children felt threatened by the test situation and wanted to end it as soon as they could. If it can be assumed that Tokelauans are ethnically identifiable with Maoris (both groups are Polynesians), Barrett's work suggests that there will be a difference between Tokelau and Pakeha children in the observed relation between reaction times and score. The responses of the Tokelau children will show the reaction time relation, and those of the Pakeha children will show the difficulty level relation. In this study, this prediction applies only on the comprehension test. The communication task was in no way comparable to the procedures used by Barrett.

The nature of the association between reaction times and scores has implications for communicative success whether it is a difficulty level relation or a reaction time relation. Where a difficulty level relation holds, the implication is that children require longer to process the more difficult items. It is clear too, that where times are longer for one group of children, these children require more processing time than the other children do. Where a reaction time relation holds, children exhibit a tendency

to make a rapid response that induces errors. These errors can potentially contribute to communication failure. If the reason for this tendency is found to be either impulsiveness (Kagan, 1966) or a high level of anxiety (Barrett, 1975), correction of these factors should improve communication.

7.2.1.1 Structure test

Differences between the reaction times of children from the two ethnic groups were investigated. To explore the suggested relations between reaction times and scores, correlations between reaction times and scores and between reaction times and difficulty levels were calculated. Further analysis was carried out on variables grouped as for analysis of the scores. The groups thus corresponded to those in §6.3.2. This was undertaken to investigate the type of response made by each group of children to individual items that they found particularly difficult.

Although evidence of both relations was found, the difficulty level relation was found to predominate. There was also evidence of age development and of differences between the two ethnic groups.

Analysis of the reaction times in groups further showed that reaction time data can be used to assess the validity of items. Two examples of this occurred, and they are discussed in §7.3.1.3 together with other data relevant to testing procedures.

Variables investigated: Reaction times were recorded on structural variables tested during the second session only. These are:

2. Singular
3. Plural
5. Past
6. Present
7. Negative
8. Passive and negative

19. Who questioning Agent, active
20. Who questioning Object, active
21. Who questioning Locative, active
22. What questioning Agent, active
23. What questioning Object, active
24. What questioning Locative, active
25. What questioning Verb, active
26. Which questioning Agent, active
27. Which questioning Object, active
28. Which questioning Locative, active
30. Who questioning Agent, passive
31. Who questioning Object, passive
32. What questioning Agent, passive
33. What questioning Object, passive
34. Which questioning Agent, passive
35. Which questioning Object, passive
36. Yes/no questions, active - yes
37. Yes/no questions, active - no
38. Yes/no questions, passive -yes
39. Yes/no questions, passive - no
40. If - main clause (true)
41. If - main clause (false)
42. If not - main clause (true)
43. If not - main clause (false)
44. Main clause - if (true)
45. Main clause - if (false)
46. Main clause - if not (true)
47. Main clause - if not (false)

Calculation procedures: Latency scores could not be taken when a child made no response. Since no-responses were scored as incorrect, latency calculations were performed on correct responses only. All calculations were made on the mean time of two correct responses or, in cases in which only one correct response was made, on that response time alone.

All reaction times were transformed by a logarithmic transformation and all analyses were performed on the transformed scores. In the first place times were correlated with scores, and then additional statistical investigations were made by analyses of variance of groups of variables corresponding to those studied in §6.3.2.

All significance levels for the analysis of variance were obtained from the tables in Winer (1962). However, Winer gives the ^{significance} λ of the F ratio at the .05 and .01 levels only. There are instances in the results reported in this section where the significance level

was clearly beyond the .001 level, but this could not be ascertained.

7.2.1.1a Differences between the two ethnic groups, and evidence of age development

Tokelau children at both age levels respond at a slower rate than Pakeha children of the same age level, but there is some evidence that the response rate of the Tokelau children becomes more rapid over the two year period.

An analysis of variance of ethnic group and age indicated clearly significant ethnic group differences ($F = 8.86$; $p < .01$) and clearly significant age differences ($F = 9.79$; $p < .01$), but no interaction between the two variables ($F = .31$). The full analysis is given in Appendix XXIV, Table i. When the mean reaction times of each group (Table 63) were examined, it was found that Tokelau children respond more slowly than Pakeha children, and younger

Table 63 Reaction times: transformed means and t-values

	5 years	7 years	t
Tokelauans	.46	.41	2.13*
Pakehas	.41	.38	1.88
	2.48*	1.38	

* $p < .05$

children respond more slowly than older children.

The fact that the differences between the two groups are greater at the five year level than at the seven year level is some indication that, although there is no interaction between ethnic group and age, the response rate of the Tokelau children is not only becoming more rapid over the two year period, but it is also approaching that of the Pakehas. It appears then, that an increase in the rate of response parallels an increase in the growth of structural knowledge (cf. §6.1.2).

Although these results indicate that Tokelau children respond more slowly than Pakehas, they do not indicate whether any particular difficulties were experienced by the Tokelauans. The data is further analysed for information of this point in the next two sections where the evidence for both difficulty level and reaction time relations is explored.

7.2.1.1b Difficulty level relation

For each group of children correlations between the mean reaction times and scores were very high (Table 64). They were also very similar.

Table 64 Correlations between mean scores and mean reaction times

	5 years	7 years
	r	r
Tokelauans	-.55***	-.54***
Pakehas	-.47***	-.53***

*** $p < .001$

The fact that the co-efficients are negative indicates that this is a difficulty level relation. The more difficult items (on which the scores were low) took a long time (had a longer reaction time) and the easy items were responded to quickly.

This finding was supported by an analysis of variance performed on the reaction times of the easiest and the most difficult items (Appendix XXIV, Table ii.¹⁰ The F ratio of the difference between the times taken for easy and difficult items was 46.58. This is

10. To obtain the extremes of ease and difficulty, mean reaction times on variables the mean score of which either on or below the lower quantile or on or above the upper quantile were selected.

highly significant ($p < .001$).

Separate analyses of number and conditional variables provide further evidence of the general applicability of the difficulty level relation. In each case the difference in reaction times corresponds to the difficulty level of the items as indicated by the scores.

The analysis of reaction time data on the number variables indicates a significant difference ($F = 33.90$; $p < .01$) between singular and plural. The full analysis of variance is given in Appendix XXIV, iv. Reaction times on singular items were less (mean = .23) than on plural items (mean = .32). Analysis of scores reported in §6.3.2.3a indicated that singular items were easier than plural items.

Analysis of the conditional items points to the same relation between reaction times and difficulty level. Separate analyses of variance were performed on the variables of conditional clause position, polarity and truth value for each group of children (Appendix XXIV, Tables iv-vii). The results show that in each case the only main effect variable significant at the 1% level or above was truth value. Reaction times were longer on false items than on true items (Table 65).

Table 65 Reaction times on true and false conditionals:
transformed means

	Tokelauans		Pakehas	
	5 years	7 years	5 years	7 years
True	.35	.38	.39	.31
False	.61	.50	.50	.39

Results reported in §6.3.2.5e indicate that all children found false

items harder than true items. Clearly all children took longer to respond to the more difficult false items than to the easier true items.

7.2.1.1c Reaction time relation

Evidence for reaction time relations is very limited. It is confined to one group of variables only, questions in either the active or the passive on either the agentive or the objective case.

Analysis reported above (§6.3.2.2a) showed that questions in the passive on the objective were difficult for all the children. Since the general trend was for a clear difficulty level relation for all groups of children, it was expected that reaction times for these items would be longer than for the others. However, analyses of variance for each age level (Appendix XXIV, viii and ix) showed that there was a voice by case interaction at the seven year level only (5 years: $F = .49$, ns.; 7 years: $F = 15.44$, $p < .01$). There were no interactions between ethnic group and either of the linguistic variables.

Comparison of the means (Table 66) shows that, whereas the mean

Table 66 Reaction times on questions (voice and case):
transformed means

	Active		Passive	
	Agentive	Objective	Agentive	Objective
5 years	.59	.57	.58	.59
7 years	.55	.50	.52	.60

reaction time of the five year olds was similar on all the variables, the seven year olds took longer on passive/objective questions than they did on passive/agentive questions, but they took less time on active/objective questions than on active/agentive questions. It

would appear that the five year olds had failed to perceive that passive/objective questions were more difficult (scores on these items were very low) than other items in this group. They responded to them at the same rate, whereas the difficulty of the items meant that they required longer processing times. These results suggest that a reaction time relation held on these items.

The reaction times of the seven year olds more closely reflect the difficult levels of the items. But they are not completely parallel. Figs. 6 and 7 which show the reaction time interaction and the score interaction, indicate that the relation between difficulty and time holds for questions on the objective (subjects

Fig. 6 Interaction between the variables of voice and case

Fig. 7 Interaction between the variables of voice and case

Note: the scale has been reversed for easier comparison between the two graphs.

11. This figure is based on the following data.

	Active		Passive	
	Agentive	Objective	Agentive	Objective
7 years	38.43	47.78	22.23	-21.00

took longer to make a correct response to the more difficult passive questions), but reaction times on active/agentive questions were longer than on passive questions although the active questions were easier. However, reaction times and scores on each of the active/agentive and the active/objective questions were very close, indicating that there was little difference between the difficulty levels of these items. This could be responsible for obscuring the relation. This evidence suggests that a reaction time relation holds for the five year olds on passive/objective questions (they responded comparatively quickly to these difficult items), but not for the older children who took longer on the harder items. For the older children, the relation was a difficulty level one.

It is unlikely that the explanation for the reaction time relation on passive/objective questions for the younger children can be traced, as Kagan suggests, to a high anxiety level. The reaction time relation was not generally evidenced in this study, and anxiety in the test situation would affect scores and times on a large number of items. Rather this finding is an indication that these children did not perceive the difficulty of passive/objective questions and were either responding randomly or adopting a wrong strategy in their response. Since no record was made of what the incorrect responses were, it was not possible to pursue this line of reasoning further.

On the other hand, the difficulty level relation appears to hold for the seven year olds on items in this group. The more difficult passive/objective questions took longer to respond to. It might therefore be argued that the longer response times of the seven year olds are an indication that the difficulty of these structures has been perceived and that efforts are being made to follow the correct strategy. In which case the longer reaction

times are a sign that the seven year olds are closer to an easier comprehension of this structure than are the five year olds even though the latter made more rapid responses.

When the times of the five year olds from the two ethnic groups on these items are inspected (Table 67) it can be seen that the younger Tokelau children took longer on passive/objective

Table 67 Reaction times on questions (voice and case) by five
year olds: transformed means

	Active		Passive	
	Agentive	Objective	Agentive	Objective
Tokelauans	.61	.57	.61	.63
Pakehas	.59	.53	.53	.53

questions than they did on any other type, and longer too than the Pakeha children ($t = 4.04$; $p < .001$). Evidently the difficulty relation held for the Tokelau children and the reaction time relation for the Pakehas on this variable. It would appear then, that if the suggestion in the preceeding paragraph holds, that the five year Tokelauans were closer to comprehension of the passive/objective than were the five year old Pakehas. The Tokelauans were apparently aware that these were harder and that they required a longer reaction time. This supports the finding of §6.3.2.2a where it was shown that although the scores obtained by the two groups on passive/objective questions were similar, the comparative difficulty of these items for the Pakeha children indicated that they found them particularly hard.

7.2.1.2 Communication task

Analysis of the association between reaction times and scores on the communication task was performed to investigate the suggestion

that this association will follow a reaction time relation (cf. §7.2.1). However, this investigation is complicated by the nature of the communication task. The task was designed to investigate a particular ability, the ability to use language to effect communication. The reciprocal character of communication was reflected in the fact that scores were, in every case, assigned to pairs of children. Both the speakers and the listeners were included. The speaker's role was to initiate the communication and the listener's role was to respond, and difficulties were experienced on both sides of the screen. Where difficulties arose and communication was not readily effected, a speaker was encouraged to persist in his efforts. However, his persistence often depended as much on the patience of his listener as on his own abilities as a speaker. Because it is not possible therefore to say whether it is the performance of the speaker or of the listener that determines the length of the reaction time, observations on the score/reaction time relations apply to pairs of children.

Reaction times were also analysed for differences between each type of communication situation at each age level, and for evidence of an increase in communicationspeed over the two year period.

Procedures: To record the reaction times the following procedures were adopted. The stop-watch was started when the instructions were concluded and it was stopped when the correct item was identified by the listener. If it was apparent that no communication would take place, both the session and the watch were stopped after 60 seconds (cf. §3.4.1.1). In these cases a communication failure was recorded and no reaction time was taken. To be consistent all reaction times for failed communications were discounted, so only times for correct responses were included in the analysis.

Analysis: To normalize the data, all reaction times were transformed by a logarithmic transformation and all calculations were performed on the transformed scores.

7.2.1.2a Relation between reaction time and communication accuracy

Correlations between reaction times and scores were generally insignificant (Table 68). However, a significant positive correlation for the five year old Tokelau pairs who spoke their own language suggests that this is a reaction time relation. On the other hand, a strong negative correlation for five year olds in inter-ethnic situations in which the speaker is a Pakeha is evidence that this relation is a difficulty level one.

Table 68 Correlations between mean scores and mean reaction times: communication task

	5 years r	7 years r
T → T	.44(E); .83*(T)	-.29
P → P	.08	-.05
T → P	-.29	-.32
P → T	-.87**	-.18

* $p < .05$; ** $p < .01$

The low correlations for the seven year old groups and for two of the five year old groups indicate that most children were as likely to make a successful communication as they were to linger in the attempt.

The positive correlation for the Tokelau speaking five year olds shows that these children made more errors when they communicated rapidly, but made fewer when they persisted with the task. The correlation between these variables for the English speaking Tokelau children was not significant, but it was in the same direction.

This result would appear to support the reaction time hypothesis, but in practice, it is not really possible to separate out cause from effect. Does the fact that, for young Tokelau children, the items are harder (as gauged by lower scores) cause the more rapid response, or do rapid responses lead to wrong responses? Either way these two factors are clearly related and so contrast with difficulty level relations.

The significant negative correlation for five year olds in inter-ethnic communication in which a Pakeha child was the speaker suggests that this is a difficulty level relation. Where a pair found communication difficult (as gauged by low scores) they took longer to make a correct response, but where there was less difficulty communication was more rapidly achieved. The direction of the relation is not in doubt here as it is most unlikely that the longer communication times caused the lower level of accuracy.

In situations where the reaction time relation holds, an explanation for the tendency to make rapid responses must be sought. This is difficult in this case because the reciprocal nature of the task means that the performance of speaker and listener cannot be separately identified. However, two explanations for the reaction time relation have been advanced and these must be mentioned. Kagan (1966) has suggested that this relation is the consequence of a more general tendency to impulsiveness, while Barrett (1975) more specifically suggests that it indicates that children feel threatened by a testing situation and want to end it as soon as they can. The evidence of a reaction time relation among five year old Tokelau children might suggest that these children are impulsive or feel threatened in this situation. But this situation cannot be maintained when it is realised that the same children also participated in a communication task with Pakeha

children where a difficulty level relation was observed. The reasons why the relation between reaction times and scores when five year old Tokelau children are the listeners should be a reaction time relation when the speaker is a Tokelauan and a difficulty level relation when the speaker is a Pakeha are not clear. Either the performance of Tokelau speakers differs from that of Pakeha speakers when the listener is a Tokelauan or the other way round (the performance of Tokelau listeners varies according to the ethnic group of the speaker). Probably both suggestions are correct.

It is of interest however to note that where communication was least successful (5 years: $P \rightarrow T$) the relation was a difficulty level one. Persistence by either speaker or listener or by them both resulted in increased efficiency. In general however these findings provide no consistent support for either a reaction time relation or a difficulty level relation on the communication task. This fact in itself suggests that time taken, be it long or short, is not a major factor contributing to success on the task.

7.2.1.2b Variation in communication situations

There were no significant differences between reaction times for successful communication situations at either age level (Table 69 and 70).

Table 69 Communication task reaction times (five year olds):
numbers, means, standard deviations and t-values

	M	SD	N	$P \rightarrow P$ t	$T \rightarrow P$ t	$P \rightarrow T$ t
$T \rightarrow T$	1.41	.21	20	1.86	.00	.21
$P \rightarrow P$	1.24	.34	21	-	1.66	1.42
$T \rightarrow P$	1.41	.27	16	-	-	.18
$P \rightarrow T$	1.39	.32	19	-	-	-

Table 70 Communication task reaction times (seven year olds):
numbers, means, standard deviations and t-values

	M	SD	N	P → P t	T → P t	P → T t
T → T	1.19	.30	31	.19	.81	.04
P → P	1.18	.20	32	-	1.51	.95
T → P	1.25	.25	30	-	-	.28
P → T	1.23	.24	32	-	-	-

7.2.1.2c Age development

Each type of communication group involving at least one Tokelau child showed some increase in speed when communication was successful, over the two year period (Table 71).

Table 71 Differences between communication task reaction times
of five and seven year olds: t-values

	t
T → T	2.88**
P → P	.81
T → P	2.00*
P → T	1.96*

7.2.1.3 Discussion

The matching of the response rate of the listener to the expectations of the speaker and the requirements of the topic is an important component of communication success. When a speaker has to wait for what seems to him to be a disproportionate amount of time before his listener makes a response, the success of the communication may be threatened. On the other hand, a listener may make a response that is too rapid, and which does not allow him sufficient time to process the message. Information on reaction times reported in this section points to the possibility of these situations occurring, and to their implications for communication between Tokelau and Pakeha children. These implications are discussed below. In addition, evidence of variation in reaction times between different

ethnic groups suggests implications for cross-cultural testing. These are discussed in §7.3.

Information on the communication task did not point to a clear relation between reaction^{times} and scores, but data from the test of structural comprehension indicated that reaction times were generally associated with difficulty level; more difficult items tended to take longer. Hence the association was a difficulty level relation of the type outlined above. Speed of response differentiated between second language learners and native speakers in that Tokelau children took longer to make a correct response than Pakeha children. This difference in performance constituted a distinction, in addition to that of the scores, between the two ethnic groups. There was extremely limited evidence of a reaction time relation and what evidence there was suggested that children from both ethnic groups tended to make rapid responses where they had not perceived the difficulty level of the item. It did not therefore contradict the evidence of a general difficulty level relation. In no way was the reaction time relation evidence of either a tendency to impulsiveness or of a high anxiety level for children from either ethnic group. On the contrary, the consistency of the difficulty level relation is evidence that children were sufficiently relaxed to delay a response until they felt confident that the necessary processing had been completed. The evidence of a difficulty level relation in this study does not generally support Barrett's (1975) study in which she reports that a reaction time relation accounts for variation in response rate between Maori and Pakeha children over different test conditions. She did, however, note that rapid responses were most clearly evidenced under test conditions offering minimal support. Test

conditions in this study offered maximum support, and it is possible that this alleviated test anxiety and suppressed any tendency to make rapid responses.

The reaction time data from the comprehension test was all recorded in a carefully structured test situation, albeit a relaxed one. This differed from a natural communication situation in a number of ways (cf. §3.3) and therefore it is only with some caution that the findings can be related to the real life problems that Tokelau children may have in understanding English. In a natural communication situation, additional clues both linguistic and situational are available, and natural redundancy assists communication. But these clues may also be relatively confusing, for it is possible that the nature of a correct or appropriate response is not as clear under these circumstances as it is in a test situation. Data from this study suggests that, even where Tokelau children understand, they may be appreciably slower to make a correct response. This slowness may be interpreted as a lack of comprehension, and would be likely to give the impression that further speech would not be understood. It is in such situations that communication breaks down.

The ambiguous nature of the evidence from the communication task would appear to contradict this suggestion. Analysis of the scores and reaction times indicated no clear relation between time taken and communication success. However, the nature of the task meant that the contribution of either the speaker or the listener could not be separately identified. Furthermore the task differed from natural communication in one important respect. The presence of a screen separating the participants led to a complete reliance on verbal means of communication. The only signs of comprehension that the listener could offer to the speaker were

verbal ones. In natural situations non-verbal feedback would also be offered. However, feedback of any type was not really necessary for communication to be effected, and both §7.2.2.1 and Appendix XVI show that the occurrence of verbal feedback was infrequent. Evidence that communication had succeeded generally involved a non-verbal identification of the object itself to the investigator. The task therefore encouraged the speaker to be independent of listener response. Communication task data could, therefore, provide no evidence of the exact effect of delayed response by the listener in natural communication settings, although results from the comprehension test suggest that some delay might occur.

7.2.2 Communicative style

Analysis of the scores obtained on the communication task indicated that there were differences in communicative efficiency between the groups of children who participated in the study (cf. §6.1.2). However, the task used has also a diagnostic value which permits the investigation of some factors that may be associated with communicative failure or success. It has, in particular, been used to study differences in communicative style and the relation between communicative style and communicative efficiency. The following outline of previous findings in this field points to the relevance of this line of inquiry for the present study and suggests some dimensions worth following up.

Differences between the communicative efficiency of children at different age levels were noted in a number of studies (cf. §3.4.1). In their discussion of their findings, Glucksberg and Krauss (1967) suggested that the comparatively low communicative abilities of younger children can be attributed to a lack of social editing skills,

but they produced no experimental evidence in direct support of this suggestion. Flavell et al. (1968) investigated this hypothesis and the nature of these social editing skills. In addition to obtaining a measure of communicative efficiency, they investigated the style of the communication messages of the children, and found that the development of role-taking skills (the ability to perceive and to meet the listeners' needs) and the decline of ego-centric speech (Piaget, 1926) enable subjects to produce messages that may result in improved communicative efficiency.

It is likely therefore that the greater communicative ability of older children can be attributed to an increase in the development of skills related to awareness of the needs of the listener. But differences in communicative efficiency have also been found between children of the same age but from different socio-economic groups. Bernstein (1972) has suggested that these are also attributable to variation in the development of social editing skills and can be traced to differences in child rearing practices among parents from different social groups. Heider (1969) used the communication task technique to investigate this suggestion. She found that there were differences in communication style between pairs of middle class children and pairs of lower class children, and that these differences correlated with differences in communicative efficiency.

While it is by no means clear that the studies of British class differences have any relevance in New Zealand, these studies do point to the possibility that variation in communication efficiency can be traced to variation in communicative style. This in turn raises the question of what effect, if any, these differences in communicative style may have on the communication

efficiency of pairs of children from different social groups. Ruth (1966), Krauss and Rotter (1968) and Heider (1969) have separately investigated the hypothesis that intra-group communication is more efficient than inter-group communication, but their results are conflicting. The findings of Krauss and Rotter and of Ruth suggest that both types of communication are equally efficient, whereas Heider's results suggest that intra-group communication is more efficient. It is possible that these differences can be traced to variation in the procedures for subject selection: in the Krauss and Rotter and the Ruth studies the two groups, middle class and lower class, are less clearly differentiated from each other than they are in Heider's study, and so it is less likely that social class differences in communicative ability would be shown up. In contrast, Heider followed very stringent selection procedures that clearly differentiated the socio-economic status of the subjects. It would seem then that where subjects are clearly differentiated as to socio-economic status, differences in communicative style are likely to be sufficiently great for inter-group communication to be less efficient than intra-group communication.

These findings suggest that differences in communicative style between Tokelau and Pakeha children, which reflect variation in the development of social editing skills, may contribute to the comparative difficulty of inter-ethnic communication. An exploratory analysis of the data in this research was undertaken to examine aspects of the communicative style of speakers (and of listeners where feedback was offered) and to try to relate them to communication efficiency. Because the study centered upon children who were learning English as a second language, further analyses

were undertaken to explore the use of English by speakers, both Tokelau and Pakeha, in the construction of messages.

The communications were all recorded on a Sony cassette tape recorder (TC-126CS) and these were transcribed into conventional orthography. These transcripts formed the basis of the analyses.

Initially the transcripts were examined for insights into the nature of the approaches to the communication task that the children tended to adopt. The account of these (§7.2.2.1) is both impressionistic and heuristic since quantitative analysis was not only impossible but also inappropriate. Transcripts were subsequently analysed for information of quantitative aspects of communicative style and their relation to communicative efficiency. In the formulation of the approach to this analysis three specific questions were asked:

1. How frequent were the indicators of inter-personal relations (vocatives, questions, imperatives) used by children in each type of communication setting and to what extent was feedback offered?
2. What was the ability of speakers in different communication settings to make use of a variety of words to effect communication?
3. To what extent do speakers in different communication settings make use of repetition?

7.2.2.1 Approaches

In the effort to achieve communication the children followed a variety of approaches. This variety was both very rich and extraordinarily elusive and this attempt to present this diversity is necessarily sparse. The reader is also encouraged to refer to Appendix XVII for further examples of the transcripts.

This account makes no attempt to trace an association between the approach adopted by the speaker and success or failure on the task. This account, in fact, demonstrates that such an association is unlikely to be found. In some cases a particular procedure would succeed and the listener could identify the object correctly and in other cases the same procedure would fail.

The communicative demands of this task required the child to relate, in some way, an object¹² to the listener. Ideally it required consideration of both the physical properties of the object and the requirements of the listener. However, the object was clearly the most immediate component (the child could see it, whereas he was separated from the listener by a screen), and therefore most of the communications focussed on the object with few linguistic indicators of the fact that this was a communicative act (cf. §7.2.2.2). In fact, there were very few instances of sustained dialogue.

The attention commanded by the object led most speakers to focus on its physical properties, and most communications took the form of a listing of these. Typical is the following description of one of the dolls. It was spoken by a seven year old Pakeha girl to a Tokelauan:¹³

This girl ... she's got yellow hair and she's got orange coat and a yellow ribbon and a yellow thing around her and she's got one shoe on ...

or this description of one of the cars spoken by a five year old

12. Throughout this section 'object' is used to refer to the item the child was required to describe. In two cases, however, this was a picture.

13. No attempt was made in the transcriptions to identify sentence boundaries. Longer pauses are marked by three dots and shorter pauses are marked by commas.

Tokelau boy to another Tokelauan:

It's got a man in it and it's blue and it's red
and ... it's got a number nine and it's a racing
car and it's got a ...

Most of the communications were of this nature, and their success rate was on the whole high. It was a procedure that enabled the speaker to impart information about the object to the listener without the necessity of paying particular attention to the listener's requirements. Furthermore it was a relatively simple procedure to follow: there were not many constraints on the order in which attributes of the object could be named. However some speakers failed to achieve a sufficient level of internal organization for the communication to succeed. They became confused and this sometimes resulted in unsuccessful communication. Typical is this description of Snow White spoken by a seven year old Pakeha girl to another Pakeha:

She's got black hair ... a red ribbon and her
her ... she's got a white big singlet coming
out of her frock ... and blue and red on her
sleeves, purples and brown on her middle ...
brown frock and a brown ... and a light brown
frock, and a red frock ... there's a broom ...

Although a factual approach was the most common one, there were a number of communications in which the speaker showed an understanding of the physical features of the object and offered some interpretation or comment on them, as in these two, also about Snow White spoken by a seven year old Tokelau boy to a Pakeha:

The house is all untidy and got some mess too ...

A man chasing the girl and a girl is running
away ...

As with the factual listings, they required a level of internal organization, and there were times when confusion similar to that described earlier resulted in unsuccessful communication, as in this account of one of the Snow White pictures spoken by a five year old Pakeha girl to a Tokelauan:

Picking the brush, picking the brush, picking the brush ... chairs and ..., she's picking a brush and some other chairs ...

Some children evidenced interpretive skills that can only be described as highly imaginative. These were particularly evident on the Snow White pictures. They apparently regarded the instructions ("Tell ... about this one") as an invitation to relate the story of the picture. In some instances the account contained few references to the actual scene depicted:

This man ... this horrible woman she's told this man to go and get this woman ... a nice woman and this man liked her, but he didn't want to kill her and so she got away ...

This was spoken by a seven year old Pakeha child to another Pakeha and, perhaps surprisingly, it was successful.

The success of this approach depended primarily on shared knowledge and assumptions as much as on accuracy. These were not always present. The following two descriptions of the Snow White pictures, spoken by a five year old Pakeha girl to a Tokelauan child failed. Either the Tokelau child was not familiar with the stories, or else the level of accuracy of the story details was not high enough. Perhaps they failed on both accounts.

Helen, a witch and Cinderella is in the witch's house and then a little scared, Helen ... Cinderella is inside the witch's house, she saw the witch, eating a apple and she'll die ...

Cinderella run away 'cos she was scared when she was eating an apple. She saw a witch ... the witch and she's a scarey witch ... Robin Hood and Cinderella run away from the witch and he saw a broom ...

Obviously this child was taking the opportunity to relate parts of two or three different fairy stories.

When asked to describe objects the more imaginative children would invent a 'story' about it. They were apparently unaware that this might not be shared by a listener. The following communication by a five year old Pakeha boy to another Pakeha did not succeed, perhaps for this reason, but also perhaps because his 'story' could have applied to any one of the four cars that were in front of him:

What's that car doing ... going to the petrol ...

Some more car, petrol in the car ... all the wheels blue ...

There were in addition a few instances in which the information offered in the communication bore little relation to the object being described. There were not many like this. The following description of one of the playing cards, spoken by a five year old Pakeha girl to a Tokelauan is typical:

She looking ... this girl's looking like a boy ... she's looking like a boy ...

Such communications were invariably unsuccessful.

7.2.2.2 Interactional factors

The account given in the preceeding section of various approaches to the communication task noted that most of the children followed a listing strategy. This tended to be efficient, and it did not require the speaker to pay any particular attention to the needs of the listener as he encoded the information. However, Flavell et al. (1968) have demonstrated that the ability of the speaker to perceive a situation from his listener's point of view and the ability to meet his listener's needs both increase with age and improve the efficiency of the communication. The communication task transcripts were, therefore, examined for evidence on this point.

The investigation focussed on both the speaker and the listener. In the first place a study was made of the linguistic markers of the interaction. These were the use of vocatives (the listener's first name) and the use of questions (e.g. "Have you got a ...?") and imperatives (e.g. "Find a ..."). In the second place the complete transcripts were looked at for evidence of feedback offered by the listener during the communication.

7.2.2.2a Linguistic markers of interaction

Speakers in the communication task made very little use of the linguistic markers of interaction. The means (recorded in Appendix XXV) were so low that correlations between them and the scores would have been inappropriate.

There was some evidence that the seven year old Tokelau children used more vocatives than their Pakeha age mates in intra-ethnic communication ($t = 2.53$; $p < .01$). Also the younger Tokelau children used more than the older Tokelau children in inter-ethnic communication ($t = 2.27$; $p < .05$). These are the only differences

on the vocative scores and they are too few to form any pattern. None of the differences in the number of questions and imperatives used in any of the communication settings were significant.

There are a number of factors that could effect these results. In particular, if two children are relative strangers, the speaker is less likely to use the listener's first name. However, it seems clear from these findings that overt reference to the listener was not a common strategy for effecting communication.

7.2.2.2b Evidence of feedback

Instances of feedback offered by the listener were also very few, and there were no significant differences between any of the types of communication group in this respect (means and t-values in Appendix XXV).

To assess the extent to which the use of questions or imperatives, forms which grammatically recognize the presence of an interlocutor, prompted the listener to offer some feedback, correlations between the use of these forms and instances of feedback were calculated (Table 72).

Table 72 Correlations between speakers' use of questions and imperatives and feedback offered by listeners

	5 years	7 years
	r	r
T → T	.86***	.40
P → P	.93***	.40
T → P	.87***	.62**
P → T	.91***	.37

** p<.01; *** p<.001

The lower correlations among the older children probably reflect the greater ease with which they performed the task. As listeners, they understood the speakers faster and more efficiently than did

the younger children, and hence there was little scope for feedback to occur. On the other hand, the comparatively high correlations between the use of these interactional forms and instances of feedback among the younger children are some indication that some two-way communication was occurring.

7.2.2.3 Language variety

To investigate the ability of the children to draw upon their knowledge of the vocabulary and structure of English to effect communication, an analysis was made of the number of different words used by speakers at each age level and in each type of communication setting.

The results were examined for evidence of differences in the communicative style of speakers at each age level in the various communication settings. The relation between language variety and efficiency of communication and the effect of listener variables were also investigated.

7.2.2.3a Evidence of differences between speakers from the two ethnic groups

The means of the number of different words used by speakers of each ethnic group at each age level and in each type of communication setting are shown in Table 73. t-values calculated to test for significant differences between the means are shown in Table 74.

Table 73 Different words used in communication: means, standard deviations and t-values

	5 years		7 years	
	M	SD	M	SD
T → T	7.14	4.35	9.98	3.82
P → P	10.30	5.90	12.73	5.55
T → P	6.84	4.66	10.83	4.34
P → T	11.67	6.30	14.97	6.31

Table 74 Differences between means of the number of different words used by Tokelau and Pakeha speakers: t-values

	5 years	7 years
	t	t
T → P/P → P	2.91**	2.06*
T → T/P → T	3.01**	4.94***
T → T/P → P	2.22*	4.12***

* $p < .05$; ** $p < .01$; *** $p < .001$

Clearly Pakeha speakers have a greater command of language variety in English than Tokelau children. Whereas there are advantages in being able to manipulate language in this way, it is not a skill that is related to efficiency of communication on this task (cf. §7.2.2.3c). It could, in fact, be argued that the Tokelau children achieved communication more economically than the Pakehas. The further possibility, that listener variables affect the speakers' language variety, is explored in §7.2.2.3d.

7.2.2.3b Age development

In all types of communication setting there was a significant growth in the range of language used by the speakers (Table 75).

Table 75 Differences between the number of different words used by five and seven year old children: t-values

	t
T → T	2.81**
P → P	2.14**
T → P	4.28***
P → T	2.58**

** $p < .01$; *** $p < .001$

The fact that the greatest gains are shown by Tokelau speakers in inter-ethnic communication suggests that these children gain in confidence as well as efficiency in speaking to Pakeha children over

this two year period.

7.2.2.3c Variety of language and effectiveness of communication

There was no evidence of a relation between variety of language and effectiveness of communication in settings in which communication was relatively successful. There is, however, some evidence of such a relation in the least successful communication group.

Correlations calculated between the number of different words used and scores on the communication task were very low (Table 76). An exception occurred in inter-ethnic settings at the five year level in which Tokelau children were the speakers.

Table 76 Correlations between communication scores and number of different words

	5 years	7 years
	r	r
T → T	.50	.07
P → P	.14	.34
T → P	.55*	.09
P → T	.17	.18

* $p < .05$

This finding should be looked at in the light of the analysis of scores on the task reported in §6.1.2.1. There it was shown that the efficiency of communication in this setting and at this age level was lower than any of the others. Results reported in this section suggest that variety of language in settings where communication is potentially difficult could be a critical factor.

7.2.2.3d Listener variables and language used

The significance of the differences between the means of the number

of different words used by Tokelau children speaking to both Tokelau and Pakeha children and by Pakeha children speaking to both Pakeha and Tokelau children (Table 73) were calculated by t-tests (Table 77).

Table 77 t-values of differences between means of the number of different words used by Tokelau and Pakeha speakers to listeners from each ethnic group

	5 years	7 years
	t	t
T → T/T → P	.25	1.08
P → P/P → T	1.04	2.04*

* $p < .05$

The data shows that speakers do not generally alter their range of language according to the ethnic group of the listener. Seven year old Pakeha speakers are a possible exception. They apparently use a wider variety of language when talking to Tokelau children than when talking to Pakehas, although the time taken to do this is not significantly longer (Table 70). It would appear that the older Pakeha children have developed an awareness of difficulties associated with inter-ethnic communication, and are willing to use a wider variety of language in order to communicate effectively with the Tokelauans.

7.2.2.4 Repetition

It was evident during the administration of the task that some children made extensive use of repetition in order to communicate. They apparently believed that it was only necessary to make certain that their listener heard the selected bit of information for him to be able to identify the object correctly. To investigate this suggestion, a measure of the use of repetition by each pair at each age level was obtained by expressing the number of different words

as a percentage of the number of total words, so the lower the percentage the greater was the repetition. These percentages were used to investigate changes in the use of repetition between five and seven, and differences in its use by speakers at each age level in different types of communication setting.

7.2.2.4a Changes in the use of repetition between five and seven

Percentage repetition used by five year olds and seven year olds are shown in Table 78. Although the differences between the percentages of the two age groups are not statistically significant they suggest that the five year olds used more repetition than the seven year olds.

Table 78 Repetition: number of different words expressed as a percentage of the total number of words

	5 years	7 years
	%	%
T → T	51.31	70.14
P → P	55.72	72.23
T → P	57.07	60.86
P → T	53.55	62.36

This finding reflects the fact that the younger children used fewer words than the older children, but it also gives an indication of what use they made of the more limited range of language at their command. Clearly when communication was not successful the younger speakers tended to repeat the information already offered and not to attempt to search for fresh facts about the object.

7.2.2.4b Differences between intra-ethnic and inter-ethnic communication

The differences between the percentages of seven year olds in each type of setting are not significant. However, they possibly indicate that speakers of both ethnic groups made more use of repetition in

inter-ethnic communication. This suggests that both Tokelau and Pakeha speakers experienced some slight unease in situations of inter-ethnic communication. Under these circumstances, points were more laboured and this resulted in more repetition.

7.2.2.5 Summary and Discussion

7.2.2.5a Summary

1. The response of the younger children of each ethnic group to the two-way nature of the communication task was more evident than that of the older children (§7.2.2.1). The questions used by younger speakers elicited more feedback from their listeners (§7.2.2.2b). However, the relation between these and unsuccessful communication is not clear.
2. The number of different words used by Pakeha speakers was greater than the number used by Tokelau speakers in all types of communication (§7.2.2.3a). This factor relates to communicative efficiency only in the situation in which communication is most difficult (5 years; T → P) (§7.2.2.3d).
3. Younger children repeat their comparatively limited vocabulary to a greater extent than the older children (§7.2.2.4a). There is some evidence that older children make more use of repetition in inter-ethnic communication than in intra-ethnic communication.

7.2.2.5b Discussion

This exploratory analysis of differences in communicative style points to some differences between children from different ethnic groups and from different age levels. The most noticeable of these relate to the number of different words used.

It is clearly possible that the greater number of different words used by the Pakeha children is a consequence of their larger comprehension vocabularies (§6.1.1). However, the smaller vocabularies of the Tokelau children do not appear to affect the scores of communication pairs in which they were the speakers, except in the situation in which most difficulty was experienced.

No differences between the two ethnic groups in the ability of speakers to perceive and to meet the needs of their listeners were noted. Possibly the matching of the two ethnic groups for socio-economic status was sufficiently accurate to mask any differences. However, it does seem unlikely that major stylistic differences can be attributed to ethnic status. There was also no evidence of growth in this respect. The fact that there was more feedback offered by the younger listeners undoubtedly reflects the fact that these children found the task more difficult. The older listeners could identify the correct object without any need to question the speaker any further, and where feedback was not necessary it was not offered. A task that was more demanding of the seven year olds would have enabled more realistic assessment of the differences between the two age levels on this point.

It would appear then, that the ability of the younger Tokelau children to communicate with Pakeha children of their own age is affected more by their lower level of vocabulary knowledge and their inability to use this knowledge than it is by other differences in communicative style. While it is clearly possible that a more detailed investigation would reveal stylistic differences, this study has shown that vocabulary knowledge relates to communicative skill, and that the growth that takes place during the first two years in school facilitates communication.

7.2.3 Error analysis

The difficulties experienced by five year old pairs in which Tokelau children were speaking to Pakehas were not evident when Tokelauans spoke to Tokelauans (§6.1.2.1c). A possible explanation for this is that young Tokelau children make errors in their speech which, although understood by fellow Tokelauans, impede communication when the listener is a native speaker of English. To investigate this suggestion, an analysis was made of the errors made by speakers at each age level in each communication setting in which English was spoken. The aim was to identify a class of errors that might affect communication accuracy.

Identification of errors: Few of the speakers were confident in their approach to the task, many were groping towards effecting communications and a good deal of their speech was hesitant. There are therefore many units of speech that cannot be reliably identified as sentences so it was felt that any analysis of errors carried out at the sentence level would be unrealistic. The nature of the task, however, was such that all children in describing the objects in front of them made frequent use of noun phrases. In fact, some speakers used them exclusively. It was therefore decided to investigate errors made at this level of analysis.

Many of the noun phrases consisted of participial constructions (e.g. 'a girl carrying a basket'). These constructions are clearly abbreviations of either a continuous present or an embedded relative and there is no way to identify which structure was intended. In fact, in each case the relation of the noun to the participle is the same, so the distinction is unlikely to be a real

one for the children. Participial structures were, therefore, not considered.

In a descriptive task of this nature many noun phrases contained adjectives. Some times there were a number of them in what almost amounts to a list (e.g. 'a blue and red and yellow dress'). Frequently the order of the adjectives deviated from that which is normally accepted in standard English (e.g. 'a red big one'). Because it is likely that these adjectives were produced as a list rather than as part of a complete noun phrase construction, they could not be properly considered as noun phrase errors. Furthermore, variations in the order of adjectives is unlikely to contribute greatly to communication failure. On both these counts adjective errors were omitted.

There was, however, one class of error that had, at least potentially, an effect on communicative efficiency. This was errors associated with determiners, in particular those in which there was a number conflict between determiner and noun. These were the use of a singular determiner with a plural noun (e.g. 'he got one shoes') or vice versa (e.g. 'he got white shoe'), and the use of a determiner that is appropriate for a count noun with a mass noun (e.g. 'a yellow hair'). In standard English concord is required between the number of the determiner and the number of the noun and is therefore a degree of redundancy in the construction. However, where number is a binary distinction, a failure to agree results in an ambiguous phrase. Thus it is unclear whether the speaker of 'one shoes' was referring to one or to two shoes. This information was critical in some of the items used in the communication task.

An investigation of determiner errors is clearly a very limited one, but the discussion above has illustrated the necessity for confining it in this way. Besides, in view of the fact that this section of the study was only intended to be exploratory this was not considered a serious problem. Although this investigation can make no contribution to the question of whether or not the errors made by second language learners are comparable to those made by first language learners, determiner errors are widely attested in studies of the acquisition of English as a first language. In any case the study is somewhat limited in scope and it would be unwise to make generalizations of this nature (cf. §2.2).

Calculation procedures: Determiner errors were identified from the transcripts and were then rechecked against the tapes.

A simple addition of the number of errors made by speakers is not suitable for this type of study. Some speakers may have had no occasion on which to produce the form, so clearly it is misleading to claim that they have made no errors. Instead the notion of 'obligatory context', developed by Brown (1973), has been adopted as the criterion. The error score of each speaker was computed by expressing the number of errors as a percentage of the number of obligatory contexts. By following this procedure an error score is obtained which is independent of the communicative style adopted by the speaker.

7.2.3.1 Differences between ethnic groups

Five year old Tokelau children made noticeably more errors than Pakeha children of the same age in all types of communication. This pattern was repeated at the seven year old level except that

there is no difference between the two ethnic groups in intra-ethnic communication.

The results of t-tests calculated to test for differences between the error scores of speakers from each ethnic group in each type of communication indicate the tendency of Tokelau children to make more errors than Pakehas (Tables 79 and 80).

Table 79 Error scores (five year olds): means, standard deviations and t-values¹⁴

	M %	SD	N	P → P t	T → P t	P → T t
T → T	19.64	32.98	14	1.73	.45	1.97
P → P	3.33	17.95	30	-	1.79	.35
T → P	14.96	24.52	19	-	-	2.21*
P → T	5.75	12.29	52	-	-	-

* $p < .05$

Table 80 Error scores (seven year olds): means, standard deviations and t-values¹⁴

	M %	SD	N	P → P t	T → P t	P → T t
T → T	5.04	13.34	45	.33	2.31	.27
P → P	6.25	21.55	52	-	1.84	.14
T → P	15.73	29.29	49	-	-	2.21*
P → T	5.75	12.29	52	-	-	-

* $p < .05$

At the five year old age level the difference is only statistically significant in inter-ethnic communication ($p < .05$), however, the other t-values of differences between Tokelau and Pakeha speakers

14. The very large SDs evident in these results reflect the fact that there were many speakers who made no errors at all. In the case of the five year olds, the Ns were small because there were a large number of communications in which there were no obligatory occasions. These were not considered.

are approaching this level of significance ($p < .05$ when $t > 2.07$).

The fact that there is possibly a difference in intra-ethnic communication at the five year level but none at the seven year level is probably attributable to the effect of listener variables and is discussed in §7.2.3.4.

7.2.3.2 Age development

A decrease in the proportion of errors made by five and by seven year old children is evident only in intra-ethnic communication between Tokelau children.

The t-value of the difference between the Tokelau children in intra-ethnic communication was significant at the 5% level. All other t-values were non-significant (Table 81).

Table 81 Differences between error scores (five to seven years):

	<u>t-values</u>
	t
T → T	2.43*
P → P	.63
T → P	.10
P → T	1.50

* $p < .05$

It would appear that a growth in communicative efficiency is not generally accompanied by a decline in the proportion of errors. This finding is consistent with the finding that error scores did not relate to communication efficiency (§7.2.3.3).

7.2.3.3 Relations between speakers' errors and communication efficiency

Correlations were calculated between the communication scores and the error scores for each type of communication at each age level (Table 82).

Table 82

Correlations between communication scores and error scores

	5 years	7 years
	r	r
T $\rightarrow$ T	.17	.10
P $\rightarrow$ P	.21	.04
T $\rightarrow$ P	.27	.06
P $\rightarrow$ T	.11	.15

Although these correlations are all well below the level of statistical significance, it is interesting to note that the higher r was obtained for five year old pairs in which a Tokelau child was the speaker and a Pakeha the listener. This is a very tentative indication that errors may contribute more to communication failure in this type of situation than in any of the others.

7.2.3.4 Effect of listener variables

There is some evidence that seven year old Tokelau children are more prone to error when talking to a Pakeha child than when talking to other Tokelau children.

The difference between the number of errors made by seven year old Tokelau children in intra- and inter-ethnic communication is significant at the 5% level (Table 80). This difference was not observable at the younger age level (Table 79). The five year olds made approximately the same number of errors in each type of communication. It would seem that the older children have developed an awareness of the ethnic group of their participants.

It is possible only to guess at the reasons for this. A likely explanation is that the Tokelau children found communication with Pakehas was a greater strain than with a fellow Tokelauan. Under this strain their control over their use of English declined. This

sensitivity was yet to be developed by the younger Tokelau children who have, most likely, had less to do with Pakeha children.

7.2.3.5 Summary and discussion

Five year old Tokelau children make more determiner errors than Pakeha children of the same age, but this does not affect communicative efficiency. Seven year old Tokelau children make more errors than Pakeha children of the same age in inter-ethnic communication.

It has already been pointed out that this study can provide no *decisive* evidence for or against the first language/second language question, however these results indicate that the relation between comprehension and production in second language acquisition is substantially the same as in first language acquisition. There is considerable evidence that in both first and second language acquisition (cf. §3.3 and §6.3.3.2a) the development of comprehension skills precedes the development of production skills. Such evidence suggests that the comprehension difficulties experienced by Tokelau children would be paralleled by errors in their speech product. While no detailed comparison between comprehension and production is attempted in this study, findings reported in this section suggest that this is largely true.

In the particular type of communication task used in this study there was no relation between the occurrence of errors and communicative efficiency. While this finding might not be repeated in a task of a different nature, it does appear that errors made by young Tokelau children are not communicatively significant. The implications of this point are discussed at greater length in §8.2.2.

7.3 Implications for language testing

This section focusses on the implications of the present study for language testing in general and for cross-cultural language testing in particular. In this respect it takes up a number of the questions that were raised in the discussion of the design of this research. It is basically a report on test data from the present study, and no attempt has been made to cover the topic completely.

In the first place aspects of test construction are discussed. In particular, the relations between the different measures are looked at to ascertain the extent to which they measure separate skills. Reliabilities are reported, and the potential use of reaction time data in assessing the validity of separate items is evaluated. Secondly, the cross-cultural implications of the study, both for the design and for the conduct of tests for use with young children are investigated.

7.3.1 Construction of language tests

The design of this research called for the development of assessment procedures to investigate a representative sample of language skills (§3). These were selected with reference to a model that emphasized the multifunctional nature of language. Thus a variety of skills in the second language could be assessed. The skills investigated were comprehension of both vocabulary and structure and communication with both peers and teachers. Comparisons between the scores obtained on these measures were undertaken to investigate the extent to which these can be regarded as independent skills. These comparisons also provided an opportunity to investigate the relation between tests of knowledge of discrete points of linguistic structure and functional measures of linguistic ability.

The sampling of variables in the vocabulary and structure tests involved a number of assumptions (§3.2.1 and §3.3.1) that were checked out in the course of pilot work. Analysis of the reliabilities of both these tests enabled further confirmation of these assumptions to be made. Some assumptions were also made in the construction of items and analysis of the reaction time data (§7.2.1), suggested that this may be used to evaluate the validity of individual items and so check these assumptions. To direct the discussion to a consideration of this possibility some score data is reconsidered in the light of the reaction time data.

7.3.1.1 Comparisons between the different measures

7.3.1.1a Vocabulary and structure

Comprehension of vocabulary and structure appear to be related skills for all groups of children.

Correlations between scores on these measures were high for each group of children (Table 83), and the correlation for all the

Table 83 Correlations between vocabulary and structure scores

	5 years	7 years
	r	r
Tokelauans	.76**	.72**
Pakehas	.73**	.45**

** $p < .01$

children was .86 ($p < .01$). The lower figure for the older Pakeha children can be attributed to the fact that their scores were, on each of these measures, approaching the maximum possible.

7.3.1.1b Teachers' ratings and comprehension measures

Teachers' ratings of the abilities of the Tokelau children to understand English corresponded more closely to the results obtained by high and low scorers than to the scores in the middle range.

Initially, the relation between the teachers' ratings and the scores was investigated by both correlation and χ^2 procedures (Table 84).

Table 84 Correlations and χ^2 s between teachers' ratings and scores on the comprehension measures

	r	χ^2
5 years: Vocabulary	.53**	10.08
Structure	.33**	23.95
7 years: Vocabulary	.37**	20.05
Structure	.22	13.78*

* $p < .05$; ** $p < .01$

The results showed some discrepancies between the two statistical procedures indicating that the relation between the two scores was not at all straightforward.

To explore further the nature of the association a graph was drawn for each age group of the relation between the ratings and the scores on each of the measures (Fig. 8). The graphs show one clear pattern. In three out of the four (Fig. 8.2; 8.3; 8.4) it is apparent that the teachers made no clear distinction between the ratings 3 (moderate) and 4 (good). The graphs either flatten out or reverse at these points. On the other hand, the teachers' ratings of the five year olds were more closely related to the vocabulary test scores, although it would seem, from the very flat line on the graph, that the teachers were making some distinctions that were not brought out so clearly by the test.

It would appear that they were guessing.

Fig. 8 Relations between median of scores obtained by Tokelau children and teachers' ratings of ability to understand English

Fig. 8.1 5 years: vocabulary

Fig. 8.2 7 years: vocabulary

Fig. 8.3 5 years: structure

Fig. 8.4 7 years: structure

As was outlined above, teachers' ratings were sought as a measure of communicative efficiency between teacher and child and they may be based on a number of factors other than the child's linguistic skills. They were not obtained to validate the comprehension measures, or vice versa, and indeed this analysis has uncovered a number of discrepancies between the two measures. However, it is clear that had these ratings been made on a three point scale there would have been considerable correspondence between the two measures. This is some evidence that the two skills are related.

7.3.1.1c Teachers' ratings and communication task

There was little statistical evidence of an association between teachers' ratings and communication efficiency. Initially correlations between the two measures on each type of communication

in which Tokelau children were the speakers were calculated and were found to be non-significant (Table 85).

Table 85 Correlations between teachers' ratings and communication
scores

	5 years	7 years
	r	r
T → T	.11	.08
T → P	.27	.09

There were two factors which could account for these low correlations. In the first place many of the scores on the communication task represented a response that was 100% correct. In the second place, teachers were possibly not making a clear distinction between ratings of 3 (moderate) and 4 (good) on the rating scale (cf. §7.3.1.1b). The relation between the two measures was further investigated by a procedure which took these two factors into account. Scores on the communication task were divided into two categories, 100% correct and less than 100% correct, and categories 3 and 4 on the teachers' ratings were combined into a single category thus converting them onto a three point scale. Tables of the recategorized variables were then drawn up and χ^2 values calculated (Table 86).

All the χ^2 values between the two measures were non-significant and the distributions of the scores shown in Table 86 makes it clear that the ease that was experienced in this particular communication task was not generally reflected in the teachers' ratings. Many pairs achieved a 100% rate on the communication task using English but teachers were reluctant to rate their English speaking skills as 'very good', the highest ranking available.

Table 86 Tables and χ^2 values of the relation between communication scores and teachers' ratings (recategorized)

<u>5 years: T - T</u>		<u>7 years: T - T</u>	
100%	100%	100%	100%
-	3	-	2
8	9	2	24
-	2	-	4
$\chi^2 = 3.71$ ns		$\chi^2 = .48$ ns	

<u>5 years: T - P</u>		<u>7 years: T - P</u>	
100%	100%	100%	100%
3	-	-	2
11	6	4	22
1	1	-	4
$\chi^2 = 1.12$ ns		$\chi^2 = 1.05$ ns	

There is one further factor that obscures the relation between the two measures. The teachers were asked to rate the speaking skills of individual children, but the communication task measured the communication efficiency of pairs of children. The contribution of the listener could well have raised scores which in this analysis have been attributed to the speaker alone. The measures are then not directly comparable.

7.3.1.1d Communication task and comprehension measures

There is some evidence that communication efficiency and the ability to understand selected lexical and structural variables of English are related skills.

Correlations were calculated between the combined scores of both speaker and listener in each of the vocabulary and structure tests and the score obtained by each pair on the communication task (Table 87). To retain ethnic homogeneity only intra-ethnic scores were considered and only the scores of children who spoke

Tokelau were used.

Table 87 Correlations between comprehension scores and
communication scores

		N	Vocabulary	Structure
5 years:	All groups	44	.32**	.32**
	Tokelauans	6	.42	.59
	Pakehas	11	.45	.65
7 years:	All groups	64	.13	.44
	Tokelauans	13	.61***	.17
	Pakehas	16	.09	.13

** $p < .01$; *** $p < .001$

Correlations were generally high, but unfortunately the nature of the data makes clear interpretation difficult. In the first place correlations were depressed when scores on either measure neared the 100% mark. This is particularly evident in the case of the seven year old Pakeha children. In the second place, some of the correlations failed to reach significance because of the very small Ns.

It would seem, however, that despite the inadequacies of the data the direction of these correlations points to a relation between the two skills for both first and second language learners.

7.3.1.2 Reliability of vocabulary and structure measures

Reliabilities were calculated in each case by a split halves procedure. An additional measure of the reliability of the structure test was obtained from an equivalent halves procedure. All reliabilities were corrected according to the Spearman Brown formula.

The split halves reliability of the vocabulary test¹⁵ was high enough (.91) for confidence in the test to be well-founded and on the structure test the split halves reliability¹⁶ was .93 and the equivalent halves reliability¹⁷ was .92. These were also very high.

7.3.1.3 The use of reaction time data as evidence of item validity

Analysis reported in §7.2 indicated that reaction times in the test of structural comprehension were related to the difficulty level of the items. Longer reaction times occurred on more difficult items. An alternative relation was also considered in which speed of response determined accuracy of response. This was termed the reaction time relation: if the child responded rapidly he tended to make errors; if he delayed his response greater accuracy was achieved.

Evidence of a reaction time relation would imply that the response made by a child was affected by factors external to his own ability to understand the stimulus sentence. Impulsiveness (Kagan, 1967) and anxiety (Barrett, 1975) have been suggested as possible reasons. Either way, the validity of the item is seriously questioned. It was therefore reassuring to find that in

15. Because there was an odd number of items at each frequency level (15), the fifteenth item in each was omitted so that there were equal numbers (7) from each level in each of the halves.

16. The two halves of the split halves reliability of the structure test were formed by taking, on one hand, the scores of the odd-numbered items in Form A and the even-numbered items in Form B, and on the other hand, the scores of the even-numbered items in Form A and the odd numbered items in Form B.

17. Form A and Form B were considered equivalent halves.

no cases where reaction times were recorded was a reaction time relation of this nature evident. On the other hand, the potential validity of an item is confirmed where a difficulty level relation is found. Difficult items take longer to process because they are more difficult for the child to understand and, hopefully, not because of any other factors.

This type of confirmation is particularly useful where analysis of the scores suggests that children may be responding to non-criterial linguistic variables. Reaction time data can help to clarify the nature of the response. The group of variables that tested comprehension of the conditional posed this problem. Tokelau children obtained scores that were higher than those of Pakeha children on the true conditions and lower than those of Pakeha children on the false condition. It was suggested (§6.3.2.5e) that the variables of imperative and the conditional had been confounded, and that Tokelau children made a correct response to the true items by processing only the imperative and disregarding the conditional clause. Reaction time data confirmed this. An analysis of variance computed for each group of children separately (Appendix XXIV, v-viii) between the three variables concerned (position of the main clause, truth value and polarity) showed truth value to be highly significant in every case (5 year Tokelauans: $F = 33.60$; 7 year Tokelauans: $F = 30.80$; 5 year Pakehas: $F = 8.56$; 7 year Pakehas: $F = 22.69$; $p < .01$ in each case). Inspection of the means (Table 65) suggested that the difference in the reaction times on the two items for the Tokelau children, particularly the younger ones, was greater than for the Pakeha. An analysis of variance confirmed that the ethnic group by truth value interaction was significant ($F = 6.26$; $p < .05$). The full table is given in Appendix XXIV, xi. Tokelau children tended to

make correct responses on the true condition very rapidly by following the imperative. Correct responses on the false condition were fewer and those there were, were made very slowly because it was necessary to consider the conditional clause. Hence reaction time data confirms the view advanced in §6.3.2.5e that items designed to test for the true condition could in fact be testing comprehension of the imperative for Tokelau children, and that only items designed to test the false condition validly test ability to understand conditional clauses.

However, the score analysis indicated that this suggestion did not hold in every case. Pakeha children showed a different score pattern. They made fewer correct responses to the true condition than the Tokelau children, and more correct responses to the false condition. It was suggested that this reflected an attempt to process the conditional, and hence there were more opportunities for errors. Reaction time data shows that times taken by the Pakeha children under the two conditions were closer than for the Tokelau children indicating that, perhaps, the same strategy was being followed in each case. Hence correct responses to true items made by Pakeha children are a more valid indication of comprehension of the conditional than are correct responses made by the Tokelau children.

This difference between the two ethnic groups is also noted when the scores of children from each age level are compared (cf. Table 42), and the difference is similarly reflected in the reaction times (Table 65). The F-ratio for the age by truth value interaction on the reaction times was 8.35 ($p < .01$) (Appendix XXIV, xi).

There is one instance on the test where no consistent relation between score and reaction time is evident. Reaction times to the two tense variables were generally very similar for children from both ethnic groups whereas the scores of the Pakehas on the past tense items were significantly higher (Table 88).

Table 88 Tense scores (proportions correct) and reaction times:
transformed means

	Present		Past	
	Score	RT	Score	RT
Tokelauans	16.63	.17	15.52	.20
Pakehas	17.65	.18	25.08	.19

It would appear that all subjects were responding very rapidly and possibly at random. It is not clear why this should have occurred, but the comparison of the scores and the reaction times has indicated that the validity of these items may be in doubt.

7.3.1.4 Summary and discussion

7.3.1.4a Summary

1. The high correlations between the vocabulary and the structure tests indicate that these measures are investigating two very closely associated skills. The relations between each of these and the communication measures were less close, but the indicators are that they are also related skills. There was no observable relation between the teachers' ratings and scores on the communication task which suggests that these two measures are investigating separate aspects of linguistic behaviour.
2. The reliabilities of the vocabulary and structure measures were very high, indicating that the assumptions behind the construction

of the tests were well-founded.

3. The possibility that reaction time data can be used to validate items was explored on the few variables for which suitable data was available. The analysis demonstrated that some items may be valid for one group of children but not for another.

7.3.1.4b Discussion

The traditional nature of the two comprehension tests, vocabulary and structure, means that the procedures for calculating the reliabilities of these tests are more fully developed than for the tests of functional knowledge, which reflect more recent interests in the field of language testing. Clearly the reliabilities in the tests used in this research are very high (cf. §7.3.1.2), and there is considerable evidence of the internal validity of many of the structural items. However, such data does not necessarily produce valid estimates of general language abilities (Carroll, 1961). The use in this study of four different measures, two using a discrete point approach and two functionally based, raises the question of which measure most adequately represents the English language skills of the children.

In view of the very great problems involved in the sampling of items for the construction of discrete point tests so that valid generalizations can be drawn (cf. §3.3), many investigators have suggested that tests of functional language skills have greater external validity than discrete point tests (cf. Carroll, 1961). Related to this research, this implies that the investigations of communicative efficiency are more valid estimates of language ability than the comprehension tests. If this is the case, greatest

significance should be attached to the results of the communication investigations.

However, while external validity is perhaps more likely to be obtained on such functional tests, there are still many problems. Two functional measures were developed for use in this research, a communication task with peers and a rating made by the teachers, and there was almost no correspondence between them (cf. §7.3.1.1c). It is very likely that unidentified situational variables had intervened, and it is impossible to unravel the effects of such variables. Clearly neither of these measures should be interpreted as evidence of general ability in English, but they must be regarded as evidence only of the particular skill that each one was designed to investigate.

Where comparisons are sought, different results will be obtained if either the task investigating communicative abilities with peers (the only functional measure for which data from both ethnic groups is available) or the comprehension tests are taken as sole evidence of general abilities. If differences on the communication task are used as an indication of the comparative ability of the two ethnic groups, little difference between them will be identified (except, perhaps, at the five year level in inter-ethnic communication). In contrast, differences on the two comprehension tests were much more marked. However, correlations between communication scores and scores on each of the comprehension tests indicated that these were not unrelated measures. It appears that all three measures are tapping different but related skills, although the comprehension measures produce relatively lower scores for the Tokelauans.

It would therefore seem that neither the comprehension measures

nor the communication task are sufficient evidence of general ability in English where inter-group comparisons are sought. However, the tentative association between the two types of measure suggest that where intra-group comparisons are sought the discrete point tests are probably fairly representative of general abilities and thus more valid than Carroll (1961), Perren (1967) and Spolsky (1968) have suggested.

7.3.2 Cross-cultural language testing

While there are clearly many different aspects to the design and conduct of cross-cultural language tests (cf. §2.1 and §5.1), the discussion in this section takes up only those points to which this research can contribute. These are necessarily limited in scope, for the investigation of problems associated with cross-cultural research was not the focus of the study, but individually they underline the need for care in the design and conduct of such studies. The points that are covered are the use of speed conditions and the selection of vocabulary items. For both of these points, results reported earlier are reconsidered in the light of their implications for test design. In addition, the results of an investigation into the effect of the ethnic group of the interviewer on the scores obtained by either Tokelau or Pakeha children on the vocabulary and structure scores are reported and discussed.

7.3.2.1 The validity of speed conditions in cross-cultural testing

Findings reported in §7.2.1.1 demonstrated that Tokelau children responded to items testing structural comprehension significantly more slowly than Pakeha children. It is clear from this that scores obtained on the test would have been different if the test

had been administered under speed conditions. The gap between the scores of the Tokelau children and the scores of the Pakeha children would have been wider, because the slower response rate of the Tokelauans would have reduced their score to a greater extent than that of the Pakehas. The scores obtained by the Tokelau children would give a misleading impression of the ability of the children to understand English structure.

These findings are evidence that the imposition of speed conditions can invalidate cross-cultural studies of language skills. Where the skills of second language learners are compared to those of native speakers either by comparison of two matched samples or by the use of norm-referenced tests where the normalization sample are native speakers, the results will show greater differences between the two groups when responses are restricted by a speed condition than when there is no such restriction. If the aim of the study is to investigate responses at speed, and indeed, the ability to process information at speed may be essential for communicative competence in natural situations, this procedure is valid. But if the aim is to investigate language knowledge the results will be totally misleading.

7.3.2.2 Choice of vocabulary items

The equivalence of the relation between frequency and ease for both the ethnic groups (cf. §6.3.1.2) suggests that frequency was an appropriate basis to select items for a vocabulary test for use with both Tokelau and Pakeha children.

On the other hand, the five year old Tokelau children demonstrated a marked difficulty with domestic vocabulary (cf. §6.3.1.4). While this finding may simply reflect the fact that these children generally found the high frequency items harder than the Pakehas,

such items are clearly inappropriate in any test in which there is no principled basis for the selection of the items. Both the PPVT and the EPVT contain among the early items a number of words that may fall into this domestic category.¹⁸ It is clearly possible that Tokelau children would fail disproportionately early on such items and thus obtain lower scores on the test as a whole.

7.3.2.3 Interviewer effect

The scores on both vocabulary and structure measures were analysed by an analysis of variation with interviewer effect (Appendix XXVI). The results clearly showed that there was no interaction between interviewer and scores.

This result conflicts with previous research into the effect of the ethnic group of the interviewer on test scores, which suggest (cf. §5.1.1) that such an effect may be a very significant factor in cross-cultural research. However, there are two possible explanations for the insignificance of this factor in this study. The first centres on the interviewers and the second on the nature of the test situation.

When the two interviewers were preparing for the study considerable care was taken to match the procedures that were used (cf. §5.2.1). It is therefore possible that there was no noticeable effect precisely because considerable care had been taken to ensure that there would be none.

18. PPVT: table, shoe, finger, children, lamp, sitting etc.
EPVT: drum, fence, sewing, cobweb, hook etc.

It is also possible that variables associated with the ethnic group of the interviewer interacted with situational variables. The test situation established for the testing of vocabulary and structure comprehension was as relaxed as possible. Every effort was made to reduce the anxiety that would be caused by a strange adult asking strange questions. It is clearly possible that in such circumstances the ethnic group of the interviewer has less effect than in rigidly conducted testing situations (cf. Labov, 1968; Zigler, 1973). Since all of the testing situations in this study were conducted in a relaxed atmosphere this hypothesis could not be investigated.

7.3.2.4 Summary and discussion

7.3.2.4a Summary

1. The generally slower reaction times of the Tokelau children on the structure test suggest that these children would obtain lower scores if a speed condition had been applied. Clearly such a condition would widen the gap between the scores of Tokelau and Pakeha children and hence invalidate research, the aim of which was to investigate aspects of linguistic knowledge.
2. The need to consider the effects of different contexts of language acquisition in the construction of vocabulary tests was demonstrated by the finding that the younger Tokelau children experienced particular difficulty on domestic vocabulary.
3. The ethnic group of the interviewer had no effect on the scores of either Tokelau or Pakeha children. Clearly this was evidence that the care taken to eliminate any potential differences had succeeded.

7.3.2.4b Discussion

A central problem in the design and conduct of cross-cultural research is the need to ensure that the scores of neither group are either raised or depressed by the effect of any variable other than the ones the test is investigating. Where the scores of both groups are affected in the same way, the inter-group comparisons will not be invalidated, although the test will not measure the skill that it was designed to measure. Where the scores of only one group are affected by other variables, the gap between the two groups will either widen or narrow and inter-group comparisons will be totally invalid.

The findings discussed in this section suggest two variables that may invalidate research that compares the language skills of Tokelau children who are learning English as a second language with those of native speakers. These are the imposition of speed conditions and the failure to consider domain of language acquisition. A failure to account for either of these factors could widen the gap between the scores of the two groups and so invalidate the research.

A further factor that may affect the size of the gap noted between children from the two ethnic groups relates to the type of measure that is used. Discussion in §7.3.1.4 pointed out that estimates of the extent to which the English language skills of the Tokelau children differ from those of Pakeha children of the same age vary according to whether data from the comprehension tests or from the communication task is considered.

But these findings also raise the question of whether or not such problems can ever be resolved satisfactorily. In particular, it is doubtful whether differential responses to some variables can

ever be eliminated. If, for example, plenty of time is allowed, as it was in this study, the native speakers may be artificially favoured, for perhaps they are better able to use the time to process the stimulus, and thus to make a correct response. This is speculative, but the possibility remains and it does suggest that culture free tests may be a chimera (cf. Anastasi and Cordova, 1953).

Chapter 8

THE LANGUAGE EDUCATION OF TOKELAU CHILDREN

Two basic questions were the motivation for this research.

(a) Does continued use of the first language impede the acquisition of a second language? (b) What are the most appropriate approaches to the teaching of a second language?

To answer these questions an assessment of the English language skills of the Tokelau children was made and examined for evidence of the effect of knowledge of Tokelau on the development of English language skills and for information on the process of language acquisition. The major findings that are relevant to the formulation of answers to each of these questions are given below followed by a discussion of the answers that these findings suggest.

In addition to the main study further information was obtained on three areas of related interest: the Tokelau children, factors associated with communication success and the implications of this research for language testing. It is hoped that observations on these points will inform the following discussions and assist in the formulation of realistic answers to the two central questions.

8.1 First language maintenance

8.1.1 Major findings

Information relevant to this question came from both sections of the main study: the effect of knowledge of Tokelau and the process of second language acquisition.

1. Knowledge of the Tokelau language is a significant factor

contributing to the lower scores obtained by the five year old Tokelau children on the vocabulary and the structure tests. However, the significance of this effect is largely lost during the first two years at school (§6.2.1.1).

2. Knowledge of the Tokelau language is not a significant factor in the development of the ability to communicate in English. It does not relate at all to the scores obtained by the older children on the communication task. It does, however, contribute to the relative inefficiency of communication between a Tokelau speaker and a Pakeha listener at the five year age level (§6.2.2.1).

3. Knowledge of the Tokelau language is a significant factor contributing to the impression that teachers gain of the English language skills of the Tokelau children (§6.2.2.2).

4. During their first two years at school, Tokelau speakers acquire a knowledge of English structure at a rate that suggests they are approaching the level obtained by their Pakeha age mates. However, they acquire English vocabulary at a rate that is equal to that of Pakeha children of the same age (§6.2.1.2), and therefore would not appear to be approaching the level of vocabulary acquisition obtained by native speakers.

5. The process of acquisition of both vocabulary and structure is substantially the same for both native speakers and second language learners. In each case the order of acquisition of variables correlated highly between the two ethnic groups and there was very little evidence of transference when scores on the variables were examined in greater detail (§6.3).

6. The use of English by Tokelau-speaking parents is unlikely to improve their children's English (§7.1.2.3a), and may seriously limit their chances of acquiring Tokelau (§7.1.2.4b).

8.1.2 Discussion

These results indicate that the continued use of the Tokelau language does not affect equally each of the language skills that were investigated in this research. The acquisition of English structure and the development of the ability to communicate with other children progress well in conjunction with first language maintenance, but the acquisition of vocabulary knowledge and the ability to communicate with their teachers apparently do not.

While these findings would appear to suggest that the advisability of first language maintenance is in some doubt the balance is not equal. In particular, the two way nature of communication implies that communications by Tokelau children with their teachers cannot be seen as a function of the children's English language skills alone. It is necessary to take account of both speaker and listener variables. Evidence presented in §7.1.4 and discussed in relation to the two way nature of communication in §6.2.3 suggest that the teachers' lack of familiarity with the language background of the children could affect their ratings of the children's English language skills.

These findings clearly point to the possibility of improving conditions for the acquisition of a second language while use of the first language is continued. The familiarity of teachers with the language background of the children can be improved upon, and techniques for the enlargement of vocabulary knowledge are among the most advanced of those developed for use in second language instruction. These two points will be taken up at greater length

in the next section where approaches to second language teaching are discussed.

It would appear that the undesirable effects of first language maintenance can be remedied without advocating its discontinuance. There is further evidence in this study that discouraging the use of Tokelau is both ineffectual in improving the English language skills of the children and likely to produce results that are contrary to the wishes of the Tokelau people.

The ineffectiveness of the use of English by Tokelau-speaking parents (§7.1.2.3a) can clearly be traced to the recency of the migration. All the Tokelau parents who participated in this study had migrated to New Zealand in the ten years immediately prior to this research. Since they have few opportunities to learn English in the Islands their contact with English has taken place almost entirely since they were adults, and many, particularly the mothers, do not speak English well. They are, in fact, more at ease in their own language (cf. Table 54).

A policy of first language discouragement is likely to result in first language loss. Results reported in §7.1.2.4b indicate that children who do not regularly use Tokelau at home are significantly less proficient in the language than are children for whom Tokelau is the home language. Not only is this clearly contrary to the wishes of the Tokelau people whose commitment to the maintenance of their language is generally very marked (cf. §7.1.2.3) despite strong pressure from English (cf. §7.1.2.2), but the consequences of first language loss among children from linguistic minorities are well attested (cf. Spolsky, 1972). In New Zealand, Walker (1973) attributes loss of identity and an increased sense of insecurity among Maori youth to a decline in the use of the Maori language.

It is to be hoped that the Tokelau people will be given every encouragement to continue to use their language for as long as they wish to do so.

8.2 Pedagogical implications

Children who speak Tokelau as a first language perform at a level that is approximately two years behind that of Pakeha children of the same age on tests of their ability to understand English vocabulary and structure. They also experience initial difficulty in communicating with Pakeha children of their own age, and their teachers associate their English language difficulties in the classroom situation with what they believe to be the children's home language background. Clearly then there is a need for a careful consideration of approaches to the development of the English language skills of these children so that they may participate fully in and benefit from their school experiences.

A response to this need was the second of the motivating reasons for this research. An investigation of the process of language acquisition was undertaken to identify what might be an appropriate approach to the second language instruction of young children. It was suggested that if strong evidence of transference from the first language was identified, then not only should continued use of the first language be discouraged, but a programme of instruction that found its rationale in learning theory and habit formation would be appropriate. If on the other hand, second language acquisition was shown to be characterized by a creative response to the input from the child's second language experience that is similar to the response made to the same data by native speakers then, ceteris paribus, formal instruction is not necessary (cf. §1.5).

The major relevant findings of this study are outlined

below.¹ The discussion that follows attempts to draw out the pedagogical significance of these findings, and, as in the previous section, it draws heavily on the findings reported in §7 for additional insights into the language education of young Tokelau children.

8.2.1 Major findings

1. Vocabulary: The process of vocabulary acquisition by young Tokelau children is comparable to that of native speakers (§6.3.1), and the relation between frequency and ease is similar for all groups of children (§6.3.1.2). Five year old Tokelau children appear to experience early difficulty with domestic vocabulary (§6.3.1.4), but this may be associated with the frequency ease progression and it is not evident at the seven year level. However, although the process is similar, the level of vocabulary knowledge of the Tokelau children does not appear to be approaching that obtained by the Pakeha children. Although their rate of vocabulary acquisition may increase in later years this finding suggests that the Tokelau children may continue to remain at a disadvantage in this area.

2. Structure: Results reported in (§6.3.2) suggest that the process of second language acquisition by young Tokelau children is generally very similar to the process of acquisition by native speakers. But there is some conflicting evidence that not only

1. Some indications of appropriate teaching strategies were identified in the previous discussion (§8.1.2). The findings on which these were based are repeated here for convenience.

suggests that the distinction between the two theories (cf. §1.5 and §8.2) of second language learning is simplistic (cf. §6.3.3), but also identifies some specific areas of difficulty. In particular, there are indications that the order of words and morphemes in Tokelau is likely to contribute to the formation of strategies that the child relies on in the processing of the second language. These difficulties do not however impede effective progress in the acquisition of English structure by the Tokelau children, for their rate of development indicates that they are likely to attain eventually to a level that is comparable with that of the Pakeha children.

8.2.2 Discussion

The discussion that follows outlines the rationale for an approach to the development of second language programmes for young children and offers some specific suggestions for their effective operation.

The similarity between first language acquisition and second language acquisition suggests that the process is similar for both native speakers and for second language learners. Consequently an approach that relies on learning theory and habit formation (drills, language laboratories etc.) is inappropriate. On the contrary, an approach to instruction that maximizes the opportunities of the learner to experience the second language in natural discourse and to develop a creative response to the input data is most appropriate for children of this age (cf. Wolfe, 1967; Jakobovitz, 1968; Cook, 1973; Dulay and Burt, 1972; Macnamara, 1973).

When this conclusion is related to the New Zealand situation, it can be seen that it is no more than an assertion of confidence in the practices that are normal in infant rooms in New Zealand

schools. At this stage of schooling, strong emphasis is placed on the provision of a variety of language experiences and on opportunities for relating language to other creative arts in the development of integrated programmes. The findings of this study suggest that this relaxed but absorbing environment is the most appropriate one for young Tokelau children. Indeed, the vitality with which the children tackled the communication task (cf. §7.2.2.1 and Appendix XVII), essentially a language game, is evidence of their capacity to enjoy and to benefit from such experiences.

It would appear then that the teachers' role is primarily that of facilitator rather than instructor. Specific insights that this research offers into how the teacher might most effectively fill this role relate to the significance of errors in the speech of the second language learner, the rate at which he is able to understand the second language and the relations between school and home, in particular the familiarity of the teacher with the language background of the children. Finally, it will be shown that the teacher may appropriately act as instructor in some instances.

Learners of any language make mistakes. In first language acquisition these are barely noticed. Indeed they are frequently regarded with parental satisfaction as an integral component of the acquisition process. In contrast, the mistakes of the second language learner are generally regarded as errors. There is considerable dispute about the significance of such errors, both as regards the extent to which production errors are evidence of comprehension difficulties and as regards the value of efforts to correct errors. In view of the fact that the Tokelau children learning English as a second language made more determiner errors

than native speakers (cf. §7.2.3.1), the significance of these errors along both these dimensions is discussed below.

Tarone (1974) has proposed that the relation between the comprehension and production abilities of the second language learner is essentially the same as for monolingual speakers (cf. §6.3.3). Comprehension can succeed with the application of certain heuristic and probably universal strategies, but accuracy in production depends upon a more thorough mastery of the rules of the language. This suggests that errors in speech do not necessarily reflect a failure in comprehension but rather an incomplete grasp of the rules of the language. Carroll (1973) has suggested that, in formal language instruction, this delay be exploited by the teacher, and that attempts at second language speech be delayed to provide the learner with unimpeded early opportunities to develop listening skills in the second language.

Errors are not only characteristic of language acquisition. They are also functional. The speech of a child who is acquiring his first language is characterized by the occurrence of a large number of forms that differ from accepted adult usage. This is evidence that the child is formulating a number of hypotheses about the structure of the language he is learning and is testing them out in his own speech. The occurrence of errors in the speech of a native speaking child is generally accepted as evidence of the child's progress. The findings of this research suggest that although errors in the speech of young Tokelau children do not affect communication efficiency (cf. §7.2.3.3), they may, in fact, be evidence of the child's progress in the acquisition of English as a second language, and, as in the case of the first language learner, there is no need for immediate correction of such errors

for learning to proceed.

The reaction times of the Tokelau children were significantly slower than those of the Pakeha children. Although clearly this study provides no grounds for assessing the extent to which speed of response can affect comprehension accuracy in natural situations where many other factors both linguistic and situational may intervene, frequently helpfully (cf. §3.3), it is clearly possible that this slowness on the part of the Tokelau children would contribute to the effectiveness or otherwise of communication. This suggestion is reinforced when it is noted that there were (with one exception) no significant differences between the communication scores of the two ethnic groups at either age level (cf. §6.1.2.1). On the communication task all speakers were encouraged to persist with the task and this quite possibly made the task of the listeners (particularly the Tokelau listeners) easier, and thus improved the effectiveness of the communication. Where a speaker is obliged to wait unexpectedly long for a response he is likely to conclude that his listener has not understood. To function effectively as a facilitator the teacher needs to be aware of this delay and to reduce the pace of the conversation accordingly.

Teachers are not generally very accurately informed about the first language experience of the Tokelau children in their classes (§7.1.4.1). It is possible that this lack of familiarity contributes to the impression that the teacher gains of the child's ability to use English in the classroom (cf. §6.2.3). More significantly, the effectiveness of teachers in the language education of the Tokelau children is in some doubt if they are not even aware of the first language of each child.

Clearly the differences between home and school are more marked for Tokelau children than they are for Pakeha children, and it is very important that every effort should be made to bridge that gap. Any initiative taken by teachers in this respect would be beneficial. However this need not be a one-way bridge and an additional approach to the task is suggested by the readiness of the younger children to use their own language in school (cf. §7.1.4.2a) and the pleasure that they took in talking with Mrs Savelio in Tokelau (cf. §3.5.3). If Tokelau parents were encouraged to participate in the daily routine of the school there would be more opportunities for the children to use their own language, and for Pakeha children and teachers to become familiar with some of the customs and culture of the Tokelau people. A more informed and welcoming attitude to the Tokelau language would make the transition between home and school a more gentle one for many children. An additional advantage would be that the parents themselves would, hopefully, increase their understanding of the aims of education, and therefore be more informed in their support of their children.

Attention to these three points, the relative insignificance of errors, the necessity for patience, and greater contact between home and school will, in all probability contribute noticeably to the extent to which the teacher is able to create an environment that is conducive to second language acquisition. But there are two areas in which these results indicate that carefully devised programmes may improve the early education of the Tokelau children. These are the development of vocabulary knowledge and the acquisition of literacy skills.

The importance of vocabulary knowledge and its relation to

communication success was made clear in §7.2.2.3c. Results reported in §6.2.1.2 indicate that the Tokelau children would benefit from some specific assistance in vocabulary development if they are to increase their rate of acquisition sufficiently to attain eventually the same level as Pakeha children of the same age. Indeed, Cazden (1968) has proposed that vocabulary development benefits more from formal instruction than does the acquisition of structural knowledge. While the enlargement of vocabulary is an explicit aim in the language education of all children, both native speakers and second language learners, in their first years at school, some specific suggestions as to the vocabulary needs of the Tokelau children arise from the results of the vocabulary test used in this research. The observed relation between frequency and ease (cf. §6.3.1.2), which is already exploited in junior education (Arvidson, 1970) provides the basis of proposals for a programme of vocabulary development. The younger Tokelau children would benefit from initial instruction in the higher frequency levels while for the seven year olds the third frequency level is the source of greatest difficulty. Domestic vocabulary is comparatively unknown by the five year olds, but this difficulty appears to lessen as they become more proficient in the higher frequency words. However, some early assistance in this area would probably be quite appropriate.

It was suggested in §6.2.3.2 that Tokelau children may benefit from specially prepared reading programmes. The first two years are crucial for them in the acquisition of oral language skills and it is unlikely that they are sufficiently familiar with English during these years for their reading skills to advance at the same rate as those of native speakers. An approach that has attracted

great interest in the United States in recent years (cf. United States Senate, 1967) involves the development and use of early reading materials in the native language for use with minority groups. However, the Tokelauans in New Zealand are too small a minority for such an approach to be feasible. Therefore concentrated literacy programmes should be designed for use when the Tokelau children have progressed well in oral English. These should enable them to progress in written language skills to the level of their Pakeha age mates in the minimum amount of time, and thus avoid falling behind in their education.

This research has suggested that confidence in the present approach to the language education of Tokelau children is probably well-founded. It has also indicated ways in which teachers may become more aware of the particular needs of children who are acquiring English as a second language, and it has suggested two areas in which attention to the development of suitable programmes for formal instruction is required.

Appendix I

Pilot work: Vocabulary

Materials: For all pilot work, items were prepared by the writer using a variety of materials including photocopies of drawings and some original drawings made by the writer and her friends.

Procedures for testing the assumptions of the sampling: The design of the test called for a random sample to be drawn from frequency levels in the Rinsland (1945) list. Pilot work was conducted to ensure that such words were appropriate (were not too easy or too difficult) for use with young Tokelau children learning English as a second language and to justify drawing conclusions about the size of a child's vocabulary based on his knowledge of a random sample. Such a sample would need to be representative of the complete list. It was therefore decided to draw two random samples from each frequency level and to test for correlations between them.

Initially, two parallel samples (lists A and B) were drawn from the higher frequency levels (up to and including the 2nd 500 of the 2nd 1000: each frequency level was a group of 500 at this stage). For list A, the 10th, 30th and 50th word etc. at each level was identified, and for list B the 20th, 40th and 60th word etc. was identified. In some cases it was found that the item randomly selected by this method could not be pictured, in which case the word next above on the list was chosen. If this too was unsuitable, the word one below was attempted. In only one case was it necessary to choose the word two above.

These higher frequency items were tested individually in preliminary pilot work on children of immigrant Polynesian parents (excluding Tokelauans) who were between the age of five years and

five years six months approximately and between the ages of seven years and seven years six months approximately. 24 five year olds and 9 seven year olds were tested in Newtown and Mount Cook Primary Schools.

In the first place, the total scores on the A and the B lists for the five year olds only (there were too few seven year olds at this stage) were compared and the correlation between them calculated. Then the scores on the A and B lists in each of the four frequency levels were compared and the correlations between each of them were calculated. The correlation between the two total scores was .96 and the correlations between each of the four frequency groups were, in descending order of frequency .78, .79, .80, and .73.

To investigate the effects of shortening the tests, a random sample of three items from each of the frequency groups in lists A and B were drawn. The correlations were not as high as those between the larger samples (.49, .49, .73, .66). This was an indication that the selection of only three items at each level would not form a statistically reliable test.

Because it was clear, even before any analysis was possible, that the difficulty level of the older children had not been reached by items in the 2nd 500 of the 2nd 1000 it was decided to extend the base. To do this the base was organized in groups of 1000 instead of 500. To investigate the sample size necessary for a base organized in units of this size, a random sample of 15 items from each of the 1st and 2nd 1000 groups was drawn (using items and results from the earlier pilot work) and tested. The correlations between them were (for 24 five year olds) .65 and .87. It was considered that these figures justified this procedure for the construction of the test.

An Extended pilot study: Two random lists of fifteen words each were then drawn from each of the 3rd and 4th 1000 frequency levels from the base (Rinsland). Together with the A and B lists of 15 words each drawn from the two higher 1000 frequency levels (reported above) they were piloted on 20 five to five and one half year olds and 20 seven to seven and one half year olds Pacific Island (non-Tokelau) children in the Newtown, Mount Cook, Windley and Corinna Primary Schools. The full lists of items are given in Table I.iv at the conclusion of this appendix.

The correlations between the A and B lists in each of the four frequency levels were, with one exception, significant at the 1% level or beyond (Table I.i and I.ii).

Table I.i Extended pilot study: vocabulary scores (five year olds): means, standard deviations and correlations

	List A		List B		
	M	SD	M	SD	r
1st 1000	12.3	2.3	11.7	2.2	.62**
2nd 1000	8.7	3.3	10.9	3.3	.84**
3rd 1000	6.4	2.8	8.1	3.4	.71**
4th 1000	4.3	2.3	3.9	3.4	.17
	** p<.01				

Table I.ii Extended pilot study: vocabulary scores (seven year olds): means, standard deviations and correlations

	List A		List B		
	M	SD	M	SD	r
1st 1000	14.5	1.0	13.9	1.3	.55**
2nd 1000	12.5	2.3	13.8	1.4	.82**
3rd 1000	9.4	2.4	10.1	2.2	.75**
4th 1000	7.8	2.7	6.5	2.5	.77**
	** p<.01				

Where the means are at either extremity (the 4th frequency level for the five year olds and the 1st frequency level for the seven year

olds) the correlations are comparatively depressed. However they were in general sufficient to conclude with some confidence that both lists were representative of the base from which they were sampled.

A Pilot study with Tokelau children: Since the test was designed for use with Tokelau children, it was further piloted on a small sample of Tokelau children¹ (10 five year olds and seven year olds). The items were drawn by taking each alternate item from both A and B lists of the initial pilot work (the full list is in Table I.v at this conclusion of this appendix). The results are shown in Table 1.iii.

Table 1.iii Tokelau pilot study (vocabulary): means and standard deviations

	5 years		7 years	
	M	SD	M	SD
1st 1000	11.3	2.8	14.7	.6
2nd 1000	9.3	2.6	12.8	2.0
3rd 1000	7.0	2.5	11.7	2.0
4th 1000	4.6	1.5	7.6	2.6

The means are in each case similar to the means of the scores of the Pacific Island non-Tokelau children.

The test: The test was formed by drawing alternate words from the lists used in the initial pilot work. The items were also alternate to those given to the pilot sample of Tokelau children.

1. These were Tokelau children who although five and seven years old at the time of the pilot test, had turned six and eight respectively before the final form of the test was administered. They were therefore not the subjects of the main study.

Table I.iv Items used in the extended pilot study

	List A	List B
1st 1000	pencil	pony
	home	kitten
	bell	break
	light	meat
	fire	sheep
	ride	hat
	desk	coat
	rope	rain
	leg	bag
	bicycle	jelly
	string	moon
	horn	paint
	tiger	build
	woman	star
	drum	swing
2nd 1000	plate	ring
	brush	key
	arrow	bedroom
	lamb	marble
	fence	groceries
	tent	tractor
	cheese	clock
	dance	electricity
	steam	tap
	mirror	playground
	prince	rake
	scarf	sink
	vase	worm
	dream	fill
	chest	crack

	List A	List B
3rd 1000	beg	castle
	crown	driver
	enjoy	football
	gift	jolly
	measles	onion
	potato	raise
	serve	smoke
	target	traffic
	axe	branch
	bud	canoe
	diamond	flock
	guard	harbour
	hunter	map
	notice	orchestra
	pine	ruler
4th 1000	adventure	beast
	bundle	crawl
	dam	edge
	flash	harm
	message	modern
	navy	palace
	project	reward
	argument	berry
	breathe	dwarf
	destroy	insect
	expensive	material
	machinery	pleasure
	mix	saucepan
	prevent	speech
	space	ceiling

Table I.v Items used in the Tokelau pilot study

1st 1000	pencil	2nd 1000	plate
	bell		arrow
	fire		fence
	desk		cheese
	leg		steam
	string		prince
	tiger		vase
	drum		chest
	kitten		key
	meat		marble
	hat		tractor
	rain		electricity
	jelly		playground
	paint		sink
	star		fill
3rd 1000	crown	4th 1000	bundle
	gift		flash
	potato		navy
	target		argument
	bud		destroy
	guard		machinery
	notice		prevent
	castle		beast
	football		edge
	onion		modern
	smoke		reward
	branch		dwarf
	flock		material
	map		saucepan
	ruler		ceiling

Appendix II

Vocabulary test

1. home	31. beg
2. light	32. enjoy
3. ride	33. measles
4. rope	34. service
5. bicycle	35. axe
6. horn	36. diamond
7. woman	37. bud
8. pony	38. pine
9. break	39. driver
10. sheep	40. jolly
11. coat	41. raise
12. bag	42. traffic
13. moon	43. canoe
14. build	44. harbour
15. swing	45. orchestra
16. brush	46. adventure
17. arrow	47. dam
18. tent	48. message
19. dance	49. argument
20. mirror	50. breathe
21. scarf	51. expensive
22. dream	52. mix
23. ring	53. space
24. key	54. crawl
25. groceries	55. harm
26. clock	56. palace
27. tap	57. berry
28. rake	58. insect
29. worm	59. saucepan
30. crack	60. speech

Appendix III

Comparison of the McEldowney study with similar frequency studies

The use of data from the McEldowney (1966) study of structural patterns in the written language of twelve year olds in a study of the aural comprehension of children aged between five and seven years requires evidence that frequencies in the two modes and each age level are comparable.

There are two studies, both of children living in the United States, that contain data that enable a comparison to be made. (Harrell, 1957; O'Donnell et al., 1967). Harrell studied the frequency of structural patterns in the spoken and written language of children nine to fifteen years. Because his subjects were older than the children who participated in this research, his data is relevant to the spoken-written comparison alone. However, the subjects in the O'Donnell et al. study ranged from Kindergarten to grade VII (mean ages: 5.10 - 12.11 years), and so comparisons between the age groups five to seven and twelve years could be made.

Both Harrell and O'Donnell et al. defined their units of analysis slightly differently. Harrell used the clause as his basic unit, claiming that this could be defined more closely than 'sentence'. O'Donnell et al. used the T-unit. It seems clear, however, that both these units include the concept of simple sentence as defined by McEldowney and so data from all three studies is comparable.

There are quite clearly functional differences between spoken and written language, and these involve different aspects of the speaker/writer's knowledge of his language. This is apparent from any examination of a transcript of speech (for examples from this study see Appendix XVII). However, there are also many similarities.

The findings of both Harrell and O'Donnell et al. suggest that the most significant differences between speech and writing is the number of constructions that are subordinate or co-ordinate to the basic unit. Similarities between the two modes were most apparent in the internal structure of the basic unit. O'Donnell et al. analysed the structure of T-units and found that there were few differences in the frequency order of these structures in the spoken and written output of children of any age. Of particular relevance for this study is the fact that there were no significant differences between the spoken and written language of twelve year olds. Relative frequencies of structures used by these children are given in Table III.i. They correlated very high (Table III.ii). Clearly the differences between spoken and written language cannot be traced to the use of alternative main clause structures in the two modes.

The age comparison, between the spoken language of six year olds and of twelve year olds, was made by correlating the frequencies of the structures as used by each age level (cf. Table III.i). The correlation was in this case also very high (Table III.ii). Finally the age/mode comparison was made and written language of twelve year olds was correlated with the spoken language of six year olds. This too, was very high.

Table III.i Percentage of occurrence of structural patterns of main clauses in the speech of kindergarten children (6 years) and in the speech and writing of grade VII children (12 years), and their relative frequencies (from O'Donnell et al., 1967, Tables 23 and 24)

	6 years		12 years			
	Speech		Speech		Writing	
	%	Fy	%	Fy	%	Fy
Subj - Vb	36.17	2	44.67	1	43.37	1
Subj - Vb - Obj	40.43	1	41.59	2	41.25	2
Subj - Vb - Pred Nom	5.07	3	2.41	5	1.56	5
Subj - Vb - Pred Adj	2.50	4	3.41	3	5.89	3
Subj - Vb - Ind. Obj - D Obj	.23	8	.47	8	.55	7
Subj - Vb - Obj Comp (Nom)	.11	9	.13	10	.06	11
Subj - Vb - Obj - Adj Comp	.23	8	.99	6	.54	9
Adv - Vb - Subj	.33	7	.09	11	.55	7
<u>There</u> - Vb - Subj	1.70	5	2.59	4	1.57	4
<u>It</u> - Vb - Subj	.11	9	.21	9	.41	10
Passive	.58	6	.84	7	1.05	6

Table III.ii Correlations between the frequencies of occurrence of structural patterns of main clauses in the speech of kindergarten children (6 years) and in the speech and writing of grade VII children (12 years) (based on data from O'Donnell et al., 1967, Tables 23 and 24)

	Speech	Writing
6 years: Speech	.992	.991
12 years: Speech	-	.998

A statistical comparison of the data from McEldowney with that of O'Donnell et al. was not possible because the two studies used different models for the analysis of their material. It is clear, however, that the frequencies reported in them are very similar. McEldowney reports that the subject-predicate construction is the most frequent clause structure in her data and that the direct object most frequently follows the verb. This agrees with the O'Donnell et al.

data for the spoken language of kindergarten children. Similarly, both studies report that actives are very much more frequent than passives. They also agree that the subject - verb - indirect object - direct object construction is rare.

It would appear then that the structure of the written language of twelve year olds and the spoken language of six year olds differ predominantly in the length of the sentences, and not in the main clause structure. All the structures included in the test constructed for this research with the exception of the two operating at sentence level (conjunctions and conditionals) operated at or below the level of clause structure (simple sentences). They are therefore adequately accounted for by comparisons of data from the Harrell and O'Donnell studies. O'Donnell reports that conjunction (and) is a high frequency structure at all age levels and in each mode (Table 10). Conditionals were selected for this research as a low frequency item. This low frequency accounts for the fact that they do not appear at all in the O'Donnell study for any age or mode. However, Harrell's subjects (all ages) used them, and they used them more often in speech than in writing. This is evident that their use in an aural test is not unrepresentative of spoken language.

Appendix IV

Pilot work: Structure

The precise form of the items and the test situation were established in the light of experience gained in preliminary pilot work (cf. §5.2). To check on the form of the test and to obtain reliability data, a further pilot study was run. The subjects were 20 five year old and 20 seven year old non-Tokelau children living in Wellington and Porirua. These children had previously participated in pilot work for the vocabulary test (cf. Appendix I).

A split-half reliability co-efficient was calculated by the Pearson Product moment formula, and corrected by the Spearman-Brown formula. The corrected reliability for the five year olds was .85, and for the seven year olds .92. This was judged to be high enough for the main study to proceed with confidence.

In the calculation of the reliabilities the pictorial items prepared to test comprehension of the present and past tense morphemes were omitted as these were unsatisfactory. They were redrawn and a small pilot study was run to check them before they were included in the main study. The exact form of the yes/no Question items had also not been satisfactorily established before the beginning of the pilot study. Further trial runs were made before the final form was decided upon.

Appendix V

Structure testGroup IForm A

1. The dog jumps up and rides in the truck.
2. The tanker hits the truck.
3. The dog the truck is carrying is brown.
4. Who is standing on the roof?
5. The tanker is hit by the truck.
6. What is standing in the petrol station?
7. The dog that the truck is carrying is black.

Form B

1. The car that the truck is following is blue.
2. What is standing on the roof?
3. The truck is pushed by the car.
4. Who is standing in the petrol station?
5. The truck the car is following is blue.
6. The truck pushes the car.
7. The woman gets up and rides the horse.

Group IIForm A

1. The rabbit likes running. You make him run.
2. Give the dog to the rabbit.
3. The rabbit likes the dog jumping. You make him jump.
4. The dog likes the rabbit to run. You make him run.
5. Show me the rabbit's dog.
6. The dog likes to jump. You make him jump.
7. Give the dog the rabbit.

Form B

1. Give the mother the girl.
2. The mother likes to jump. You make her jump.
3. Show me the girl's mother.
4. The mother likes the girl to sit. You make her sit.
5. The girl likes the mother jumping. You make her jump.
6. Give the mother to the girl.
7. The girl likes sitting. You make her sit.

Group III Form A

1. Which doll is pushing the girl? (mother)
2. Where am I putting the doll? (basket)
3. Who is being pushed by the girl? (boy)
4. Is the car being pushed by the tanker? (yes)
5. What is pushing the car? (tanker)
6. Which doll is the girl being pushed by? (mother)
7. What is the mother doing?
8. Which doll is the girl pushing? (boy)
9. Who is the girl being pushed by? (mother)
10. Is the boy pushing the girl? (no)
11. What is the car pushing? (truck)
12. Which doll is being pushed by the girl? (boy)
13. Who am I giving the baby to? (girl)
14. Who is the girl pushing? (boy)
15. Is the car pushing the truck? (yes)
16. What is the car being pushed by? (tanker)
17. Who is pushing the girl? (mother)
18. What is being pushed by the car? (truck)
19. Is the mother being pushed by the girl? (no)
20. What am I putting the girl in? (basket)
21. Which box am I putting the girl in?

Form B

1. Which box am I putting the dog in?
2. What am I putting the boy in? (basket)
3. Is the horse being followed by the car? (no)
4. What is being followed by the horse? (car)
5. Who is following the girl? (boy)
6. What is the horse being followed by? (truck)
7. Is the boy following the girl? (yes)
8. Who is the girl following? (mother)
9. Who am I giving the plane to? (girl)
10. Which doll is being followed by the girl? (mother)
11. What is the horse following? (car)
12. Is the horse following the truck? (no)
13. Who is the girl being followed by? (boy)
14. Which doll is the girl following? (mother)
15. What is the dog doing?

16. Which doll is the girl being followed by? (boy)
17. What is following the horse? (truck)
18. Is the girl being followed by the boy? (yes)
19. Who is being followed by the girl? (mother)
20. Where am I putting the car? (box)
21. Which doll is following the girl? (boy)

Group IVForm A

1. If you can't eat it, put it in the box (true) (doll)
2. Put it in the box if you can't eat it (false) (sweet)
3. If you can't eat it, put it in the basket (false) (choc)
4. If you can eat it, put it in the box (true) (sweet)
5. Put it in the basket if you can't eat it (true) (whistle)
6. Put it in the basket if you can eat it (true) (choc)
7. Put it in the box if you can eat it (false) (car)
8. If you can eat it, put it in the basket (false) (plane)

Form B

1. If you can eat it, put it in the box (false) (boat)
2. Put it in the basket, if you can eat it (false) (truck)
3. Put it in the box, if you can eat it (true) (sweet)
4. Put it in the box, if you can't eat it (true) (block)
5. If you can eat it, put it in the basket (true) (choc)
6. If you can't eat it, put it in the box (false) (sweet)
7. Put it in the basket if you can't eat it (false) (choc)
8. If you can't eat it, put it in the basket (true) (pencil)

Group VForm A1

1. The mother sweeps the floor
2. The boy isn't sitting
3. The boy holds the truck
4. The paint spilt
5. The dogs dig
6. The train isn't hit by the car

Form Aii

7. The boat isn't pulled by the duck
8. The kittens play
9. The boy dived
10. The girl rides the horse
11. The girl isn't painting
12. The cup falls

Form Bi

1. The dog isn't chased by the cat
2. The boys write
3. The match burnt
4. The boy sails the boat
5. The girl isn't reading
6. The girl drinks

Form Bii

1. The baby climbs
2. The girl isn't cooking
3. The girl holds the dog
4. The mummy cleans the windows
5. The girls stand
6. The boy isn't pushed by the girl

Appendix VI

Teachers' Rating Schedule

As you may know the New Zealand Council for Educational Research is conducting a survey on the language behaviour of young children. We are interested in obtaining information on the knowledge of language(s) other than English of the children who are taking part in the survey. Since some of the children you teach are taking part would you kindly answer the following questions to help us.

Name of child

1. Mother tongue of child
2. In your estimation and using any other sources of information available would you say that he/she understands this mother tongue.

Fluently

Well

Moderately

A little (i.e. a few words)

Not at all

3. Again in your estimation and using any other source available would you say that he/she speaks this mother tongue.

Fluently

Well

Moderately

A little (i.e. a few words)

Not at all

4. Does he/she understand English (use as your criterion the ability to learn in an English medium classroom)

Fluently

Well

Moderately

A little (i.e. a few words)

Not at all

5. Does he/she speak English (again use as your criterion the ability to learn in an English medium classroom)

Fluently

Well

Moderately

A little (i.e. a few words)

Not at all

Appendix VII

Tokelau Language AssessmentInstructions

Kikila ki te faitotoka

Kikila ki luga

Mai ake te tuhi

Tuku te peni i luga o te tuhi

Togi te tuhi ki luga o te laulau

Tuku te poloka kukula ki luga o te poloka hehega

Ke mafaia oi fau he pa ina poloka.

Conversation (ring response)

Ko ai koe? T.E.S. N/R

Ko ai to tamana? T.E.S. N/R

Kua hia nei o tauhaga? T.E.S. N/R

Kua ke iloa tuhi to igoa? (7s only) T.E.S. N/R

Ei ei ni o uho mani o tuawhawhine? T.E.S. N/R

E toka whia? T.E.S. N/R

Ko ai na tino e nonowho i te koutou whale? T.E.S. N/R

(Helili agai ki te kaiga)

E mahani olo koutou ma te koutou kaiga kina lotu ina Aha-Ha T.E.S. N/R

Ko ai te igoa o to whaiaoga? T.E.S. N/R

Ko tea te vahega ei ei koe? T.E.S. N/R

Ei ei ha koutou T.V.? T.E.S. N/R

Ko te a te ata e fiafia koe ki ei? T.E.S. N/R

Ei ei he tavale ma to tamana? T.E.S. N/R

Ko ai te mahani omai koulua ki na aoga T.E.S. N/R

Ka uma na aoga haka-hahako T.E.S. N/R

Koe ki to koutou whale

	Very good	Good	Moderate	A little	Not at all
Speaking	5	4	3	2	1
Understanding	5	4	3	2	1

Appendix VIII

Tokelau Mothers' Interview Schedule

1. Name of child
Ingoa o te tamati
2. Sex M 1
He tama pe he teine F 2
3. Date of birth/...../.....
Aho Whanau day month year
4. Place of Birth
Na whanau i whea
NZ 1 Tok 2 WS 3
AS 4 Other PI 5 UnK. 6
5. Date of arrival in NZ/.....
Aho na tau nuku ki NZ month year
6. Did go to pre-school? Yes 1
Na aoga is i te aoga a No 2
tamaiti?
7. How many schools has been to?
Tokowhia aoga kua whano?
8. Do you have a TV? Yes 1
E iei he Tv ma koutou? No 2
9. Does watch it?
E mahani ia kikila ki te TV?
less than 1 hour a day? 1
e maua he itula te aho?
1-2 hours a day? 2
tahi pe lua itula i te aho?
3-4 hours a day? 3
tolu pe wha itula i te aho?
5 or more hours a day? 4
lima pe hili atula i te aho?

10. How many children in your family?

E whia au tamaiti ia te koe nei?

1 2 3 4 5 6 7 8 9

.....

11. Is your first child?

Ko tau tamati muamua?

Ko tona toka whia ia

1 2 3 4 5 6 7 8 9

12. Do you want to speak Tokelau well when he's grown up?

Yes 1

No 2

E whowhou koe ke le lei te whaka Tokelau a ka matua?

13. What language do you usually speak at home to the children?

Ko te a te gagana e mahani tautala ai koe ki na tamaiti i te kaiga?

English 1 Tokelau 2 Samoan 3
Maori 4 Other PI 5 Other 6

14. (If Tokelau) Do you try to speak English to?

Yes 1

No 2

E tautala whaka Peletania koe kia?

15. Do you correct when he talks English?

Yes 1

No 2

E whakahako e koe ia ka whai e whai e whaka Peletania?

16. Which language did you learn first?

Ko te a te gagana na tautala (ako) ai koe muamua?

English 1 Tokelau 2 Samoan 3
Maori 4 Other PI 5 Other 6

17. (If Tokelau) Do you speak English or Tokelau best?

Eng. 1

Tok. 2

E hili tau tautala whaka peletania pe ko tau whaka-Tokelau?

18. Where did you live when you were a child?

Nae nowho koe i whea i na aho nae tamaiti ai koe?

NZ 1 Tok 2 WS 3
AS 4 Other PI 5 UnK. 6

19. Your date of birth

Aho whanau o koe

.../.../....
day month year

20. Do you have a job? Yes 1
E whai galuega koe? No 2
21. What language does your husband usually speak at home to the children?
Ko te a te gagana e mahini tautala ai to tokalua ki na tamaiti i te kaiga?
English 1 Tokelau 2 Samoan 3
Maori 4 Other PI 5 Other 6
22. Which language did your husband learn first?
He a te gagana na ako muamua e to tokalua?
English 1 Tokelau 2 Samoan 3
Maori 4 Other PI 5 Other 6
23. (If Tokelau) does he speak English or Tokelau best? Eng. 1
E hili tana whaka Peletania pe ko tana whaka Tok. 2
Tokelau?
24. Where did your husband live when he was a child?
Nae nowho i whea to tokalua i na aho nae tamaiti ai?
NZ 1 Tok 2 WS 3
AS 4 Other PI 5 UnK. 6
25. Your husband's date of birth? .../...../....
Aho whanau o to tokalua? day month year
26. Do you have any children's books? Yes 1
E i ei ni tuhi o tamaiti ma koutou? No 2
27. Can speak Tokelau Yes, well 1
E tautala e ... whaka-Tokelau A little 2
Understands but can't speak 3
Not at all 4
28. Can speak Samoan Yes, well 1
E tautala e ... whaka-Hamao A little 2
Understands but can't speak 3
Samoan and a little Tokelau 4
A few words Samoan and Tokelau 5
Not at all 6
29. Mothers code
30. Fathers code

Appendix IX

Letter to Mothers

Akaokoga a te Gagana Peletania a Tamaiti Tokelau.

Kua i ei tomatou talitonuga veia matua taua ma tatau ki tamaiti Tokelau kua aumau i Niu Hila ke vave malamalama ma iloa lelei faka Peletania aua a latou akaokoga gaholoholo ki luma. Ko te mea ia, ke mafai i faiakoga ke fehoahoani ki tamaiti e tatau ona iloilo muamua ni auala e fakafaigofie ai te Igilihi ki tamaiti.

E fakatalohaga atu ai la ma te fakaloalo lava ki matua Tokelau i Ueligitone e tuha ma tenei taumafaiga ka taumafai ki ei ia Mrs Penny Jamieson mai to ofiha o te "N.Z.C.E.R." (New Zealand Council for Educational Research). Ka fia kamataina teia galuega ia Aukusi fe ko Setema. Ka fia talatalanoa hoki ia ma na matua kae maihe na fanau taki 5-5½ ma te 7-7½ tauhaga. E pa hoki kina faleakoga e akoako ai na taupulaga i e nei e fia taumafai ni hukeya (fakapitoa) i te Igilihi lava ki ei.

E lagolagoina malohi e te "Epidemiology Unit" o te falemai i Ueligitone teia e pulea e Dr Ian Prior tenei taumafaiga a Mrs Penny Jamieson.

Ko te fakamoemoe ka fehoahoani ma lagolagoina e ki tatou tenei galuega taua.

Tofa koutou aloha lahi

John E. Watson
Director

The Learning of English by Tokelau Children

We believe it important that Tokelau children living in N.Z. should learn English as quickly and as well as possible, so they can benefit from their time at school. Teachers need to know more about how much English Tokelau children know and speak so that they can help them to learn more.

This letter is to introduce Mrs Penny Jamieson who is undertaking a research project for my Council to find out this information. She plans to visit the homes of all Tokelau children between the ages of 5-5½ yrs and 7-7½ yrs living in the Wellington area to talk to their mothers about the languages they talk at home. She hopes to make

these visits in August and September. She will also visit the children at school and test them for their knowledge of English.

Mrs Jamieson has the full support and help of the Epidemiology Unit at Wellington Hospital headed by Dr Ian Prior.

I am therefore asking for your support in this important work.

Yours sincerely

John E. Watson
Director

Appendix X

Schools attended by children in the studyWellington Area

Corinna, Porirua East
 Tairangi, Porirua East
 Holy Family Convent, Porirua East
 Windley, Porirua East
 Russell, Porirua East
 Cannons Creek, Porirua East
 Maraeroa, Porirua East
 Newtown
 Strathmore
 Porirua East
 Sacred Heart Convent, Petone
 St Michael's Convent, Taita
 Brentwood, Upper Hutt
 Hutt Central
 Puketiro, Maungaraki
 Petone Central
 Lyall Bay
 Glenview, Porirua East
 Porirua
 Stokes Valley
 Tui Glen, Stokes Valley

Auckland Area

Flat Bush, Otara
 Mayfield, Otara
 Henderson South
 Glendene, Henderson
 Kingswood, Mangere
 Mt Albert Primary
 St Joseph's, Ponsonby
 Sacred Heart, Ponsonby
 Onehunga Primary

Rotorua

Rotorua Central
 Whakarewarewa

Appendix XI

Pilot work: Presentation of the stimuli

Two pilot runs were carried out to investigate the feasibility of using a tape recorder to present the stimuli. In the first a recording was made of two presentations of each item by a New Zealand born male school teacher. However, young children whose native language is not English appeared to have difficulty in the aural perception of the stimuli. The voice quality of this speaker was somewhat authoritative, possibly reminding the children of a head-teacher. So a second tape was prepared with a New Zealand woman infant-teacher saying the stimuli. The voice quality on the second tape was considerably more gentle, but the children still found perception difficult. To find out if this effect was attributable to the method of presentation or to the English language abilities of the children, a small study was run with a group of Tokelau-speaking six year olds in which they were given instructions in English and Tokelau, taped and alive. They not unexpectedly found the Tokelau taped instructions easier than the English taped instructions, but they also appeared to have less difficulty with the English instructions when they were presented live by the researcher than when they were recorded. The same differential in response to taped and live presentations was not observed in children who were native speakers of English. It therefore, appeared that taped presentations depressed the score of non-native speakers of English but not of native speakers. On this account it was decided to present the stimuli 'live'.

Appendix XII

Statistical procedures

A preliminary check of score frequencies showed that the data from the comprehension tests was highly skewed: this was particularly evident in the case of the seven year old Pakeha children who had, on a number of variables obtained scores of 100% or very near. The validity of the analysis of binary data, which by its inherent nature is non-Normally distributed, by procedures such as the analysis of variance based on least squares estimates and two tailed t-tests which assume that the data is normally distributed has been questioned by a number of writers. Cox (1970) says that if the values 'are not normally distributed no method of estimation that is linear in the values will, in general, be fully efficient' (p.17). Snedecor and Cochran (1967) point out that 'the analysis of proportions presents more difficulties than of normally distributed continuous data' (p.493).

Suggestions as to the appropriate way of analysing such data have, in general, varied, but there appears to be general agreement that some form of transformation is required. Winer (1962) discusses the choice of a scale of measurement and transformations and suggests that a 'logarithmic transformation is particularly effective in normalizing distribution which have a positive skewness' (p.221). Snedecor and Cochran suggest that when data in the form of proportions or percentages are being analyzed, if all values lie between 25% and 75% the results given by transformations vary little from analysis on the raw scores, but should the values 'range from close to zero up to 50% or beyond there are reasons for expecting that the row and column effects are more likely to be additive on a logit scale than on the original p scale' (p.494). They cite

the following example:

Suppose that the data are the proportions of cases in which the driver of the car suffered injury in automobile accidents classified by severity of impact (rows) and whether the driver wore a seat belt or not (columns). Under very mild impacts p is likely to be close to zero for both wearers and non-wearers, with little if any difference between the two columns. At the other end, under extreme impacts p will be near 100% whether a seat belt is worn or not, with again a small column effect. The beneficial effect of the belts, if any, will be revealed by the accidents that show intermediate proportions of injuries ... thus in the scale of p , row and column effects cannot be strictly additive over the whole range (p.494).

In the data obtained from the present study, the score of the older Pakeha children are close to 100% in many cases; by adopting a logit transformation we avoid obtaining interactions that can be attributed solely to the 'ceiling effect' operating on the scores of the older Pakeha children.

The formulae adopted for analysis of the data are those suggested by Cox (1970). If R is the number of items correctly answered out of a total of n items and we define:

$$y = \log \frac{R + \frac{1}{2}}{n - R + \frac{1}{2}}$$

then y is approximately normally distributed with mean zero and variance given by:

$$V = \frac{(n + 1)(n + 2)}{n(R + 1)(n - R + 1)}$$

The significance of the difference between any two scores can be calculated using the formula:

$$z = \frac{y_1 - y_2}{\sqrt{V_1 + V_2}}$$

If the scores are drawn from matched rather than independent samples, z will be an upper bound for the true z .

The effect of this transformation is to normalize the distribution of the data and to enable the significance of any differences found to be obtained by reference to a standard table of the Normal distribution. As all the comparisons between means on this study were 'planned' comparisons, it was not necessary to widen the significance limits to make allowances for multiple comparisons, and the usual 5%, 1% and .1% levels have been used.

The effect of the logistic transform on skewed data such as that encountered in this study can be illustrated by presenting parallel analyses using both the classical analysis of variance model and the logistic transform model. Parallel analyses were performed on total scores obtained in each of the vocabulary and structure tests. Results show in Table XII.i indicate that the main result of the logistic transform is to reduce the interaction

Table XII.i Interactions on vocabulary and structure tests using
two statistical procedures

	z-values	F ratio	z-values	F ratio
Ethnic group (A)	15.00***	139.38***	14.09***	101.62***
Age (B)	18.99***	77.61***	18.94***	63.45***
A x B	.38	4.87*	3.04*	3.82*

* $p < .05$; ** $p < .01$; *** $p < .001$

effect between the age and ethnic group variables on the vocabulary

test. In theory, this is not undesirable, since the interaction by the analysis of variance procedure may well have been caused by the 'ceiling' effect of the bests, for the seven year Pakeha children in particular.

Appendix XIII

Means, t-values and z-values: vocabulary and structure items
i. Vocabulary

Item	Mean Scores						Differences					
	Tokelau 5	Tokelau 7	Pakeha 5	Pakeha 7	Tokelau 5-7 t	Tokelau 5-7 z	Pakeha 5-7 t	Pakeha 5-7 z	5 years t	5 years z	7 years t	7 years z
1. Home	0.81	0.96	0.91	0.98	-1.99*	-1.87	-1.35	-1.28	-1.24	-1.22	-0.59	-0.56
2. Light	0.91	1.00	0.98	1.00	-2.09*	-1.99*	-0.97	-0.85	-1.37	-1.34	0.00	0.00
3. Ride	0.67	0.83	0.74	0.93	-1.66	-1.60	-2.32*	-2.16*	-0.71	-0.71	-1.35	-1.32
4. Rope	0.64	0.98	1.00	1.00	-4.22***	-3.38**	0.00	-0.71	-4.77***	-3.61**	-1.02	-2.16*
5. Bicycle	0.81	0.93	0.95	1.00	-1.54	-1.49	-1.43	-1.35	-2.04*	-1.94	-1.77	-1.75
6. Horn	0.86	0.98	0.98	0.98	-1.97	-1.83	0.03	0.05	-1.99*	-1.89	0.00	0.00
7. Woman	0.36	0.68	0.83	0.95	-5.65***	-4.45***	-1.72	-1.63	-5.02***	-4.20***	-1.19	-1.16
8. Pony	0.36	0.93	0.93	1.00	-6.60***	-4.75***	-1.79	-1.71	-6.74***	-4.85***	-1.77	-1.75
9. Break	0.31	0.70	0.48	0.80	-3.79***	-3.42**	-3.21**	-2.94**	-1.57	-1.54	-1.03	-1.02
10. Sheep	0.93	0.95	1.00	1.00	0.40	-0.39	0.00	0.03	-1.79	-1.75	-1.45	-1.44
11. Coat	1.00	1.00	1.00	1.00	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00
12. Bag	0.67	0.95	0.95	0.98	-3.49***	-3.00**	-0.55	-0.51	-3.54***	-3.08**	-0.59	-0.56
13. Moon	0.67	0.85	0.79	0.95	-1.96	-1.88	-2.26*	-2.08*	-1.22	-1.20	-1.49	-1.45
14. Build	0.71	0.93	0.95	0.98	-2.55**	-2.35*	-0.55	-0.51	-3.05**	-2.74**	-1.02	-0.99
15. Swing	0.93	1.00	1.00	1.00	-1.79	-1.71	0.00	0.03	-1.79	-1.75	0.00	0.00
16. Brush	0.79	1.00	1.00	0.98	-3.35**	-2.88**	1.02	0.93	-3.35**	-2.93**	1.02	0.89
17. Arrow	0.64	0.93	0.88	0.98	-3.28**	-2.90**	-1.66	-1.58	-2.62*	-2.47*	-1.02	-0.99
18. Tent	0.45	0.88	0.93	1.00	-4.51***	-3.79***	-1.79	-1.71	-5.46***	-4.26***	-2.36*	-2.26*
19. Dance	0.81	0.98	0.91	1.00	-2.50**	-2.27*	-2.08*	-1.99*	-1.24	-1.22	-1.02	-0.89

i. Vocabulary (cont.)

Item	Mean Scores				Differences							
	Tokelau		Pakeha		Tokelau 5-7		Pakeha 5-7		5 years T & P		7 years T & P	
	5	7	5	7	t	z	t	z	t	z	t	z
58. Insect	0.38	0.85	0.62	0.88	-4.92***	-4.10***	-2.76**	-2.55*	-2.21*	-2.14*	-0.32	-0.32
59. Saucepan	0.19	0.45	0.74	0.90	-2.58*	-2.45*	-2.93	-1.84	-5.94***	-4.72***	-4.85***	-3.98***
60. Speech	0.07	0.30	0.26	0.43	-2.73**	-2.54*	-1.55	-1.53	-2.40*	-2.24*	-1.11	-1.15
Totals												
1-15	0.71	0.92	0.90	0.97	-6.49***	-7.41***	-4.06***	-2.82**	-6.09**	-6.26**	-2.32*	-2.90**
16-30	0.68	0.93	0.91	1.00	-7.44**	-8.11***	-4.54***	-5.63***	-6.70***	-7.12***	-3.52***	-4.32***
31-45	0.47	0.69	0.61	0.98	-6.22***	-7.97***	-9.36***	-9.86***	-4.07***	-5.19***	-6.38***	-6.74***
46-60	0.31	0.59	0.51	0.73	-7.38***	-9.62***	-6.27***	-8.42***	-5.63***	-7.24***	-3.67***	-5.69***
1-60	0.54	0.76	0.73	0.89	-8.64***	-14.96***	-8.30***	-11.71***	-7.38***	-13.31***	-5.00***	-8.96***

ii. Structure

Item	Mean Scores						Differences					
	Tokelau		Pakeha		Tokelau 5-7		Pakeha 5-7		5 years T & P		7 years T & P	
	5	7	5	7	t	z	t	z	t	z	t	z
1. Conjoined VP	0.88	0.98	0.98	0.99	-2.28*	-1.76	-0.55	-0.63	-2.26*	-1.56	-0.59	-0.31
2. Singular	0.59	0.79	0.60	0.83	-3.74***	-4.08***	-4.12***	-4.44***	-0.20	-0.28	-0.66	-0.72
3. Plural	0.48	0.63	0.57	0.74	-3.74***	-2.72**	-4.12***	-3.43***	-0.20	-1.52	-0.66	-2.21*
4. Possessive	0.64	0.94	0.86	0.96	-4.50***	-4.26***	-2.37*	-2.02*	-3.09***	-3.21**	-0.65	-0.50
5. Past	0.67	0.96	0.92	0.99	-6.63***	-6.14***	-2.82**	-2.65**	-5.17***	-5.37***	-1.49	-1.10
6. Present	0.78	0.88	0.80	0.91	-2.44**	-2.84**	-2.63**	-2.82**	-0.38	-0.39	-0.98	-0.18
7. Negative	0.32	0.64	0.67	0.85	-3.92***	-5.72***	-2.58*	-3.73***	-4.48***	-6.29***	-2.82**	-4.20***
8. Passive & Negative	0.57	0.54	0.65	0.54	0.60	0.60	1.66	2.06*	-1.27	-1.49	0.00	0.00
9. Infin. with DO	0.68	0.93	0.91	0.95	-4.24***	-3.44***	-1.16	-1.15	-3.82***	-3.07**	-0.67	-0.27
10. Infin. with- out DO	0.98	0.99	0.99	1.00	-0.55	-0.25	-0.97	-0.54	-0.58	-0.31	-1.02	-0.59
11. Part. with DO	0.67	0.93	0.83	0.91	-3.93***	-3.85***	-1.57	-1.66	-2.35*	-2.45*	0.30	1.09
12. Part. with- out DO	0.98	0.99	1.00	0.99	-0.55	-0.53	1.02	0.64	-1.43	-1.26	0.00	0.00
13. Ind. Obj. with to	0.83	0.90	0.83	0.89	-1.11	-1.19	-1.02	-0.14	0.00	-0.83	0.22	0.45
14. Ind. Obj. with out to	0.54	0.69	0.74	0.81	-1.84	-1.87	-1.07	-1.05	-2.75**	-2.70**	-1.54	-1.93
15. Active	0.68	0.91	0.87	0.98	-3.81***	-3.52***	-2.76**	-2.43*	-3.00**	-2.96**	-1.79	-1.92

ii. Structure (cont.)

Item	Mean Scores						Differences					
	Tokelau			Pakeha			Tokelau 5-7			Pakeha 5-7		
	5	7	5	7	5	7	t	z	t	t	z	z
16. Passive	0.16	0.25	0.27	0.33	-1.37	-1.29	-0.64	-0.65	-1.76	-1.79	-0.92	-1.08
17. Who	0.74	0.95	0.92	0.99	-3.56***	-3.51***	-1.97*	-2.14*	-2.78**	-2.96**	-1.39	-1.44
18. What	0.50	0.59	0.49	0.66	-1.12	-1.11	-2.06*	-2.23*	1.14	0.15	-0.93	-0.98
19. Who Q.Agt Act.	0.58	0.88	0.79	0.95	-4.57***	-3.90***	-2.87**	-2.82**	-2.79**	-2.73**	-1.67	-1.59
20. Who Q.Obj. Act.	0.45	0.81	0.73	0.98	-4.57***	-4.64***	-4.56***	-4.06***	-3.42**	-3.53***	-3.08**	-3.08**
21. Who Q.loc. Act.	0.81	0.99	0.98	0.99	-3.09**	-3.54***	-0.55	-0.63	-2.84**	-3.28**	0.00	0.00
22. What Q.Agt Act.	0.48	0.64	0.75	0.89	-2.02*	-2.13*	-2.00	-2.00*	-3.67***	-3.64***	-3.18**	-3.33**
23. What Q.Obj. Act.	0.63	0.93	0.85	0.98	-4.46***	-4.20***	-2.81*	-2.79**	-2.92**	-3.12**	-1.31	-1.62
24. What Q.loc. Act.	0.77	1.00	0.98	0.99	-4.15***	-4.07***	-0.55	-0.25	-3.55***	-3.63***	1.02	0.59
25. What Q.Vb. Act.	0.80	1.00	0.99	1.00	-3.79***	-3.75***	-0.97	-0.54	-3.61***	-3.49***	0.00	0.00
26. Which Q.Agt. Act.	0.68	0.93	0.91	0.95	-4.03***	-3.89***	-3.03**	-3.19**	-2.74**	-2.75**	-1.79	-2.03*
27. Which Q.Obj. Act.	0.36	0.63	0.55	0.75	-3.44***	-3.39**	-2.69**	-2.66**	-2.23*	-2.48**	-1.88	-1.69
28. Which Q.loc. Act.	0.67	0.96	0.99	1.00	-4.58***	-4.28***	-0.97	-0.53	-5.39***	-4.69***	-1.35	-1.61
29. Where Q. Act.	0.80	0.99	1.00	1.00	-3.60**	-3.64**	-0.00	-0.05***	-3.95***	-4.02***	-1.02	-0.59

ii. Structure (cont.)

Item	Mean Scores						Differences					
	Tokelau		Pakeha		Tokelau 5-7		Pakeha 5-7		5 years T & P		7 years T & P	
	5	7	5	7	t	z	t	z	t	z	t	z
42. $\frac{\text{If not - MC}}{(\text{true})}$	0.93	0.90	0.93	0.96	-0.63	-0.60	-0.98	-0.37	0.00	-0.92	-1.63	-0.65
43. $\frac{\text{If not - MC}}{(\text{false})}$	0.11	0.39	0.32	0.66	-3.84***	-3.91***	-4.56***	-4.43***	-3.57***	-2.69**	-3.21**	-3.46***
44. $\frac{\text{MC - If}}{(\text{true})}$	0.95	0.91	0.92	0.96	-1.05	-0.65	-1.27	-1.50	0.96	0.88	-1.35	-1.28
45. $\frac{\text{MC - If}}{(\text{false})}$	0.14	0.58	0.36	0.79	-5.23***	-5.46***	-4.80***	-5.34***	-2.77**	-3.02**	-2.26*	-2.83**
46. $\frac{\text{MC - If not}}{(\text{true})}$	0.92	0.75	0.92	0.83	2.73**	2.74**	1.48	1.61	0.00	-0.13	-1.03	-1.25
47. $\frac{\text{MC - If not}}{(\text{false})}$	0.14	0.54	0.44	0.91	-5.32***	-5.03***	-6.26***	-5.69***	-3.86***	-4.08***	-5.19***	-4.75***
48. $\frac{\text{Embed. } \emptyset}{}$	0.48	0.58	0.46	0.55	-1.28	-1.29	-1.09	-1.09	0.51	0.15	-0.33	-0.35
49. $\frac{\text{Embed. that}}{}$	0.58	0.65	0.70	0.66	-0.93	-0.98	0.56	0.67	-1.75	-1.64	0.19	0.03

Appendix XIV

Differences between the scores of boys and girlsi. Vocabulary

5 year olds:

Tokelauans		Pakehas	
	M F		M F
11 - 22	- 2	21 - 30	- 1
21 - 30	10 1	31 - 40	6 8
31 - 40	9 9	41 - 50	14 13
41 - 50	5 13	51 - 60	4 6
51 - 60	- 5		— —
	— —		24 28
	24 28		
	$\chi^2 = 1.48$ ns.		$\chi^2 = 1.42$ ns.

7 year olds:

Tokelauans		Pakehas	
	M F		M F
21 - 30	1 -	41 - 50	4 4
31 - 40	5 1	51 - 60	24 18
41 - 50	8 13		— —
51 - 60	14 8		28 22
	— —		
	28 22		
	$\chi^2 = 5.86$ ns.		$\chi^2 = 0.14$ ns.

ii. Structure

5 year olds:

Tokelauans		Pakehas	
	M F		M F
31 - 40	1 4	41 - 50	1 -
41 - 50	4 4	51 - 60	5 4
51 - 60	11 7	61 - 70	6 9
61 - 70	5 10	71 - 80	10 13
71 - 80	3 3	81 -	2 2
	— —		— —
	24 28		24 28
	$\chi^2 = 4.07$ ns.		$\chi^2 = 1.81$ ns.

7 year olds:

	Tokelauans	
	M	F
51 - 60	3	-
61 - 70	8	9
71 - 80	13	10
81 -	4	3
	<hr/>	<hr/>
	28	22
	$\chi^2 = 2.91$ ns.	

	Pakehas	
	M	F
61 - 70	3	-
71 - 80	11	11
81 -	14	11
	<hr/>	<hr/>
	28	22
	$\chi^2 = 2.68$ ns.	

Appendix XV

Raw means and standard deviations of total vocabulary and structure scores.

		Tokelauans		Pakehas	
		5 years	7 years	5 years	7 years
Vocabulary:	mean	.54	.78	.73	.89
	SD	.13	.12	.11	.07
Structure:	mean	.57	.74	.71	.82
	SD	.14	.07	.09	.06

Appendix XVI

Listener - Speaker effectAnalysis of variance on the variables of listener and speaker
for five year old communication pairs

Source	SS	df	MS	F
Listener (A)	1.38	1	1.38	2.90
Speaker (B)	.93	1	.93	1.95
A x B	2.55	1	2.55	5.35*
within cell	40.23	84	.48	

* $p < .05$

Appendix XVII

Transcripts from communication task

5 years T → T

1. T. John What's in this picture it isn't, it's a lady
J. what Indians

T. No it's a lady It's holding a basket...
J. no, it's a Indian Indian

T. the lady's holding a basket no... John do you
J. no, Indian what

T. know what it is what is it no, it's a lady it is so
J. yes cowboy no

T. she's holding a basket yes, John... do you know, do
J. it is not no

T. you know what it is what is it
J. yes Indian

2. Got some Indians and some clo...some Indians and clo...
3. The girl is white... the witch is chasing the girl... the witch is
up in the box, broom, bloom, door watching
4. It's got white shirt and a yellow hair and... a ribbon and a clo...
and brown hair... he's got a orange clo
5. He's got a brown hair and two shoes and her hand and her green
clothes and her black dress and her jersey and...

5 years T → P

1. T. Have you got a giant yea have you got a tree have
D. what what

T. you got a tree... have you got ... a boot on the giant. Have
D.

2. Have you got a little girl with a black thing around her dress and blue and yellow and white and two p... and two shoes and some brown hair and collar
3. M. John... you got this one you got... um... one her shoes is
J. um

M. lost one her shoes is lost I think what she's
J. what no no

M. wearing pardon that's right that's right
J. clothes clothes what

4. That's a girl bringing a basket
- 7 years $T \rightarrow T$
1. Cinderella... and there's a broom and it's got a crashed chair and it's got white cup but it's a big brown one
2. This man he sent this lady away in the woods
3. It's got black hair, it's got rubber bands on the little girl and it's got a bow and arrow and it's got...
4. This girl's got long hair and she's got two shoes on and she's wearing her hands like this... he's... yellow curly hair
5. L. Mary Ann Hurry up... what's in the picture, Mary Ann do you
M. what

L. know it's all in the picture a chair, blanket, broom, chair,
M. what

L. cup
M.

7 years T → P

1. Can you see a doll with one shoe one, can you see a doll with a yellow hair
2. Cinderella, Snow White I mean... she saw a dirty dirty house with all stuff in it and which one is it
3. There's a girl got two shoes and a brown hair and blue dress and a black thing round her dress and a white...
4. L₁. Lynette, do you know which picture is this this picture,
L₂. what

L₁. a lady with a hand, a basket and a dress and a scarf and long hair

5. M. Diane, can you see a girl with a blue dress
D. what tell us the

M. what

D. colour tell us the colour

7 years P → P

1. The wicked witch who showed the farmer, huntsman to kill Snow White... he is in the forest, and he's got a red jacket on
2. It's got one shoe on and one shoe off and it's green dress and green, no red orange dress, a green... and grey hair
3. I want you to listen for a few minutes and there's chairs all over the room and there's a lady in there and she got....
4. G. Find a blue one can you see a blue one a blue
B. tell me more yeah

G. car yeah

B. yeah, yellow wheels got it

7 years P → T

1. You see there was a big hat walking with a basket
2. It has blue on it and a red steering wheel and yellow wheels
3. A girl's got a hat on and a basket and a blue scarf and shoes and a green dress, yellow hat and black hair and a red scarf and a basket and shoes and...
4. This is a picture of Cinderella who is come into a house and found it is very messy and the house belongs to seven dwarfs and in the picture there is a table with plates all piled up
5. Telagi, have you got a big blue car with yellow wheels and red steering wheel

Tokelau: 5 years

1. Te ata teia, te whahine Initia ē pulou, oi heiai. Te whahine Initia ē whauke makie kie Initia, Ko te Initia ka hano oi...
ko te Initia ē puloe
2. He tavale ei ei te tine i ei. Kae ve ē blue na
3. T. What colours this girl got no te
P. got te teine got orange kofu

T. kofu o te teine e lanua blue ko lanua te
P. e lanua green

T. hea
P. ko white

Appendix XVIII

Teacher's estimates

i. Tokelau speaking - English speaking

5 years			7 years		
	Tok	Eng		Tok	Eng
1	19	-	1	10	-
2	6	13	2	3	3
3	5	23	3	11	23
4	11	11	4	13	19
5	11	5	5	13	5
	—	—		—	—
	52	52		50	50

ii. Tokelau understanding - English understanding

5 years			7 years		
	Tok	Eng		Tok	Eng
1	12	-	1	5	-
2	6	6	2	9	1
3	16	26	3	12	16
4	9	15	4	14	25
5	9	5	5	10	8
	—	—		—	—
	52	52		50	50

iii. 5 years - 7 years

speaking			understanding		
	5 years	7 years		5 years	7 years
2	13	3	2	6	1
3	23	23	3	26	16
4	11	19	4	15	25
5	5	5	5	5	8
	—	—		—	—
	52	50		52	50

Appendix XIX

Differentiating Items

The following tables list items that differentiate between two groups of children at the 1% level or beyond. Frequency level is also indicated.

i. Vocabulary: 5 year Tokelauans - 5 year Pakehas

	FL		FL
rope**	1	groceries**	2
woman***	1	tap***	2
pony***	1	worm**	2
bag**	1	message**	4
build**	1	argument**	4
brush**	2	palace**	4
tent***	2	saucepan***	4
dream***	2		

ii. Vocabulary: 7 year Tokelauans - 7 year Pakehas

	FL		FL
beg**	3	harbour**	3
serve**	3	message**	4
pine**	3	argument**	4
jolly**	3	saucepan***	4

iii. Vocabulary: 5 year Tokelauans - 7 year Tokelauans

	FL		FL
rope**	1	crack***	2
woman***	1	enjoy**	3
pony***	1	measles***	3
break**	1	pine**	3
bag**	1	canoe**	3
brush**	2	orchestra**	3
arrow**	2	adventure***	4
tent***	2	dam**	4
mirror**	2	message***	4
dream**	2	argument**	4
ring**	2	crawl***	4
groceries**	2	palace***	4
tap**	2	insect***	4
worm**	2		

iv. Vocabulary: 5 year Pakehas - 7 year Pakehas

	FL		FL
break**	1	diamond***	3
crack**	2	bud**	3
beg**	3	pine***	3
enjoy**	3	message**	4
measles***	3	argument**	4
serve***	3	palace***	4

v. Structure: 5 year Tokelauans - 5 year Pakehas

Possessive**
 Past***
 Negative***
 Infinitive with direct object**
 Participle with direct object**
 Indirect object with to**
 Active**
Who**
Who questioning Agent, active**
Who questioning Object, active***
Who questioning Locative, active**
What questioning Agent, active***
What questioning Object, active**
What questioning Locative, active**
What questioning Verb, active***
Which questioning Agent, active***
Which questioning Object, active**
Which questioning Locative, active***
Where active
Who questioning Agent, passive***
What questioning Agent, passive***
Which questioning Agent, passive**
Yes/no questions, passive - no**
If - main clause (false)**
If not - main clause (false)**
 Main clause - if (false)***
 Main clause - if not (false)***

vi. Structure: 7 year Tokelauans - 7 year Pakehas

Negative***
Who questioning Object, active***
What questioning Agent, active**
Who questioning Agent, passive***
What questioning Agent, passive***
Which questioning Agent, passive**
If - main clause (false)***
If not - main clause (false)**
 main clause - if (false)**
 main clause - if not (false)***

vii. Structural: 5 year Tokelauans - 7 year Tokelauans

Singular***
 Plural**
 Possessive***
 Past***
 Present**
 Negative***
 Infinitive with direct object***
 Participle with direct object***
 Active***
 Who***
Who questioning Agent, active***
Who questioning Object, active***
Who questioning Locative, active***
What questioning Object, active***
What questioning Locative, active***
What questioning Verb, active***
Which questioning Agent, active***
Which questioning Object, active**
Which questioning Locative, active***
Where active
Who questioning Agent, passive**
What questioning Agent, passive**
Yes/no questions, active - no**
Yes/no questions, passive - no**
If - main clause (false)***
If not - main clause (false)**
 Main clause - if (false)***
 Main clause - if not (true)**
 Main clause - if not (false)***

viii. Structure: 5 year Pakeha - 7 year Pakeha

Singular***
 Plural***
 Past**
 Negative**
Who questioning Agent, active**
Who questioning Object, active***
What questioning Object, active**
Which questioning Object, active**
Who questioning Agent, passive**
What questioning Agent, passive***
Which questioning Object, passive**
Yes/no questions, active - no***
If - main clause (false)***
If not - main clause (false)***
 Main clause - if not (false)***

Appendix XX

Difficulty order of items: vocabulary and structure

i Order of difficulty (vocabulary): 5 year Tokelauans

1. speech .07	32. raise .57
2. pine .12	space .57
dam .12	34. mirror .62
message .12	berry .62
5. breathe .19	36. rope .64
saucepan .19	arrow .64
7. argument .21	worm .64
8. bud .24	diamond .64
beg .24	40. ride .67
10. serve .29	bag .67
11. break .31	moon .67
measles .31	ring .67
expensive .31	44. build .71
14. canoe .33	45. rake .76
15. woman .36	axe .76
pony .36	47. brush .79
crawl .36	traffic .79
palace .36	49. home .81
harm .36	dance .81
20. adventure .38	bicycle .81
21. harbour .38	52. horn .86
insect .38	53. light .91
22. enjoy .41	drive .91
mix .41	55. sheep .93
25. tent .45	swing .93
tap .45	57. scarf .95
crack .45	58. key .98
28. groceries .48	59. clock 1.0
orchestra .48	coat 1.0
30. dream .55	
jolly .55	

ii Order of difficulty (vocabulary): 7 year old Tokelauans

1. expensive .15	33. woman .88
2. beg .23	tent .88
3. speech .30	dream .88
4. bud .33	36. rake .90
5. breathe .33	crack .90
6. dam .38	38. bicycle .93
7. pine .40	39. pony .93
8. saucepan .45	build .93
9. serve .53	arrow .93
10. argument .55	axe .93
11. harbour .58	43. home .95
12. message .60	sheep .95
13. jolly .63	bag .95
14. harm .65	mirror .95
15. diamond .67	ring .95
16. berry .67	worm .95
17. break .70	49. rope .98
mix .70	horn .98
raise .70	dance .98
20. measles .75	traffic .98
21. enjoy .78	53. light 1.0
orchestra .78	coat 1.0
adventure .78	swing 1.0
crawl .78	brush 1.0
25. canoe .80	scarf 1.0
space .80	key 1.0
palace .80	clock 1.0
28. ride .83	driver 1.0
tap .83	
30. moon .85	
groceries .85	
insect .85	

iii Order of difficulty (vocabulary): 5 year old Pakehas

1. beg .21	3. bud .26
breath .21	speech .26

5. expensive .33	35. arrow .88
6. pine .36	driver .88
dam .36	37. home .91
8. message .38	dance .91
9. berry .41	ring .91
10. serve .45	40. pony .93
adventure .45	tent .93
12. break .48	scarf .93
13. measles .52	dream .93
argument .52	tap .93
15. harm .55	45. bicycle .95
16. canoe .57	bag .95
17. jolly .62	build .95
harbour .62	rake .95
orchestra .62	worm .95
insect .62	axe .95
crawl .62	51. traffic .98
22. mix .64	light .98
23. diamond .68	horn .98
24. raise .69	key .98
enjoy .69	55. rope 1.0
26. space .71	sheep 1.0
27. ride .74	swing 1.0
crack .74	brush 1.0
saucepan .74	clock 1.0
30. palace .76	
31. moon .79	
mirror .79	
33. woman .83	
groceries .83	

iv Order of difficulty (vocabulary): 7 year old Pakehas

1. breath .33	5. beg .55
2. expensive .40	6. bud .60
3. speech .43	7. harm .65
dam .43	8. adventure .73

9.	raise .75	40.	light 1.0
10.	break .80		bicycle 1.0
	crawl .80		pony 1.0
12.	pine .83		sheep 1.0
	berry .83		coat 1.0
14.	argument .88		swing 1.0
	mix .88		tent 1.0
	insect .88		dance 1.0
17.	serve .90		scarf 1.0
	driver .90		dream 1.0
	saucepan .90		ring 1.0
	jolly .90		key 1.0
	space .90		groceries 1.0
22.	ride .93		clock 1.0
	measles .93		tap 1.0
	palace .93		rake 1.0
25.	woman .95		worm 1.0
	moon .95		crack 1.0
	enjoy .95		axe 1.0
	canoe .95		diamond 1.0
	harbour .95		driver 1.0
	message .95		
31.	home .96		
	mirror .96		
33.	horn .98		
	bag .98		
	build .98		
	brush .98		
	arrow .98		
	traffic .98		
	orchestra .98		

v. Order of difficulty (structure): 5 year old Tokelauans

1. If - main clause (false) .07
2. If not - main clause (false) .11
3. Main clause - if not (false) .14
Main clause - if (false) .14
5. Passive .16
6. Yes/No questions, passive - No .19
7. What questioning Object, passive .24
8. Who questioning Object, passive .29
9. Which questioning Object, passive .30
10. Negative .32
11. Which questioning Agent, passive .33
12. Who questioning Agent, passive .35
What questioning Agent, passive .35
14. Which questioning Object, active .36
15. Which questioning Agent, active .41
16. Yes/No questions, active - No
17. Who questioning Object, active .45
18. Embedding ϕ .48
What questioning Agent, active .48
Plural .48
21. What .50
22. Subject - verb - indirect object - direct object .54
23. Passive and negative .57
24. Embedding that .58
Who questioning Agent, active .58
26. Singular .59
27. What questioning Object, active .63
28. Possessive .64
29. Participial complement with direct object .67
Which questioning Locative, active .67
Past .67
32. Infinitival complement with direct object .68
Active .68
34. Who .74
35. What questioning Locative, active .77
36. Present .78

37. Where, active .80
What questioning Verb, active .80
 39. Who questioning Locative, active .81
 40. Yes/No questions, passive - Yes .82
 41. Subject - verb - direct object - to indirect object .83
 42. Yes/No questions, active - No .86
 43. Conjoined verb phrase .88
 44. Main clause - if not (true) .92
 45. If not - main clause (true) .93
 46. If - main clause (true) .95
Main clause - if (true) .95
 48. Infinitival complement with no direct object .98
Participial complement with no direct object .98
- vi. Order of difficulty (structure): 7 year old Tokelauans
1. What questioning Object, passive .20
 2. Which questioning Object, passive .24
 3. Passive .27
 4. Who questioning Object, passive .29
 5. If not - main clause (false) .32
 6. Main clause - if (false) .36
 7. Yes/No questions, passive - No .39
 8. Main clause - if not (false) .44
 9. If - main clause (false) .46
 10. What .49
 11. Which questioning Object, active .55
 12. Plural .56
Which questioning Agent, passive .56
 14. Singular .60
 15. Who questioning Agent, passive .62
What questioning Agent, passive .62
 17. Yes/No questions, active - No .63
 18. Passive and negative .65
 19. Negative .67
 20. Embedding ϕ .70
Embedding that .70

22. Who questioning Object, active .73
Yes/No questions, passive - Yes .73
24. Subject - verb - indirect object - direct object .74
25. What questioning Agent, active .75
26. Who questioning Agent, active .79
27. Present .80
28. Yes/No questions, active - Yes .81
29. Participial complement with direct object .83
Subject - verb - direct object - to indirect object .83
31. What questioning Object, active .85
32. Possessive .86
33. Active .87
34. Infinitival complement with direct object .91
Which questioning Agent, active .91
36. Who .92
Past .92
Main clause - if (true) .92
Main clause - if not (true) .92
40. If not - main clause (true) .93
41. If - main clause (true) .95
42. Conjoined verb phrase .98
What questioning Locative, active .98
Who questioning Locative, active .98
45. Infinitival complement with no direct object .99
What questioning verb, active .99
Which questioning Locative, active .99
48. Participial complement with no direct object 1.00
Where, active 1.00

vii. Order of difficulty (structure): 5 year old Pakehas

1. Passive .25
Which questioning Object, passive .25
3. What questioning Object, passive .28
4. Who questioning Object, passive .30
5. If not - main clause (false) .39

6. Yes/No questions, passive - No .44
7. Which questioning Agent, passive .52
8. Main clause - if not (false) .54
Passive and negative .54
10. Main clause - if (false) .58
Embedding $\emptyset$.58
Who questioning Agent, passive .58
13. What .59
14. What questioning Agent, passive .60
If - main clause (false) .60
16. Plural .63
Which questioning Object, active .63
19. Negative .64
What questioning Agent, active .64
20. Embedding that .65
21. Subject - verb - indirect object - direct object .69
Yes/No questions, passive - Yes .69
23. Main clause - if not (true) .75
24. Singular .79
25. Who questioning Object, active .81
26. If - main clause (true) .83
27. Yes/No questions, active - No .84
28. Present .88
Who questioning Agent, active .88
30. Subject - verb - direct object - to indirect object .90
Yes/No questions, active - Yes .90
If not - main clause (true) .90
33. Main clause - if (true) .91
Active .91
35. Infinitival complement with direct object .93
Participial complement with direct object .93
Which questioning Agent, active .93
What questioning Object, active .93
39. Possessive .94
40. Who .95
41. Past .96
Which questioning Locative, active .96
43. Conjoined Verb Phrase .98

- 44. Infinitival complement with no direct object .99
 Participial complement with no direct object .99
Who questioning Locative, active .99
Where, active .99
- 48. What questioning Locative, active 1.00
What questioning Verb, active 1.00

viii. Order of difficulty (structure): 7 year old Pakehas

- 1. What questioning Object, passive .20
- 2. Passive .33
- 3. Who questioning Object, passive .39
- 4. Which questioning Object, passive .44
- 5. Passive and Negative .54
- 6. Embedding ϕ .55
- 7. Yes/No questions, passive - No .55
- 8. What .66
If not - main clause (false) .66
 Embedding that .66
- 11. Yes/No questions, passive - Yes .69
- 12. Plural .74
Which questioning agent, passive .74
- 14. Which questioning object, active .75
- 15. Main clause - if (false) .79
- 16. Subject - verb - indirect object - direct object .81
- 17. Main clause - if not (true) .83
 Singular .83
- 19. Negative .85
Who questioning Agent, passive .85
Yes/No questions, active - Yes .85
If - main clause (true) .85
- 23. What questioning Agent, active .88
What questioning Agent, passive .88
- 25. Subject - verb - direct object - to indirect object .89
If - main clause (false) .89
- 27. Present .91

- Participial complement with direct object .91
- Yes/No questions, active - No .91
- Main clause - if not (false) .91
- 31. Infinitival complement with direct object .95
 - Who questioning Agent, active .95
 - Which questioning Agent, active .95
- 34. Possessive .96
 - If not - main clause (true) .96
 - Main clause - if (true) .96
- 37. Active .98
 - Who questioning Object, active .98
 - What questioning Object, active .99
- 40. Conjoined verb phrase .99
 - Past .99
 - Participial complement with no direct object .99
 - Who .99
 - Who questioning Locative, active .99
 - What questioning Locative, active .99
- 46. Infinitival complement with no direct object 1.00
 - What questioning Verb, active 1.00
 - Which questioning Locative, active 1.00
 - Where, active 1.00

Appendix XXI

Effect of language background variables on vocabulary and structure scores: z-values

	Vocabulary	Structure
	z	z
Mothers' first language	2.11*	2.12*
Mothers' language usage	.62	.73
Mothers' best language	1.69	2.09*
Fathers' first language	.85	1.36
Fathers' language usage	.56	.43
Fathers' best language	1.39	1.32
Mothers' language choice for child	.07	.22

* $p < .05$

Appendix XXII

Relation between language background variables and Tokelau language abilities

5 years:

i.	Mothers' first	Tokelau speaking		Tokelau understanding		
		Tok.	non-Tok.	Tok.	non-Tok.	
	1	4	15	1	2	10
	2	4	2	2	2	4
	3	4	1	3	12	4
	4	11	-	4	8	1
	5	10	1	5	9	-
		<hr/>	<hr/>		<hr/>	<hr/>
		33	19		33	19
ii.	Mothers' language usage	Tok.	non-Tok.	Tok.	non-Tok.	
	1	1	18	1		12
	2	3	3	2	1	5
	3	4	1	3	11	5
	4	11	-	4	9	-
	5	10	1	5	9	-
		<hr/>	<hr/>		<hr/>	<hr/>
		30	22		30	22
iii.	Fathers' first language	Tok.	non-Tok.	Tok.	non-Tok.	
	1	13	5	1	9	3
	2	5	1	2	4	2
	3	3	1	3	12	2
	4	11	-	4	9	-
	5	11	-	5	9	-
		<hr/>	<hr/>		<hr/>	<hr/>
		43	7		43	7

iv.	Fathers' language usage	Tokelau speaking		Tokelau understanding		
		Tok.	non-Tok.	Tok.	non-Tok.	
	1	-	18	1	-	12
	2	3	3	2	1	5
	3	3	1	3	9	5
	4	10	1	4	8	1
	5	9	2	5	7	2
		<hr/>	<hr/>		<hr/>	<hr/>
		25	25		25	25

v.	Mothers' language choice for child	Tokelau speaking		Tokelau understanding		
		Tok.	non-Tok.	Tok.	non-Tok.	
	1	5	14	1	1	11
	2	4	2	2	2	4
	3	15	-	3	15	1
	4	11	-	4	8	1
	5	9	2	5	8	1
		<hr/>	<hr/>		<hr/>	<hr/>
		34	18		34	18

7 years:		Tokelau speaking		Tokelau understanding		
vi.	Mothers' first language	Tokelau speaking		Tokelau understanding		
		Tok.	non-Tok.	Tok.	non-Tok.	
	1	5	5	1	1	4
	2	2	1	2	7	2
	3	9	2	3	10	2
	4	13	-	4	14	-
	5	13	-	5	10	-
		<hr/>	<hr/>		<hr/>	<hr/>
		42	8		42	8

vii.	Mothers' language usage	Tokelau speaking		Tokelau understanding		
		Tok.	non-Tok.	Tok.	non-Tok.	
	1	3	7	1	1	4
	2		3	2	2	7
	3	6	5	3	8	4
	4	12	1	4	13	1
	5	12	1	5	9	1
		<hr/>	<hr/>		<hr/>	<hr/>
		33	17		33	17

viii.	Fathers' first language	Tokelau speaking		Tokelau understanding		
		Tok.	non-Tok.	Tok.	non-Tok.	
	1	7	2	1	3	1
	2	2	1	2	7	2
	3	11	-	3	12	-
	4	11	1	4	12	1
	5	13	-	5	10	-
		<hr/> 44	<hr/> 4		<hr/> 44	<hr/> 4
ix.	Fathers' language usage	Tok.		Tok.		
		Tok.	non-Tok.	Tok.	non-Tok.	
	1	1	8	1	-	4
	2		3	2	1	8
	3	8	3	3	10	2
	4	9	3	4	10	3
	5	12	1	5	9	1
		<hr/> 30	<hr/> 18		<hr/> 30	<hr/> 18
x.	Mothers' language choice for child	Tok.		Tok.		
		Tok.	non-Tok.	Tok.	non-Tok.	
	1	4	6	1	2	3
	2	2	1	2	5	4
	3	9	2	3	10	2
	4	10	3	4	10	4
	5	9	4	5	7	3
		<hr/> 34	<hr/> 16		<hr/> 34	<hr/> 16

Appendix XXIII

Demographic variablesi Effect of demographic variables on vocabulary and structure scores: z-values

	Vocabulary	Structure
Mothers' place of birth	1.65	1.61
Fathers' place of birth	1.25	1.65
Siblings	.24	.16
Pre-school	.41	.23
Television	.00	.16
Child's place of birth	.65	.84
School attendance	.23	.18

ii. Place of birth: Tokelau children

	5 years	7 years
	%	%
New Zealand	82	52
Tokelau Is.	12	36
Western Samoa	6	10
Other P.Is.	-	2

iii. Place of birth: Tokelau parents

	5 years		7 years	
	Mother	Father	Mother	Father
	%	%	%	%
New Zealand	10	6	6	4
Tokelau Is.	60	75	80	80
Western Samoa	31	9	12	6
Other P.Is.	-	4	2	4
Australia	-	2	-	2
No father	-	4	-	4

iv. Pre-school attendance

	5 years	7 years
	%	%
Pre-school	73	46
No pre-school	27	54
	$\chi^2 = 7.8; p < .001$	

v. School attendance

	5 years	7 years
	%	%
1 school	98	70
2 schools	2	24
3 schools	-	6

vi. Number of older siblings

	%
8	2
6	6
5	7
4	13
3	13
2	20
1	21
0	19

vii. Time spent watching Television

	5 years	7 years
1 hour	17	6
1 - 2 hours	23	16
3 - 4 hours	35	32
5 hours	19	38
No TV	6	8

Appendix XXIV

Reaction Timesi. Analysis of variance of mean reaction times: ethnic group and age

Source	SS	df	NS	F
Ethnic group (A)	.73	1	.73	9.79**
Age (B)	.07	1	.07	8.86**
A x B	.00	1	.00	.31
within cell	.01	160	.01	

** $p < .01$ ii. Analysis of variance of mean reaction times: difficulty level, ethnic group and age

Source	SS	df	NS	F
Difficulty level (A)	.45	1	.45	46.58**
Ethnic group (B)	.47	1	.47	4.82*
Age (C)	.04	1	.04	3.71
A x B	.00	1	.00	.19
A x C	.00	1	.00	.37
B x C	.03	1	.03	2.60
A x B x C	.01	1	.01	.74
within cell	.62	64	.62	

* $p < .05$; ** $p < .01$ iii. Analysis of variance of mean reaction times: number, ethnic group and age

Source	SS	df	NS	F
Number (A)	.59	1	.59	33.90**
Ethnic group (B)	.03	1	.03	1.97
Age (C)	.02	1	.02	1.19
A x B	.00	1	.00	.00
A x C	.20	1	.20	1.19
B x C	.10	1	.10	5.91*
A x B x C	.01	1	.01	.79
within cell	4.66	269	.02	

* $p < .05$; ** $p < .01$

- iv. Analysis of variance of mean reaction times (5 year old Tokelauans): position of main clause, truth value and polarity

Source	SS	df	MS	F
Position of main clause (A)	.08	1	.08	1.61
Truth value (B)	1.66	1	1.66	33.60**
Polarity (C)	.02	1	.02	.31
A x B	.01	1	.01	.16
A x C	.02	1	.02	.42
B x C	.13	1	.13	2.70
A x B x C	.11	1	.11	2.28
within cell	9.22	187	.05	

** $p < .01$

- v. Analysis of variance of mean reaction times (5 year old Pakehas): position of main clause, truth value and polarity

Source	SS	df	MS	F
Position of main clause (A)	.01	1	.01	.07
Truth value (B)	.71	1	.71	8.56**
Polarity (C)	.01	1	.01	.90
A x B	.02	1	.02	.21
A x C	.01	1	.01	.14
B x C	.31	1	.31	3.73
A x B x C	.01	1	.01	.70
within cell	20.61	247	.08	

** $p < .01$

- vi. Analysis of variance of mean reaction times (7 year old Tokelauans): position of main clause, truth value and polarity

Source	SS	df	MS	F
Position of main clause (A)	.04	1	.04	1.44
Truth value (B)	.92	1	.92	30.80**
Polarity (C)	.01	1	.01	.41
A x B	.00	1	.00	.00
A x C	.00	1	.00	.00
B x C	.05	1	.05	1.64
A x B x C	.02	1	.02	.62
within cell	7.39	247	.03	

** $p < .01$

vii. Analysis of variance of mean reaction times (7 year old Pakehas): position of main clause, truth value and polarity

Source	SS	df	MS	F
Position of main clause (A)	.02	1	.02	1.16
Truth value (B)	.42	1	.42	22.69**
Polarity (C)	.08	1	.08	4.23*
A x B	.06	1	.06	3.46
A x C	.01	1	.01	.39
B x C	.05	1	.05	2.69
A x B x C	.09	1	.09	4.62*
within cell	5.25	281	.02	

* $p < .05$; ** $p < .01$

viii. Analysis of variance of mean reaction times (5 year olds): ethnic group, voice and case

Source	SS	df	MS	F
Ethnic group (A)	.53	1	.53	17.31**
Voice (B)	.00	1	.00	.00
Case (C)	.00	1	.00	.00
A x B	.02	1	.02	.73
A x C	.02	1	.02	.73
B x C	.02	1	.02	.49
A x B x C	.00	1	.00	.24
within cell	9.08	295	.03	

** $p < .01$

ix. Analysis of variance of mean reaction times (7 years olds):
ethnic group, voice and case

Source	SS	df	MS	F
Ethnic group (A)	.23	1	.23	10.29**
Voice (B)	.08	1	.08	3.43
Case (C)	.02	1	.02	1.03
A x B	.08	1	.08	3.77
A x C	.02	1	.02	.69
B x C	.34	1	.34	15.44**
A x B x C	.01	1	.01	.34
within cell	6.67	299	.02	

** $p < .01$

Appendix XXV

Linguistic markers of interaction:i. Question and Imperatives: means and standard deviations

	5 years		7 years	
	M	SD	M	SD
T → T	.68	1.61	.35	.70
P → P	.48	1.57	.17	.42
T → P	.60	1.53	.36	.82
P → T	.62	1.68	.19	.68

ii. Vocatives: means and standard deviations

	5 years		7 years	
	M	SD	M	SD
T → T	.50	1.12	.35	.70
P → P	.25	.64	.08	.33
T → P	.55	1.05	.21	.41
P → T	.26	.66	.09	.28

iii. Feedback: means and standard deviations

	5 years		7 years	
	M	SD	M	SD
T → T	.18	.83	.15	.57
P → P	.23	1.34	.08	.53
T → P	.30	1.03	.23	.81
P → T	.38	1.38	.00	.00

Appendix XXVI

Interviewer effect

- i. Standardized logistic factorial contrasts on vocabulary scores of variables of ethnic group of interviewer, ethnic group of child and age of child

		Z
Ethnic group of interviewer (A)		.22
Ethnic group of child (B)		2.85**
Age of child (C)		.92
A x B		.22
A x C		.00
A x B x C		.08

** $p < .01$

- ii. Standardized logistic factorial contrasts on structure scores of variables of ethnic group of interviewer, ethnic group of child and age of child

		Z
Ethnic group of interviewer (A)		.20
Ethnic group of child (B)		3.01**
Age of child (C)		.81
A x B		.20
A x C		.00
A x B x C		.15

** $p < .01$

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