THE RECEPTIVE LEXICON OF DUAL LANGUAGE GIBRALTARIAN PRIMARY SCHOOL CHILDREN

by

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TABLE OF CONTENTS

TABLE OF CONTENTS

OVERVIEW OF CHAPTERS

FIGURES

TABLES

SAMPLE DETAILS

CROSS-SECTIONAL ANALYSES BASED ON TRIAL 1 DATA

ANALYSES BASED ON LONGITUDINAL DATA - DEVELOPMENT

LEXICAL PROFICIENCY

CORRELATIONS

ANALYSES OF CONCEPTUAL VOCABULARY

ANALYSES OF BILINGUALITY AND CONCEPTUAL VOCABULARY

RELIABILITY AND VALIDITY

BPVS-RELATED ANALYSES

SECOND LEVEL ANALYSES

ITEM ANALYSES

GRAMMATICAL AND SEMANTIC CATEGORIES OF LEXICAL CORPUS

ACKNOWLEDGEMENTS

"Necessity", it is said, "is the mother of invention". It is often the prime motivator for embarking on the oft turbulent waters of research. It was the memory of the frustrations this author experienced when working as a speech therapist with Dual Language speech and language impaired children, in Gibraltar, that prompted this research. The need for the development of appropriate assessment and diagnostic instruments quickly became apparent. So was the need for the studies into aspects of Dual Language in Gibraltar which had to precede the designs and development of such instruments.

It was in recognition of these needs that Gibraltar's Director of Education, Mr Julio Alcantara, employing his characteristic far sight, authorised the conduct of this study in Gibraltar. He proposed to assign one of his Education Officers, Mr Leslie Lester, to act as the chief liaison officer for the projected two year duration of this investigation. He also placed at my disposition clerical and other support which I might require during my visits to Gibraltar. To these two friends and colleagues I owe an immeasurable gratitude, not only for making it possible, a priori, but also for making it 'easier'.

At the 'coal face' were the headteachers who allowed me to 'disrupt' their schedules, withdraw children and take classes over, and also showed such interest. The research assistants in each school were responsible for ensuring that data was collected in my absence and sent to me. The class teachers also helped to collect data in my absence and tolerated the necessary disruptions of their programmes. All these good people at all times demonstrated their professionalism, gave me encouragement and shared invaluable insights. I am honoured to record my gratitude publicly to them all.

One of my greatest vote of thanks must of course go to the 'dramatis personae' forming the 'cast' of nearly 400 subjects in this 'production'; these are of course the Gibraltarian Primary School children themselves who conducted themselves impeccably during the tasks presented to them. Some of them participated in two, three and all four trials, and during the ones conducted during the summer months, did so cheerfully, despite the warm weather.

I acknowledge with thanks the help, encouragement and financial support given to me by the Dean of the Faculty of Health and Social Sciences, Professor Judith Hitchen, in the University of Central England in Birmingham. My thanks also go to those colleagues in the School of Speech Therapy who believed in the value of the work I was conducting and who were supportive throughout. Ian Martin in Cox 'Computer' Focus, devoted a lot of time in developing appropriate computer programmes which allowed for the very complex data to be arranged so that they could be statistically analysed.

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But for all the help, encouragement and support that colleagues have given me for so long, it is my wife Shirley who has had to live with all my trials and hard work. Her moral and active support and her tolerance of the many privations and erratic and often disrupted family life, has made all things possible. Her support has by no means been passive. I have lost count of the number of hours she has spent typing drafts and more drafts, correcting, adding, arranging an unending number of complex tables, and at all times responding to all my demands regarding this investigation. She will be relieved to know that the end is 'nearer' - I have promised her that if I am successful she can have the 'h' of my PhD . I owe her a debt which I will try to repay, though it may take very long.

DEDICATION

I dedicate this thesis to my wife **SHIRLEY ANN** 'as partial fulfilment' of my eternal debt of gratitude to her.

אשת חיל מי ימצא ורחק מפנינים מכרה

(A Woman of worth who can find? For her price is far above rubies)

(Proverbs xxxi)

DECLARATION

The Librarian at the City University, London, is granted powers of discretion to allow this thesis to be copied in whole or in part, without further reference to the author.

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ABSTRACT

The overall objective of this investigation was to study the receptive lexicon of Dual Language (DL), Gibraltarian, primary school children (aged 4-12).

The central task required subjects to identify which one of four pictures presented, corresponded to a given stimulus word. Initially, 246 lexical stimuli were employed. This lexical corpus comprised 111 lexemes in Spanish and their translational equivalents in English (i.e. 'true' words) and 24 'nonsense' words which were meant to act as 'decoys' to discourage children from guessing. Seventy five of the 'true' words corresponded to the first 75 items in the British Picture Vocabulary Scales (BPVS). The rest had been selected from, and corresponded to, other pictures chosen from a cross section of the first 75 BPVS plates. Following a pilot study, this lengthy task was reduced to leave a lexical corpus comprising 102 'true' words in Spanish, their translational equivalents in English, and four 'decoy' words. The final analyses involved 100 of the 'true" words.

Both a cross-sectional and a longitudinal design were employed and the investigation, lasting over two years, comprised four trials. Over 400 children took part but only 392 completed the first trial. 249 (nearly 64%) of the latter completed the second trial; 160 of these i.e. 64.3%, did so approximately 6 months later and 48 (19.3%, all attending one of the two middle schools used) completed the trial a year later. 153 subjects (39% of the original cohort completed the third trial) and 73 (nearly 19% of the original cohort) completed the fourth trial.

Children below 6 years of age were given the task individually and the BPVS picture manual was used for these. Older children completed the task in groups and the pictures were projected from transparencies onto a screen.

Several variables were studied, but the main focus of attention was on a small selection of these. Perhaps the two most important were lexical development in each of four linguistic variables (i.e. Spanish, English, 'Bilinguality' and Conceptual Vocabulary) and its relationship between each variable. The relationship between each language (i.e. Spanish and English) was of particular interest. Others included comparisons between cross-sectional and longitudinal designs and the correlational relationship between development in each linguistic variable (LV) and age.

A battery of second level investigations comprised two further sets of analyses. The first aimed at comparing these DL subjects' performance with BPVS 'normalised' scores. The

second comprised an item analysis of correct responses in Spanish and in English; this analysis also provided information of lexical familiarity in each language. An analysis was also conducted to establish how many items were known in both languages i.e. 'bilingual' responses; this provided information of 'equilingual' lexical familiarity.

Most analyses, were conducted according to age group which had been categorised in intervals of 6 months. A certain number of analyses attempted to establish gender and school differences.

The main findings were as follows. Generally speaking, lexical development with age was in evidence in all linguistic variables and there was a positive correlation between the performance in linguistic variables. Longitudinal data reflected more sensitivity in revealing lexical development than cross-sectional data. The notion of Conceptual Vocabulary (CV) provided a substantially enhanced measure of 'true' indicator of lexical proficiency than any other linguistic variable. This was particularly poignant in the comparisons conducted with BPVS 'normalised' data. These showed that the performance of many of the younger subjects (up to the age of at least 7) was comparable to 'BPVS monoglots' if CV was the criterion of lexical proficiency as opposed to Spanish (L1), or worse still, English (L2). The lexical proficiency in both L2 and L1 was inferior to that of CV at all times. An item analysis failed to produce evidence that there was a socio-cultural bias in any of the lexical corpus employed. It also provided a measure of the relative familiarity in each language of the lexicon for each item, and indicated that the pattern was varied.

Several practical pedagogical implications of the conclusions arrived at following the interpretation of the analyses are proposed. These focused mainly on issues regarding the assessment, identification and management of specific and second language learning problems. Possible future areas of research are proposed and discussed.

CHAPTER 1

BACKGROUND TO AIMS

CHAPTER 1. BACKGROUND TO AIMS

1.1 INTRODUCTION

In recent years, research in the field of applied linguistics has tended to concentrate on the field of *semantics* and *pragmatics*. The current investigation into *lexicon* may be considered therefore, as running counter to this trend. Some linguists and speech and language therapists have suggested that there is little point in studying *vocabulary*, except perhaps during the first two years of a child's life. The implication is that it is more productive to study *how* children acquire *meaning* (i.e. *semantics*). Others argue however, that the study of semantics is an extremely complex task since semantics can not be studied just at a *lexical* level. Grammatical, syntactic and *prosodic* variables also play a role in determining *meaning*.

Some applied linguists hold the view that because the ultimate role of language is *communication,* the most important field of study has to be *pragmatics*. A study in this field would consider the use individuals make of language, how they respond to others' language during communicative interactions, the nature of linguistic behaviour prompted by different situations, etc. In order to investigate the *pragmatics* of language, a variety of strategies have been employed e.g. *discourse analysis,* which is based on different theoretical models such as Halliday's (1973, 1975).

As the linguistic parameters increase in complexity, so do the number of variables that need to be considered. Studies in fields such as *semantics* and *pragmatics* are therefore, almost invariably restricted since it becomes so difficult to account for the inherent multiplicity of variables, their interactional effects, and how they contribute to, or influence the subject under investigation.

In order to contain the potential resource and methodological demands, most research has been based on small population samples and restricted to one, or at best a limited number of linguistic variables forming part of the total linguistic behaviour putatively under investigation. For example, in a study of pragmatics, it may only be logistically possible to observe a subject's use of language in a *single* situation. Such a study may therefore, concentrate on a child's linguistic behaviour during play, or during his interaction with a parent. A composite picture of the pragmatic skills, in different situations, may be drawn from the results of different studies each focusing on one particular domain. The validity of such an exercise would have to account for tester and subject variabilities, among other factors.

This argument in no way suggests that such studies can not, or do not contribute to the larger generic body of knowledge, but that they merely explore only some of the problems underlying the plausibility of any generalisations which can be made of the subject at large.

Though acknowledging that the grammar and sound system of a second language needs to be learned when acquiring that second language, many adult L2 learners believe that "the most difficult aspect of learning a second language involves acquisition of a vocabulary sufficient to meet their receptive and productive needs", (Gass and Schachter, 1989). Learning a lexical item is a complex skill. One has to learn the exact sequence of sounds in the word - a slight change in this sequence could result in a word which has a completely different meaning. One also has to learn all the meanings associated with the word learnt and its grammatical and syntactic category, its co-occurrence and restrictions. If the word is a verb, one has to learn the "number of arguments it can take, the thematic roles of the arguments, and how these ... may be encoded syntactically", (Gass and Schachter, 1989).

From the developmental viewpoint, the study of *lexicon* is not without its difficulties and is essentially multivariate but not to the same extent as studies in more developmentally advanced linguistic parameters. Studies in semantics and pragmatics during early language development have been conducted and have contributed useful knowledge to the field of developmental linguistics. Such studies tend to present fewer research problems than those conducted at later stages of linguistic development. Lexical development is however, less complex to investigate across a wider range of developmental stages.

Whereas the early lexical development of monolingual infants is reasonably well documented in the literature, there is little evidence that it has been addressed in children after the age of three. It is acknowledged that there may be justification for this when it relates to monolingual children since once these children transcend the holophrastic, or single word stage of utterance, studies in areas such as language structure, semantics and pragmatics may be considered more fruitful and appropriate in the field of applied linguistics. However, studies in the lexical development of older 'bilingual' children are more than justified if only because many 'bilingual' children start developing a second language (L2) lexicon after the age of three. Those children who start learning a second language even later than this, particularly if the L2 is the language medium used in school, are required first of all to build up an adequate lexicon in L2 so they can benefit

from formal teaching, be able to communicate with their monolingual peers, and eventually to be able to develop reading and writing skills in L2.

Gass and Schachter (1989) say that it is not surprising that there are very few studies on both L1 and L2 lexical acquisition. One of the reasons they give for this is that "There are few if any explicit theories about the acquisition of the lexicon and little knowledge about what kinds of mental mechanisms or input information are needed for lexical acquisition to take place."

Hudson (1989) argues that an explicit model of how meanings of lexical items are acquired is crucially dependent on a formal theory of the lexicon. He proposes that Jackendoff's (1983) preference rule system can provide a formal theory which in turn could serve as an acquisition model. The preference rules are the processes by which the interaction between three conditions i.e. necessity, centrality and typicality, on lexical meaning results in a preferred weighting of these conditions themselves. He suggests that these three conditions can be used as determinants of cross linguistic differences, in a psychologically insightful way. This theoretical approach can be helpful in clarifying the nature of learners' task in trying to acquire the meanings of words in their target language that are superficially synonymous with those in their native language. Such meanings may differ in their necessity, centrality and typicality weightings.

It is almost certain that complex theories such as these, particularly when they are not easy to operationalise for research purposes, has resulted in a paucity of research, or at best a preference for predominantly descriptive research in lexical acquisition of two languages. The need for such research is, however, imperative, as will be discussed in the next section.

1.2 THE NEED FOR STUDIES IN 'BILINGUAL' LEXICAL DEVELOPMENT

Clark (1995) argues that without words, children can not talk about people, places, their experiences etc. Without words, there would be no sound structure, no word structure, no word meanings and no syntax. "The lexicon is central to language acquisition." Levenston (1979) has criticised the neglect of studies in the lexical development of 'bilinguals'. He considers that such studies are needed for pedagogical purposes. This need is well demonstrated by Asher (1966, 1969) as will be briefly discussed in Chapter 5.6.3. Justification for the inclusion of vocabulary items in L2 teaching programmes has largely been made in the absence of research findings of L2 normative studies. The selection of vocabulary items for teaching purposes was based, in the 1960s and 1970s, on frequency counts such as Thorndike and Lorge (1944), Kucera and Francis (1967),

García Hoz (1953) and more recently, the Oxford Concordance Project (Burnard, Hockey and Marriott, 1979; Hockey and Marriott, 1980). Many of these counts were based on how frequently different words appeared in a variety of publications. The *frequency* of a word was thus, dictated by external and, invariably, subjective agents, from sources such as authors, journalists and researchers and not necessarily related to the language used in conversation.

Frequency counts have often been considered a reflection of the usefulness of a word. Furthermore, the sources employed for such frequency lists were largely those designed for L1 speakers or readership, and therefore, their usefulness for L2 learners was not considered, nor was the fact that the lexicon appearing in print could be quite different from the lexicon required for social communication.

Meara (1982) regrets the fact that research into 'bilingual' lexical development has been largely neglected by applied linguists and states that "... once they (L2 learners) have got over the initial stages of acquiring their second language ... acquisition of vocabulary (is) their greater single ... problem." He considers the research conducted on vocabulary to be "... largely atheoretical and unsystematic..." and that there are "... no clear theories of vocabulary acquisition." Much of this relates to the teaching of L2 vocabulary rather than its development. These observations still hold true and recent reports on L2 vocabulary, or lexical, development, seem to be limited to children not older than age three. For example, Vihman (1985) studied the lexical development of one two year old 'bilingual' child. Several literature searches have yielded only a very small number of studies conducted in the last ten years on the vocabulary development of 'bilinguals'. Gui Schi-Chin (1982) studied the English vocabulary development of a Chinese 'bilingual'. Chavez (1982) studied five and a half to twelve and a half year old, Spanish-English speaking Hispanic-American children but the main objective of the study was to compare Spanish translations of the English forms of the Peabody Picture Vocabulary Test (Dunn and Dunn, 1965 version). More recently, Villata (1985) studied the trilingual lexicon of over 400 Italian-French-English speaking nine to twelve year old Canadian children whose first language was Italian. The study was based on the expressive lexicon elicited from these subjects who were asked to write down as many words as they could think, within 10 different semantic categories. Subjects were allowed 10 minutes for each category. Villata's study was primarily cross linguistic. The analyses of the data included a comparison for each word and, where given, its translational equivalent, in terms of the number of subjects giving the word, expressed as a percentage of the total possible. In addition, an *integration index* was calculated for each word. This was done for each language and expressed as a ratio of the percentage response for that word in the particular language to the total percentage response in all the languages.

Duncan (1989) conducted an investigation of (*expressive*) L2 English semantic development in 12 Punjabi-English and 12 Bengali-English-speaking DL children (*sequential* 'bilinguals') aged 3-5 years, in the West Midlands. She also studied their (expressive) vocabulary in L2 English. The results of her study are briefly reported in Section 2.2, in the next Chapter. Whereas Villata's study considered all his subjects' languages, Duncan had not aimed to investigate her subjects' DL lexicon and only studied the children's second language.

All these studies were conducted in different ways and had different objectives.

In the remedial field, *Dual Language* (*DL*) children with specific language learning problems, may present at the prelinguistic or one word stage, in either or both languages. Such children will need help with acquiring a basic, or at least, enhanced lexicon. When faced with DL children whose home linguistic background is L1 exclusively, but who are faced with an L2 as the language used in school, it is important to be very selective in the choice of lexicon that would best meet their needs. As will be discussed later (See Section 2.1.2 and 2.3.5) the lexicon in L1 needed to be able to communicate at home is likely not to be exactly the same as the one needed in school, or in the host community, as exemplified by the phenomenon termed *diglossia* (See Section 2.1.2).

1.3 RATIONALE FOR STUDYING RECEPTIVE DEVELOPMENT

Studies of expressive language, particularly with young children, present several strategic and methodological difficulties. A consideration in deciding to research the receptive lexical development for this thesis was that many children show more reluctance to *speak* about, than they do to *point* at, pictures or objects, the latter being a common strategy in studies of comprehension of language. It is thus, more difficult to elicit children's co-operation in studies of expressive language. Much time can therefore, be expended in obtaining the necessary co-operation from children in such studies, particularly if the researcher is a stranger to them. Such co-operation is a necessary prerequisite for ensuring the validity and reliability of such a study.

Secondly, if expressive language is being elicited with the aid of pictorial material, the nature of the verbal responses given to such stimuli may depend on how well the stimuli depict the required verbal response. Many pictorial stimuli, no matter how clear and unambiguous they may appear to the adult, may present a child with a variety of stimuli to which a particular verbal response can be attributed. Furthermore, if a selection of pictures is presented and the researcher indicates the one to which the response is needed

by pointing at it, some children may name the precise part of the picture the finger is pointing to. For example, if the picture is of a person, and the researcher's finger is inadvertently pointing to the person's *head* whilst asking "What's this?," the child's answer could well be *head* or *face*, etc.. To elicit the response under investigation, the researcher then has to provide further instructions. This can increase the *receptive* complexity of the instruction which could in turn adversely affect the child's expressive performance. Providing the verbal stimulus and requiring a *pointing* response from the child presents less equivocality.

A third consideration was based on the fact that *productive retrieval* of verbal labels is more difficult than *recognition* i.e. encoding is usually more difficult than decoding. Moffitt et al (1971) found that their subjects did better in tests of receptive lexicon, such as in the PPVT "... since it requires a pointing rather than a verbal response."

The most important consideration for the decision to study receptive lexical development, however, was that *expressive* language behaviour is not as good an indicator of knowledge of a language as *receptive* language behaviour. This would be most crucial when data have to be analysed. It is more difficult to make valid and reliable analyses of productive than of receptive skills. One example to illustrate this problem is in dealing with children's over-extensions. Clark (1979) provides evidence to indicate that children understood many of the words they had extended in production so that those who called all animals *doggies* responded correctly when presented with a selection of pictures of different animals, and asked to point to the picture of another animal, e.g. a *cow*. A similar problem at the end of the continuum may be presented by the older children who may insist on *semantic* precision (e.g. responding *terrier* to a picture of a *dog*, when the latter was the response being investigated) or on being over discursive.

Not being able to produce a word on demand does not imply that the word does not exist in the person's lexicon. The debate predominating in the sixties and seventies as to whether comprehension precedes and/or exceeds production (Fraser et al, 1963; Clark, 1979) and as to the relationship between production and comprehension was not conclusive (Clark et al, 1974; Ingram, 1989). Benedict (1979) concluded, from her longitudinal study of eight monolingual children over a six month period, that the rate of comprehension acquisition was the same as or greater than that for production; this study was somewhat limited as it only recorded the first fifty words produced by the children and all children were under two years by the time the study finished. Ingram (1989) discusses several studies of comprehension and production in monoglots, each investigating a variety of linguistic contexts e.g. vocabulary (Benedict, 1979), semantics

(Nelson, 1973) but there has been a paucity of studies on *comprehension* v. *production*, in the last decade.

This issue however, does not seem to have been recently addressed for bilingual children. Suffice it to say that the existence of a *semibilingual* stage in the development of *sequential* 'bilinguals' (See Section 2.1.1, below), would justify the priority given to studying DL subjects' *receptive* skills.

A further consideration is suggested by De Vito (1970) who stresses the importance "of assessing comprehension levels ... (as well as productive speech)." He also adds that "tests of comprehension as opposed to expression would be less sensitive ..." to culture-bound test items.

All these are important considerations in the research of the monoglot's *single* language; they are crucial when the study involves subjects who are not only acquiring *two* different languages but are also likely to be bicultural.

1.4 RELATIONSHIP TO PREVIOUS WORK BY THIS AUTHOR

During clinical work as a speech and language therapist in Gibraltar in the late sixties-early seventies, the author was confronted with particular assessment and diagnostic difficulties. The main reason for these problems was that there were no appropriate language tests for the DL Gibraltarian children referred to speech therapy. The only tests available were in English and had been standardised on English monoglots living in the United Kingdom. It was thus, impossible to identify reliably whether some of the children referred had a language-learning problem and if so, whether it was a first or second language learning problem.

Accurate and reliable diagnoses were crucial since they had management implications (Abudarham, 1980a, 1980b, 1982). For example, a child with a second language learning problem might best be helped by a teacher of English as a second language, whereas a child with a specific (first) language problem would probably need the expertise of a speech therapist. The problem was most significant with children who had mild-moderate language problems since the existence of any type of language problem was not always readily detectable or even easy to differentially diagnose when first suspected. Because most Gibraltarian children were not exposed to a significant degree to their second language (i.e. English) until they started formal schooling at the age of four, these diagnostic problems mostly affected children between the ages of four and six.

The dilemma was compounded by the fact that, at the time, there were no appropriate Spanish language tests for Gibraltarian children. Studies regarding language assessment published in the Spanish literature (e.g. García Hoz, 1946, 1953, 1977; Justicia Justicia, 1985a, 1985b) were based on Spanish ***monoglots*** who spoke different variations of Spanish e.g. Castillian Spanish. These assessments were also standardised on Spanish monoglots. The Spanish spoken in Gibraltar, as will be seen later (See Section 2.3.4) is far removed from Castillian, so that such tests would have little diagnostic validity.

Any valid and reliable language test for use with DL Gibraltarian children would have to take into account, not only the Spanish and English spoken in Gibraltar, but also other factors such as how long a child had been exposed to each language, particularly English, how frequently each language was used, etc. Other factors that would need to be considered are discussed further in Chapters 2.1.1 and 2.1.3.

The alternative to using tests to diagnose language problems was long term observation. This strategy however, did not solve the problem entirely, particularly with the younger children and with those with mild-moderate problems. This was mainly due to the fact that no linguistic norms existed for Gibraltarian children, and at the time of writing, still do not. Therefore, observations of the children's linguistic behaviour could not be related to normative, developmental parameters.

This author conducted an informal pilot study (Abudarham, 1970) into the 'bilingual' vocabulary of Gibraltarian children. Despite its limited design, much was learned from this study which then led to the formulation of certain theoretical positions, and in turn influenced the design criteria of the present investigation (See Chapter 6 in Abudarham, 1987).

This author was born and educated in Gibraltar and speaks English and Gibraltarian Spanish (*Yanito*) fluently. Through his work as a speech and language therapist in Gibraltar, he also had opportunities to observe and address the socio-linguistic, cultural and educational factors underlying the linguistic behaviour of Gibraltarian children. It is considered essential that researchers into any aspect of 'bilingualism' should have an intimate knowledge of not only the languages being researched but also the cultural and sociolinguistic nuances inherent in the population chosen for the study. Much research has been conducted by investigators who either do not know both languages fluently, or are not familiar with the linguistic and socio-cultural norms of the population they study. Such a lack of awareness can affect the validity and reliability of the study.

This study proposes the following aims.

1.5 AIMS OF STUDY

1.5.1 MAIN AIM

The *main aim* of this investigation is to study the ***Receptive Lexicon*** of ***Dual Language (DL) Gibraltarian, Primary School children***.

The following parameters will be investigated:

A. RECEPTIVE LEXICON of DL Primary School children aged 4-12 years:-

i) in *Spanish*
ii) in *English*
iii) as a *'Bilingual'* measure i.e. *'Bilinguality'*
iv) as a measure of subjects' *Conceptual Vocabulary (CV)*

(See *Operational Definitions* in Sections 3.2.1, 3.2.2, 3.2.3, 3.2.4 and 3.2.5)

B. DEVELOPMENT (See *Operational Definitions* in Section 3.2.6) of *Receptive Lexicon* of DL children aged 4-12+ years:-

a) Cross-sectional Study - The development of the receptive lexicon as reflected by the performance of all DL subjects completing *Trial One* (T1), across each age group:-

i) in *Spanish*
ii) in *English*
iii) as a *'Bilingual'* measure - i.e. *'Bilinguality'*
iv) as a measure of subjects' *Conceptual Vocabulary (CV)*

b) Longitudinal Study - The development of the receptive lexicon as reflected by DL subjects' performance across *four* trials over a maximum period of two years:-

i) in *Spanish*
ii) in *English*
iii) as a *'Bilingual'* measure - i.e. *'Bilinguality'*
iv) as a measure of subjects' *Conceptual Vocabulary (CV)*

C. CROSS-LINGUISTIC PHENOMENA, namely -

i) The nature and degree of *Lexical Dominance* of one language over the other and of each linguistic variable over the other e.g. Conceptual Vocabulary v. L1, L2, Bilinguality.

ii) Lexical *Dominance Shift* from one language to the other, across the ages

iii) *Correlational Relationships* between linguistic variables

(***Note**: Lexical Familiarity* and *Equilingual Familiarity* - See *Operational Definitions* in Sections 3.2.7 and 3.2.8 - will be dealt with under *Subordinate Aims*, below).

Only data from Trial 1 will be used for these analyses.

1.5.2 SUBORDINATE AIMS

a) To compare DL subjects' *Receptive Lexical Proficiency* in ***English, Spanish***, and ***Conceptual Vocabulary*** with published *British Picture Vocabulary Scales* norms (in English) for *Monoglot English* peers.

b) To conduct *Item Analyses* to determine if and how each language may favour comprehension of one of the *translational equivalents* for *each* item, and to what extent the name for each referent is known in *both* languages i.e. *Lexical Familiarity* and *Equilingual Familiarity.*

Only data from Trial 1 will be used for these analyses.

This chapter has outlined the background and main aims of this study. A rationale for the study of *Receptive Lexicon* has also been discussed

CHAPTER 2

THEORETICAL ISSSUES

CHAPTER 2 THEORETICAL ISSUES

2.1 WHAT'S IN A NAME? 'BILINGUALISM' - A MULTIFACETED PHENOMENON

2.1.1 Introduction

The plethora of terms found in the literature describing second language learning only adds to the confusion. Psychologists, linguists, socio-linguists, applied linguists, psycho-linguists and students of second language teaching, have all contributed to this state of affairs. Early researchers in the field of 'bilingualism', provided inadequate descriptions of '*bilingualism*'. Until the early sixties, very little differentiation was made though some recognition of a small variety of different types of 'bilingualism' became evident. It is thus, difficult to evaluate the results of studies conducted before this time.

Most of the early studies grouped their subjects under the heading 'bilingual', regardless of whether they had just been introduced to a second language (L2). Frequently, other information was lacking such as, (i) how each language was acquired, (ii) whether the subjects could speak one language but only understand the second i.e. *semibilingualism*, (iii) how long they had been speaking the L2, (iv) the use and frequency of use of each language, (v) whether one language was used more frequently than the other or (vi) whether each language was restricted to mutually exclusive (societal) domains e.g. *diglossia*.

Clearly, each of these factors could result in different types of 'bilingualism' and determine, and indeed explain, research results. For example, results of studies concluding that *bilinguals'* language proficiency in L2 was inferior to monoglots' proficiency in that language could be explained if the subjects were 3-5 year old *sequential bilinguals* who started learning a second language after the age of three (McLaughlin's term, 1978). Several other examples can similarly be invoked to support this criticism and some will emerge from the discussion.

By and large, the perspective on the *dual language* phenomenon, was determined by the researcher's academic and professional background. Socio-linguists were inclined to consider the social use of each language; linguists were more interested in the nature and structure of the language used and the subjects' proficiency in each language; psychologists were more likely to focus their attention on the process by which each language was acquired. The 1970s started witnessing a convergence of many of, and

sometimes all, these interests and this was palpably reflected in the research methodology and the more carefully formulated operational definitions employed.

The truth of the matter is that the type of 'bilingual' subject or 'bilingualism' studied was often not easy to define. Quite when an individual, for example, could be considered to have first been exposed to a second language is not easy to determine. Criteria for such a decision often depended on subjects' (or parents') subjective reports. The same problem applied when determining use and frequency of use of each language. What constituted *exposure* to a second language, was equally difficult to determine. For example, as Jakobovits (1971) has queried, would hearing another language constantly whilst on a two week holiday in a foreign country constitute exposure to a second language and could this experience be used to date such exposure? Could a subject be considered to have acquired a 'bilingual' status on the strength of watching television programmes in a second language, even though he never heard this language in any other context? The effect of passive second language learning through television does not seem to be well documented (though see Pearl et al, 1989) and yet many children in present day society spend a large part of their lives sitting in front of a television screen. A recent study by Rice and Woodsmall (1988) found that children did enhance their vocabulary from television viewing.

On the issue of language *proficiency*, it was often not possible to define a subject's *bilinguality*, or even proficiency in the L2, until after the research had been concluded. Indications as to the dominance of one language over the other was often based on subjects' self rating which as Meara (1982) points out, is an unreliable method of appraisal.

Bearing all this in mind, it is not difficult to understand and appreciate why there has been so much criticism about research findings in the field of 'bilingualism', and why the validity of such studies is constantly queried. Whereas the problems may not be totally inescapable, it behoves all researchers in this field to be aware of current terminology and its theoretical bases. Anyone involved with 'bilingual' individuals at a pedagogical level must be *au fait* with the relevant terminology since such knowledge may influence assessment and teaching programmes. Professionals such as remedial teachers and speech and language therapists need to be familiar with a terminological and typological framework to enable them to differentially diagnose language problems and develop appropriate management strategies.

The implications of such considerations do not only have educational but often political repercussions, as well. The whole philosophy of mother tongue teaching is still

controversial and widely disputed in the highest political and educational echelons of British society (Ballantine, 1983; Verma, 1987; Wallace, 1987). Assessment and diagnostic strategies which may sometimes result in decisions on school placement and streaming are often affected by theoretical issues underlying this common phenomenon referred to as 'bilingualism'.

2.1.2 Brief Overview of Terminology

The most often used term to describe knowledge of two languages is undoubtedly *bilingualism* and even those who criticise the use of this term still use it, albeit in its loose form. Abudarham (1987) has argued that this term suggests a narrow perspective of the phenomenon since it seems to be predominantly used from a psychological, or psycholinguistic, as opposed to a sociological, or sociolinguistic, viewpoint. It is the psychological processes involved in the acquisition of the two languages which are implied by this term, and not the sociological use of each, or both, languages (*vide* Ferguson's term *diglossia* discussed below).

'Bilingualism' has been defined in a variety of ways and has been based on a variety of criteria which do not always accord to a general consensus. Bloomfield (1935) defined it as *native-control of two languages*. If this criterion were to be strictly adhered to, it is possible that the putative number of 'bilinguals' in the World would be reduced significantly. This definition does not suggest that proficiency in each language has to be roughly equal e.g. *balanced bilingualism* (or *equilingualism* - See Baetens Beardsmore, 1982) a term used by Lambert et al (1958). However, it does not include anything less than native proficiency in both languages (quite how *native* proficiency can be reliably determined is still a matter of inexhaustible debate). There are those who believe that very few individuals achieve native proficiency in both languages, or even *balanced bilingualism* (Diebold, 1961; Selinker, 1972).

At the end of the continuum, Macnamara (1969) used the term 'bilingual' to denote a person who possesses one of the following language skills in a second language:- speaking, writing, listening, and reading, even to a minimal degree. This definition is perhaps too loose and would probably include a majority of the population.

Mueller et al (1981) stated that "it is a label which is wide ranging in its applications" and chose not to attempt to "enumerate and evaluate the various definitions of bilingual." They offer, however, their own definition as "the alternate use of two languages in the same individual", a definition probably borrowed from Weinreich (1970).

The word *alternate* would seem to suggest that the 'bilingual' either uses each language independently and/or in different situations, or that at any one given moment, the 'bilingual' may *switch* from one language to the other. There is no suggestion in this definition that an efficient communication system can result from the fusion of parts of each language. Selinker's work (1972) indicates that what develops is not an amorphous, unstable communication system which has resulted from arbitrary and random interlanguage interference and which changes rapidly, but quite the opposite. *Interlanguage* is thus, "a transitional system reflecting the learner's current knowledge of L2" (Ellis, 1994).

Selinker (1972) refers to a stage at which a second language learner *fossilises* linguistic phenomena. He claims that only five per cent of L2 learners can achieve native proficiency in all aspects of the *target language* (*TL*). Those who do not, tend to develop an *interlanguage* (*IL*) which seems to result from influences of the *native language* (*NL*) and the *TL*. Selinker considers that a separate linguistic system develops i.e. *interlanguage*, and that this is based "on the observable output which results from a learner's attempted production of a TL norm." Furthermore,

> "Fossilisable linguistic phenomena are linguistic items, rules and subsystems which speakers of a particular NL will tend to keep in their TL relative to a particular TL, no matter what the age of the learner or the amount of explanation he receives in the TL". (In Richards, 1974:36).

The *IL* however, might seem more likely to be an inferior, less precise version of the *TL* rather than a viable communication system comprising borrowed linguistic items from both languages. Viability of a communication system must, however, take into account whether speakers using the same interlanguage or communication system can communicate effectively with each other. This is in fact what does happen quite often, though viability has often been decided on the basis of whether a 'bilingual' is able to communicate with a monoglot in their common language. This would seem to be an unrealistic criterion.

Some researchers insist that it is only when an individual *uses* both languages that he can be considered to be 'bilingual'. Mueller et al (1981) acknowledge that the word *use* in their definition is vague but defend it on the grounds that it avoids "the problems arising from specification of quality as presented by Haugen's definition of 'bilingualism'." Haugen (1956) defined 'bilingualism' as ".... the ability to produce complete and meaningful utterances ...." in the other language. The terms *use* and *produce*, however,

seem to underline the individual's *expressive* skills and not his *receptive* skills. The use of these terms might have resulted in errors of omission in the theoretical and practical framework of the 'bilingual' phenomenon. It is possible for someone to comprehend a language whilst not being able to speak it. This phenomenon is well recognised and terms such as *semibilingualism* (Hockett, 1968) and *receptive bilingualism* have been applied to it.

It sometimes happens, though not exclusively, in a situation when individuals can understand a language similar to their first e.g. when L1 is Spanish and L2 is Italian. To what extent one could say that such individuals are 'bilingual' is a moot point but one has to acknowledge the fact that such individuals could not be classified as being monoglots in the same way as, say, English speakers who do not understand a second language at all.

The term *semibilingualism* is of particular interest in the present investigation since all the subjects studied, were at some stage in their linguistic development, *semibilinguals* and not 'bilinguals'. This fact, in no small measure, determined this researcher's decision to study the 'receptive' rather than the *productive*, or *expressive*, lexicon. It can never be justified not to study *receptive* skills in the early language development of 'bilinguals'. Since expressive skills do not manifest themselves as demonstrably as receptive skills, it has been argued that assessing, or studying, *receptive* skills provides a better and truer indicator of someone's linguistic abilities or potential (De Vito, 1970).

This issue assumes great importance in the pedagogical and remedial field of applied linguistics. Many of the children referred for remedial work because of a suspected (first) language-learning problem, have a functional understanding of L2 though they do not seem to be able to produce meaningful utterances in the second language. Furthermore, one should note that not seeming to be able to express oneself in a second language is not always because one *can not* but because one *will not*, often for affective reasons (Abudarham, 1987:12 and 32).

Arguing against the specificity of many of the terms that have been discussed in the recent literature, Abudarham (1980a, 1987) proposed a more general term *Dual Language* (*DL*). It appeared that in developing terminology which attempted to achieve precision about the exact nature of 'bilingual' phenomena, the wider implications of a dual language status were being lost and there was a danger that adherents of any one term would focus their attention on only one aspect of the phenomenon. Abudarham (1987) further argued that by using the term *Dual Language*, a clear reference to the existence of two languages was maintained without the need to specify any of the

sociolinguistic or psychological implications that so many other definitions often did not seem to acknowledge. This term was linked with the word *System*, i.e. *Dual Language System*. Before one can refer to a two-language status as a *system*, the existence of linguistic and functional rules have to be demonstrated. Such rules do, in fact, exist in the dual language phenomenon. One example is given by Dulay et al (1978) who state that *code alternating* i.e. shifting from one language to another within a single sentence or conversation, is not a random and uncontrolled process. There is a definable system and these alternations occur "only at specific, definable syntactic junctures." These junctures can thus, be anticipated. Switching normally occurs at relative-clause boundaries, at the beginning of verb phrases and before adverbial clauses (Dulay et al, 1978). If it takes place at other junctures, this may be a reflection of an L1 learning problem.

Because it lacks specificity, the term DL is flexible enough to accommodate the way in which DL individuals make use of L1 and L2. The term *system* could still indicate that the two languages were functionally independent from each other, or that the lexicon (and possibly) grammar of each language interchanged through a process such as lexical borrowing or *transfer* (García, 1983; Hamers and Blanc, 1990) of linguistic structures and rules from one language to the other. These processes would result in a new unitary code with its own idiosyncratic linguistic features and rules, rather like a new language being created from the original two. Thus, the duality of language does not exclude the functional separation of the two languages nor their fusion, to produce a viable communication system. The term *dual* simply indicates, therefore, that at some stage, two languages or codes are involved, whether inclusive or exclusive to each other.

Sharwood Smith (1991) cites evidence from research in cross-linguistic influence in language loss and acquisition (e.g. Dechert and Raupach, 1989; Obler and Hyltensham, 1989; Seliger and Vago, 1991) which indicate that "L1 and L2 knowledge is not rigidly separated." Knowledge in one linguistic system can affect knowledge in the other.

The unitary nature of the emerging code has been attested to by many researchers. Kessler (1988) describes two stages of lexical development for *simultaneous* bilinguals i.e. 'bilinguals' acquiring both languages at the same time and before the age of three. Stage one is characterised by a *single system* so that even if linguistic features of both languages are used, they operate as a single linguistic system. Even though Kessler states that a second stage develops with the onset of the child's awareness of the existence of two languages, when differentiation between L1 and L2 linguistic features starts, as Selinker (1972) has reported, an interlanguage usually develops which often contains features, from both languages, which have become established, or fossilised, and remain throughout adulthood.

It seems necessary to add one more word to the term *Dual Language System*. Not all individuals in a potential DL environment can be considered to have a DL system. This notion arises from a clinical reality. Often, so called 'bilingual' children are referred to speech therapy. Very often some of these children are not 'bilingual' as yet. Some are too young and have not yet started formal schooling (in English schools). Others have only recently arrived in Britain from the Asian subcontinent, Far and Middle East, and have had a negligible exposure to the English language (See Verma, 1987). In order to emphasise that these individuals are not yet DL but *potentially* so, Abudarham (1987) suggested that the word *Background* should be added to the term *DL System*.

This term has implications for research in this field, and for assessment and diagnosis of language proficiency and/or potential. Most published assessment strategies involve testing an individual's proficiency in only one language. Abudarham (1976, 1979, 1980a, 1980b, 1987) argued that whereas this was a useful exercise, it did not consider the fact that the individual could, in certain circumstances, borrow from the other language, particularly if a lexeme or other linguistic feature was not available, or readily so, in the language being tested. Correct responses made, albeit in the other language, would not be credited. Similarly, opportunities for responding in another language are usually not given.

An important sociological perspective of 'bilingualism' was introduced by Ferguson in 1959 and subsequently employed by other researchers, most notably Fishman (1968a, 1968b). Ferguson coined the term *diglossia* to underline the social use that DL speakers made of each language. He further argued that two varieties of languages are often used in many speech communities and by DL speakers. These varieties could be in the form of two dialects of the same language, or even two distinct languages as similar as Spanish and Italian, or as dissimilar as English and Cantonese. Thus, two languages "can exist side by side throughout the community with each having a definite role to play" (Ferguson, 1959).

Ferguson referred to the "superposed language" as the H or High language, and to the regional (native) language as the L or Low language. He considered that one of the most important features of *diglossia* was that each language had a specific function and was used in a specific situation. Fishman (1968a, 1968b) referred to these situations as *domains*. An analysis of the illustration given by Ferguson relating to situations in which the H and L languages might be used, indicates that the H language is likely to be employed in academically, religious and politically related situations. The L language was used more in personal and social situations. The H language was often considered more

prestigious by its speakers than the L language. On occasions, some *diglossics* will refuse to use the L language even though they may be very fluent in it - a type of linguistic snobbery!

The H/L distinction does not only appear in oral communication but may also be present in the community's literature. It is more common for children to learn the L language and, even though they may hear the H language at home and outside, they may not learn this language until they start formal schooling. Ferguson (1959) says that the difference in the way each language is acquired has strong implications. An individual is most likely to feel more comfortable with the L than with the H language. The L language is learned in an informal way and, whereas the grammar of the L language is learned implicitly, the grammar of the H language is learned formally and by having to study its rules.

Ferguson's concept of *diglossia* refers to two varieties of the same language. However, in the sixties, other authors extended the term to the functional characteristics of two or more unrelated languages. Fishman (1967, 1968a, 1968b) thus built on Ferguson's paradigm and also attempted to relate psychological/psycho-linguistic perspectives e.g. *compound* and *co-ordinate bilingualism* (terms used by Ervin and Osgood, 1954; Lambert et al, 1958; Weinreich, 1970) with the sociological/sociolinguistic basis implied in the term *diglossia*. Furthermore, Fishman (1967) states that *diglossia* and 'bilingualism' can also coexist in a mutually exclusive way.

The implication of the concept *diglossia* for research and pedagogical work is that clearly, DL children's total lexicon, for example, may possess certain significant characteristics. In the first instance, many of the words acquired during the early stages of linguistic development can be considered to be phonologically, lexically and semantically (cognitively) easier than those acquired during later stages. Most standardised language tests are developmentally based so that items typical of early language are contained in the earlier part of the test. One has to consider that DL children may not have acquired the lexicon for such items in their L2 though they may have in L1, depending on factors such as whether the items are bound by L2 speakers' culture. Words may also be known in the L language and not the H language (the latter usually being a DL speaker's L2), or vice versa, because they have been acquired in specific domains. The practical significance of this has been discussed in a previous publication by this author (Abudarham, 1987); reference to this issue will be made in Chapter 5.6 of this thesis.

The validity of works on language acquisition conducted by Weinreich (1953), Ervin and Osgood (1954), Lambert et al (1958), were criticised by Macnamara (1967) on

methodological grounds, as has the validity of the concepts of *compound-co-ordinate-subordinate* bilingualism (Diller, 1972). Nevertheless, the literature continued to address the issue though a reluctance was often evident to completely discard its usefulness or practical implications (Shaffer, 1976; Albert and Obler, 1978). It is sometimes not possible to state whether children acquire two languages in a *compound* or *co-ordinate* fashion. It is probably true of *sequential* 'bilinguals' (See McLaughlin's definition below) that both strategies operate at some time or other since they are developing both languages sometimes in the same and other times in different language acquisition contexts. This particularly occurs in schools where they will be acquiring language taught in the classroom, in one instance, i.e. in a *fused* context resulting in a *compound* system, and in another instance, they might be developing both languages *separately* at home and at school, that is a *co-ordinate* system.

Two further terms relating to the time of acquisition of the second language are extensively used in the recent literature. McLaughlin (1978) and Kessler (1988) state that *simultaneous bilingualism* describes "acquisition of two languages before the age of three ....". Kessler acknowledges that this is "... a somewhat arbitrary point which takes into account that children normally by this age have much of the first (L1) language system ....". *Sequential bilingualism* refers to the acquisition of an L2 after the age of three.

Sequential 'bilingualism' usually has very significant implications. For example, in simultaneous 'bilingualism', a child usually learns grammatical and syntactic rules in a similar instinctive way as a monoglot. The issue as to whether first language learning is the same as second language learning has been hotly disputed in the last two decades, by Kessler (1971), Ravem (1974), Ervin-Tripp (1978), Adams (1978) and McLaughlin (1981; 1985) who have all concluded that L2 acquisition is very similar to L1. However, others such as Fillmore (1976) have opposed this conclusion. There is in fact no significant consensus, mainly because many of these researchers reached their conclusions after studying DL subjects who had different language backgrounds and who had been introduced to a second language at different ages etc. The nature and extent of the linguistic features between the languages and their relative use (social and frequency) would seem to be largely responsible for the diversity of conclusions.

In addition to the issues regarding what constitutes 'bilingualism' in terms of the use of two languages, several authors (Diebold, 1961; Pohl, 1965; Kessler, 1971; Selinker, 1972; Baetens-Beardsmore, 1982; Abudarham, 1987; Hamers and Blanc, 1990) have addressed the concept of *bilinguality* or how 'bilingual' one could become. In this case, we are not referring necessarily, to the ability to use or understand two languages

generally, but more specifically to whether a DL subject could be as proficient in one language as in the other, regardless of the communication context. In terms of lexical proficiency, this would be reflected by the number of referents that a DL subject would be able to identify in both languages. This, as will be referred to later (See Sections 2.2.7 and 3.2.3), is a different concept to that of Swain's (1972) term *Conceptual Vocabulary* (See Section 2.2.7 and 3.2.4).

There is not always a consensus of opinion regarding the definition of *bilinguality*. Hamers and Blanc (1990) define it as "a psychological state of the individual who has access to more than one linguistic code as a means of social communication." Equivalent competence in both languages has been termed *ambilingualism*, *balanced bilingualism* (See Baetens-Beardsmore, 1982) and *balanced bilinguality* (Hamers and Blanc, (1990). In the present study, this phenomenon is referred to as a subject's *bilinguality* (See Section 3.2.3, below).

How such bilinguality has been measured is not always clear particularly when the measure involves linguistic parameters more complex than *lexicon*, e.g. syntax. Kessler (1971) found that her 'bilingual' (English/Italian) subjects were 77 per cent 'bilingual' in their syntactic skills. In a study of the possible effects of a DL upbringing on the vocabulary of Gibraltarian children, Abudarham (1970) found that the child performing best was a seven year old who could name 85 per cent of the referents in both languages.

In the light of the present terminological dilemma, it is easy to find solace in the two very insightful observations made by Jakobovits:

> "The question when is a person bilingual is actually not a very interesting one and there seems to be no particular advantage in seeking arbitrary limits for a definition. A more relevant concern is that of specifying the extent of an individual's knowledge about the second language" (1971:85).

Jakobovits goes on to explain what such specifications must include. These are not exclusively related to aspects such as proficiency and degree of 'bilingualism' but to *use*, *function*, *interference*, etc.. The pitfalls resulting from a *folk* definition of 'bilingualism' are poignantly illustrated by Jakobovits.

> ".. a foreigner who is capable of uttering a few mechanical sentences with a good pronunciation and accurate syntax, impresses the (the native speakers) as being 'bilingual'; whereas someone who speaks their language with a strong fluent accent and lacks fluency, does not, despite the fact that the latter's knowledge is considerably greater than the former's ... " (1971:85).

2.1.3 Typology

It is evident that the vast number of terms that have appeared in the literature (Baetens Beardsmore, 1982; Abudarham, 1987) in the last four decades need *harnessing* so that they can form the basis of a cohesive, theoretically rational and functional framework for the study of 'bilingualism'. One way of achieving this is by developing a *typology*. Tosi (1982) reviews various approaches at establishing a typology; some are educationally related and others sociologically inspired.

It would seem to this author that other factors can form the basis of a typology. The developmental aspects of a second language acquisition have both educational and sociological significance for the individual. Once exposed to a second language, the proficiency level of the DL speaker, and how and when each language is used, also has educational and sociological significance. It would therefore, seem that the following parameters could form a typological framework:-

i) timing of the acquisition of the second language
ii) language development and acquisition contexts
iii) the relative proficiency in each language
iv) the use and frequency of use of each language

(Abudarham, 1987)

Each of these parameters has been treated in various degrees of depth in the literature but they often appear in different studies which in turn refer to previous work.

This author has already reviewed some of these parameters (Abudarham, 1987) and has discussed how most of the terminology appearing in the past and current literature can be accommodated within these four parameters.

This section has provided an overview of the terminology regarding dual language. This author has argued that the terminology and typology are inadequate and has proposed new ones.

2.2 DEVELOPMENTAL STUDIES

2.2.1 Introduction

It is likely that any present day ill-conceived thinking about 'bilingualism' is still influenced by early research in this field. De Jong (1986) reflects concerns by parents that a 'bilingual' upbringing will have adverse effects on linguistic, social and cognitive development.

It is necessary to place current research in context by reviewing these studies and by providing a critical overview of subsequent research leading to the present body of knowledge. In addition, it would be remiss to omit some discussion of studies on linguistic parameters other than the one investigated in this study since lexicon is only one aspect of 'bilingualism'. To study lexical development for example, without making reference to these could be seen as suggesting that lexicon is the paramount linguistic parameter and that its acquisition is an end to itself.

The claims made in the past that a Dual Language (DL) upbringing has adverse effects on other developmental skills, in particular the development of speech and language, have been largely discredited over the last 20 years or so. However, negative attitudes towards 'bilingualism' may be found among the *lay* population, and also among some professionals.

Much has been written about the effect of learning a second language on cognitive development, intelligence and on the rate and process of language learning. The literature regarding this is reviewed and the reported effects on linguistic development are explored in some detail. The effect of socio-cultural factors (such as attitudes and motivation) on second language-learning will also be discussed.

2.2.2 Effects of 'Bilingualism' on Linguistic Development

General Considerations

Early reports on the adverse effects of 'bilingualism' on speech and language development are now considered unreliable by most authors. Most of these studies are criticised mainly on methodological grounds (Larsen-Freeman and Long, 1991). Many of the earlier studies considered only one of the DL children's languages, very often only L2, or at best each language independently. The argument has already been presented that a viable verbal communication system can result from a mixture of two languages, and

most of these studies did not assess the DL children's communicative competence resulting from this mixture. The children may also have been penalised when their language was assessed because their proficiency in L2 was compared to the monoglot's in that language (See studies on DL Welsh/English children's vocabulary by Saer, 1922; Italian/English subjects by Grabo, 1931; Welsh/English children by Barke and Parry-Williams, 1938). Thus, only the language common to both groups of subjects was tested.

Current studies of this nature acknowledge that any conclusions made cannot result in generalisations about the development of communicative skills of all DL subjects in the world, and must be limited to observations related to the development of the language common to the particular groups under discussion. Among those who have studied their subjects' proficiency in both languages have been Kessler (1971) whose studies involved Italian/English speaking children in the United States of America (USA), Fishman, Cooper and Ma (1971) with Spanish/English speaking American children, Saunders (1982) with two German/English 'bilinguals' and Fantini (1985) with a Spanish/English speaking child. Many of the detailed studies conducted on the development of speech and language of the DL individual have been single case studies (e.g. Ronjat, 1913 [involving a French/German 'bilingual' subject]; Pavlovich, 1920 [involving a Serbian/French 'bilingual' child]; and Leopold, 1939-50, with his own English/German speaking child).

Single case studies are weak in external validity but allow researchers opportunities to make in depth and detailed observations of a child's linguistic development. The researchers were often parents (e.g. Leopold, Saunders, Fantini) who were thus, in regular daily contact with their subject and therefore, had an intimate knowledge of their linguistic development and the context of this development. Most other studies have been based on not more than a handful of subjects. Studies on larger samples are not very common and though they may have the strength of numbers which may allow for generalisations to be made, can often not investigate linguistic phenomena in great detail.

Very often, the DL linguistic status of subjects is not clearly described. For instance: Were they *semibilinguals*? How long had they been exposed to L2? At what age did they start learning L2 (i.e. were they *simultaneous* or *sequential* 'bilinguals')? How was their 'bilingualism' determined or measured? Unlike simultaneous 'bilinguals', sequential 'bilinguals' have an L1 from which L2 can develop during its early stages. Recent studies have indicated that phenomena such as interference (or *transfer* - García, 1983, who studied Spanish/English speaking subjects), ease with which a second language is acquired, the rate at which L2 is learned, and other effects of a DL background on

different linguistic parameters, may differ depending on whether both languages are learned simultaneously during infancy (i.e. *incipient* or *simultaneous* 'bilingualism') and before the age of three (McLaughlin, 1978, who studied Chinese/English and English/Spanish speaking 'bilinguals') or whether the individuals are exposed to a second language after this time (i.e. *sequential* 'bilingualism', McLaughlin, 1978).

Another important consideration often neglected in early studies, is the relationship between the two languages spoken by the DL subjects. The nature and extent of structural differences between the two languages, and the relative complexity of their linguistic parameters, can influence the development of each language. As mentioned earlier, most recent studies conducted in the last decade and a half, concluded that L2 acquisition is very similar to L1 acquisition (Kessler, 1971; Ravem, 1974, whose studies involved Norwegian/English speaking 'bilinguals'; Ervin-Tripp, 1978 [English/French 'bilinguals']; Adams, 1978 [Spanish/English 'bilinguals']; McLaughlin, 1978, 1981), though others have claimed that the process is not exactly the same (Macnamara, 1976 [Italian/English and Latin/English 'bilinguals']; Fillmore, 1976 [Chinese/English 'bilinguals']). However, the degree of similarity may again depend on factors such as the age at which the child is exposed to L2, how far L1 is developed, the extent of linguistic differentiations between the languages, and the use (frequency and social) of each language.

There is no reliable evidence that, in normal circumstances, a DL upbringing has any adverse effects on a child's development of speech and language. During the early stages of L2 development, DL children's L2 can not be expected to be as advanced as their corresponding monoglot peers', who usually have the edge on them - if only because of the number of years they have been acquiring and using the language.

Most of the literature available deals with *simultaneous* 'bilinguals'. The results of L1-L2 interactions in *sequential* 'bilinguals' is only recently being addressed. Studies in this area are bound to reveal processes which will have appreciable significance for pedagogical and remediation programmes.

It is evident that many of the reported linguistic errors and disadvantages ascribed to DL children in early studies, can also be observed in monoglots (Dulay et al, 1978) particularly during their linguistic development in the first five years. It is important when evaluating or studying a DL child's linguistic development to identify those errors which one would also expect to find in the linguistic development of a monolingual child. If these are seen as peculiar to the DL child, attempts to remediate them may prove abortive.

Unless DL children are subjected to any factors which are known to adversely affect the learning of language, they should be able to develop communicative competence in both languages. Let us now consider some specific issues related to speech and language development.

2.2.3 Rate of Development

The speed with which and the extent to which language skills are developed depend on a number of factors, among which is the individual's language processing capacity and ability to learn other linguistic skills in particular. These skills may not always seem to correlate highly with intelligence because other variables such as environmental factors also contribute to these skills.

There are wide variations in the language-learning abilities and rate of development in children within any one population, as the Bristol Language Project (Wells, 1985) showed. In a follow up study, Skehan (1986) used data from Wells' longitudinal study of the L1 English acquisition of over sixty children in the Bristol area of England who participated in the Bristol Language Project. Subjects who had developed their first language more quickly then, were also faster at developing a second language during their early teens.

Fillmore (1976) observed different rates of L2 development in her subjects. She argued that a superior rate of development was due to the children's ability to employ the necessary cognitive and social strategies successfully. When acquiring an L2, children may use social strategies which will enable them to communicate with the corresponding monoglots in social situations. They may thus, learn to use *formulaic* expressions i.e. phrases without knowing exactly what they mean. These children can therefore, use a linguistic system to communicate even though they may not always understand what they are saying. The children are able to use situational clues to understand what is happening and respond appropriately. *Sequential* 'bilinguals' with more sophisticated social and cognitive strategies, seem to develop L2 faster.

Kessler (1988) states that "all studies of infant simultaneous bilingualism give evidence of uneven development of the two languages." This does not mean that development in both languages is retarded. More recently, Goodz (1994) studied the linguistic development of simultaneous 'bilingual' English-French Canadian children from middle and upper-middle class families in Canada and found no delay. In most DL cases however, exposure to one of the languages is greater than to the other, and it is likely that the one receiving greater exposure develops faster. There are other factors which will

influence the rate of development of L2. Some, such as intelligence and cognitive aptitudes for language-learning, also influence the rate of development in monoglots. Others are perhaps more specific to DL children than to monoglots. These include motivation, attitudes, amount of exposure to L2, at what age DL children are exposed to L2 and how advanced their L1 development is at this point. Hamers and Blanc (1990) confirm that most researchers have not considered factors related to language development such as "the role played by the environmental linguistic input and by the interactional setting in which acquisition takes place." These can vary from one subject to another and from one DL population to another. Recently, several authors have addressed the relationship between rate of development and other social factors such as sociability, communicative need and social context (See Wong Fillmore, 1991).

2.2.4 Language Aptitude, Proficiency and Dominance

In the earlier part of this century, there was a great deal written about the proficiency and aptitude of DL speakers, most of it pessimistic. Jespersen (1922) stated that DL children never learned any of their languages as proficiently as they might have learned one of them, had they been monoglots. Macnamara (1966) concluded that "there is some firmly-grounded evidence indicating that bilinguals have a weaker grasp of language than monoglots."

An interesting insight is proposed by Troike (1984). She argues that if it were true that a 'bilingual' experience causes a linguistic handicap which in turn were to be responsible for poor results on linguistic tests and academic tasks, then Hispanic Americans who are more socio-economically deprived than both White and Black Americans (though less so than the latter) should perform worse on language tests than both these monolingual groups. Hispanic Americans however, perform worse than Whites but better than the Blacks. Language proficiency alone can thus, not explain poor performance.

The present author advances another argument that until it can be confirmed that there is a greater incidence of speech/language handicap in non-immigrant, native DL populations, such as those found in Switzerland, Wales and Gibraltar, causality can not be laid at the door of the *bilingual experience.*

It would seem that the early research into DL children's language judged their proficiency and aptitude in each language by the highest standards. Christophersen (1973) argues that "there is not in theory any limit to the degree of proficiency that may be achieved in a second language, and that consequently the traditional distinction between *native* and *non-native* in language is of doubtful validity." Others, such as Jakobovits (1971) and

Wilkins (1972), believe that "the ability to learn languages is certainly not an aptitude which is quite distinct from all other learning ability."

Haugen (1956) who studied 'bilinguals' in America with a number of different languages and English, argued that language aptitude results from a combination of several skills. Genetic factors alone cannot account for aptitude, as the individual is influenced by many other experiences. Carroll (1953, 1967, 1981) outlined all the skills that would have to be tested to demonstrate an individual's language-learning potential. These included tests of mimicry, rote memory, ability to develop meanings inductively, and phonetic discrimination. Weinreich (1953) mentioned another skill related to language-learning potential which he called *switching facility*. This was an ability to switch from one language to another during the course of a conversation. Haugen (1956) concluded that it still had to be shown whether differences in language-learning potential were not a function of the DL subject's aptitudes and opportunities for language-learning. He argued that the fact that basic linguistic patterns are more easily acquired in children than in adulthood, suggests that language aptitude is not correlated with intelligence or maturity in any direct way. This might indicate that the acquisition of a second language during adulthood, as indeed are other forms of learning at this stage of life, is more difficult. The assumption that this is not due to language aptitude or intelligence does not necessarily follow.

Following a certain amount of interest in the language learning aptitude of DL subjects, in the earlier part of this century, research on its role was largely neglected, a point acknowledged by Skehan (1986) and later on by McLaughlin (1990). They both acknowledged that Carroll's (1981) model of language aptitude was one of the better developed in applied linguistics. However, the model needed to be revised in the light of developments in contemporary cognitive psychology. In a study of information-processing used by mono-, bi- and multilinguals who were required to learn a miniature linguistic system, Nation and McLaughlin (1986) found that multilingual subjects "were found to learn the grammar significantly better than bilingual or monolingual groups when the instructions called for implicit learning but not when ... explicit learning" was required (McLaughlin, 1990). They attributed these results to better automated letter- and pattern-recognition skills by multilingual subjects for the implicit learning tasks. Another study by Nayak et al (1987) showed that there was no difference between multilinguals and monolinguals in vocabulary and (grammatical) rule learning. Skehan (1986) concluded from his study that both language-processing capacity and family influences which help children develop the "ability to use language in a decontextualised manner" are related to aptitude in second language learning. He also concluded that aptitude in first

language learning is reflected in subsequent second language learning (See 2.2.7, below).

Many of these studies have obviously been conducted on sequential 'bilinguals', and most of these were adults. It is more difficult to conduct similar studies which could identify predictors of second language-learning aptitude/skills in simultaneous 'bilinguals' or young sequential 'bilinguals'.

The argument as to what constitutes language proficiency and how it can be measured still continues (e.g. Oller, 1980; Cummins, 1980). Cummins (1979) (whose studies involved Irish/English, English/Ukrainian and French/English 'bilinguals') believes that L2 can only be mastered after a threshold of competence in L1 is reached. What this *threshold* is and how it can be measured is not made clear. He described two levels of proficiency which he calls *Basic Interpersonal Communicative Skills* (*BICS*) and *Cognitive and Academic Aspects of Language Proficiency* (*CALP*), respectively.

The latter level of communicative and language proficiency is a prerequisite for verbal reasoning and verbal intelligence. Cummins (1979) states that, in the case of an immigrant who has arrived at a country after the age of six, this level of proficiency is not achieved until the child has had up to seven years experience with the language.

The notion that language proficiency must be viewed at two levels (i.e. *BICS* and *CALP* levels), has implications for research into the possible effects of 'bilingualism' on language skills. Acceptance of this view would suggest that claims of past research (that language proficiency is affected by 'bilingualism') should be reconsidered, since some of these have been made as a result of DL subjects' performance on tests comprising items of a *cognitive academic* nature. In addition, the subjects studied may not have had a sufficient period of experience with L2, following their arrival in the host country, during which to achieve the researchers' criteria for language proficiency. Any inferior performance on such tests could, therefore, have been due to insufficient experience in L2 rather than to any irrevocable and detrimental effects of the 'bilingualism' itself.

To date, language proficiency is being conceptualised in a variety of ways. Canale and Swain (1980) who studied Canadian French/English 'bilinguals', proposed a theoretical model of communicative competence, distinguishing between *grammatical*, *sociolinguistic* and *strategic* competence. Canale (1983) added *discourse* to these areas of competence. Cummins (1984) used a different framework making a distinction between context-embedded and context-reduced situations. In their five year study into the *Development of Bilingual Proficiency* (*DBP*) (1982-87) of Canadian French/English

'bilinguals', Harley et al (1990), reported using an integration of these two paradigms resulting in a 3x3 matrix comprising *grammatical*, *discourse* and *sociolinguistic* competence assessed in *oral* and *written* production modes and by multiple-choice written tests. Though the study by Harley et al (1990) is probably the largest and most ambitious investigation of its kind, their particular model of *language proficiency* has not been supported (Bachman, 1990, who researched into English/French, English/Portuguese and French/Chinese bilinguals). No doubt, future research will provide us with other conceptual and operational models of language proficiency. In the meantime, one must sadly conclude that until a definition of proficiency is universally accepted, the difficulties in evaluating studies in this area will remain.

Closely related to *proficiency* and *aptitude,* are the issues of language *dominance*, *dominance shift, balanced* 'bilingualism' (or as it is sometimes referred to, *ambilinguality*) and the age at which these can be observed. The literature reports on a variety of ways of defining and measuring *dominance*. In the present study, the focus is on *lexical* dominance measured in a number of *objective, quantitative* ways.

Oller (1983) states that bilingual *balance* or *dominance* refers to when an individual or society uses two or more languages with equal facility. The languages may then be said to be *balanced*, a condition which rarely exists, i.e. *perfect* balance. As the present and other studies have shown however, one can define a *degree*, or percentage, of 'bilingualism' and this should not be ignored as it may have practical implications, as will be seen later. The more common condition is *dominance* as reflected by the language used with greater facility. Generally, *degrees* of dominance can be distinguished. Sociolinguists commonly believe that relative proficiency in two or more languages will tend to differ as a function of domains of usage (Fishman et al, 1971; Saunders, 1982).

Dominance has always attracted a substantial amount of research which has been conducted in a number of ways. Often, ambiguous stimuli have been presented to 'bilingual' subjects (Lambert, Havelka and Gardner, 1959) which they have to interpret. One variation of this presentation has been in the form of *dichotic* auditory presentation of translational equivalents, one in each ear (Magiste, 1986; Epel and Putter, 1995). If the resultant pattern indicates that the words identified by the subject belonged predominantly to one of the languages, this was claimed to show dominance of that language.

The *dichotic listening* approach at establishing language dominance has been criticised on several grounds. Apart from the fact that the better-hearing ear could influence the results, the different phonetic acoustic and phonological differences between each pair of words might make one or the other easier to detect. Furthermore, an inappropriate choice of

words could, for reasons already given, determine how *diglossics* respond. Cooper (1971) argues that "a single difference score to express degree of bilingualism may be insufficiently revealing of relative proficiency because 'bilingual' speakers may use each language under socially differentiated circumstances." Younger subjects would also find these tasks somewhat complex. This would certainly have been the case in the present study in which children as young as 4 years who had only just started schooling participated .

Lambert (1955) employed reaction time to measure the linguistic *dominance* of three groups of French/English 'bilinguals', grouped according to the subjects' declared dominance in each language, or to 'bilingual' *balance*. Results were positive though there were some anomalies due to respondents' favourable attitudinal dispositions towards the language that came out best.

Another strategy to establish dominance was employed by Cooper (1971). He stated that *balanced bilingualism* would be indicated if performance or scores were equal in each language. He used direct and indirect measures of degree of 'bilingualism', the former involving tests of listening comprehension in Spanish and English. This task was not too dissimilar from the one used in the present study except that Cooper's measuring instrument was not the same as the one used in this study (i.e. BPVS picture stimuli).

Cooper (1971) also used indirect tests comprising measures of verbal fluency and self-ratings of relative usage, in several societal domains. It must be pointed out that most of Cooper's 48 subjects were older than those participating in the present study (See Chapter 5 for further comment).

Another strategy used to determine *dominance* is through questionnaires or interviews. Hernandez-Chavez et al (1978) state, "frequency of use does not necessarily have a relationship to actual language proficiency..", nor to dominance. Hernandez-Chavez et al (1978) recognised that self-report questionnaires can yield inaccurate responses due to inaccuracy of recollection and socio-cultural condition in the 'bilingual situation'. The use of, and ability to use a number of languages may be highly valued by respondents and the number of languages reported to be known and/or used might be exaggerated.

Romaine (1995) states that self-rating scales to indicate dominance do not give a true indicator since the respondent's rating can be affected by many factors not least attitudes towards each language and the perceived status value of one of the languages. To these variables must be added affective factors, whether respondents have a clear idea of the particular domains, and their perception of what constitutes proficiency in each language. For example, poor phonological skills, even in the presence of great competence in other

linguistic skills, is sometimes enough to make 'bilinguals' under-rate their proficiency in their second language.

Baetens-Beardsmore (1982) comments on inaccuracies resulting from determining dominance of language from census reports based on respondents' declaration of their *use* of a language. He cites research of this type conducted in Wales to establish respondents' knowledge of Welsh. Even though they were highly competent in the language, some respondents denied any knowledge of Welsh. Baetens-Beardsmore (1982) attributes this to their emotional bond between Welsh nationalist politics and knowledge of Welsh. Similarly, in Belgium, respondents have claimed knowledge of French when in fact they could hardly manipulate the language. Baetens-Beardsmore (1982) believes that this happened because the census was interpreted as a referendum which would indicate the linguistic capability the respondent would like to be identified with rather than his true knowledge of one or more languages.

Subjects' perception about the appropriacy of the use of a particular language in a particular context may determine the apparent dominance of a language. Cornejo (1975) found that the 'bilingual' Mexican-American subjects he studied were English dominant as measured by their choice of language during conversation. Even when addressed in Spanish by the researcher, children switched to English. The reason for this could be that the children perceived the research environment as English or that the interlocutor was not a member of family or social circle i.e. the domain was not perceived as a social one in which they might be expected to use their *mother tongue*. It could also have been that many of the topics used to elicit language samples were probably seen on T.V. e.g. Batman, and these programmes were transmitted in English.

However, perhaps somewhat more surprising to Cornejo (1975) was the fact that when observed speaking to parents who spoke to them mainly in Spanish, subjects still responded mainly in English. This could be accounted for by the children wishing to identify with the host society and their monoglot peers and opting for speaking English, a phenomenon which has already been noted in Chapter 2. The children thus, might have started life speaking Spanish but chose English as the preferred communication code.

It is perhaps because of examples such as this that Dodson (1981; 1985) has proposed that the term *dominant* be applied only to the majority language spoken in a group. A *mother* tongue is not necessarily the preferred language. He states that no 'bilingual' can at any one time have *two* preferred languages for any single domain. Those whose ease of use in the second language is extremely close in most if not all domains to that of the preferred language should be classified as *balanced* 'bilinguals'.

Dodson (1985) argues that terms such as *first* language, *dominant* language and *mother tongue* are "blunt instruments" and proposes the term *preferred* language "to denote that language in which a bilingual whether developing or developed, finds it easier to make individual utterances in discrete areas of experience at any given moment." Dodson (1985) states that ease of use is determined by both language proficiency and by social and psychological factors which may affect the individual's facility in either language in specific situations. Every 'bilingual' has a *preferred* language for every domain and this preference may vary for the same individual depending on domain. The status of one of the languages can change over time from preferred to second. It is at that precise moment of time when the status switch occurs as a result of environmental changes, says Dodson, that the individual could be referred to as *equilingual* but this status does not last long. Berman (1979) said that dominance is determined by three inter-related factors, quantity of situational exposure and variety of contexts of use, linguistic knowledge and proficiency, cognitive processing and the nature of 'bilingualism' strategies.

Other studies of dominance have employed criteria such as performance in word completion tasks and facility in reading (Lambert et al, 1959). Baetens-Beardsmore (reported in Baetens-Beardsmore, 1982) also conducted a study with French students of English in Belgium using the same word association tasks as Lambert et al (1959) and found strikingly different results. Baetens-Beardsmore's (1982) subjects who were all French dominant scored better in English. He argues that the task took place in the context of an English-dominated classroom setting. The subjects probably interpreted the exercise as a test of knowledge of English and produced consistently higher scores in English than in French. This is another example of how environment and context can determine, or influence, 'bilinguals'' perception of which is their dominant language despite the fact that it might not agree with measures of proficiency.

Another study employing quantitative measures was conducted by Saunders (1982). He used Edelman's (1969) measure of proficiency to test his boys' German/English dominance. They were asked to name as many items found in a number of domains, in one language and then the other in 45 seconds (each). Thomas' dominance was different in different societal domains. Performance was also affected by the time of day and both boys made more errors in German when they had been using English all day in school.

Finally, the role of *metalinguistic awareness*, and how it relates to language proficiency in DL subjects, has been the subject of recent research (See Bialystok, 1991a) and is likely to continue receiving more systematic attention. Reference to this is made in Section 2.2.15, below.

2.2.5 Babbling

Leopold (1939-50) reviewed studies related to babbling and reported that there was no proven difference between monoglots and DL children in the onset of babbling. Perhaps this could be explained by the conclusions arrived at in the earlier part of the century by investigators such as Ronjat (1913), Bühler (1930) who studied Swiss German/French 'bilinguals', Gregoire (1937), and more recently, McNeill (1970), that the sound features of babbling are universal. What is not clear is whether the stage of babbling described in these studies was the random babbling, characteristic of the first six or seven months of the child's development, or the replicated babble that is typical of the later stages. During this second stage, it is more likely that the sounds produced are related to the child's linguistic background.

2.2.6 Articulation and Phonology

There is a close relationship between articulatory and phonological development and the development of lexical, semantic, syntactic, grammatical and pragmatic skills. A child who does not develop articulatory and phonological skills '*normally*' may face problems in the development of other linguistic skills. Carrow (1957) found that the articulation or phonetic accuracy in her DL Spanish/English subjects' L2 was inferior to that of the corresponding monoglots; this is not surprising since one could expect phonemic interference from one language to the other. However, in an earlier study Ronjat (1913) concluded that his son Louis demonstrated the pronunciation of a monolingual child (in French and German, respectively) from the very beginning. He did not believe that the DL upbringing retarded his child's speech. He also found that phonetic, morphological and syntactic development progressed in parallel in both languages and loans from one language into the other remained isolated. Pavlovich's study (1920) of his child Douchan (Serbian and French) resulted in similar conclusions. Leopold (1939-50) agreed with Ronjat (1913) and Pavlovich (1920) that 'bilingualism' did not harm the speech and language or the general development of his daughter Hildegard who was exposed to English and German.

Studies in phonological processing indicate that the monolingual and DL child's development is similar even though the latter has to cope with two phonological systems which may be very different to each other. In children acquiring both L1 and L2 simultaneously, there may be a period of confusion initially, especially when the difference between corresponding phonemes is difficult to acquire. Leopold (1939-50) reported a period of phonological confusion in his daughter Hildegard. On the other hand, Fantini (1985) makes a distinction between not being able to produce phonemic

distinctions and being able to perceive them. His son Mario did not consistently produce the English /θ/ so that *'thought'* became *'sought'* , and /*δ*/, so that *'this'* became *'dis'*. Romaine (1984; 1995) comments that "This kind of asymmetry between production and perception is quite common for [monolingual] children." Clearly, a child's metalinguistic skills contribute greatly to how long a period of confusion may last and the nature of such confusion. Fantini (1985) reported that English phonology exerted practically no influence on his son's Spanish and that at age 5:0, his phonemic inventory was normal for both languages, deviating only in his control of English allophones.

Munro (1988) studied the phonology of six English/Welsh *simultaneous* 'bilinguals'. She found that the use of these children's phonological simplifying processes "was similar to that of monolingual (English) children." She also found a "parallel in the variability between children from similar linguistic backgrounds" so that even though the same processes were available, "children selected from them in different ways." An interesting observation in this study was that despite the fact that the children's language dominance patterns were different, "there was no marked difference in the nature and timing of the processes in their two languages." It is of course possible that these observations would not be the same for *sequential* 'bilinguals' as their phonology in the first language (by age 3) is more likely to be more established (albeit, not completely) before the L2 phonology starts developing.

Other authors have reported periods of phonological confusion (e.g. Ruke-Dravina, 1967, in Swedish/Latvian subjects). On occasions, there may be an interference which produces phonemes that do not appear in either language. Leopold reports on his daughter's production of diphthongs which did not exist in the adult model of German or English. The relationship between the two languages may influence the emerging phonology, at least for a time. Murrell (1966) who also studied trilingual subjects, reported that when two corresponding phonemes are differentially difficult to acquire, the easiest phoneme will be used for both languages. A tendency to avoid words difficult to pronounce was reported by Celce-Murcia (1975) who studied French/English 'bilinguals'. However, the parameter '*ease of acquisition*' is not well defined and may be affected by other factors, such as whether the children receive a different amount of exposure to each language so that the phonemic system of the language they hear most is rendered easier to acquire.

Other investigators have claimed that if the two languages are in balance, the period of confusion is relatively short (Pavlovich, 1920). Ball (1988) whose studies involved Welsh/English 'bilinguals', points out that the degree of phonological interference may be affected by the relative status of the languages being acquired by the child. He cites the

case of a boy whose English showed interference from his Welsh but this was reversed after several years of attendance at a school in an English-dominant area.

Other studies have reported no period of confusion (Engel, 1967 [Italian/English]; Oskaar, 1970, 1976 [German/English]), whilst Burling (1959) [Garo/English] found that the phonemes in his son's dominant language were sometimes substituted for those of the less dominant language. In a sense, these *conclusions* must be considered *inconclusive* because one has to carefully evaluate the degree of difference in the phonologies of the languages studied. It is partly for this reason, perhaps, that such a variety of conflicting results have been reported. Before any firm conclusions can be drawn, one has to take into account the inter-relationship between the subjects' articulatory proficiency and the corresponding phonological realisations (in addition to other factors such as amount of exposure to each language, and whether the acquisition is simultaneous or sequential).

Basing their claims on a study of one Icelandic child's development of English fricative and affricate segments, Hecht and Mulford (1982) concluded that "neither a Transfer (interference) nor a Developmental Position alone provides an adequate explanation of L2 phonological development ...." which "... is best accounted for by a systematic interaction ..." between the two. They concluded that transfer best predicted the order of difficulty of English fricatives and affricates, while the developmental hypothesis best predicts sound substitutions for difficult segments. These conclusions plus the existence of variability in language models among different language learners, and in individual children's production, have to be taken into account in studies of L2 phonological acquisition.

It would seem that with regard to sequential 'bilinguals' there is likely to be more phonological interference during the early stages of this L2 development until they master the L2 phonology. However, much also depends on the model presented to the children at home and school and in the society they live in. Observations during earlier research with DL children in Gibraltar (Abudarham, 1987) indicated that children will often use certain phonological features of L1 when speaking L2. This does not mean that all the L1 phonology is applied to L2. Certain L2 phonemes seem to be more vulnerable - for example the aspirated voiceless English plosives /p,t,k/ - and these are often replaced by the unaspirated Spanish equivalents. This pattern, together with some L1 prosodic features, often becomes established or fossilised in the adult's L2 system. Since a large majority of the population share this phonological system, one can hardly consider the phenomenon a handicap. It should be pointed out, however, that regional variations of English found in the United Kingdom may also alter phonemic features of the standard

language i.e. Standard English. The unaspirated, voiceless plosives, for example, appear in the Yorkshire phonology: there is no suggestion that in this case these are considered *errors*.

Whereas a relationship has been noted between age and second language productive ability (See Fathman, 1975, who studied English/Spanish 'bilinguals'), the order of the stages of L2 phonological acquisition does not seem to differ in sequential 'bilinguals' of different ages. It is thought, however, that the difficulties of acquiring an L2 phonology increase with age.

2.2.7 Lexical Development

Bateman (1914) examined 35 children with different mother tongues and established that the first word appeared at a mean age of ten months. This norm is similar to the one reported in the literature about the appearance of first words for monoglots.

Authors such as Saer (1922), Grabo (1931), and Barke and Parry-Williams (1938), who concluded that the vocabulary levels of monoglots were superior to those of DL peers may, albeit unintentionally, have strengthened the over-generalisation that the capacity of DL speakers to acquire vocabulary in general was inferior to the monoglots'. There is, to date, no evidence for this: most researchers will agree that, all other learning skills being intact, DL children are able to acquire as great a vocabulary repertoire as monoglots when the number of words known in *both* languages are included in the vocabulary count (Swain, 1972 and Abudarham, 1987, both of whom studied Spanish/English subjects, the former in Canada and the latter in Gibraltar). Taeschner (1983a) who studied Italian/German 'bilinguals', has recognised the problems in comparing the DL subject's acquisition of the lexicon with that of the monoglot's. Romaine (1989) supports Taeschner's argument that the capacity of the DL child to produce new words is shared between two languages. New words are learned at the expense of acquiring equivalents. The DL child is able to speak both languages by drawing from the total lexicon available to it. The DL child is therefore, able to "denote the same number of concepts as the monolingual" (Romaine, 1989). Furthermore, the fact that DL children may not have twice the number of words in their vocabulary as monolingual children, does not necessarily impair their ability to communicate.

Despite the fact that the argument for considering DL subjects' lexicon in both languages and their conceptual vocabulary has been mooted for nearly two decades, there is much research which ignores it. There are however, some notable exceptions. Vihman (1985) studied her DL (Estonian/English) child. She concluded that at two years of age and even

if 84 *duplicate* words (i.e. words known in both languages referring to the same concept) were not included in her final count, her subject had a vocabulary of at least 400 words, which "would be considered more than adequate by any standard." Thus, lexical delay was not an issue. More recently, Rimel and Eyal (1995) compared the lexical knowledge of 20 Hebrew-English 'bilingual' toddlers aged 18-30 months with an age-matched control group of 20 monolingual (Hebrew speaking) peers. The data was collected by parents using the 1991 MacArthur Communicative Development Inventory for Toddlers (Hebrew-English version). They measured the 'monoglot' subjects' average (expressive) vocabulary in Hebrew, the average vocabulary of the 'bilingual' subjects in each language, the average combined vocabulary in both languages, and their total *conceptual vocabulary*. Rimel and Eyal (1995) found that 'bilingual' children "expressed themselves in significantly fewer words in each language than did the monolingual Hebrew speaking subjects". However, "no significant differences were found when the total number of words or concepts [i.e. conceptual vocabulary] were compared between the two groups." These results, they claim, confirm the findings of Pearson et al (1993) that the linguistic potential of the 'bilingual' child resembles that of the monolingual, but that the bilingual's lexical knowledge is *divided* between their two languages. These two studies are not quite comparable however, since Rimel and Eyal's was on *expressive* vocabulary and Pearson et al's claim related to *receptive* vocabulary; this should however, not detract from the validity of the independent findings.

There are a number of factors which sometimes makes the results of some studies into lexical development difficult to evaluate. For example, the type of 'bilingualism' under study is not always clearly defined; one would expect different conclusions, depending on whether the languages are being acquired *simultaneously* or *sequentially*, and at which age and linguistic developmental stage the DL subjects are at the time of an investigation. One would expect that the lexicon in L2 of young *sequential* 'bilinguals' would be inferior to monoglots in the same language i.e. the monoglots' L1. Duncan's work (1989) with Punjabi/English and Bengali/English children, supported this hypothesis (see below).

Another variable which is not always considered in studies of DL subjects' lexical development is the status, extent and nature of any *lexical transfer* and *borrowing* (García, 1983; Odlin, 1989; Hamers and Blanc, 1990; Ellis, 1994) and whether *loan* words are included in the research results. The nature and extent of lexical transfer and borrowing may also depend on the type of DL acquisition (See 2.2.12, below).

Two further issues, mentioned earlier would seem to be relevant. First, there is the fact that a DL child, particularly if a *sequential* 'bilingual' or a *diglossic*, may not have

acquired a lexical item in one language but may have done so in the other. When studying lexical acquisition therefore, both languages must be considered. After all, as far as DL children are concerned, as long as they receive a positive response to the name they give to a referent, they do not much care (nor may they be aware) whether the word belongs to the L1 or L2 lexicon. In fact, sometimes, a DL child will use a lexical item in L1 to refer to one concept and its equivalent in L2 to refer to a different concept. For example, Volterra and Taeschner (1978) found that one of their subjects used the preposition *there* in German (*da*) for things that were visible and present, and the equivalent in Italian (*la*) for things that were neither visible nor present. On occasions, lexemes in one language will predominate and be used almost exclusively, particularly if they have been well established semantically.

Another consideration when evaluating DL children's lexical repertoire in any one of their languages is the amount of guessing or generation of correct words in one language because of knowledge of similar sounding words in the other. If monolingual German children respond correctly to the English command *come here*, it is not necessarily because they understand English but because the German equivalent sounds so similar, (*komm hier*). A similar *guessing* strategy may be employed when children may make up a word in L2 from their knowledge of L1. Leopold (1939-50) reports that his daughter generated her own word for *candle* in German. She uttered the word *Kandl* using a German pronunciation though she did not know the correct German word *Kerze*.

In the case of simultaneous 'bilinguals', the lexicon may develop as a unitary system and no distinctions between languages are made. In time, the DL child starts differentiating the lexical items of the separate languages (Volterra and Taeschner, 1975). Volterra and Taeschner (1975) also reported that in the early stages of DL development, children may not be able to name the same referent in both languages. Kessler (1988) describes two stages of lexical development for simultaneous 'bilinguals'. Stage One is characterised by a *single system* so that even if linguistic features of both languages are used, they operate as a single linguistic system. Leopold made the same observations of his daughter. During Stage Two, the children start differentiating between L1 and L2 features. This marks the onset of an age of awareness. The literature does not always agree what this age is. Leopold (1939-50) reported that his daughter reached this awareness at two years two months. Saunders, (1982 p.122) found that his children Frank's and Thomas' awareness that few people of their acquaintance understood or spoke German had been present from about age 2 years in both children.

Fantini (1976) reported that his son Mario, a simultaneous and co-ordinate 'bilingual', used distinct, separate language systems by two years eight months but it was not until

age 3:6 that he knew the names for each language, learning the name *Spanish* (the home language) before the name *English*. Volterra and Taeschner (1978) found that their two subjects who were sisters, started differentiating between their two languages at age two years eight months. Others have reported that DL children are not aware of their 'bilingualism' until they reach the age of three (Geissler, 1938 [German/English]); in the case of sequential 'bilinguals', this would naturally occur after the age of three since by definition, the child has not been exposed to L2 before this. Ronjat (1913) described two levels of awareness; the first level occurs at one year six months, but full awareness not until three years. The reported level of DL children's awareness that they have two languages thus, ranges between ages two years two months and three years (the role of *metalinguistic* awareness is discussed briefly, in Section 2.2.15 below). All these studies were conducted on simultaneous bilinguals and the conclusions were based mainly on single case studies. This could account for the wide, individual variation.

Unless reports of studies of DL subjects' lexical development clearly indicate that the factors mentioned above have been considered, it is not possible to evaluate their claims. If consideration of the duality of the lexicon is an acceptable parameter in the measurement of lexical development, then there is no evidence to indicate that lexical acquisition is inferior in DL children. It would not seem surprising, however, to find that if measured by monolingual standards, and depending on other factors already mentioned, some DL children's lexical development in the corresponding language may appear to be inferior.

Cross-linguistic comparisons regarding lexical development are sometimes confounded because different corpuses of referents have been employed to assess lexical levels in each language. Such studies at best indicate a DL subject's lexical proficiency in each language independently and often compare DL subjects with corresponding monoglots. Romaine (1989) argues that "it does not make sense to assess or study bilinguals as if they were two monolinguals since it is unlikely that a bilingual will have similar experiences in both languages."

Sometimes, even studies which employ a common referential corpus, have based their conclusions on norms for monoglots. Such norms have been used to establish lexical proficiency in the language common to the monoglot and DL subject (i.e. L2) and also to compare the DL subject's L1 lexical proficiency. Whereas the present study, as will be seen later, conducts similar comparisons, such a practice can at best only indicate *trends* (See Chapter 5) and any results must be considered with caution. Fantini (1985) conducted such a study. He tested his 4 year 9 months old son Mario on the Peabody Picture Vocabulary Test (Dunn and Dunn, 1981), when he was Spanish dominant. When

his performance in English was compared with the established norms for English-speaking monoglots, he ranked in the 29th percentile. The practice of comparing a 'bilingual' subject's L2 skills with monoglots in that language is generally considered to be invalid and may result in a conclusion that this percentile rank might suggest a specific, or even, second language-learning problem.

When tested with a Spanish version of the PPVT a day later however, Mario's raw score was double the one he had previously obtained in English. This enhanced performance was thought to be a reflection of the child's superior receptive lexicon in his L1 i.e. Spanish, and the degree of the enhancement can not be accounted for by any rehearsal effect. Mario's performance in English, in subsequent formal testing in school, compared favourably with monoglot peers'.

Some studies of DL lexical development may also be disadvantaged by a method, often employed, of calculating word counts in each language. This may be based on spontaneously produced data, often contextually-bound, the context sometimes favouring the use of one language or the other. One such study was conducted by Duncan (1989) who concluded that the Bengali-English-speaking children's total word count was inferior to the Punjabi-English-speaking children's during the earlier ages but slightly superior in the 4:9 year old age group. She concludes that comparisons of these children's total word count in L2 English with that reported in the literature for English monoglots aged 3:2 years indicated that the former's was inferior. This result is not surprising particularly since her subjects were sequential 'bilinguals'. They were therefore, unlikely to have had the same intensity of exposure to L2 as the monoglots and certainly not for as long. The Punjabi L2 subjects' total word count did not equal or exceed the 3:2 year old English monoglot's till age 3:9; the Bengali L2 subjects did not equal or exceed this word count till age 4:9. Again, these results are hardly surprising given their 'bilingual' status.

Though investigations employing the same referential corpus to study lexical development in both languages contain certain inherent disadvantages, they reveal more effectively subjects' *word power*, or in Swain's (1972) term, their *conceptual vocabulary*. Saunders' studies of his sons (1982) did to some extent pay consideration to such a premise (see below). The notion of *conceptual vocabulary* (Swain, 1972; Doyle et al, 1977 [Canadian French/English]) is an interesting one and should be considered an important parameter in all studies of the lexical development of DL children. This notion takes into account the number of referents known lexically in either of the two languages. 'Bilingual' subjects' *conceptual vocabulary* is almost invariably greater than their vocabulary in L1 or L2 (Swain, 1972; Doyle et al, 1977; Saunders, 1982; Abudarham,

1987) but not as great as their *total lexical repertoire* i.e. *all* words known in *both* languages.

Saunders (1982) reported that his first son Frank knew 144 out of 200 items in German by age 5:5 and 135 out of the same 200, in English. However, Frank knew 163 out of 200 items in at least one of the languages, thus showing that his *conceptual vocabulary* was greater than the one in English or German. His *total lexical repertoire* was 279 words. Saunders' second son Thomas, knew more in both languages by the same age i.e. 155 in German and 145 in English. His *conceptual vocabulary* of 169 was also greater than the one in English or German. It is interesting to note that, despite the fact that his *total lexical repertoire* was greater than his brother Frank's by 21 words, his *conceptual vocabulary* was only greater by 6 words.

There is some evidence that the ability to learn vocabulary in L1 is generalised to vocabulary acquisition ability in L2. Skehan (1986; 1989), in a follow up study of children who participated in the *Bristol Language Project* (Wells, 1985) found that those who had performed well in L1 vocabulary tests in earlier life did so as well in vocabulary tests in L2, subsequently.

Whereas DL children's vocabulary development may be a little slower at first, they soon catch up with monoglots (de Villiers and de Villiers, 1979). The apparent initial delay may not be the case when DL children's *conceptual vocabulary* or *total lexical repertoire* are considered, as opposed to comparing their vocabulary in L2 with the vocabulary of the corresponding monoglot in the same language. Observations of children learning an L2 after the age of three indicate that a certain amount of lexical borrowing from L1 takes place until the child develops the appropriate lexicon in L2. This is to be expected and cannot be considered a disadvantage. In fact, when children have ceased to be exposed to L1, the lexical development in L2 progresses unhindered and L2 then becomes their own language, to the extent that L1 may be completely forgotten within a year.

Those children who continue being exposed to both languages simply continue developing their lexicon in each language. They may develop an L1 lexicon which relates mainly to one domain (Fishman, 1968a, 1968b) and an L2 lexicon which relates mainly to another domain, depending on factors such as the societal use of each language. When a word is not available in the language they want to use at any given time or situation, they may well use its equivalent from the other language, or even generate their own from the one they know; this indeed is thought to be the case with Gibraltarian DL children. Naturally, there will be a certain percentage of a child's total lexicon comprising L1 and L2 semantic equivalents, in Vihman's terminology (1985), *duplicate words*. The

size of this 'bilingual' lexicon will depend very much on the language acquisition contexts, whether the languages are kept functionally apart, and so on. Word for word, there is no evidence that these children's total lexicon is inferior in any way to the lexicon of a monoglot. One would expect that as the lexicon in L2 is developing, there will be stages when the L2 lexicon will naturally be inferior to the monoglot's in that language, but this can hardly be considered a disadvantage which on its own can have adverse effects on the DL child's linguistic development.

2.2.8 Semantic Development

It is not acceptable to discuss the acquisition of vocabulary without also considering semantics, particularly with regard to early language development. Studies of strategies such as generalisations or over-extensions, (when a child uses one word for several referents, e.g. *Daddy* may mean *father* but also all *males*), or holophrastic utterances (e.g. *Mummy* could mean *Mummy come here*), may be more profitable than studies of early lexical acquisition, since this characteristic is also typical of monoglots. There is general agreement in the literature that the DL child's semantic development parallels the monoglot's (Kessler, 1988).

The fact that a child has a lexical item in his expressive language does not mean that it has been understood or that its meaning is the same as the adult's. The father of a young Down's Syndrome girl, for example, reported to this author that, contrary to evidence from formal testing of her receptive skills, she knew the word *faster* because she used to say the word when her father pushed her in her cart during play activities in the garden. On closer examination, however, it became evident that the child associated the word with the concept of *push*, because her father would ask her if she wanted him to make her go *faster* as he pushed the cart. The child would then echo the word *faster* though she did not understand its true meaning (Abudarham and Brinkworth, 1984). By no means is all of a child's lexicon susceptible to over-extensions, and the frequency of this linguistic phenomenon decreases as the lexicon increases and as cognitive skills develop.

Another consideration in the case of DL acquisition should be that one language may have a single lexical item for several conceptually related referents. For instance, the word *brush* may require the addition of another lexeme to differentiate between the different types of brushes. In other languages however, this differentiation may be made by the use of different (often single) lexemes. In Spanish, for example, *brocha*, *pincel* and *cepillo* (*de **dientes/zapato***) are all words for different types of *brushes* (*paintbrush*, *artist's brush* and *tooth/shoe brush*). The DL child would therefore, need a more extensive lexicon to respond correctly. This has implications for studies in

vocabulary acquisition. Kessler (1988) states that "one difficulty for bilinguals is that the meanings of some words have different semantic ranges in the two languages being acquired." Romaine (1989) states that the existence of cross-linguistic influence at the semantic level is reported in almost all the studies of 'bilingual' children.

This author's previous work with DL Spanish/English children in Gibraltar, most of whom can be classified as sequential 'bilinguals', indicated that children responded to any one of three pictures depicting a *ladder*, *staircase* and *steps* when asked to point to the Spanish lexical item *escaleras*. This was because the Spanish word for *ladder* and *staircase* was the same (*escaleras*) and therefore, had a wider semantic range than its English equivalent. A response to any two of these pictures was therefore, correct. Interestingly, the younger children were not always able to make the visual-conceptual distinction between *steps* (*escalones* in Spanish) and *staircase* (*escaleras* in Spanish) when responding to the stimulus word *escaleras*, so that some responded to *steps* and some to *staircase* as both pictures contained *steps*. However, the English lexical item for each of these pictures was more referent-specific and each word was completely different in its phonological representation: *escaleras* is very similar phonologically to *escalones* but *ladder* and *staircase* sound completely different. This fact may have favoured a correct response to the lexical item in English rather than to the one in Spanish. A DL child's performance in a vocabulary assessment can, therefore, be affected by the language(s) employed. Thus, when studies in DL lexical acquisition are reviewed, the nature of the lexicons of the languages involved may be an important consideration in determining and evaluating conclusions reached.

An interesting area of recent research involves the development of *prototypical exemplars* by DL subjects. A *prototypical exemplar* is the best exemplar of a category e.g. a *robin* may be the best example of a *bird* considered by an individual. Aitchison (1994) studied how culture and native language may subconsciously influence L2 learners' view of prototypical exemplars and borderline items. An example of a borderline item for the category of *furniture* could be a *television* or *refrigerator*. Her 11-14 year old English monoglot subjects became more confident about borderline items with age. She found that her Italian, Chinese and Spanish adult speakers were probably influenced by the category membership in their native language (or culture) especially with regards to whether a *goose* was a *bird* and a *walnut* a *fruit* - over 20% denying that the *goose* was a *bird* and asserting it was a *fowl*, and over 40% claiming that a *walnut* was a *fruit* albeit of a dried kind. This was despite the fact that the adults were fluent speakers of English. She concluded that category membership (or semantic categories) in L1 differed in some degree from that of English. Unfortunately, Aitchison (1994) does not provide data for DL children's development of *prototypical exemplars*.

The pattern of vocabulary development in DL children is vulnerable to variations as for monoglot children. In a study by Yoshida (1978), his three-and-a-half-year-old Japanese/English speaking child acquired more nominals than other classes. In addition, words from semantic categories closely relating to the child's environment were acquired earlier. The child's English vocabulary was also expanded through loan words taken into Japanese from English. The nature and range of a DL child's vocabulary varies with life experiences.

The relationship between semantics, and grammar, and syntax has not received the attention it deserves in studies of 'bilingualism' where L1 and L2 vary substantially in their grammar and syntax. It is possible that DL speakers may in fact attempt to achieve the same semantic goals by employing the less complex syntactic (and prosodic) rules of their L1 when speaking L2. Thus, an interrogative in English (L2) may be uttered using syntactic rules and prosodic features of interrogatives in L1; for example, '*Are you ...?*' type of word reversals signalling the interrogative form in English, may not exist in DL speakers' L1 and thus not used when they ask questions in English. The English monoglot may therefore, perceive the utterance as a statement rather than a question and interpret incorrectly the DL speakers' semantic intention. Their semantic/expressive skills can hardly be evaluated by using criteria applied to their L2 monoglot counterparts.

2.2.9 Morphology, Grammar and Syntax

Leopold (1939-50) found no identifiable effect of the DL background on his daughter's morphological system even after the second year when the system is supposed to reach full maturity. The present author's studies with Gibraltarian Spanish/English speaking DL children have revealed morphological *interference/transfer*, but contain no evidence that morphological development as a concept suffers. For example, whereas a child may say '***skipando***' (-'***ando***' being the present continuous morphological inflection for '***skipping***') this is due to *interference/transfer* from Spanish. The fact remains that the child has marked an appropriate morphological inflection albeit from a different language. The use of morphemes with a variety of word bases indicates that the child has segmented the inflectional marker and has not just memorised a lexical item containing such an inflection (Vihman, 1982). Past research does not make it clear that such a distinction has been made and this may partly account for the variability in the claims made about the development of inflectional morphology in DL children.

Both simultaneous and sequential 'bilinguals' may apply morphological inflections from one language to verb or noun stems in the other (Burling, 1959; Oskaar, 1970;

Abudarham, 1987). McLaughlin (1981) states that "morphology usually follows syntax in some languages that are so structured that morphological and syntactic features must be acquired simultaneously." Factors such as the relative complexity of the morphological system in each language and the way each language is acquired may result in developmental variations. This was one of the reasons considered by Vihman (1982) for her DL son's delay in acquisition of inflectional morphology. Murrell (1966) and Fantini (1976) reported morphological delay in their subjects whereas Burling (1959) and Imedadze (1967) [Russian/Georgian] found none. Fantini (1985) reported however, that his son Mario's mixing at lexical and morphological levels continued till age 2:8 but this diminished as he continued in an English-speaking nursery. Fathman (1975) found that older sequential 'bilinguals' scored higher on her morphology and syntax subtests, though the younger children did better than the older ones in phonology subtests. The order in which children of different ages learned to produce the structures in the test was the same.

Sequential 'bilinguals' may also borrow morphological inflections from L1 and apply them to L2 until the L1 equivalents are learned. Not all studies cited in the literature conclude that L2 morphological development mirrors the same developmental features as for corresponding monoglots. Carrow (1971) reported that syntactically, the various grammatical structures in her Spanish/English 'bilinguals' develop in a sequence reflecting normal patterns in monolingual children. However, Hakuta (1974) found that the morphological development in L2 of his five-year-old Japanese subject acquiring English, did not always reflect the English monoglot's development. In a later study (1976), he reports on other research with Japanese children indicating similar findings.

Vihman (1982) considered factors such as the language acquisition strategies that a particular child might employ. Some children may adopt a whole-word approach to learning and will thus, not pay too much heed to the segment within a lexical item. Individual variations in inflectional morphological development may be determined by this factor and by the possibility that some DL children might employ different strategies in the acquisition of each of their languages.

Smith, (1933, 1935, 1957) and Carrow (1957) reported that DL children made a greater number of grammatical errors than monoglots. Again, only L2 was considered in these studies: there is no account given of grammatical accuracy in the children's L1. Smith's (1957) study of children of Chinese origin in Hawaii indicated that as they became less 'bilingual' (i.e. almost monoglot English speakers), a smaller number of grammatical errors (in L2) were made. Smith did not seem to explain this in terms of L1-L2 *interference*. As a result of some of these studies, one could be forgiven for concluding

that this was a *deviant* effect on the child's development of grammar due to exposure to two languages as opposed to an acceptable *normal* effect of language *transfer*. Commenting on Smith's earlier findings in the 1930s, McLaughlin (1978) hypothesises that:

> "One confounding factor that limits the generalisability of this research is that pidgin English was quite common in the Chinese community in Hawaii at that time and perhaps the main reason why the children performed so poorly is that they used this variant of English as their standard" (78:173).

And yet the claims made by Smith about the effect of 'bilingualism' on language development, have since been responsible for many assumptions appearing in the literature and for forming the hypothetical bases of other studies.

The literature is, generally speaking, in agreement about syntactic development in DL children. Kessler (1971) studied the syntactic development of 12 Italian-American children. She concluded that syntactic structures common to the two languages were acquired in approximately the same order and at the same rate as monolingual children. This indicated that DL children could equal their monoglot peers in the development of syntax. In addition, the appearance of specific structures was dependent on the extent of the linguistic complexity (describable in terms of case grammar relations) and not on the language used. Kessler (1971) found that the most linguistically complex structures were the ones acquired last. Imedadze (1960) had concluded the same following her study of a DL Russian and Georgian speaking child. But this is also true of monolingual children. Kessler (1971) concluded that first and second language-learning for these children were not qualitatively different processes. Imedadze (1960) found that syntactic structures followed the same developmental order in both of the DL child's languages as they did for monolinguals. Taeschner (1983a) found parallel syntactic development for her girls, in German and Italian, from the earliest stages. One exception was in explicitly connected sentences and the participle and infinitive. These appeared relatively late and not at the same time in both languages. This pattern however, is not exclusive to DL children and is often reflected in German and Italian monoglots. This phenomenon can therefore, not be attributed to 'bilingualism'. Kessler (1988) agrees that the DL child uses the same developmental processes as the monoglot, starting with the holophrases and moving on to rule-governed utterances.

Other studies have reported the same observations. Like monoglots, DL children acquire simple forms before complex ones (Dato, 1971) [American English and Spanish speaking subjects living in Spain]. There is a relationship, however, between the

development of syntactic structures in both languages and their semantic relationship. If this relationship is more complex in one language than in the other, the corresponding syntactic structures are acquired later. Carrow (1971) also concluded that language develops according to a systematic pattern of growth regardless of the language. On occasions, the more complex syntactic structure of one of the languages has been acquired first but this has occurred when that language had been acquired earlier than the other. Leopold found that his daughter's syntactic development in one language was influenced by syntactic rules in the other. This was clearly a case of *transfer*.

The syntactic development of sequential 'bilinguals' may manifest different characteristics to that of the simultaneous 'bilinguals'. Very much depends on the age and linguistic (L1) stage at which children were exposed to L2. Ravem (1968) studied his six-and-a-half-year-old Norwegian-speaking son's syntactic development in English (L2) and subsequently, in 1974, the syntactic development of his three years and nine months old daughter. He concluded that his son learned the modal *do* in the same way as an English monoglot. Also, the children did not usually invert the word order in *Wh*-interrogatives, just as is observed in the language development of monoglots. The children did not use Norwegian question patterns. In another study of *Wh*-questions, Ravem (1974) observed that his children made certain syntactic errors in English (e.g. not inverting the auxiliary verb and the subject): these errors reflected English rather than Norwegian developmental patterns. Furthermore, the errors made in English were similar to those found among English monoglots. Generally speaking, the children went through the same stages as L1 learners, with a few exceptions attributed to L1 interference.

Dato (1970) reported similar results to Ravem (1968). He studied American English-speaking children (aged between four and six-and-a-half) in Spain, who were acquiring Spanish. Even though a literal translation from English would suggest inversions in interrogatives, the children did not do so when speaking Spanish. However, Dulay et al (1974a) studied sequential Spanish/English 'bilinguals' aged between five and eight and concluded that the sequence of acquisition of L2 syntactic structures was different to the way that corresponding monoglots developed them.

Sequential 'bilinguals' have already acquired some experience of the world and a certain amount of language in L1, so they do not have to cope with as many conceptual aspects when they start acquiring L2. *Simultaneous* 'bilinguals' have not had this experience and do not have a previous language base to draw on when they are developing an L2. The early stages of syntactic development, as in phonological development, in the *simultaneous* 'bilingual', may be marked by a unitary syntactic system which may be drawn from the two languages. Volterra and Taeschner (1978) reported that the two

simultaneous 'bilinguals' they studied (Italian-German) developed such a syntactic system. Furthermore, it appeared to be different from the syntactic system of either language. Eventually, the children are able to make and use appropriate distinctions in the syntactic systems of each language.

2.2.10 Pragmatics

Ellis (1994) reports that though pragmatic development of DL subjects has been studied since the seventies, it was done so as to explain how learners acquired grammatical competence. Hatch (1983) for example, examined the ways in which learners develop topics as a way of exploring why certain grammatical features are acquired before others. Only recently however, states Ellis (1994) has the acquisition of pragmatic competence in its own right been studied, most of this work being on specific illocutionary acts.

Ellis (1994) reviews some of the literature related to *interlanguage pragmatics,* that is, "the performance and acquisition of speech acts" (as opposed to interactional acts) by L2 learners. Most of the published literature is based on cross-sectional studies and Ellis (1994) highlights the need for longitudinal studies which would provide evidence of developmental sequences. This has resulted in knowledge about how L2 learners *use* an L2 but very little is known about how *rules* of speaking are acquired. The data have been mainly spoken, as opposed to written, collected in natural settings and also elicited by means of discourse completion tasks. Results of such studies seem to suggest that pragmatic skills in L2 very much depend on proficiency in L2.

Referring to studies on *interlanguage requests* by Walters (1979), Carrell and Konneker (1981) and Olshtain and Blum-Kulka (1985), Ellis (1994) arrives at a tentative conclusion that "with sufficient exposures to the L2, learners are able to perceive the socio-linguistic distinctions encoded by native speakers in requests but they may become oversensitive to them."

Ervin-Tripp et al (1987) report that the results of their study suggest that their low-level learners of L2 French relied more on *situational* than *linguistic* clues as a means of *comprehending* requests because they may have problems selecting appropriate request strategies for different situations. Such learners will sometimes respond according to requesting politeness norms in L1. High - intermediate level learners may also use longer requests than native speakers.

Ellis (1992) conducted a two year longitudinal study in a classroom setting of two L2 English subjects (the 10 year old's L1 was Portuguese and the 11 year old's was Punjabi). He concluded that there was "clear evidence of developmental progression" but

elaborated requests were not made and there were limitations in their ability to use requests in a number of ways. For example, the majority of requests were direct and there were few examples of non-conventional requests. Ellis (1994) suggests two possibilities for this. First, that the learner was still developing the necessary linguistic and pragmatic knowledge and secondly, that a classroom setting may not have been conducive to the full acquisition of request forms and strategies.

Whereas requests in different situations are made differently across cultures (Ellis, 1994), Olshtain (1989) who conducted a cross-cultural study involving speakers of Canadian French, German, Australian English and Hebrew concluded that *apologies* were realised in very similar ways by his subjects. Ellis (1994) concludes that both socio-cultural norms of L1 and linguistic proficiency in L2 influence how apologies are made in L2.

Refusals by L2 speakers have not been studied as much as requests and apologies and none of the studies have been longitudinal. There would seem to be pragmatic transfer from L1 as Beebe et al's (1990) study has suggested. Their Japanese learners responded to the interlocutor's status rather than to their familiarity. An appropriate level of L2 proficiency was also needed for such pragmatic transfer to occur.

Pragmatic skills are complex ones and comprise several attributes in addition to the ability to make *requests*, *apologies*, and *refusals* already discussed above, and at a basic level, skills such as *turn taking*, *eye contact* are all pragmatic skills. Most studies of pragmatic skills have concentrated on one, or at best, a small number of pragmatic skills. It is therefore, impossible to arrive at conclusions about pragmatics in the wider sense of the word. In addition, many of the studies have been of adult L2 learners and often limited to a particular cultural background. As has been discussed earlier, socio-cultural factors can affect pragmatic skills in L2. It is thus, impossible to make generalisations about the pragmatic skills of L2 adult learners. Because of the dearth of studies in children, the same applies for the pragmatic skills of young L2 learners. Finally, most studies have been cross-sectional and little can therefore, be said about the *developmental acquisition* of pragmatic skills in L2 learners.

2.2.11 Fluency Disorders

Smith (1931) reported cases of stuttering in infants exposed to two languages before one was completely learned. However, there is no evidence of causal relationship. In evaluating this finding, one has to consider that normal non-fluency is common during infancy even in monoglots (Van Riper, 1971). It is, therefore, possible that stuttering was misdiagnosed by Smith. Reports that there is a high incidence of stuttering among Asian children in England have not conclusively proved that exposure to a second

language is the cause of this. Psychogenic, organic and socio-cultural factors could be the prime cause of a DL child's dysfluency in the same way as they can affect monoglots.

Lemert (1970) published a comprehensive summary of studies related to the existence of stuttering in several cultures. He concluded that stuttering does not occur in every culture and that it was "reasonably certain that its incidence varies from culture to culture". He argues that a number of variables peculiar to a society or culture may be responsible for different incidences. Among these are pressures on the child from strict rearing practices, competitiveness, intolerance of inadequate performance (Bloodstein, 1987), socio-economic pressures (Morgenstern, 1956) particularly those to which ethnic minorities are most susceptible, and cultural stigmatisation of certain kinds of speech problems such as stuttering. The fact that existence of 'bilingualism' is not necessarily implicated in these studies does not mean that these factors, especially the socio-economic one, can not also affect minorities living in a non-native country and who may also be 'bilinguals'.

Wright (1992; 1994) highlights the relationship between 'bilingualism' and stuttering, relevant to some Asian children in the United Kingdom. She quotes Travis et al (1937) who found more stutterers among 'bilinguals' than in monolingual children in the East Chicago white immigrant population. Travis et al (1937) did however, acknowledge that the difference may have been due to the economic insecurity and emotional instability found in many homes at a time of financial depression. Paradis and Lebrun (1984) disputed the validity of the claims made by Travis et al (1937) that there was a higher incidence (2-8%) of stuttering among 'bilinguals' than for monolinguals (1.8%). Paradis and Lebrun (1984) found that when grouped according to race and linguistic origin, Travis' black English-speaking monolinguals and children who could not speak English well, are much more likely to stutter more than the rest. They therefore, concluded that any correlation between stuttering and 'bilingualism' must be unreliable. Hoffman (1991) comments that a 'bilingual' child may develop a stutter when his/her social and educational experience is "so devastating as to disturb his/her psychological well-being." Again, this type of experience can underlie stuttering in monoglots.

Mattes and Omark (1984) claimed that bilingual children are more prone to stuttering. Paradis and Lebrun (1984) provide counter evidence for such claims. They scrutinised the data reported by two French doctor and orthophonist, Pichon and Borel-Maisonny, respectively (Pichon, 1936) who claimed that 14% of the children in their study who stuttered used more than one language . It is however, not clear how 'bilingual' these children were or what type of 'bilinguals' they were. Lebrun and Paradis (1984) concluded that some of the stuttering symptoms described by Pichon and Borel-Maisonny are also found in monolingual stutterers.

The view that stuttering is common in bilinguals because of syntactic overload was proposed by Karniol (1992) [Hebrew -English]. The child mentioned in her study in fact did not stutter for a long time so the claim is lacking in credibility.

Lacey (1987) reported that her caseload of stutterers consistently comprised over 50% Bengali children when children from this group made up only 35% of the general school population. There could of course be several reasons for this. One could be that those referring children to speech therapy might be more sensitive to young Asian children's speech problems than to white monolingual children's because of their belief that 'bilingualism' causes speech problems and that children from minority groups are more likely to be educationally disadvantaged. They may thus, more readily refer to speech and language therapy young minority group children with speech problems than white monoglot peers.

The figure for adolescent Bengalis participating in a stuttering therapy course was reduced to 30-40% and was more comparable to the Bengali school population. Lacey (1987) attributed the different figures for the young and adolescent Bengali children to the fact that the latter were more integrated with their English monoglot peers and parental support and counselling was not as vital as with the younger children.

Wright (1992; 1994) concluded from her survey that more therapists found that "they were treating a lower percentage of Asian clients than warranted by the percentage of Asians in their local population". She acknowledges that because of factors such as possible inaccurate National Population Census, low referral rates from the Asian community, poor take-up or failure to remain in therapy, "we are unable to conclude from these [her] findings that there is a lower incidence of stuttering in the Asian community." Wright (1992; 1994) however, does not provide data as to how many of the subjects referred to in her study were 'bilinguals'. The relationship, or lack of relationship, between 'bilingualism' and stuttering in her study can therefore, not be ascertained.

Waheed (1995) found that speakers of English as a Second Language experience more difficulty transferring fluency targets to conversation than native English speakers. She claims that "similar difficulties were also found among bilingual and bicultural stutterers." However, she does not claim that there is a higher incidence of stuttering in 'bilingual' subjects because of their 'bilingualism'.

Rustin et al (1995) acknowledge that they have not found any evidence in their work with 'bilingual' stutterers that it is the 'bilingualism' rather than socio-cultural and other

factors which causes the stuttering. Saunders (1982) supports the view that there is no causal relationship between 'bilingualism' and stuttering. He criticises those who advise parents "to expose their children to only one language, or at least delay the exposure to two languages" when their children demonstrate "unclear speech or stuttering." He adds: "... there is ... no evidence that bilingualism per se causes stuttering or dysfluent speech." It must be said, however, that Miller and Abudarham (1984), who are both 'bilingual' speech therapists researching into the field of 'bilingualism', have successfully advocated the delay of exposure to a second language until the problems of the first are resolved - they present a case study in Chapter 10 of Miller's book which provides evidence for the success of this advice. Perhaps a more convincing argument against 'bilingualism' causing stuttering is that there is no evidence found in the available literature that the incidence of this disorder is higher among 'non-ethnic' DL children (e.g. *white* DL Welsh children, Gibraltarian children) than among their monoglot peers. 'Bilingualism' is therefore, not considered to be a precipitating factor - though one suspects it could contribute to the fluency problem.

2.2.12 Interference/Transfer and Code Switching

The types of *interference* between the two languages have been well documented by Weinreich (1970). *Interference* can occur at any linguistic level - phonological, morphological or syntactic. It is not always the case that L2 interferes with L1; sometimes L1 interferes with L2. Interference, is manifested by the use of linguistic elements of one language substituting, modifying, or being added to elements of the other (See earlier example '***skipando***'). Since Weinreich's major work, others have reported on the nature, extent and implications of interference. By and large, interference is considered to be a *normal* phenomenon during the development of two languages, whether simultaneous or sequential. The degree and nature of interference depends on factors such as the similarity of the languages learned. Whether one language is dominant, the age at which the DL child is exposed to L2, whether the languages are kept differentiated with regards to their social use and whether the *one-person-one-language* system operates. There is less interference when this latter system is employed, when the frequency of use is similar for each language and when knowledge of each language is balanced. It is thought that simultaneous bilinguals acquiring both languages in a *fused* context are more vulnerable to interference. Interference is sometimes perceived as confusions, but samples of codal or linguistically related interference would seem to be a normal characteristic. It is this belief that has prompted recent workers to refer to this phenomenon as *transfer* (García, 1983; Hamers and Blanc, 1990) which has a more positive connotation (García, 1983).

Ellis (1994) states that *transfer* describes the incorporation of features of the L1 into the knowledge systems of the L2. Transfer is indicated by L2 errors which mirror L1 structures. Results of error analysis studies (e.g. Dulay et al, 1974b) have cast doubts on the validity of earlier claims that *interference* or *negative transfer* would occur when the target language differed from the L1 and that if patterns of the L1 and L2 were similar, a *positive transfer* would take place - L1 could thus, help or hinder the acquisition of L2. Contrastive analysis was thought to be able to predict when *interference* would occur. However, *transfer* often did not take place when there were differences between the target and native languages. Also many of the errors that learners made appeared to reflect intra-lingual processes. They were thus, the result of processes based on the learner's existing knowledge of the L2, rather than *interference*. However, more recently the importance of *transfer* has once again been acknowledged (e.g. See Odlin, 1989).

Romaine (1989) argues that what have sometimes been attributed as errors due to interference are really *developmental errors*; monoglots would also make similar errors in the course of their linguistic development. She states that "there is a great deal of research to support the idea that first language interference is not the prime cause of learner errors."

Code switching is the term given to the alternate use of each language within the same utterances or conversation. It can only start once the DL child becomes aware that there are two language systems and can make the appropriate differentiation. Kessler (1988) says that code switching then becomes routine in simultaneous 'bilinguals'. The nature and degree of the switching will depend on several factors. Leopold (1939-50) found that his daughter was able to use the appropriate language with German and English speakers, respectively, by the age of two years and two months. This awareness can develop at an early age. Fantini (1985) noted that his son Mario's code switching started only a few days after the introduction of English words into his active vocabulary. Code switching was well established and executed by age 2:8, and by age 3:0 Mario was able to switch between English and Spanish depending on the language spoken by the individual he was addressing.

As mentioned earlier, Dulay et al (1978) have stated that switching normally occurs at relative-clause boundaries, at the beginning of verb phrases and before adverbial clauses. They have also claimed that when this happens at other junctures, an L1 learning problem may be indicated. This would suggest that there is a rule-bound system determining switching behaviour. Romaine (1995) however, claims that "recently some linguists have expressed doubts about being able to account for switching as rule-governed behaviour." However, certain rules might be identifiable as reflected by Poplack (1980) who

described three types of Code Switching one being *tag-switching* involving the insertion of a tag e.g. *you know* in one language when the utterance is in the other language. *Inter-sentential* switches take place at clause boundaries or between speaker turns. *Intra-sentential* switching occurs *within* a clause.

The dominance of one language over the other may affect the degree and ease with which switching takes place. It is thought that the more balanced the languages, the more switching will occur. Recent research with English/Danish 'bilinguals' (Petersen, 1988) has reported a correlation between language proficiency and type of switching e.g. switching at word level, or constituent level. Fluent 'bilinguals' tend to switch at constituent level and those who do not have equal proficiency in both languages, switching predominantly at word level.

The ability to switch could conceivably have advantages and disadvantages; from the former point of view, it allows DL speakers to express themselves in an alternate code when the lexicon or linguistic structures are not readily available to them in the other code. On the other hand, this facility might reduce the opportunities and motivation for learning the relevant lexicon and linguistic structures in that language. It is perhaps partly for this reason that DL speakers may sometimes be found wanting when assessed in L2, though they may have the lexicon and linguistic structures in L1. This hypothesis is central to the present study and is responsible for the advocacy that both the DL speaker's language has to be assessed/studied (See Chapter 5.6).

2.2.13 Age of Learning

In 1953, Penfield, a neuro-physiologist, claimed that as people grow older, the language-learning centres in the brain harden, making the learning of language a much more difficult task. This would suggest that learning a language during the earlier part of childhood would be easier. A child, states Penfield, can substitute the right hemisphere of the brain for the left which normally controls speech but older persons cannot do this. "Once functional localisation of acquired skills has been established, the earlier plasticity tends to disappear" (Penfield, 1953).

Ever since Wernicke and Broca, there have been many studies which have tried to establish localisation of linguistic function in the brain, not only in monoglots but also in 'bilinguals'. According to Albert and Obler (1978) 'bilingual' brains are more bilateral and less fixed with respect to cerebral dominance than those of monoglots. Bialystok (1994) states that such claims have strong implications for theories of acquisition. Another neuro-linguistic approach attempts to evidence constraints on the acquisition of

language as the brain develops. Lenneberg (1967) thus, argued that it is more difficult to learn a language after puberty because of changes in the brain occurring at that time. Bialystok (1994) argues that any maturational constraints would affect both first and second language acquisition. She concludes that "while biological influences may continue to shape language acquisition throughout life, there is no reason to assume that the influence remains constant or that the shape of the emerging language remains identical." It is difficult to establish, she argues, which areas of language proficiency may be most influenced by any biological constraints and when such an influence is most prominent.

McLaughlin (1978) briefly reviews the *Critical Period Hypothesis* which resulted from Penfield's and Roberts' (1959) and Lenneberg's work (1967) on the biological factors affecting first and second language-learning. He argues that the evidence of subsequent studies indicates that the *critical period* for language development would seem to occur between the ages of two and four or five. Lenneberg (1967) argued that before this time, the child is too immature physically, and after puberty the brain becomes too inflexible to learn language; this would apply to learning both L1 and L2. McLaughlin (1978) acknowledged that at the time of writing, not enough was known about cerebral dominance, and when laterality and its relationship to language-learning was established, to support or reject the hypothesis.

The critical period hypothesis would seem to have been discredited by subsequent research. One study (Ramsey and Wright, 1974) found that the younger the child when introduced to English (L2), the better the performance on various tests of English. Other recommendations about the optimal age for L2 learning range from simultaneous acquisition from birth (whilst keeping the two languages distinct by associating each with different persons in the child's environment), to introducing L2 only after L1 has been well established. However, some studies (Grider, Otomo, and Toyota, 1961 [Japanese/English]; Politzer and Weiss, 1969 [Spanish/English]; Braine, 1971; Bühler, 1972 [Swiss German/French]; Snow and Heofnagel-Hohle, 1975 [English/Dutch]; Ervin-Tripp, 1978) seem to indicate that older children and adolescents acquire a second language better in a natural environment. In fact, the literature is very ambiguous about the optimal age for learning L2. There are many variables which will determine the degree of success with which an individual will acquire L2. Some reports claim that second language-learning is easier during the developmental stage when children are exposed to language-learning and language-stimulating environments in a more intensive manner, than in later life. Furthermore, as mentioned earlier, the older child may possess higher cognitive skills which will facilitate L2 learning and in addition has an L1 to work

from. Reference has already been made to the relationship Fathman (1975) found between age and syntactic development.

Results of some studies suggest that different linguistic skills may be favoured by the age at which a DL subject is exposed to a second language, some skills being favoured during childhood and others during adult L2 acquisition. For example, children are thought to be better at pronunciation, in particular. Others (e.g. Harley, 1986) will argue that conclusions can only be reliably arrived at when such research is controlled and considers identical variables such as teaching strategy and context. This viewpoint is more likely to refer to subjects who receive formal instruction in a second language. It is difficult to see how such variables can be practically controlled for simultaneous 'bilinguals' particularly, who are more likely to learn a second language spontaneously, or in a naturalistic setting. Hamers and Blanc (1990) attest this view. They state that "it is important to distinguish between studies of L2 learning in a formal classroom situation and those of informal L2 acquisition in natural settings."

Despite a considerable body of work on the subject of optimal age for learning a second language, Cook (1991) concludes that "research evidence in favour of the superiority of young children has proved surprisingly hard to define." Cook cites the conclusion arrived at by Singleton (1989) in the latter's authoritative review of the age factor. Singleton refers to the one interpretation that, in naturalistic situations, those whose exposure to L2 begins in childhood, generally surpass those whose exposure begins in adulthood. Singleton (1989) concluded that this interpretation does not seem to be contradicted by the available data. Cook (1991) states that "age in itself is not so important as the different interactions that learners of different ages have with the situation and with other people."

Psycho-social factors may also encourage a child to be more receptive to learning a language. Ervin and Osgood (1954) suggested that some younger children may have a dependence on models resulting from their *identification* with the people who satisfy their needs. Other children, adolescents and adults may not find this need and may therefore, not be as motivated to learn a second language. It may not be possible to arrive at a conclusion, particularly since research has shown that the ease with which certain linguistic skills may be acquired is age-related: for example, older people may find it more difficult to acquire correct pronunciation in L2.

Fathman (1975) argued that the data from her study did "not prove that there is necessarily a critical period for second language-learning but they do suggest that the ability to learn aspects of a second language may be age related." She considered that other factors such as environment and maturity may influence L2 learning. She

concluded that " .... the second language acquisition process changes with age in terms of order of learning." The pre-teen years seem to favour L2 learning in preference to the post-pubertal period. However, so many factors affect language-learning, and in particular second language-learning, that it would be invidious to postulate an optimal age for second language-learning. Cook (1986; 1991) similarly concludes that much research is still open to interpretation as they involve different methodologies and different types of learners e.g. *immigrant* v. *native* subjects.

Cook's view does not seem to have altered much in recent years. Pursuing the *age of learning* issue is not credited with much value. McLaughlin (1987) reports that "more recent theory has largely ignored the Critical Period Hypothesis perhaps because of considerable evidence against it ..." Klein (1986) however, would seem at first not to give up on the possible implication of this hypothesis. He suggests that if the hypothesis holds true, it would have implications for the method of instruction before and after the age of puberty. This assertion, as McLaughlin (1987) points out, relates more to language *acquisition* (i.e. as a result of facilitation) than to language development (i.e. the natural and spontaneous learning of language). Klein (1986) acknowledges however, that there is serious doubt as to the truth of the hypothesis, pointing out that the biological evidence as shown by the work of authors such as Paradis and Lebrun (1983) with French/English 'bilinguals', is by no means conclusive.

Hamers and Blanc (1990) concurred that there is little empirical evidence for support of the hypothesis and that most of what there is stems from clinical data. They assert that if such a critical period exists, it is not absolute and there are indications that "linguistic competence can be acquired and improved after puberty." It would seem however, that there is a *sensitive* period for learning a second language (Eckstrand, 1981) which is not biologically determined. Rather, the advantage lies in introducing a second language early enough to allow the child more time to learn it and at an age when L1 learning has not reached a great extent and thus, the child is not overburdened with a great load of *linguistic baggage*. Following on from this discussion, Hamers and Blanc (1990) suggest that it is the "cognitive and linguistic advantages linked to early bilinguality that should enable us to draw conclusions about the optimal age for introducing L2."

Scovel (1988) had also argued that socio-cultural and cognitive explanations need to be considered as well as neurological, genetic and environmental ones when debating if there is a critical period. He found no evidence for there being a critical period for the acquisition of syntax, lexicon and semantics. However, he argued that after puberty, an L2 adult learner will never master the phonological system of the target language to the level of a native speaker. Scovel was clearly referring to the acquisition of *expressive*

phonology and does not address the possibility that even adult L2 learners might be capable of acquiring phonological competence at a receptive level. Long (1990) has presented evidence to suggest that the acquisition of a native-like accent is not possible by learners who begin learning after the age of six. He also argues that it is very difficult for learners who begin learning a second language at puberty to acquire native-like grammatical competence. Scovel (1988) had presented somewhat different evidence to argue that the critical period for a native-like pronunciation is around the age of twelve. He claims that the evidence in favour of a critical period for grammar is equivocal. Ellis (1994) claims that there is general agreement that older learners enjoy an initial advantage in the rate of acquisition. This might well be so since the "business of learning language" is not new to them and they have a more advanced metalinguistic awareness.

Newport (1990) reported that the age of initial exposure to the second language is the single most important factor in determining eventual proficiency. He showed that age related effects applied to complex structural aspects of morphology and not the simpler ones such as basic word order. More recently, Bialystok (1994) concluded that the evidence supporting the notion of a critical period in L1 learning has been ambiguous. She adds that the evidence for a neurological argument indicating a critical period in L2 learning is controversial. Romaine (1995) concludes that "what is *critical* about second language acquisition is age as much as the circumstances in which it takes place" and the social context provided for the 'bilingual' child.

In order to pursue further the issue of an optimal age of learning a second language, one would certainly have to study second language development of simultaneous 'bilinguals' so as to establish how effective second language learning might be if introduced before the child's third birthday. Hamers and Blanc (1990) attest to the fact that relatively few children get the opportunity to develop simultaneous bilinguality and so data regarding the nature and effectiveness of learning during early infancy is scarce. Comparisons with sequential 'bilinguals' are therefore, not always possible.

2.2.14 Non-linguistic Considerations

Several non-linguistic factors which may affect the success with which a second language (L2) is learned (and, conversely, the possible effects that learning L2 may have on other parameters) have been considered in the literature. Sociological and cultural variables may influence the attitudes and motivation of an individual towards the learning and/or use of L1 and/or L2. An individual's innate abilities for language-learning and its effects on L2 learning has been discussed in the literature at great length. In fact, the major focus of attention of early researchers is on the relationship between intelligence,

cognitive skills and L2 learning. Other considerations have included neurological factors and personality traits.

2.2.15 Intelligence and Cognition

Some early studies on intelligence and cognition, and 'bilingualism' (Saer, 1922; Smith, 1923) concluded that 'bilingual' children did not do as well in certain tasks as their monoglot peers. The intelligence of DL subjects was estimated by a variety of means, ranging from standard IQ tests (sometimes translated into the children's L1), to their ability to perform other tasks, such as those requiring *accuracy of thought* (Smith, 1923), and by the use of *non-verbal* tests (Jones, 1938, [Welsh/English]).

Smith (1923) concluded that monoglots between the ages of eight and 11 years, made more progress than 'bilinguals' in their "powers of expression, choice of vocabulary and accuracy of thought." Arsenian (1937) conducted very extensive studies of 'bilingual' children in New York (among them English/Moroccan speaking) and concluded that "the acquisition of two language systems ... does not seem ... to have a detrimental influence on mental ability and development." Jones (1938) concluded that "bilingualism did not seem to be a hindrance to thinking" carried out in verbal terms. In a later study and in collaboration with Stewart (1951) however, he found that monoglots did better in verbal and non-verbal tests than Welsh/English 'bilinguals'. Following certain adjustments of the tests to a common non-verbal basis, and even though the differences were substantially reduced, they confirmed their initial conclusions. These were similar to those arrived at by Barke (1933) and Barke and Parry-Williams (1938), who found that monoglots performed similarly in non-verbal tests but 'bilinguals' were inferior on verbal tests "especially when the verbal tests were administered in the child's mother tongue."

These conclusions, and the results of subsequent studies (Jones, 1955, 1959, 1960; Lewis, 1959), indicate that the performance of 'bilingual' children in non-verbal tests of intelligence improves with L2 (English) proficiency. This would seem to suggest that the linguistic factor had a greater influence on the 'bilingual's' performance in these so-called tests of intelligence than did the innate cognitive skills as measured through verbal tasks. Darcy (1953) surveyed the literature and concluded that "bilinguals suffer from a language handicap when measured by verbal tests of intelligence." In a later survey of the literature since 1920, relating to the effects of 'bilingualism' on cognitive development, Balkan (1970) reported that many of the tests used to assess cognitive development were verbal. Any linguistic inadequacy in DL subjects, particularly in L2 could, therefore, have been responsible for presenting a picture of inferior cognitive skills.

Among the criticisms levelled at the methodology of some of these studies, particularly those reporting negative effects of 'bilingualism', were the use of faulty statistical techniques, biased sampling and the omission of other considerations such as environmental and sociological variables (e.g. social class, frequency of schooling and social motivation) (Haugen, 1956). Jones (1959), having considered the residential locality of his subjects and occupational status of their parents concluded that, all other factors being equal, 'bilingualism' need not be considered a disadvantage. The difficulties in intellectual development did not arise from 'bilingualism', so much as "from the effects of the failure of schools and other social institutions to meet the bilinguals' needs." Whereas Jones's studies quoted so far all took place in Wales, there was evidence that conclusions of studies in the USA and Canada (e.g. Anisfeld, 1964; Peal and Lambert, 1962) coincided with those of Jones's in 1959. Thus, it was the system which was responsible for the particular results; the alleged handicaps were not permanent and could be dealt with by the system. Similarly, Balkan (1970) concluded that life problems rather than linguistic and psychological factors were responsible for inferior results in the tests used.

The operational definitions of *intellectual ability* contributed substantially to the testing of this ability. The tasks given were largely not valid as a measure of intellectual ability. Haugen (1956) stated that "the intelligence test is too gross a measure to throw much light on the psychological processes of bilingualism." He argued that many conclusions found in the literature about the effect of 'bilingualism' on intelligence have been somewhat contradictory, due to the differences in terminology and the purposes of various investigations. Support for this claim is found in recent literature (Ben Zeev, 1988) whose studies have included Hebrew/English and Spanish/English 'bilinguals', the former in Israel and the latter in the USA.

In the 1960s, the methodology of such studies began to improve, and many reported evidence of definite advantages of being 'bilingual'. Peal and Lambert (1962) conducted a rigorous study, taking into account many of the variables used previously and yet others omitted in previous studies. They found that Canadian (French/English) 'bilingual' children performed better in tests of verbal performance, non-verbal performance and intelligence than carefully matched monoglot peers. However, the results seemed to be true only of *infantile* and not *childhood* 'bilinguals'. They concluded that 'bilinguals' were more adept at concept formation and abstract thinking by virtue of the fact that they were trained in two languages. Anisfeld (1964) who also studied Canadian French/English 'bilinguals', confirmed these results. Menyuk (1971) stated that 'bilingualism' can create advantages in cognitive performance.

There has been some criticism of Peal and Lambert's study, and more recent researchers have conducted their investigations more carefully than their predecessors. Confirmation of the cognitive advantages of 'bilingualism' has come from studies conducted in many parts of the world. Among the better known are those by Ianco-Worrall (1972) who studied Afrikaans/English 'bilinguals' in South Africa, Cummins and Gulutsan (1974) who studied Ukrainian/English 'bilinguals' in Canada, Lambert (1977) who studied French/English 'bilinguals' in Canada, and Ben Zeev (1977) in Israel and New York. Oller (1983) concludes that here is no evidence whatever that learning more than one language is a hindrance to cognitive development over any reasonable period of time.

More recently however, Lemmon and Coggin (1989) studied the relationship between 'bilingualism' and intellectual function as measured by their subjects' performance in tests of concept formation, abstract and divergent thinking, and mental reorganisation and flexibility of thinking. They concluded that monolingual University students scored higher than 'bilingual' (Spanish/English) peers on most of the tests of cognitive skill. They suggest that these results may not be consistent with contrary findings from other research because their study was not based on children but adults. "As the person matures ... this early advantage may be lost." When 'bilinguals' were divided into high and low groups on the basis of their skill in *Spanish*, the high 'bilingual' group outperformed the low 'bilingual' group on the measures of cognitive skills, despite the fact that the low 'bilinguals' were somewhat superior to the high 'bilinguals' on all of the *English* tests.

Appel (1989) studied four groups of children from seventh and eighth grade in primary schools. The groups comprised Dutch monolingual children, and 'bilingual' Turkish, Moroccan and Surinamese children who had been living in the Netherlands between 8 years and 8 years 7 months. He concluded that 'bilingualism' did not affect cognitive-linguistic development negatively.

There would seem to be a high, positive correlation between the ability to learn a first language and subsequently a second. Skehan's work (1989) work has already been referred to. Hakuta and Diaz (1985) found from their longitudinal study of Japanese/English 'bilinguals' that the degree of 'bilingualism' and non-verbal ability were positively related. The longitudinal design of their study allowed for comparisons between trials and they were able to conclude that the degree of 'bilingualism' did affect non-verbal cognitive ability when the variables were controlled.

Despite the considerable methodological improvements in recent research into the relationship between 'bilingualism' and intelligence, and despite "substantial

documentation .... researchers have not yet developed and tested the validity of an explanatory model" of the positive effects of 'bilingualism' on intelligence (Diaz and Klingler, 1991, [Spanish/English]).

An interesting cognitive-linguistic variable i.e. *metalinguistic awareness*, has in the last decade been receiving increasing attention in the field of 'bilingual' studies. Bialystok (1987) studied DL subjects' conceptual understanding of a linguistic attribute. 'Bilingual' children in her study showed more advanced understanding of some aspects of the concept of 'word' than monolinguals. She concluded that this indicated a specific metalinguistic advantage over monoglot subjects. 'Bilingual' children have an enhanced awareness, states Bialystok (1991b) "of the analyses and control components of [language] processing." Inevitably, 'bilingual' children process language differently to monoglot peers (Bialystok, 1991b). Kessler and Quinn (1987) reported that 'bilingual' children performed better at problem solving tasks than their monolingual counterparts. They interpreted these results as evidence of greater metalinguistic competence and better developed creative processes. Thomas (1988) studied 'bilingual' college students learning a third language and compared their progress with monolingual peers studying a second language. He concluded that developing students' metalinguistic awareness may increase the potential advantage of knowing two languages when learning a third.

It would seem strange to claim that intelligence can be affected by language-learning when the argument is usually the reverse. Weinreich (1953) quotes Weisgerber (1933) who stated that 'bilingualism' can affect the intelligence of a whole ethnic group for generations. This conclusion lacks credibility since it would be very difficult to define and just as difficult to assess independently. The number of variables that are known to affect these two skills and their measurement confound any attempts to establish a cause-and-effect relationship between 'bilingualism' and intelligence. Ben Zeev (1988) arrives at the same conclusion. Despite this caveat, Johnson (1991) concludes that "... bilingualism may foster cognitive growth."

2.2.16 Affective Factors

Sometimes attitudes and motivation correlate highly. Individuals' attitudes to the host community, or to one of the two languages, may indeed have an influence on their motivation to learn a second language, how successfully they master the second language and how and when they use each of the languages. Cummins, Lopes and King (1987) found that attitudes of their Portuguese/English subjects living in Canada, toward the native culture play an important role in predicting bilingual proficiency.

Cheng (1995) states that children do not all learn language at the same speed for several reasons, including affective ones. Krashen (1981, 1982) has referred to his concept of affective filter of language acquisition. This refers to a language learner's subconscious (or conscious) attitude towards the second language, including motivation, self confidence, and anxiety. The lower the anxiety and the higher the motivation, the faster language learning proceeds.

If 'bilinguals' wish to identify with the host community, they are more likely to be successful and "in particular they are better at acquiring a good accent" (Christophersen, 1973). Attitudes often develop from socio-cultural and religious norms and beliefs, and these may dictate individuals' motivation for learning and using the L2. Social pressures for conformity may affect individuals either way, and second generation immigrants particularly may rebel against speaking L1. New immigrants may reject L2 in an attempt to maintain their links with the mother country, its culture and sometimes religion, and will only learn L2 when absolutely necessary. Wong Fillmore (1991) states that in learning a new language, the individual has to "suppress both social and communicative needs to a degree ...". Negative attitudes to the host culture and its values, and a strong desire to maintain their cultural or religious identity may result in a negative response to L2. Negative attitudes towards the affective environment in the classroom set by the teacher can inhibit learning of L2 (Fillmore, 1979). Romaine (1989) states that "the receptiveness of the child and family towards bilingualism is a factor affecting the outcome of any attempt to raise a child bilingually." Furthermore, the attitudes of the extended family, the school and society at large, are also important.

Even when a second language has been learned, the individual, though not entirely forgetting it, may decide consciously or unconsciously not to use it. Sometimes, one of the languages acquires a *snob value* (social or educational) and the other a *substandard* status (Haugen, 1956). Acculturation may favour L1 being dropped or used less and the importance of L2 is enhanced, though new and first generation immigrants may respond in an entirely different way.

Wong Fillmore (1991) discusses a model of language learning in a social context. She argues that three types of processes interact with each other in language learning, these being the *social, linguistic* and *cognitive.* At the first level, DL individuals need social contacts with people who speak the target language, in order to acquire the incentive to learn the language.

Personality traits may be a criterion in the motivation with which DL subjects learn L2 and the degree of proficiency they develop in it. These traits can interact with age differences. Some may not hinder language learning in young children. They may however, become major problems for older individuals (Wong Fillmore, 1991). Lambert (1963) and Gardner (1966) [French/English in Canada] found that strong-minded individuals who do not feel any dependence on the host community and who perhaps even hold prejudices, often do not seem to achieve a second language as successfully. It is possible, therefore, that such under achievement is not due to limited intellectual ability but to the influence of such personality traits. Acquiring a second language could mean acquiring a second personality and sometimes a second culture (Sharp, 1973). This may imply certain modifications to individuals' socio-cultural and religious values which they may find threatening. Identity conflict is alleged to characterise Eskimo 'bilinguals' (Sindell and Weintrob, 1972). Brophy and Aberle (1966) describe value conflicts which inhibit the satisfactory development of 'bilinguals' and their early withdrawal from school. Delinquency, the propensity to drop out of school and fragmented personality development are all laid at the door of 'bilingualism'.

Heyde (1983) showed that there was a correlation between proficiency and self-esteem in adult learners. The question is begged whether many monoglots do not also suffer from lack of self-esteem. They of course do and it is thus difficult to accept the validity of Heyde's claim. The same argument can apply to other factors such as lack of self-confidence which might be invoked as being more prevalent in DL speakers. Bley-Vroman (1989) [Chinese/English] states that affective factors may have a different effect on children than on adults. He argues that it is not clear how to specify which are the crucial affective factors which may affect children, and how to identify these factors with those seen to influence adult language learning. At present, *Affect Hypotheses* amount "to saying that children have a certain *je ne sais quoi*, absent in adults, which is crucial to language acquisition, *je ne sais comment*" (Bley-Vroman, 1989). It would seem that research has not yet been conducted which, having identified affective differences influencing language learning in a group of DL children suffering from these affective factors, can reliably demonstrate that the language learning acquisition of these children is significantly different from that of DL children not suffering from such factors.

It is not uncommon for children with one English-speaking parent to refuse to speak Spanish, as observed on a recent visit to Gibraltar, but this does not mean that they are not able to speak Spanish, and they certainly understand it very well. A distinction has to be made therefore, between the possible influences of affective factors on language acquisition, language proficiency and language use, a crucial difference which perhaps

has not been operationally made or defined in much of the past research regarding the influence of affect.

Lewis (1981) quoted Luria, who claimed that language helps the regulation of behaviour. Sudden introduction of a second language can result in psychological disturbances (including speech problems). It is not the possession of two languages in itself which can cause these disturbances but a possible conflict resulting from "unregulated transfer from one language to another". The way the two languages are acquired could influence the development of such conflicts. Other influential factors are the parents' and teachers' attitudes to the second language.

To what extent the changing political situation in Gibraltar (See Chapter 2.3) had an effect on the motivation of some of its citizens, to use more English at home, and how this may have affected their children's L2 development, is not possible to ascertain at the present moment. The only way this could be investigated is by the replication of the present study in another decade or so. By this time, the re-establishment of normal relations with a democratic Spain might alter these citizens' attitudes to the use of the Spanish language. Discussions about the value and possibility of introducing 'bilingual' education to Gibraltarian schools (Ballantine, 1983) have borne little fruit.

A phenomenon referred to as *anomie* is characterised by a confusion of identity. Child (1943) described the conflicts of the children of an Italian immigrant who lived in New York. Conflicts between home, and host language and culture resulted in frustration which could not be resolved without acceptance of one and rejection of the other. It is usually the adolescent and adult 'bilinguals' who are more vulnerable to anomie. However, this stage of anomie is not necessarily permanent. Baetens-Beardsmore (1982) reports on a pilot study of adults brought up as 'bilinguals' from early childhood onwards. After a period of about two years of experiencing anomie, they resolved the confusion and "were happy to be bilingual and bicultural." Among other factors determining the experience of anomie was DL individuals' socio-economic status and their strength of resentment at being members of a minority group (Lambert, Just and Segalowitz, 1970) [Canadian French/English]. The more homogeneous the two cultures, the less chance of anomie occurring. Individuals' motivation for actively learning L2 because they need to do so is also significant, though Lambert (1967) found that even highly motivated postgraduate students could suffer anomie. He also found that anomie started developing as students became more proficient in L2, and not necessarily in the early stages of learning L2.

The account given above may seem to warn the reader that 'bilingualism' could affect DL individuals emotionally. This would be a mistaken conclusion. Any emotional maladjustment is more likely to be environmentally determined and their difficulties almost entirely extra-linguistic (Christophersen, 1973). Where a *bilingual community* exists with its own culture, such as in Gibraltar, it is unlikely that any affective problems will result because of exposure to two languages. Research has indicated (Lambert and Aellen, 1972) that adolescent (Canadian French/English) children of parents who represented a bicultural background appeared to have no problem in identifying with their parents nor with stability or self-esteem whereas children of L1 monoglot backgrounds were more likely to. The bicultural group also showed no bias towards either of their culture groups whereas the other group clearly favoured their own ethnic group over others.

There is no evidence in the most recent literature to alter conclusions such as those arrived at by Haugen three decades ago (1956) that: "Any problems of personality adjustment ... are due primarily to [the 'bilingual's'] bicultural position and only secondarily to the recognised need for personality adaptation when switching from one language to the other." As with the results of recent research on the effect of a DL input on other non-linguistic developmental skills, such as cognition, one cannot make conclusive statements on the effects of such an input on a DL individual's affective development. There are far too many extra-linguistic variables involved, which are impossible to exclude from any objective study. If and when someone is able to prove that there is a higher incidence of mental retardation and affective disorders in 'bilingual', culturally homogeneous communities than in monoglots exposed to two cultures, claims that a DL background has a negative effect on the individual can be seriously entertained. In the present state of knowledge, the best one can say is that 'bilingualism' is unlikely to present lasting problems to the individual.

This section has presented a review of issues related to 'bilingualism', citing literature spanning over half a century. There is still much debate about certain aspects of the subject but a greater consensus is being achieved particularly about the invalidity of past claims that a bilingual experience will have adverse effects on other developmental skills.

2.3 GIBRALTAR - HISTORICAL, CULTURAL, LINGUISTIC AND EDUCATIONAL PERSPECTIVES

2.3.1 Introduction

No study in 'bilingualism' can be made in the absence of due consideration of the representative community's history and culture, since linguistic behaviour is significantly influenced by these. Another powerful force in determining the language of a community is its educational policies. This section will briefly describe these issues and relate them to the Gibraltarian linguistic system.

2.3.2 Historical Perspective

Gibraltar is a peninsula, occupying two and a half square miles, in the southern tip of the Iberian subcontinent and has been a British colony since 1704 when Admiral Rooke who was commanding an Anglo-Dutch fleet in the Mediterranean, decided, seemingly gratuitously, to capture it by force, in the name of Queen Anne of England. Before this time, Gibraltar belonged to the Spanish monarchs and was inhabited by a small Spanish community. Travel by land between Gibraltar and the Spanish mainland is possible across a low, narrow and sandy isthmus connecting them both. Most of the Spanish inhabitants fled across to the mainland and settled in San Roque, a few miles from the present border.

The Treaty of Utrecht in 1713 ratified British rule over Gibraltar which has continued ever since. Initially, the colony served as a strategic military garrison. It was not long after this event that traders and merchants from neighbouring countries were attracted to the colony, among who were Jews from Morocco, Genoese, Italians and Portuguese. They brought with them much needed victuals, building materials and other goods needed by the then predominantly military population. The local authorities welcomed these people and even though the Spaniards had stipulated in the Treaty of Utrecht that Jews and Arabs were not to be allowed to settle or even temporarily reside in the colony, the authorities turned a blind eye and allowed selective residence for some of these immigrants.

To date, there is a British military presence in Gibraltar which has, over the years, been very much reduced from its previous size. Most of the military personnel however, did not take up long residence and left when their tour of duty was over.

2.3.3 Gibraltarian Culture

Till 1969, when Spain imposed frontier and communication restrictions, most of the local population had identified with the neighbouring Andalucian culture and character for nearly two centuries, and only politically and educationally with Britain. All political and educational institutions used English as the official language and still do. Whereas the official religion is Anglican, most of the population are Catholics, though there are small Jewish, Anglican and Asian communities. After 1969, when the Spanish frontier gate was closed, a huge labour force was imported from Morocco to replace the Spanish one, and these workers were allowed to reside for short periods of time in Gibraltar. Their influence on the local culture of Gibraltar was probably negligible. More influential in several spheres however, has been the presence of the British armed services. Though they did not integrate in the local community, they were an important part of the economy and employed many locals. They also had (pre-1969) employed thousands of Spaniards who would enter Gibraltar daily, most of them returning back to the mainland at the end of the working day.

At one point, there were up to 15,000 Spaniards working in the local building trades and Naval Dockyards. There were also many women working as domestic staff and child minders, both living in and part time. There was therefore, a substantial Spanish presence, albeit largely on a daily basis. The traffic was two way, though, and most locals would look towards Spain for their entertainment and holidays. Contact between the two peoples was therefore, very close and frequent.

All this stopped with the closure of the frontier and not formally renewed till restrictions were eased, in the first instance, 13 years later in 1982, and then three years after that, in 1985, when the frontier was completely opened again. During this time, most Gibraltarians became fiercely British; a referendum received only 50 odd votes against, from the population of about 30,000, who voted massively to remain under British rule.

The significance of this to the present study is that many of the children who participated in it were born before contact had been restored with Spain. Many of the professional families particularly, encouraged their children to speak more English at home though not necessarily to the entire exclusion of Spanish which in any case the children were likely to speak with their friends. Many Gibraltarians thus, started identifying more with certain aspects of English culture and political thought.

The children participating in this study could be said to be culturally homogeneous i.e. They shared the same linguistic environment, educational system, western values and shared similar experiences.

2.3.4 Languages

The official language of Gibraltar is English and even though the variety of Spanish generally spoken by the locals may be considered by some not to be an official language, it is the vernacular. Most of the local population speak English with different levels of fluency. The news media uses mainly English though there is one bilingual newspaper and one published in Spanish. Most radio programmes are in English though some are in Spanish and local television is almost invariably in English. However, the population was able to receive Spanish television for a long time before Gibraltar obtained its first television station.

As a community therefore, Gibraltar can best be described as *diglossic* and to some extent 'bilingual', a phenomenon described by Fishman (1967) - See Chapter 2.1.2 .

As mentioned before, a variety of immigrants from neighbouring countries settled in Gibraltar. They became the Gibraltarian community and were mainly responsible for giving the colony its character and special variation of the Andalucian Spanish language, popularly referred to by Spaniards as *Yanito*. It is thought that many of the first Genoese and Italians who settled in Gibraltar were called *Giani* and, together with the added Spanish diminutive morpheme, the term *Yanito* was coined.

The differences between Andalucian Spanish and *Yanito* are really not great and speakers of both languages have no difficulty in understanding each other. The differences that exist are mainly at a lexical level and are largely the result of the multi-ethnic and multi-linguistic background of the early settlers. Examples of these lexical differences are due to well documented 'bilingual' phenomena such as lexical borrowing and transfer or interference, both at a semantic and phonological level. For example, the Spanish equivalent to the English word *liquorice bar* is *regalíz* - the *Yanito* is pronounced *likirva*, a clear case of lexical borrowing and phonological transfer. The word *nurse* or *sister* is commonly used by locals in preference to the Spanish equivalent *enfermera*, though both these words are in use.

Other words exemplify the phenomenon of *faux amis*, that is when two words are phonologically homogeneous but semantically different. A word such as *pompa* in *Yanito* means *pump* and probably came from the Italian name for the same, but in Spanish *pompa* means *pomp*. There is also evidence of words which comprise the verb stem in one language and a morphological ending in the other. For example, *sheque-**ando***, meaning *checking*, uses the English verb stem *check* and the Spanish progressive morphological ending -***ando***; similarly, to step on something is *pisar* in Spanish, though

a school child was once heard to be telling his teacher that another child had been *'piss-**ing*** me'. The borrowing or transfer process can therefore, occur in both directions. Sometimes the borrowing appears as a result of guessing what the equivalent of a word in one language might be in the other. One example of this is the word *piperia* which in *Yanito* means *water pipe*. This could be because the word in Spanish is *tuberia*, the last syllable of which has been added to the English word i.e. *pipe*.

Whereas grammatical and syntactic transfer does exist in adult speech, it would seem to be more prevalent in the emerging language of children. In both groups of speakers, there is evidence of such transfer in everyday speech. Code switching within the same sentence or conversation is also a very common phenomenon.

All these characteristics form part of a very viable communication system. It is arguable whether the term *Yanito* can be ascribed to the Spanish code only as the use of English and Spanish together is so basic a characteristic of the Gibraltarian's communication system.

The phonology of *Yanito* tends to be greatly influenced by the phonology of Andalucian-Spanish, a phenomenon which is to be expected because of Gibraltar's physical proximity to the Andalucian region of the Iberian peninsula.

2.3.5 Language Use

Despite the practice of code switching, there are occasions when the verbal behaviour is *diglossic* and communication may take place in one language exclusively depending on the societal domain. Using Ferguson's terms, *Yanito* Spanish is the L or Low language and is predominantly the local vernacular *of the street* though its use is contextually determined - if politics or education is the subject of the conversation, English might be used exclusively, or at least mainly. English is the H or High language more commonly used in the political and educational domains.

Playground language, particularly for the younger children, is more likely to be *Yanito* Spanish. The majority of the local population is likely to speak *Yanito* Spanish at home, though in many homes, not necessarily to the total exclusion of English.

Some teachers have reported that with the closure of the border between Spain and Gibraltar in the late 1960s, there seems to have been an increasing use of English language at home, possibly as a political reaction against Spain. Furthermore, with a loss of the previous daily physical, social and commercial contact with Spain and Spanish

people, more English seems to be spoken in the streets. It is difficult to predict whether this alleged trend will be reversed since the re-opening of the border.

2.3.6 Education

As implied earlier, the education system and practice has a great influence on language. Many children do not acquire English until they start formal schooling at the age of four. Before this, unless the family speaks English at home, or the child attends nursery or play school, it is very likely that exposure to English is negligible for most children. Local television programmes do not start till the early evening so that any language learned through this medium is likely to be from Spanish television. Early lexical development is therefore, more likely to be in Spanish, predominantly.

Whereas there are a few non-Government supported schools, most of the schools are Government run and the vast majority of local children will attend these. At the time when this study was being conducted, there were two Nursery Units attached to two First Schools. The former catered for children from 3 to 4.

There are also seven **FIRST** schools, four **MIDDLE** and one **PRIMARY** schools in Gibraltar (Subjects used in this study attended three of the First schools and two of the Middle schools, half of the schools in each category thus being represented). First schools catered for children aged 4-7, and the Middle schools for children aged 8-11+. All these schools are co-educational. There is also a school for children with learning difficulties.

In 1986, the average class size in First schools was 20.4 and for the Middle schools, it was 24.8. The average pupil/teacher ratio in First schools was 15.5 and in Middle schools 19.4.

All Gibraltarian-born teachers, and the vast majority of the non-Gibraltarian teachers, had received their professional teachers training in the United Kingdom. The teaching methods and curriculum were not dissimilar to schools in the UK.

Secondary Education takes place in two single-sex schools which cater for children between 12-plus to fifteen-plus. The syllabus for these secondary schools was GCE (now GCSE) oriented (Department of Education - Government of Gibraltar, 1988).

2.3.7 Language Policy in Schools

Whereas the official language in schools is English, some teachers will make allowances and speak Spanish, particularly in the nursery units and the reception classes in the first and primary schools. Despite many attempts and recommendations that a 'bilingual' language policy be introduced in the teaching (Ballantine, 1983; Flores and Ballantine, 1983), the language medium for teaching is English. Though Spanish is most children's first language (L1), it is surprisingly, not taught formally until the penultimate year of Middle school, and then, paradoxically, as a second language. This situation remains unchanged to date.

This whole Chapter has provided a brief overview of the terminology and has provided a rationale for a more general one i.e. Dual Language. It has also reviewed the literature regarding the relationship between 'bilingualism' and linguistic and non-linguistic variables. The Chapter concludes by providing a brief account about the historical, socio-cultural, political, religious, linguistic, and educational background of the subjects participating in this study.

CHAPTER 3

METHODOLOGY

CHAPTER 3 METHODOLOGY

3.1 RATIONALE FOR METHODOLOGY

3.1.1 Selection of Lexical Corpus

There are several issues that need to be addressed in any study of a population's lexicon. In the first instance, criteria for the selection of a lexical corpus to be employed have to be considered. There are a number of ways that such a corpus can be arrived at. Firstly, one can randomly select a lexicon from a dictionary so that for example, every ***'n'th*** word would be chosen until the required number is reached. This approach was quickly dismissed for several reasons, the major one being that one could easily end up with a great number of lexical items which were unlikely to be known by the younger subjects participating in the study. Another reason for rejecting such a strategy was that it was unlikely to yield a representative sample of functional lexical items which would reflect common or reasonable usage. Similarly, it was unlikely that a representative sample of grammatical and semantic categories reflected in early normal lexical development, would be obtained.

A second strategy often used in similar studies (e.g. Nelson-Burgess and Meyerson, 1975) involves observing and recording the active day-to-day lexicon used by the community to be studied. This would have involved detailed observations of the lexicon used by groups of subjects representing all the ages relevant to this study i.e. 4-12 years, a daunting task indeed which would have diverted a lot of the time and energy available from achieving the aims of the present investigation. Again, there is no guarantee that such an approach would yield an adequate or appropriate representation of the potential lexicon employed by the subjects. Indeed, particularly when studying a bilingual's lexicon, such a strategy would be very restricting since it would only yield a corpus of words most frequently used by the subjects and therefore, exclude words rarely used in day to day social interaction.

The issue of how to determine what a *learner's language* can be is addressed by Cook (1982). The decision as to whether or not generalisations can be made about the subject's language system as a whole is not an easy one to determine if natural samples of subjects' language is collected and used as the language corpus for a study. Such methodology therefore, whilst perhaps giving an indication of the subject's day to day functional language, does not yield information about the language used in other contexts. Some researchers such as Kellerman (1976) have proposed that further

information elicited from subjects about the language used in less common contexts can be added to natural samples; he called this investigative strategy *lateralisation.*

Another issue to be considered is that in certain *domains*, (Fishman, 1968a, 1968b; Fishman, Cooper and Ma, 1971) many lexical items would be exclusively used in one language and not the other. Regardless of these disadvantages, if this strategy had been adopted, it was likely to require considerable time and resources and when completed, would still necessitate a final selection in order to produce a corpus of lexical items suitable for the study. A further practical problem regarding the pictorial representation of such items is discussed below.

In past research, frequency counts have been used from which lexical stimuli have been selected. Reference has already been made to some of these (e.g. Thorndike and Lorge, 1944; Kucera and Francis, 1967; García Hoz, 1953; Burnard, Hockey and Marriot, 1979 and Hockey and Marriot, 1980) in Section 1.2. These frequency counts, as has been stated earlier, have required exhaustive study of literature such as newspaper and journals and, as already stated (See Section 1.2) there are disadvantages in employing this strategy for the selection of a lexical corpus, particularly for the purposes of a study such as this. In addition to the objections already made in this respect, to employ such a strategy to arrive at a lexical corpus in *two* languages presents a higher degree of complexity especially since the frequency of a particular word in one language is likely to be different in a second language, particularly in a *diglossic* community.

Cornejo (1975) in his study of 24 'bilingual' (Spanish-English) 5 year old children in Texas, found that only 220 of the 972 items recorded in English appeared in Thorndike's list (1921). He argues that this is because "Thorndike's frequency list does not represent the spoken vocabulary of children today since their language patterns have been highly influenced by mass media." A similar comparison of the children's Spanish lexicon with Keniston's Spanish Idiom List (1938) indicated that out of 696 items recorded, only 76 appeared in Keniston's list. Cornejo (1975) suggests that this is because this list was "tabulated from the words used in literature (drama, fiction, prose etc.)" and were thus obsolete and rare.

Published frequency counts would therefore, not yield the type of lexical corpus which is required for this study. In addition to this, frequency counts are specific to the community in which they are conducted so one would have had to conduct such a study in Gibraltar and this would require great resources (it took García Hoz, [op. cit.] 7 years to complete his study) which would have been difficult to justify, particularly in view of the comments made above about the usefulness of such a project.

The disadvantages of using lexical stimuli generated from studies conducted in Spain (García Hoz, 1946, 1953, 1977; Justicia Justicia, 1985a, 1985b) have already been referred to in Section 1.4.

This investigation involves a study of the ***receptive*** lexicon of Dual Language (DL) children aged 4 - 12, in Gibraltar. One way of studying comprehension may involve the researcher in providing the stimulus word and asking the subject to explain its meaning. This is an unduly time-consuming approach which in any case is inappropriate for the younger subjects who are likely to find accurate descriptions of words they may know very difficult, or who may employ over-extensions. The correctness of such descriptions is also likely to be difficult to evaluate. For example, if a young subject says *yummy yummy* when asked to describe a *hot dog*, would this mean that he understands exactly what a *hot dog* is, or merely the fact that it is some form of food. The problem is complicated when studying the lexicon of 'bilingual' children. A DL subject may be able to give an unequivocal description of an L1 word but an imprecise one of its L2 equivalent. Furthermore, this strategy imposes undue demands on the subjects' expressive skills which, particularly if they are poor, could affect the subjects' performance in receptive tasks not because their receptive skills are necessarily inferior but because they did not have the expressive skills required to demonstrate the true extent of their comprehension. This problem is bound to be affected particularly by the *semibilingual* status of the young DL subjects.

Similar objections are pertinent to presentations such as those used by García Hoz, (1977) which comprised tasks requiring subjects to *read* stimulus words which had been derived from an earlier *word frequency* study based on *Spanish monoglots* (García Hoz 1953) or sentences and then make appropriate *written* responses, for example, from a *multiple choice*. This strategy would have been inappropriate in this study for several reasons. In the first instance, it would exclude children who, because of their age, could not be expected to have acquired the reading skills, (even in one language) required to participate in a task employing this type of presentation. This would thus, exclude children under the age of 6. It is pertinent to mention in this regard that the vocabulary test designed by García Hoz (1977) was suitable only for children aged between 10 and 15 years. This fact alone would thus preclude the use of such a test, or a similar strategy, for subjects in the present study who were aged between 4 and 10. The exclusion of these subjects would have seriously prevented the stated aims being achieved.

Justicia Justicia (1985a) criticises the use of *frequency lists* for the selection of lexical items since these [*frequency lists*] "do not claim to evaluate global vocabulary in children... they are calculations based on *type-token* relations" i.e. the frequency of a word calculated from the total uttered or analysed. A study also conducted in Spain on *Spanish monoglots* by him (1985a, 1985b) concentrated on the subjects' ***expressive*** lexicon. The lexical stimuli were generated from previous studies of frequency counts based on Spanish monoglots and also from an alphabetically rational selection. One of the aims of the study was "to analyse spontaneous verbal ***production*** of the children via ***written*** samples in order to establish their general vocabulary." Other than the fact that the data from Justicia Justicia's study was generated from *Spanish monoglot* subjects, the fact that his study was on *productive* i.e. *expressive* lexicon, involved a different independent variable to the present study which is *receptive* lexicon. Furthermore, his subjects were aged between 6 and 10 years old and the ones in the present study were 4-12 years old.

The present study required the presentation of stimuli and responses in *both* languages. Methodologies and formats such as those used by García Hoz (1977) and Justicia Justicia (1985a) would exclude children who could not read well in *both* languages. Reading and writing skills in *English* are taught relatively early on in Gibraltar, but such skills in Spanish are not formally taught until, at the earliest, towards the end of primary schooling. Most subjects participating in the present study therefore, would not be able to cope with instructions in Spanish, nor with reading multiple choice items in this language.

By far the most effective and economical way of determining whether a subject understands a word or not is by presenting pictorial representations of the word. One option is to require a subject to simply state, in the form of an affirmative or negative response, verbal or otherwise, whether a stimulus word described *one* picture presented. This is not a reliable method because of the high probability that the correct response can be guessed. Yet another method offering a subject several possible words and requiring the subject to choose one which refers to one picture presented, may impose an unnecessary load on the subject's auditory or visual memory which may adversely affect performance, particularly with the younger subjects.

Arising from all these considerations, it was decided that the best medium for eliciting the required responses was by showing subjects a number of pictures simultaneously whilst the researcher said the stimulus word; the subjects would be required to point at the picture they thought depicted the stimulus word. Such a strategy is commonly employed in currently used language tests such as the British Picture Vocabulary Scales (Dunn et al, 1982), Peabody Picture Vocabulary Test (Dunn and Dunn, 1981), Sentence

Comprehension Test (Wheldall et al, 1987),Derbyshire Language Scheme (Knowles and Masildover, 1982).

The next issue to be addressed was the design or selection of the pictorial representations. The options ranged from the use of coloured or black and white pictures, the use of photographs of referents, to simple black and white line drawings. A previous study by this author (Abudarham, 1983) which aimed to develop and design an infants speech and language screening test for use by members of the medical and paramedical professions, indicated that photographs taken of the referents were not necessarily the best medium. The study also showed that colour presented no advantage. Young children particularly, seemed to co-operate and perform just as well when shown black and white line drawings. Other published studies (e.g. Klinger and Schad, 1974) supported this finding. Klinger and Schad found that black and white outlines were more easily visually processed by children, that photographs were more difficult to process because of blurred boundaries, and that more than four colours were potentially distracting. Dunn (1959) and Dunn et al (1982) also considered this issue when developing the PPVT and the BPVS, respectively.

The remaining question regarding the type of presentation was whether a fresh set of drawings would have to be designed. This would have necessitated a major study in itself requiring preliminary studies designed to test the validity and reliability of such drawings, in terms of their representative accuracy. It was felt that this would incur excessive resources in time and finances which were considered unjustified especially since there already was a selection of published black and white line drawings which could be suitable for the purposes of this study. For reasons discussed below a selection of pictures used in the British Picture Vocabulary Scales (BPVS) were chosen for the present investigation (See Appendix 1.1a for a sample of a BPVS picture plate).

Appendix 1.1b lists the BPVS stimulus items. Appendix 1.2 comprises a list of referents used for this study.

The procedure and criteria used for the final selection of pictorial stimuli, and the 'bilingual' lexicon attributed to them (i.e. including *translational equivalents*), are discussed below in Section 3.1.3.

3.1.2a) Rationale for Using British Picture Vocabulary Scales (BPVS) Pictures

The BPVS is a test of auditory comprehension of vocabulary. It must be stressed at this point that the BPVS was not chosen because it is a ***standardised*** *test* since the substantive aim of this study was not to *test* the children's receptive lexicon for the purpose of comparison with normative data, though, as will be seen later (See Section 4.3) and for reasons given, this did comprise a *second level* objective of the present study (See Section 3.1.2b, point 2, below). The BPVS *instrument* was thus, used primarily as stimulus material for the research *task* and not for *psychometric* purposes. Larsen-Freeman et al (1991) have distinguished between a *test* and a *task*. They argue that the difference has to do with the purpose for which it is devised. *Tests* are devised to measure what the learners know and *do not* know of the target language (TL). A subject's performance is measured against that of TL speakers. In this sense this *test* is *normative*. A *task* on the other hand, is devised to reveal what a subject *knows* (and not what is *not* known) at any one time without comparison with peers or normative data.

The BPVS picture stimuli (See Appendix 1a) were in the form of line drawings which, as Klinger and Schad (1974) found, were more easily visually processed by children.

As discussed earlier, there were a number of criteria influencing the choice of pictorial medium for this study. Their relevance to the choice of the BPVS will now be briefly discussed.

1. If an investigation is going to include a study of lexical acquisition, the lexical corpus used should be representative of the lexicon of children across developmental stages. The items included in the BPVS were chosen as a result of normative research on British children. The BPVS was based on a previous test of auditory comprehension of vocabulary called the Peabody Picture Vocabulary Test (Dunn and Dunn, 1981) whose authors collaborated in the development of the BPVS.

One of the criteria employed by the BPVS authors for the final selection of the stimuli was an analysis of item facility performed separately for each age group. This *item facility* was determined by the proportion of subjects passing an item, the proportion needing to increase uniformly with age.

2. The *validity* of the BPVS has not been confirmed through empirical evidence. There are to date no published reports in this regard.

The authors state the BPVS follows a tradition of measuring hearing vocabulary for which there is substantial evidence of *validity*. Furthermore, the BPVS has been derived from the Peabody Picture Vocabulary Test (PPVT) - Revised version (Dunn and Dunn, 1981) and as such may be seen as measuring the same attribute as the PPVT but in a British context (Reference to its content validity is made in 3.1.2b, below).

It should also be emphasised at this point that the formal education in Gibraltar is conducted mainly in English in First schools, and totally in English in Middle schools. The educational materials used in Gibraltarian schools are obtained from the United Kingdom (UK) and the syllabuses are comparable to those used in schools in the UK. These facts, therefore, serve to minimise the level of cultural bias that could be found in the BPVS material.

In support of the *content validity* of the BPVS, Dunn et al (1982) claim that the compatibility and relevance to British children of the content of the pictures and stimulus words were checked. Furthermore, the stimulus words were selected "to cover 18 categories to ensure a breadth of vocabulary" giving a "fairly comprehensive coverage of the ideas and situations likely to be encountered by most children."

With regards to *construct validity*, since the BPVS, is seen only as a measure of *hearing vocabulary,* it would not be necessary to establish *construct validity*. Furthermore, an indirect though albeit not conclusive evidence of construct validity was indicated by the gradual increase in mean Rasch ability scores with successive ages (See Table 11, of the BPVS manual). As will be seen later (See Chapter 4) such increases were similarly noted in the data resulting from this study suggesting that support for the construct validity of the measure used in this study may be invoked.

3. The BPVS was designed for children from ages two and a half to eighteen years and should therefore, comfortably cover the conceptual lexicon of children in the present study. One major consideration however, related to the possibility of items being culture bound. However, there is no known data regarding this for Gibraltarian children. The author was born and brought up in Gibraltar, and therefore shared the same language background as the subjects participating in this investigation.

As described in 3.1.3 below, an initial selection of pictures and corresponding lexical stimuli was shown to teachers and following their comments, a number of pictures were excluded as they were considered unsuitable (See Appendix 1.2). The remaining pictures were piloted (See Section 3.3.2, below) and for reasons given below (See 3.3.2, point 5), 19 were discarded from the final selection used in the main part of the investigation.

A close study of the final selection of pictures and relevant lexical corpus used suggested that the possibility of culture bias was negligible. This prediction was subsequently confirmed by an *Item Analysis* (See Chapter 5.5.2.2).

4. The BPVS requires only one stimulus word to be provided to elicit a subject's response. This response is in the form of pointing at the correct picture and requires no expressive language from the subject. This type of response is very appropriate for the 4-6 year old group particularly, and was the one required from such children in this study (See Section 3.3.2 on *Pilot Study*, for response required from older children).

5. The BPVS provides a choice of four pictures per plate (See Appendix 1.1a) but only one stimulus word is given per plate, and only one of the four pictures in a plate corresponds to this stimulus word. The task, therefore, reduces the auditory memory loading to a negligible level. The choice out of four also reduces the chances of subjects guessing correct responses to any extent which would substantially influence their performance on the whole task as reflected by the number of correct responses. In fact, for the purpose of the present study, a fifth option was built in i.e. *don't know* response, thus reducing the probability of correct guesses further.

Reference to analyses conducted by the BPVS authors to establish the performance of each of the three distracters on each picture plate is made later (See 3.1.2b, number 10, below).

6. The line drawings in the BPVS had been tried and tested and the use of such drawings had been validated by its precursor, the PPVT. Indeed, the use of line drawings is an accepted form of pictorial representation in a major proportion of language tests and educational materials, some of which have already been mentioned.

3.1.2b) Other Considerations for the Use of the BPVS

1. As opposed to other published test material designed to include assessment of vocabulary e.g. *Renfrew's Word Finding Vocabulary Test* (Renfrew, 1977) and the *Reynell Developmental Language Scales* (Reynell and Huntley, 1985) the lexical items appearing in the BPVS were chosen because they relate to ***eighteen*** semantic categories/domains (e.g. domestic fixtures, household utensils, school equipment, etc.).

Reference was made above to the *content validity* of the BPVS which the authors claim is "derived from its content". This comprises a stimulus lexicon which can be regarded "as a sample from the complete English vocabulary...." covering no less than eighteen semantic categories likely to be encountered by most children.

By using the BPVS materials, one could thus, ensure that the lexicon being tapped was widely representative of several semantic and societal domains (e.g. home and school) common with Gibraltarian children. This is a particularly important consideration when studying 'bilingualism' since the age of acquisition of certain words in any of the two languages may be determined by a particular domain (i.e. *diglossia*). For similar reasons, a lexical item may be acquired in one language only and not the other.

2. By using the BPVS, a second order hypothesis implicit in this study could be tested. As discussed in Chapter 2.2, Swain (1972) and Abudarham (1987) have argued that if a bilingual subject's *Conceptual Vocabulary* (Swain, 1972) or *vocabulary repertoire* (Abudarham, 1987) is considered, it would be found to compare favourably with a monoglot's. Such a hypothesis could be tested to some extent if the performance of the subjects used in this study (as related to the BPVS items employed) was measured by applying a modified form of the BPVS scoring system.

3. Comparisons between the number of correct responses in L1 (Spanish) and L2 (English) can be made using BPVS norms which would provide a greater measure of objectivity than if comparisons were made between a subject's performance in L1 and L2 in the whole task, i.e. BPVS plus other non stimulus BPVS items.

4. Other second order comparisons such as between age ranges, males and females, different schools etc., would similarly be enriched if made with reference to BPVS norms.

5. It was not possible to conduct the longitudinal part of the study without the collaboration of research assistants in Gibraltar. The BPVS does not require any particular examiner qualification nor formal course of training for its administrators. Since research assistants were not required to use the BPVS as a standardised assessment, they therefore, did not need any extensive training in its use for this study (See Section 3.4). The choice of the BPVS therefore, provided clear logistic and methodological advantages in relation to this investigation.

6. The BPVS "adopts an administration procedure which matches the difficulty of the items to the ability of the child" (Dunn et al, 1982). This made it suitable for use with children who may have had some slight learning difficulties and who may have been inadvertently included in the study. In addition, one of the stated purposes of the BPVS was to screen "foreign language speaking students who are to attend English-speaking schools;" this was particularly relevant to the younger children in this study.

7. Since much of the data was going to be collected during group sessions, the BPVS presented a crucial advantage over other similar material, because it did not require subjects, particularly non-readers or those with reading or written-language problems, to read the stimulus words or write their answers. Interestingly, this became an important consideration resulting from the pilot study when the younger children had been required to write down the number corresponding to the picture they wished to indicate in their response. This method had been tried because teachers reported that these children were able to recognise and write numbers from 1-10. However, it soon became clear that the younger children did not have the skills necessary to provide reliable *numerical* responses.

8. The BPVS manual claims that "extensive verbal interaction between the examiner and the subject is not required" thus making it "less threatening than many other ... tests." This was a very important consideration since many of the younger children had just started formal schooling and might already be finding their new environment and experiences somewhat intimidating. It was also an important consideration because, the children did not know this researcher and for the sake of expediency it was necessary to quickly establish a positive relationship.

9. In order to deal with groups, it was decided to project transparencies of the pictures on to a screen; Dunn et al (1982) used the same method of presentation to the older subjects, when developing the BPVS. The BPVS illustrations are "clean, bold, line drawings ..." and were "... free of fine detail and figure ground problems..." so that "... most moderately visually impaired persons are not seriously penalised ..." by its presentation.

10. Other advantages for the use of the BPVS for this study include the lexico-conceptual gradation difficulty of the items in terms of *item facility*, (determined by calculating the proportion of subjects passing an item). This was an important criterion which would ensure that the task reflected a progressive continuum of difficulty thus providing greater task sensitivity. An *item discrimination* was obtained by the BPVS authors by the expression of a point-biserial correlation between item score and total score. Further, a *distractor analysis* was also conducted by establishing the proportion of subjects selecting each picture on a plate and the point-biserial correlation between these and the total scores.

Among other criteria employed by the BPVS authors for the final choice of items for the standardisation stage and which were considered important in the present study, were as follows:

(i) The three distractors for each item should perform well at all age groups tested, they should attract some subjects, but be negatively correlated with total scores.

(ii) The selected items should cover the whole range of difficulties at an even density.

Despite the fact that these criteria were applied to English monoglots in England, and that the relevant analyses were conducted primarily for standardisation purposes, it was considered by this author that these characteristics were important requirements for the present study since Gibraltarian children, though in many ways culturally different to English children, did share important variables such as an English educational system, Western values and experiences, and similar environments and socio-economic range. As will be seen later (See 3.1.3, below) other strategies were used to determine the suitability of the final choice of items for the present study.

3.1.3 'Bilingual' Lexical Representation of Stimuli

There have been reports in the literature which warn against the potential problems presented by attempts to translate from one language to another (Chavez, 1982; Dunn, 1988). Care therefore, had to be taken that as far as possible, translational equivalents were appropriate to the Gibraltarian population.

In determining which and how many BPVS pictures should be selected, the author was guided by the recommended ceiling item for the eldest children in the sample i.e. 11-12 year olds. This was the 75th picture. Saunders (1982) used the same criterion for his study. The English lexical stimuli provided by the BPVS for these 75 items were then considered carefully, in order to arrive at an initial decision as to their appropriateness for Gibraltarian children. Most of these stimuli were thought to be within the lexico-conceptual range of Gibraltarian children. One of the criteria for this was whether the object or concept depicted by each picture was thought to be within the children's environment or range of experience. For example, Gibraltarian children were likely to be familiar with a *stadium* since there is one in Gibraltar which school children use for their sports. There were of course many items which are recognised universally, such as *parts of the body*. A similar exercise was conducted for the 25 *non-test* items selected from other BPVS pictorial stimuli for the purpose of this study.

The lexicon provided by the authors of the BPVS for the first 75 test items were kept for the purposes of this study. The lexical stimuli for the other 25 items were also determined. Once this was done, a list of the *Yanito* Spanish lexical stimuli for all these items was drawn up.

Headteachers from each participating school and other teachers who had volunteered to be research assistants were asked for their views regarding the suitability of the referents, the lexical stimuli attributed to them in English and their translational equivalents in *Yanito* Spanish. There was a small number of stimuli which were thought to be unsuitable. Among the reasons given were that, in the teachers' view, the line drawing did not accurately represent the lexical stimulus. For example, a drawing of what was meant to be a *gate,* would have probably been perceived as a *fence* (in this particular case, there was actually another drawing of a more familiar looking *gate,* in the BPVS picture book). Another example was a drawing of a *piggy bank* which was not thought would be familiar to most Gibraltarian children.

A few lexical items were suspected to be minimally used, or known in either of the two languages, by the DL Gibraltarian population. An example of this was the word for *crypt.* This type of stimulus was therefore, not used. There were also a very small number of examples of non-conventional translations. The translation proposed by this author for *snake* was initially *vicha* but teachers advised that children were more likely to use and recognise the word *serpiente* in Spanish, and interestingly enough, not *serpent* (a homophonic English translational equivalent) but *snake.*

Similarly, there were other items the names of which Gibraltarian children were likely to know in only one of the languages, regardless of which language was being used in the conversation (i.e. *loan* words). The Cuyas Spanish-English dictionary (1960) was consulted for the translational equivalents for these items. One example of this was the referent *entertainer*, for which the *English* word would be used rather than the Spanish equivalent, or which would be translated by the use of a monolingual or even 'bilingual' phrase. The accepted translation according to the Cuyas is *festejador.* Another example is the word *diving* which in *Yanito* Spanish would be translated as *tirarse* (to *throw oneself).* Since this is strictly speaking not a single word, the more accurate Spanish translation *zambullar* (which Gibraltarian children are familiar with but in not exactly the same context since it is used to describe the immersion of one's head under water, but *not* as a result of *diving*) was chosen.

It was felt that the inclusion of these items was acceptable since parameters such as *conceptual vocabulary* and *bilinguality*, two of the main phenomena under consideration, can only be studied in relation to [non-linguistic] referents i.e. in this case, the pictorial representations. If only items whose translational equivalents were likely to be as familiar in one language as in the other were included, the task was unlikely to have the necessary

sensitivity in revealing the varying proficiency in each of these linguistic variables, within and across the ages.

Appendix 5.2a-c lists the lexical stimuli used in each language.

3.1.4 Sampling Method and Selection of Subjects

The sampling method used was a random type called *cluster* sampling. Kidder (1981) states that this is one of the strategies in the category of *probability sampling*. *Probability sampling* is "the only approach that makes possible representative sampling plans". The advantage of this type of sampling method is that investigators can "estimate the extent to which the findings based on their samples are likely to differ from what they would have found by studying the population."

Subjects were selected from *three* of the 7 First schools and *two* of the 4 Middle schools. The schools from which the samples were selected, were themselves chosen because they were the biggest schools and most important of all, because their catchment area was geographically spread across the City. In addition, it was also thought that this wide catchment area best reflected an appropriate socio-economic cross section of the Gibraltarian population (See Appendix 2.1 for copies of letters from Education Adviser and from the Government Statistician in Gibraltar confirming this assumption). This factor was known to significantly influence the predominant home language. No known bias was employed in the selection of the DL subjects within the schools.

As discussed in Section 2.3.6 earlier, Gibraltarian children experience their first formal exposure with their L2 (English) when they start formal schooling from the age of four. Most of these children speak Spanish, which is their L1, at home and outside, and most of them have a rudimentary knowledge of English, mainly concentrated at a receptive level. It was, therefore, essential in any developmental study, to include these children in the present study. A previous informal and unpublished study by this author, indicated that Gibraltarian children's expressive vocabulary level in English started approximating their vocabulary level in Spanish from the age of seven and rarely earlier. Similar observations have been made regarding other linguistic parameters, in the published literature (e.g. Carrow, 1972a).

Any study of bilingualism must address issues such as language dominance since this may explain the functional use and frequency of use of each language, and this may also have pedagogical implications. Language dominance and any development change in dominance e.g. L2 dominance replacing L1 dominance, can not be studied unless the DL subjects have been given an opportunity to develop L2 sufficiently. As stated in the

discussion on *Language Aptitude and Proficiency* (See Section 2.2.4, earlier), Cummins (1979) estimated that it would take an immigrant arriving in a country at the age of 6, seven years experience with L2 to achieve communicative (language) proficiency (CALP) in L2. Not that the subjects to be studied were immigrants, but most of those just starting school, would, from an L2 point of view, be exposed to English for the first time, just as immigrants. This estimate therefore, was a useful yardstick in deciding the age range which should be covered in this investigation. These issues considered, it was decided that subjects up to and including age 12 (from age 4) would be included in the study. This represented the age range of children attending primary school.

Tables 3.1-3.5 in Section 3.4.1, below, provide details of sample sizes for each age group. Appendices 2.2 and 2.3 also give details of subjects' gender, declared home language and school attended.

3.1.5 Experimental Design

There have been two major design options in studying linguistic phenomena (in particular, development) either *cross-sectional* or *longitudinal* studies. The former, of course, is logistically easier as the researcher only needs "one shot at the sample" and no follow-ups are required. However, there has been justified criticism of this design in developmental studies. Weil (1978) argued that *cross-sectional* data may not provide accurate data about lexical development in children. Referring to methodological issues, Cook (1982) argues that "... to show how learning takes place, we need to see development in time ... One way of achieving this is to describe the *longitudinal* language development of a group of learners or a single learner ... Another is to relate different points of time in different learners...", i.e. *cross-sectional* study.

However, longitudinal group studies may present problems for internal and external validity since it is more difficult to keep irrelevant variables constant from one data collection session to subsequent ones. Not only do environmental variables change dramatically, but also researcher variables. There is an additional problem of deciding whether to employ the same task and materials throughout the course of the investigation. To change the material requires further correlational studies to ensure that variables such as task difficulty remain constant after the changes have been introduced.

An additional problem is that in a study employing a sizeable sample, it is difficult to ensure that the time lapse from one data collection session and the next is the same for all groups in the sample, purely on resource and logistic considerations. Longitudinal studies on large samples are best conducted with the support of an appropriate number of

research assistants. But this in itself can have an effect on the study's validity and reliability.

A major consideration in longitudinal studies is the threat of subject *mortality*. Many longitudinal studies, mainly through absences, usually suffer a substantial decrease of sample size as the investigation progresses.

Cross-sectional developmental studies, however, have their own disadvantages, the main one being that a particular subject's or group's progress can not be studied. In such studies, progress can only be inferred from the performance of other groups. Again, this presents threats to the internal and external validity of the study.

Ideally, therefore, both designs should be employed in developmental investigations. By the use of appropriate statistical analysis, it may then be possible to validate whether the inferences about progress made in the cross-sectional study are reflected by the actual progress observed in the longitudinal study.

Both these strategies were thus used in the present investigation.

3.1.6 Order of Presentation of Stimuli

The presentation format employed in the pilot study required the inclusion of *Decoy* items, which comprised ***nonsense words*** (See Section 3.3.1, in this Chapter, entitled *Pilot Study*) at certain strategic points (See Appendix 1.2) during the presentation. It was decided that the BPVS order of presentation of picture plates should be maintained for the group sessions since it was the natural order to be used with the younger children who were to be seen individually. In order to adhere to the BPVS prescribed order, the first 75 plates were presented in strict sequence regardless of whether any plates had to be paired with a decoy stimulus. During this part of the task therefore, the plates coinciding with the decoys were not represented again until the whole sequence of the first 75 plates had been completed. This meant that the *true* lexical stimuli corresponding to these plates were not presented until a later stage.

Because responses to lexical stimuli in both languages were required for each picture, the same pool of 75 plates had to be presented twice. In order to reduce the amount of guessing and logical deduction resulting from consecutive lexical presentation in each language corresponding to any one picture, it was decided to run through each plate, presenting the appropriate lexical stimulus in only one or the other of the two languages.

The lexical stimulus in the other language would then be provided when the same plates were re-presented at a later stage in the task.

The sequence of the language employed for each lexical stimulus was random (the decoy [nonsense] words were pronounced using the phonology associated with English and Spanish, at random). This was done to balance out the chances of children being able to guess the correct response for a lexical stimulus given in one language because they might be able to recall the correct response given to a lexical stimulus presented earlier on in the other language. So for example, a child might know a word in English but not the equivalent in Spanish. If however, the word were presented in, say, English first, when the plate of pictures is presented again in order to test if he knows the Spanish equivalent, he might be able to guess and point at the correct picture through deduction based on the earlier response. Had the Spanish word been presented first, he might not have been able to respond correctly without having received an earlier clue.

After the first 75 plates were presented, they were re-presented but not in the same order as they had been during the first time round (See Appendices 1.1b and 1.2). Again, this was done to reduce any influence of *rehearsal* or *practice* effect.

This same procedure was employed when the main study was conducted with the reduction of 38 items, 22 of which were decoy (nonsense) words. No alterations to this procedure were deemed necessary or methodologically justified because even with the omission of these items, the design maintained the same integrity.

3.2 OPERATIONAL DEFINITIONS AND METHODOLOGY

3.2.1 LEXICON

The lexical corpus used in this study related to pictures found in the first 75 picture plates in the BPVS. A total of 100 pictures were eventually used (See report of *Pilot Study*, Sections 3.3.1 and 3.3.2) requiring responses to 100 lexical stimuli in Spanish and the equivalents in English, making a total of 200 lexical items. Of these, 150 (i.e. 75 pairs in L1/L2) related to the first 75 items used by the BPVS and 25 other lexical items relating to other pictures found in the first 75 BPVS plates; these were chosen at random but in progressive order.

Lexical performance in the *whole* task comprising the 100 referents was calculated in the following:

(i) Spanish only
(ii) English only
(iii) Spanish or English i.e. *Conceptual Vocabulary* (Swain, 1972) - See Section 3.2.4, below.
(iv) *Bilinguality* i.e. the number of referents for which the correct lexical equivalent is known, by the *same* individual, in both English and Spanish i.e. *translational equivalents*- See Section 3.2.3, below.

Lexical performance in *Spanish*, *English* and *Conceptual Vocabulary* in response to the BPVS 75 test items was also measured.

3.2.2 DUAL LANGUAGE CHILDREN

Subjects included in this study were mostly children born in Gibraltar, at least one of whose parents was Gibraltarian. Only children who were known to experience a Dual Language (See Chapter 2) home/school environment, involving Spanish and English, were included in the main analyses. These children were considered to be sequential 'bilinguals', according to the terminology used by McLaughlin (1978, 1981) and others. However, it is not possible to state this categorically because it is impossible to determine how much English these children had heard passively or even actively through a medium such as Gibraltarian television programmes which were all in English. As mentioned earlier, generally speaking though, Spanish television is watched mainly during hours when these younger children are likely to be awake; Gibraltarian television programmes do not start until early evening so that those children who were likely to watch it were the older ones who had already been exposed to English in school.

In addition to the main variables under study (as defined above), a number of other variables were investigated (See also Chapter 1.2 under *Subordinate Aims*). These are defined below.

3.2.3 'BILINGUAL' LEXICON/VOCABULARY ('BILINGUALITY')

This was measured by the number of referents for which correct answers were given ***by the same individual*** (or individuals in a group) in BOTH languages i.e. ***translational equivalents***. *Bilinguality* must be differentiated from the concept of *Equilingual Familiarity* (See 3.2.8, below).

3.2.4 CONCEPTUAL VOCABULARY (CV)

This was measured by the number of correct responses to the referents given in *EITHER* language.

3.2.5 TOTAL LEXICAL REPERTOIRE (TLR)

This was equivalent to a ***total word count*** regardless whether two lexemes had the same meaning and thus referred to the same item.

3.2.6 LEXICAL DEVELOPMENT

The development of 'bilingual' subjects' lexicon was measured between neighbouring age codes in the first trial and comprised the difference between the mean number of correct responses for samples in the respective age codes.

A further measure of lexical development was calculated on a longitudinal basis, by comparing each group's performance in Trial 1 (as indicated by the mean number of correct responses) with the same subjects' performance in each of the subsequent trials; this was therefore, a repeated measures design.

Another measure of lexical development was expressed in the form of *Percentage Mean Gain* (*PMG*). This was calculated as the percentage difference, or *gain*, between the *mean* number of correct responses in Trial 1 and each subsequent trial. Since *longitudinal* data was used for this, comparisons were made between the same subjects (*repeated measures*) who participated in more than one trial.

The intervals between each trial were initially planned to be approximately 6 months but this turned out not to be possible (See *Results*, Chapter 4).

The Second Level analyses included two further linguistic concepts. They related to how familiar the lexicon was within each sample according to age code. *Familiarity* may indicate a socio-linguistic measure related to the *frequency of use* (and *difficulty*) Noble (1953). In this study *familiarity* was defined and established as follows.

3.2.7 LEXICAL FAMILIARITY

This was a measure of how familiar the lexicon for referents was. It was established by calculating how many correct responses were given by *all* the children, within defined

age codes, to each referent. Thus, the number of correct responses each referent received from the *whole* group was calculated for each language. This number was then converted into a percentage out of the total possible responses and this was used as the index of ***lexical familiarity***.

3.2.8 EQUILINGUAL FAMILIARITY

This concept has to be differentiated from the concept of *Bilinguality* (See 3.2.3, above). The difference is that *Bilinguality* was calculated by counting the number of referents *each individual* knew in both languages (the means of this measure were calculated for groups) and ***equilingual familiarity*** was established by calculating the number of subjects, within prescribed age codes, giving correct responses in both languages to each referent. It was thus, more a measure of the familiarity for each *referent* in both languages than how *bilingual* subjects were i.e. *bilinguality*. This number was converted into a percentage out of the sample size in the particular age code and was used as the index of ***equilingual familiarity***.

3.3 THE STUDY

3.3.1 Pilot Study

A pilot study was conducted by this author to allow for streamlining of the initial design. Four samples of 10 children each participated in this pilot study. The age range of the two younger samples were 5-6 years, 6-7 years. Including this children in the pilot study was necessary particularly because one had to establish at which age children could reliably cope with providing answers on the answer sheet (See next page and Appendix 3). There other two groups were aged between 7-8 years and 11-12 years, respectively. These samples were necessary mainly in order to be able to decide which was the best method of presentation and identify any flaws in the design, and establish how feasible it was to collect data from presentation to whole groups. If they could not, they would have to be seen individually. The other two samples comprised older children An original list of 246 lexical items was used on small samples of children aged between 4 and 12 years of age. The 246 lexical items comprised the following:

i) 110 English words and their Spanish equivalents, thus totalling 220 ***true*** words.

ii) 150 of these words (75 in English and their equivalents in Spanish) corresponded to the first 75 test pictures in the BPVS test and the other 70 words

(35 in English and their equivalents in Spanish) corresponded to other non-test pictures chosen at random from the first seventy five BPVS plates.

iii) 26 *Decoy* words comprising nonsense words - these were included in an attempt to determine the possible existence of a *guessing factor*.

The initial objective was to present the task to groups of children in their class environment. There were two options for the presentation of the task. A videotape had been prepared before the first visit to Gibraltar. Close ups of each BPVS picture plate of pictures were recorded allowing a 20 seconds exposure of each. To allow subjects to take in all the four pictures in the plate, the stimulus word was not uttered until each plate had been exposed for at least five seconds.

The second presentation option was in the form of overhead projector transparencies, each transparency comprising one picture plate. These transparencies were to be projected on a standard size white screen and the researcher would allow approximately five seconds between the initial exposure of each plate and the utterance of the stimulus word.

Subjects were given an answer sheet (See Appendix 3) which comprised as many rows of five boxes as there were stimulus words. Each box had a number printed in it (1-5) and the first four coincided with the number printed under each of the four pictures on each plate. The last box contained the number 5 which subjects were instructed to use if they did not know the correct response (See Appendices 3 and 4). To prevent disappointment and any undue anxiety for subjects who were likely to provide few correct responses, the instruction was given (See Appendix 4) that a picture corresponding to the stimulus word might not appear in the plate presented and if so, the subjects were advised to tick box number 5. Indeed, the only time that a picture corresponding to a stimulus word did not appear on the plate was when the stimulus word was a *Decoy,* i.e. a nonsense word.

It was anticipated that the 4-5 year olds would have to be seen individually as they had just started school and it would be difficult to monitor the conduct of the task.

Before the task was started, the subjects were told what they were expected to do and questions invited. This was followed by a brief training session when they were asked to identify half a dozen example items provided in the BPVS.

The answer sheet included a section for personal details about the subject. This included the subject's code, allotted by the class teacher so that the identity of the subject was unknown to the experimenter, the school attended, date of birth and date of test, trial number and age. There was also a section for the subject's declared home language and the frequency of its use at home (See Appendix 3). Many of the younger subjects were not able to determine which language was most frequently used at home, and the class teacher completed this section on their behalf.

3.3.2 Results of the Pilot Study

The following were the results of the pilot study:

1. The video presentation employed with a the older groups was not as flexible as the transparency presentation. On occasions, environmental sounds were loud enough to drown the playback of a stimulus word and the tape had to be stopped so that the stimulus word could be provided again by the researcher. This resulted in an undue waste of time and confusion for the subjects. Furthermore, not all schools had a videotape recorder and they had to book it from the Department of Education. This involved unnecessary extra work for several people, which threatened to stretch their goodwill.

2. The projection of transparencies was more flexible and allowed for a larger visual presentation thus enabling a clearer and better view of the pictures.

It was therefore, decided to use transparencies for the main investigation.

3. Despite assurances by a class teacher to the contrary, 5-6 year old children were not found to be able to use the answer sheets. Though they recognised numbers, many found it difficult to indicate reliably the numbered box which corresponded to the picture they thought depicted the stimulus word.

The decision was thus, made to see these children individually. In these cases, projected transparencies were considered unnecessary and the BPVS picture book was used.

4. The study had to take place during school time. Each group session took an average of one and a half hours and up to two hours. Most groups had to be seen two - three times; younger ones required up to four sessions for the completion of the task as they were not able to concentrate for long periods of time.

5. In response to discussions with teachers, some of whom recommended a shorter task, the word list was reduced by a maximum of 38 items, thus leaving 208. So as not to lose any valuable *true* data, the majority of the reduction comprised *Decoy* items. Thus, 22 *Decoy* items were removed from the initial list, leaving 4. These were left so that subjects were made aware that there were stimulus words which they did not know. It was thus, hoped that their need for guessing would be minimised. The first of these four *Decoy* words was presented early on to make the point (7th item), and the second, about a fifth of the way into the task (37th item) so that it would reinforce and also act as a reminder of this concept; the third and fourth were the 90th and 113th items, respectively.

Sixteen of the 38 items removed were *true* words but none of them formed part of the BPVS stimulus lexicon. These items were chosen by randomly not re-presenting eight plates corresponding to eight non-BPVS stimulus items in English and their equivalents in Spanish.

The effect of this strategy was that the length of the task was reduced by between 15 minutes and half an hour.

3.4 MAIN STUDY

Having received the approval of the Director of Education in Gibraltar to conduct a long term study, the main investigation was started.

An education officer was invited to act as liaison between teachers and this author in the latter's absence. Olmedo (1981) states that the examiner(s), and by extension, researchers of 'bilingualism', should have same ethnic background and know both languages. The first trial was entirely conducted by the author who is a native speaker of Gibraltarian English and *Yanito* Spanish, during a four week study visit to Gibraltar. It was considered essential to include children starting formal school because most of these were likely to come from a predominantly Spanish-speaking home background and entering school would be their first formal exposure to a second language i.e. English. The first trial therefore, took place during the first term of the academic year i.e. in the Autumn term.

Prior to conducting this trial, a meeting was held with the Liaison Officer and headteachers of five schools, three First and two Middle. These schools were chosen because they covered major catchment areas (See Section 3.1.3, earlier, entitled *Sampling Method and Selection of Subjects*) which together was likely to reflect a good representation of the population viz. socio-economic status (See Appendix 2.1) and language usage in terms of frequency of societal use of each language.

The objectives and methodology of the study were discussed as were the required local resources. The headteachers agreed to appoint a research assistant from their staff. This assistant would be trained by the author to conduct and/or co-ordinate trials in their school, in the author's absence, and would be responsible for sending all the completed answer sheets to the Liaison Officer for forwarding to the author in the U.K.

It was agreed that the assistants would co-ordinate a trial within approximately six months after the previous one and that the author would conduct the first, third, and if thought necessary, fifth trial, during his autumn term visits to Gibraltar. The assistants would thus conduct trials two and four.

Once the assistants were named, the author had individual discussions with them during which the objectives and methodology were explained. A subsequent meeting for a plenary discussion was held with all assistants so that issues could be discussed and perceptions shared. Written instructions (See Appendix 4) were also provided for the assistants.

In addition to these, discussions were also held with those class teachers who had expressed willingness to collect the data over a period of a fortnight with minimum disturbance to their general class activities. Class teachers were trained in the collection of data and assured that the task was very similar to other assessment activities conducted from time to time during the course of the year.

The training for the assistants and class teachers also involved them observing the researcher conducting data collection sessions with post-session discussions. In addition, this researcher/author observed the class teacher conducting a session and this was followed by discussion as appropriate. Research assistants were left a stock of answer sheets, copies of instructions and sets of transparencies.

Children aged 4-6 were seen individually. Older children were seen in groups. Whereas initially only 10 DL children in each age code in each school were required for the study, on the advice of teachers the whole class was given the task. This eased the work load on teachers because they did not have to organise other activities for the rest of the class. In some cases, groups included English monoglot children. These were later identified and their performance not included in the DL children's data analyses.

3.4.1. Sample Size

Table 3.1 below shows the total sample size participating in each of the four Trials.

TRIAL	1	2	3	4
SAMPLE SIZE	392	249	153	73

TABLE 3.1 NUMBER OF DL CHILDREN PARTICIPATING IN EACH TRIAL

TRIAL ONE (T1)

The first trial conducted in the first year involved children aged 4-12. Table 3.1a below shows the number completing the task in the first trial for each set of age range of 6 months and 12 months intervals.

A total of eight subjects short of 400 participated in and completed Trial 1. Nineteen others did not complete T1 and were thus not used for the *Subjects' Performance* Analyses. The data for these however, were used in the *Item Analyses*. Twenty other subjects declared they only spoke English at home and their performance was not analysed with the DL subjects.

AGE CODES

No. of DL Ss	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	Tot.
for each 1/2 year age range	6	10	6	13	24	29	16	12	9	21	24	20	22	20	31	17	4	284
for each 12 mths. age range	16		19		53		28		30		44		42		48		4	

TABLE 3.2a NUMBER OF DL CHILDREN WHO PARTICIPATED IN TRIAL 1 ON THE FIRST VISIT, AND THEIR AGE DISTRIBUTION (All these trials were conducted by this author)

Subsequent data collection sessions over the next two years included children who had not taken part in the study before. These children were therefore, added to the sample above.

The data for these children formed the basis for a *post hoc* replicated study which compared the performance of the first cohort of subjects participating in Trial 1 and the second cohort which took part in and completed Trial 1 at a later date.

The number of children in the second cohort is shown in Table 3.1b, below, and the final Trial 1 sample size is shown in Table 3.1c, below.

AGE CODES

No. of DL Ss	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	Tot.
for each 1/2 year age range	14	3	5	-	5	10	10	19	14	13	6	6	1	1	-	1	-	108
for each 12 mths. age range	17		5		15		29		27		12		2		1		-	

TABLE 3.2b NUMBER OF DL CHILDREN WHO PARTICIPATED IN TRIAL 1 AFTER THE FIRST VISIT, AND THEIR AGE DISTRIBUTION

#AGE CODES

No. of DL Ss	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	Tot.
for each 1/2 year age range	20	13	11	13	29	39	26	31	23	34	30	26	23	21	31	18	4	392
for each 12 mths. age range	33		24		68		57		57		56		44		49		4	

TABLE 3.2c NUMBER OF DL CHILDREN WHO PARTICIPATED IN TRIAL 1 OVER THE WHOLE PERIOD, AND THEIR AGE DISTRIBUTION

#KEY TO AGE CODES (in years and months)

01 = 4-4:5; 02 = 4:6-4:11; 03 =5-5:5; 04 = 5:6-5:11; 05 = 6-6:5; 06 = 6:6-6:11; 07 = 7-7:5; 08 = 7:6-7:11; 09 = 8-8:5; 10 = 8:6-8:11; 11 = 9-9:5; 12 = 9:6-9:11; 13 = 10-10:5; 14 = 10:6-10:11; 15 = 11-11:5; 16 = 11:6-11:11; 17 = 12-12:5.

All the children aged 4-8 (Codes 01-08), and one aged eight and a half (Code 09) attended First schools. The rest attended Middle schools.

The sample of 182 children completing T1 and attending First schools, represented 13.46% of the Government First schools population for the year in which TRIAL 1 was conducted.

The sample of 210 children completing T1 and attending Middle schools, represented 15.9% of the Government Middle schools population for that year. (*Statistics from Gibraltar Government, Department of Education, Biennial Report - 1984-1986*). The percentage DL sample however, in relation to the actual First and Middle school population, is higher since the official statistics quoted above include an appreciable number of English monoglot school children.

When considering the whole of the local Government Primary Schools population for that year, the sample size represents 14.7%.

The sample for T1 comprised 185 males (47.2% of total sample) and 207 females (52.8% of total sample).

Further details about the subjects' gender and reported home language, for each age group, appears in Appendices 2.2 and 2.3.

TRIAL TWO (T2)

A total of 249 DL children, representing 63.5% of those completing T1, participated in the second trial. 64.3% of these did so within 5-8 months of the first trial and 19.3% a year after the first trial. The rest completed the second trial between 15 and 19 months after the first. Only those who had completed the T1 were used for the *Subjects' Performance* Analyses. Also excluded from these analyses were those who had declared, in either or both of the trials, that they spoke only English at home.

Table 3.2 below illustrates how the sample size was distributed across the ages. It should be borne in mind however, that because not all schools conducted the second trials exactly 6 months after the first, some subjects no longer belonged to the age code immediately above the one they had been in for the first trial. The same is true for subjects who had been absent when all their peers had participated in T2 but had joined them when the latter were completing subsequent trials. For these subjects therefore, it was only the second participation in the task (See Chapter 4 where the strategy for analysing these subjects' performance is discussed).

AGE CODES

No. of DL Ss	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	Tot.
for each 1/2 year age range	5	16	7	12	13	28	23	14	12	10	18	22	13	23	17	11	5	249
for each 12 mths. age range	5	23	25	51	26	28	35	40	16									

TABLE 3.3 NUMBER OF DL SUBJECTS WHO PARTICIPATED IN T1 AND T2, AND THEIR AGE DISTRIBUTION

As in most longitudinal studies, there was the inevitable mortality rate of sample size, between trials. The main reason for this was that, without warning to the researcher, one

school felt unable to participate in Trial 2 after an interval of 6-8 months, as planned. They did however, participate in this trial 12 months later. This, and other unforeseen circumstances, led to the attrition of sample size in later trials. Because trials had been planned to take place at certain intervals, a knock on effect took place and these subjects' performance could not be included for analyses in subsequent trials.

TRIAL THREE (T3)

A total of 153 DL subjects participated in the first three trials. This represents 39% of the original sample size. Table 3.3 shows the sample size and age distribution.

AGE CODES

No. of DL Ss	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	Tot.
for each 1/2 year age range	6	8	2	10	18	22	22	9	11	7	5	14	6	9	4	
																153
for each 12 mths. age range	14		12		40		31		18		19		15		4	

TABLE 3.4 NUMBER OF DL SUBJECTS WHO PARTICIPATED IN T1, T2 AND T3, AND THEIR AGE DISTRIBUTION

TRIAL FOUR

73 DL children participated in the first four trials. This represented 18.6% of the original sample. Table 3.4 below, shows the sample size and age distribution.

AGE CODES

No. of DL Ss	03	04	05	06	07	08	09	10	11	12	13	14	15	16	Total
for each 1/2 year age range	-	2	9	3	10	8	11	1	-	6	5	4	10	4	
															73
for each 12 mths. age range	2		12		18		12		6		9		14		

TABLE 3.5 NUMBER OF DL SUBJECTS WHO PARTICIPATED IN T1, T2, T3 AND T4, AND THEIR AGE DISTRIBUTION

This chapter has discussed the way the lexical corpus was selected for this investigation and the reasons for this. The pictorial stimuli material comprised pictures taken from the British Picture Vocabulary Scales. The main reasons for this was that these black and white, line drawings had been tried and tested and some research had shown that children find these drawings easiest to process. In addition, a subordinate aim of the project was to compare the DL subjects' performance with monoglot peers. The BPVS manual contained norms based on monoglots' performance.

This chapter has also discussed the sampling method and the research design used. It also provides details of the order of presentation of the stimuli and gives operational definitions for the main variables.

The results of a Pilot Study have been discussed and how they influenced the design of the Main Study. Finally, details of the sample sizes for each of the four Trials and according to each age code, were given.

CHAPTER 4

RESULTS AND ANALYSES OF RESULTS

CHAPTER 4 RESULTS AND ANALYSES OF RESULTS

4.1 INTRODUCTION

The greater part of the chapter will report the results of these analyses and highlight the main features of these results. A rationale for the selection of the variables studied and for the statistical analyses conducted on the data will also be discussed. The interpretation and discussion of the results will be presented in Chapter 5.

A data base was created based on each subject's response to each of the 200 lexical stimuli (See Appendix 1.2) 100 in English and the *translational equivalents* in Spanish. Subjects indicated their responses on an *Answer Sheet* (See Appendix 3). A customised computer *frequency* programme in *Fortran* (*KID2.STN*) enabled the computation of the performance of each subject in each *linguistic variable* (LV) i.e. *English*, *Spanish*, *Bilinguality*, *Conceptual Vocabulary* (CV). The raw data comprised the *total* number of correct responses given to *all* stimuli by each subject. This programme also included the details incorporated in the *Answer Sheet* regarding each subject's age code, gender, school, reported home language(s), Trial number and date when the trial took place.

As mentioned earlier, the lexical corpus included the lexical stimuli for the first 75 test items in the BPVS. Modifications to the computer programme mentioned above, enabled the calculation of the number of correct responses given by each subject to these items (See Appendix 1.1b).

A second customised computer programme in *Fortran* (*KID1.STN*) enabled an item analysis for correct responses in *each* language i.e. *English* and *Spanish* (See Appendices 5.1a-d). The results of this analysis were subjected to *chi square tests*. The significance of the differences in the relative percentage of correct responses given to the *English* and *Spanish* lexical stimuli related to the 100 referents, was thus determined according to each age code. A similar programme identified the number and percentage of correct responses given to each referent in *both* languages (i.e. '*Bilingual*' responses) This was calculated for each age code (See Appendices 5.2a-c). Only *Trial 1* data were used for these analyses.

4.2 RATIONALE FOR ANALYSES

This study was mainly concerned with the *receptive lexicon* of DL *Primary School* children in *Gibraltar*. The principal lexical measure comprised subjects' performance in response to lexical stimuli in *Spanish* and in *English*. In addition, subjects' 'bilingual' lexicon i.e. *Bilinguality*, and their *Conceptual Vocabulary*, were calculated and analysed for reasons already stated.

Prior to pooling all subjects into a *whole* group, differentiated according to age code only, a series of analyses was conducted to determine the extent and significance of *gender* and *school* differences in lexical *proficiency* (See Sections 4.2.2 and 4.4.2, below). This was done to determine the extent of any homogeneity related to possible gender and socio-economic variables. Following these, it was decided to conduct all other analyses on samples *disregarding school* background.

The main analyses were conducted at *two* levels. The *first* related to the principal aims of this study. The means of the number of correct responses for each linguistic variable (LV) i.e. English, Spanish, Bilinguality and Conceptual Vocabulary (CV) in each age code were computed for this purpose. This data base reflected subjects' *basic* lexical proficiency in each linguistic variable. In addition to this, appropriate statistical tests were used to establish the statistical significance of the following:-

a) **Lexical Development** in each linguistic variable (LV) i.e. *Spanish*, *English*, *Bilinguality* and *Conceptual Vocabulary* (CV).
b) **Lexical Dominance** i.e. Spanish~English~Spanish (L1~L2~L1).
c) **Correlations** between pairs of LVs, e.g. L1 v. L2, L1 v. CV, etc.
d) ***Total* Lexical Proficiency** in each LV.

Where appropriate (See Section 4.4.3 b), below) *gender* differences for several of these variables were statistically analysed.

Only Trial 1 data (*cross-sectional* study) were used for statistical analyses of b), c) and d) above, and for those related to *gender* and *school* differences. Analyses of lexical *development* was based on data from both the *cross-sectional* and *longitudinal* study.

A *second* level of analyses related to two other variables. Firstly, comparisons were conducted between the DL subjects' Trial 1 performance in *English*, *Spanish* and *CV*, and the *norms* for English *monoglots* published in the British Picture Vocabulary Scales manual.

Secondly, an item analysis was conducted using Trial 1 data in order to identify the significance of any differences in the *frequencies* of correct responses in *English* and *Spanish,* for *each* referent. This analysis was conducted for each age code. The results were indicative of the *lexical familiarity* for *each* referent in *each* language. The percentage of correct responses given to the lexical stimuli for *each* referent in *both* languages, i.e. correct 'bilingual' responses, was also calculated. The results of *this* analysis provided an index of *equilingual familiarity.*

These analyses are described in greater detail below (See Sections 4.2.3 - 4.4.3, below).

4.2.1 Rationale for Selection of Statistical Tests

In arriving at the decision about the most appropriate statistical tests for the analyses of the data, the main consideration was the *level of measurement.* The data was generated by subjects completing a task which aimed to elicit their *receptive* lexicon. As already discussed in Chapters 3.1.1, 3.1.2a) and 3.1.2b), the picture stimuli used were selected from the British Picture Vocabulary Scales (BPVS). The underlying assumption for subjects' ability to point at correct *pictures* was that they possessed the necessary understanding of the relevant lexical stimuli presented to them, i.e. a *receptive lexicon.* In other words, their performance in such a task would reflect/reveal at least a sample of their receptive lexicon.

75 of the 100 *stimuli* used in this study corresponded to the first 75 BPVS *test* stimuli, but the other 25 were BPVS ***non****-test stimuli* selected from the pictures containing the former 75, and were chosen at random. It is stressed that the task was primarily not a *test* (See Chapter 3 1.2a) despite the fact that pictorial material from a *test* i.e. the BPVS, was used. Subjects were awarded one mark for every correct response given to each of the 100 lexical stimuli corresponding to each picture shown.

Parametric tests can only be used if certain assumptions can be made about the data. One of these assumptions is that the level of measurement has to be either *ratio* or *interval* (Siegel, 1956, p.19). A perusal of the BPVS tables of derived scores shows that performance as reflected by the *Raw Scores* was not linear. For example, Table 5 in the BPVS Manual (p. 55) states that a *Raw Score* of 140 indicates an *Age Equivalent* of 19 years 6 months, and yet half this *Raw Score* provides an *Age Equivalent* of 7 years 7 months which is a *third* of the former. Thus, double a *Raw Score* did not result in double *Standard Score* (SS) or *Age Equivalent.* In addition to this, an inspection of the *Standard Scores* in Table 2 (pp. 39 and 41) shows that a 9 years 3 months old child achieving a

Raw Score of 140 would obtain a *Standard Score* of 160, but a peer achieving half this *Raw Score* would obtain a *Standard Score* of 85 which is .53 (i.e. just over a half) of the former. This would suggest that the level of measurement does not allow the assumption that there are *equal intervals* between each point in the scale. This is a tenable argument concerning scores generated when the BPVS is employed as a *standardised test*. The argument is more compelling when, as in the case of this study, the BPVS is not used as a *standardised* instrument, or presented in a language other than English. The level of measurement represented by the number of correct responses obtained in this type of task is considered therefore, to be at best *ordinal* and would preclude the use of *parametric tests*. Support for the conclusion arrived at regarding the level measurement can be found in McNamara (1966, p.68) who says that raw scores can "scarcely be assumed to lie on an equal interval scale."

Furthermore, in using a *non-test* format, presentation and scoring system, one can not make the assumption "... that giving the correct answer to any one item is exactly equivalent (in amount of ability shown - in this case, *lexical ability*) to giving the correct answer to any other items," (Siegel, 1956, p.28). This, states Siegel, must constitute one of the assumptions.

The present author acknowledges that there is a considerable amount of controversy regarding issues related to the choice of statistical tests.

The literature on statistical analysis frequently debates opposing views regarding the criteria for the use of *parametric* and *non-parametric* tests. Boneau (1972) acknowledges such debates. He states that "... the use of the 't' test in many typical psychological situations where there are measurement considerations ...." has been challenged. Some will argue, for example, that ".... intelligence is actually measured by an ordinal scale, that equal differences between scores, on say a test, represent different magnitudes at different places of the underlying continuum. This is seen as somehow invalidating the use of the 't' test with such scores ...."

Hays (1963) states that

> ".... in intelligence testing, a score called *mental age* is sometimes the end product of giving a person a test. It is reasonable [to argue?] that the more intelligence a person really has the greater this mental age should be, other things being equal. *As numbers*, mental ages can be subjected to any arithmetic operation we choose, but the rub comes in translating the resultant numbers back into statements about amounts of intelligence."

He goes on to argue that a five year old might have a mental age of 4 years and another a mental age of 8 years. *As numbers*, it is quite true that 4 goes into 8 exactly 2 times, but "can we assert that the second child is twice as intelligent as the first? Not without considerably more justification than we have at present." He states that there is no solid theoretical or empirical reason for thinking that intelligence score must relate to *real* amounts of intelligence in the way specified by the definitions of ratio, or even interval scaling. "On the other hand, we do feel justified in thinking of intelligence tests as giving ordinal scales at least. The point is that one cannot simply assume that a certain level of scaling is or is not reached without some theoretical or empirical basis, showing how the quantities we hope to measure actually are reflected in the numbers we get."

In using non-parametric tests, the present author chose a conservative approach and has suggested at least an *ordinal* level of measurement as one can not say with certainty that it was interval or ratio. Given this argument, one did not wish to "..... overlook the question of level of measurement and tend to read quite unjustified meanings into their [*my*] results ...." (Hays, 1963).

There is a view that the use of non-parametric rather than parametric tests, results in the data being downgraded, the main contention relating perhaps to the relative *power efficiency* of such tests. As will be seen later (See section 4.4) the main statistical tests used in this study were the ***Kruskal-Wallis One Way Analysis of Variance (KW)*** (for *more* than *two independent* samples), ***Mann-Whitney U*** test (for *two independent* samples) and the ***Wilcoxon Matched-Pairs Signed-Ranks (T)*** test (for *two related* samples) (See Siegel, 1956). When compared to the power efficiency of an equivalent parametric *One Way Analysis of Variance*, the *KW* enjoys a power efficiency of 95.5%. The power efficiency of the *Wilcoxon* and *Mann-Whitney* when compared to '*t*' tests (a *parametric* equivalent) was 95.5% and almost 95% for small samples (See Siegel, 1956). This would suggest that the rigour of the non-parametric statistical analyses conducted in the present study was only *marginally* below that resulting from the use of parametric tests. Miller (1984) observes that the Mann-Whitney U test's power to "detect significance is not much less than of the *t*-test itself." Similarly, the power of the Wilcoxon test, although it makes no assumptions about population distributions, is "nevertheless almost as powerful as the *t*-test in situations where both tests could be used."

4.2.2 First Level Analyses

The subjects participating in this study constituted 13.3% (i.e. 14.7% of children in Government Schools) of the ***total*** Gibraltarian Primary School population (i.e. Government and Non-Government schools) for that year. The true percentage was

probably higher if English monoglot children are omitted from the official statistics (Gibraltar Department of Education, 1988). This omission would be justified since the analyses for the sample under investigation *excluded* these children. First and Middle Schools were also well represented in the sample (12.1% of *total* First Schools population and 14.5% of the *total* Middle Schools population; 13.4% and 15.9% respectively, of children in Government Schools). It was not possible to estimate a similar percentage for each of the *6-months* age codes used in this study as such details were not readily available but Table 4A below, shows the number of pupils in First and Middle schools at the time of the first trial, and according to school year group.

YEAR	FIRST SCHOOLS			MIDDLE SCHOOLS		
GROUP	GOVERNMENT	OTHERS	TOTAL	GOV'T	OTHERS	TOTAL
1	321	27	348	328	39	367
2	336	36	372	349	29	378
3	329	34	363	300	28	328
4	366	49	415	341	31	372
	1352	146	1498	1318	127	1445

TABLE 4A SIZE OF FIRST AND MIDDLE SCHOOLS POPULATION AT THE TIME OF THE FIRST TRIAL OF THIS STUDY, ACCORDING TO SCHOOL YEAR GROUP

The percentage of each of these groups comprising the peer population is shown in Table 4B below.

#YEAR	ALL SCHOOLS		GOV'T SCHOOLS	
GROUP	FIRST	MIDDLE	FIRST	MIDDLE
1	† 9.5	15.5	10.3	17.4
2	6.5	14.8	7.1	16.1
3	18.7	13.4	20.7	14.7
4	13.7	13.2	15.6	14.4

TABLE 4B PERCENTAGE OF SAMPLE FROM ACTUAL FIRST AND MIDDLE SCHOOLS POPULATION, IN EACH SCHOOL YEAR GROUP

N.B. #Each of these year groups represents ***two*** 6 months age codes in this study e.g. Year Group 1 above corresponded to Age Codes 01 and 02 in the present study.

†The real percentages for DL subjects in the sample in relation to those in the school population are higher because the latter include English *non-DL* (i.e. *monoglot*) children.

Figure 1 overleaf, illustrates graphically the sample size for each *school year group* (i.e. 12 months age range) expressed as a percentage of the *Government* school population.

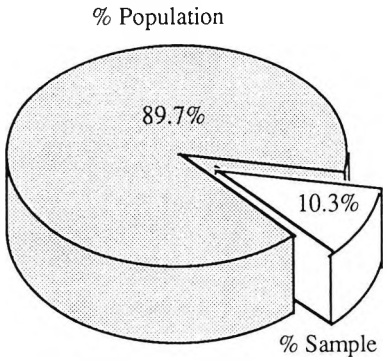

FIGURE 1a 4-4:11 year old

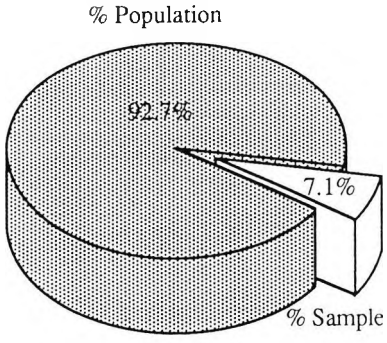

FIGURE 1b 5-5:11 year old

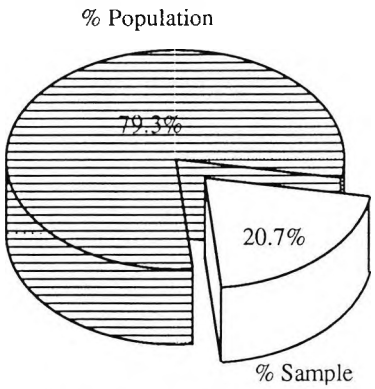

FIGURE 1c 6-6:11 year old

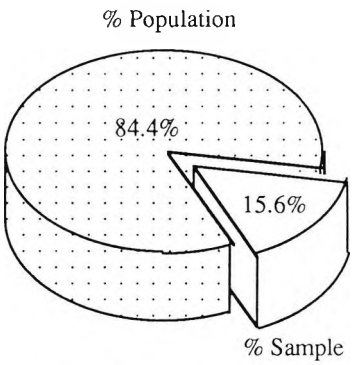

FIGURE 1d 7-7:11 year old

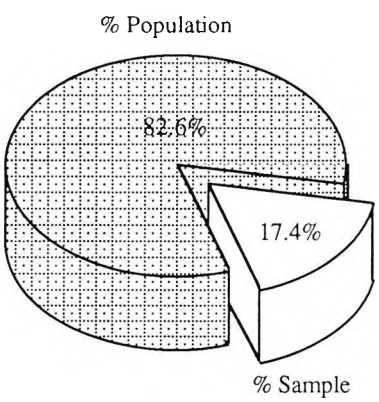

FIGURE 1e 8-8:11 year old

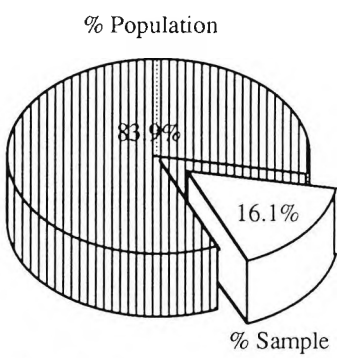

FIGURE 1f of 9-9:11 year old

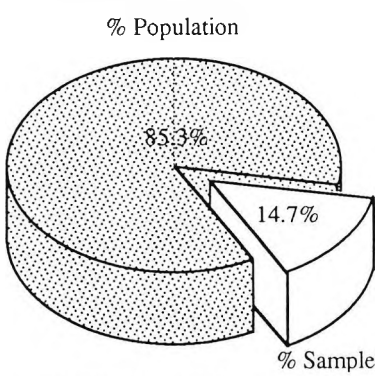

FIGURE 1g 10-10:11 year old

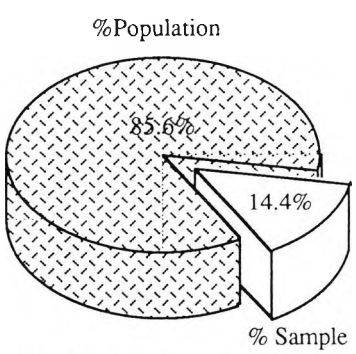

FIGURE 1h 11-11:11 year old

FIGURES 1a-h SIZE OF SAMPLES IN EACH 'SCHOOL YEAR'GROUP EXPRESSED AS A PERCENTAGE OF THE GOVERNMENT PRIMARY SCHOOLS POPULATION IN THE RELEVANT YEAR GROUP

(Age 4-7:11 = First Schools; Age 8-8:11 = Middle Schools)

A *cluster* (random) sampling method (Kidder, 1981) having been used, the schools selected belonged to discrete catchment areas in the city which, as stated earlier, was likely to reflect populations with a cross section of socio-economic status (See Appendix 2.1). It was thought that this in turn might influence the language most frequently used at home. In addition, *no known bias* was employed in the sampling of DL children within the schools (See Chapter 3.1.4).

The size of the samples, especially in relation to the parent school population, and the sampling strategy employed, suggested that there was a high probability that the samples were representative of the school population. However, the extent of significant *gender* and *school* differences regarding lexical *proficiency* was explored. Statistical analyses confirmed that there were negligible *gender* differences. Though there was a somewhat higher incidence of *school* differences, there was not a consistent *statistically significant* pattern which would indicate a universal effect of school background. Furthermore, analyses of *gender/school* interactional effects, indicated that these were also negligible. It was therefore, decided to pool all the subjects regardless of *gender* and *school background*, for the *main* statistical analyses. Some other analyses would, however, address *gender* differences.

4.2.3 Gender and School Differences

Research by Hyde and Linn (1988) has shown that any gender differences in verbal ability were negligible. However, in view of the fact that the present study was dealing with DL subjects, it was important not to make any generalisations from studies based on monoglots, such as those reviewed by Hyde and Linn. Furthermore, it was predicted that because the different schools drew children from catchment areas which could differ in socio-economic backgrounds, it was necessary to determine if this could influence lexical *proficiency* in any of the linguistic variables.

4.2.4 Whole Group Analyses

a) Lexical Development

The degree and rate of lexical *development* in each of the DL subjects' languages will depend on several factors such as the age at which they are first exposed to the second language (L2), how frequently each language is used and in what contexts, the motivation for learning L2, etc. (See Chapter 2). One can therefore, not make generalisations from other studies about the development of each language in the DL population used in the present study.

The results of analyses of the lexical development in each language, and of exploring the relationship between this development (e.g. the relative rates and degree of development in each language and at each age code) could have implications for pedagogical and remedial work. In this particular study, two other linguistic variables were also studied in addition to L1 and L2, and these were *Conceptual Vocabulary* and *Bilinguality*. How each of these develops in their own right and in relation to L1 and L2 could have both psycho-linguistic and socio-linguistic implications.

b) Validity and Reliability

The issue of the validity of the BPVS has already been discussed (See 3.1.2b). The validity of the *research* task regarding Gibraltarian DL children however, can only be addressed after the study has been concluded and the data is available for analysis. Unlike with the BPVS which measures only *English* receptive lexicon, the research task also required responses to *Spanish* lexical items.

Spolsky (1994) discusses the validity of measurement of understanding and suggests that it can not be measured because so many variables can affect understanding of language. However, his conclusion relates to the understanding beyond the single word level. The present study focuses on receptive *lexicon* and the task employed involves *single* lexical units. The measurement of such a very basic linguistic parameter is considered to be less vulnerable to other variables than the measurement of more complex linguistic parameters such as language *structure*.

Nevertheless, the interpretation of results is dependent on an understanding of the validity of the task employed. Though the lexical corpus for this research was derived from the British Picture Vocabulary Scales (BPVS) which is a standardised test, it did not restrict itself to just the *test* items, and 25% of the items used were *non-test* BPVS items, appearing in the first 75 BPVS plates. It is therefore, not claimed that the task comprising this study constituted a *test* in the *formal* sense of the term.

Validity can be measured at different levels and with a variety of degrees of rigour. *Face validity*, for example, is very much a subjective measure. It refers to the extent to which, and confidence with which, the task appears to an observer, or a subject, to be a representative sample of the ability it is supposed to be measuring (Spolsky, 1994). Dunn et al (1982) argue that the BPVS "follows a tradition of measuring *hearing* vocabulary which has *substantial evidence of validity.*" Validity studies of the Peabody Picture Vocabulary Test (PPVT) (Dunn and Dunn, 1981) from which the BPVS was

derived, provide considerable evidence for the criterion related validity of the PPVT (See Robertson and Eisenberg, 1981).

Content and *face validity* are often considered to be the same (Spolsky, 1994). However, a more precise definition of the *content validity* of a measuring instrument relates to whether it provides a representative sample of a *specific* skill or behaviour. Oller (1983) states that the only difference between *face* validity and *content* validity is that "the former is generally based on uninformed judgements whereas the latter is based on thoughtful reflection and preliminary theory building ... otherwise they are quite similar."

As was mentioned earlier, the lexical stimuli chosen for this study cover 18 different semantic categories. These were thought to comprise a reasonably comprehensive coverage of the lexical concepts and situations/societal domains likely to be encountered and experienced by Gibraltarian children. As discussed in Sections 3.1.2a(3) and 3.1.3, (in Chapter 3) earlier, this researcher involved Gibraltarian primary school teachers in arriving at a lexical corpus which was thought to have a high degree of *face* and *content validity* for Gibraltarian children.

Construct validity involves "finding evidence that the various abilities (or constructs) that are assumed ... to exist can be shown empirically" (Spolsky, 1994). Dunn et al (1982) claim that BPVS stimulus items increased in lexico-conceptual difficulty as the task progresses. Dunn et al (1982) also stated that if performance improves with successive ages, this can be considered as "an indirect but [perhaps] not conclusive evidence of *construct validity*." This researcher predicted that the performance of 'bilingual' Gibraltarian children participating in this study would improve *with successive ages*.

One other type of validity is *external validity*. This refers to the extent to which one can "generalise the results of the research to other populations and settings of interest in the hypothesis" (Kidder and Judd, 1986). One way of measuring *external validity* is by giving the same task to different samples from the same or similar research population (and in a similar setting). If there are no significant differences between the performance of these samples, a high degree of *external validity* would be indicated. As mentioned in Chapter 3.4.1 earlier, a second cohort of 108 children participated in Trial 1 six-eight months after the first cohort of 284 (See Tables 3.1a and 3.1b). In order to establish the replicability of the study, albeit *post hoc*, the first cohort's performance in each linguistic variable was compared with the performance of peers in the second cohort.

Though subjects had not been alerted to the fact that they would be participating in a second trial approximately six months later, the possibility of a *practice/rehearsal effect*

had to be considered. In order to establish the possible existence of such an effect, which could threaten the reliability and validity of the results of repeated trials involving the same task, the performance in Trial 1 of the subjects from Age Code 02-17, was compared with the performance in Trial 2 of subjects in equivalent age codes. Significant differences could indicate that a *rehearsal effect* might have been operating and/or that there was a lack of homogeneity between the two groups. Thus, a superior performance in Trial 2 by peers who had already completed Trial 1 six months earlier, could suggest a *rehearsal effect.* It had been predicted that the task was so long that it was very unlikely that any rehearsal effect would be negligible. Task *reliability* would be indicated by an *absence* of significant differences between the performance of subjects of the same age participating in Trials 1 and 2.

To ensure *reliability* in measuring performance, this researcher was responsible for calculating the number of correct responses made by each and every subject in all the trials. *Inter-tester reliability* was ensured by prior training of all research assistants and by providing for them the same procedural text and materials for the task (See Appendix 4).

c) Cross-sectional v. Longitudinal Design

As mentioned before (See Section 3.1.5) much criticism has been published (e.g. Weil, 1978; Cook, 1982; Meara, 1989) of studies employing only a *cross-sectional* research paradigm. The results of analyses aimed at testing the validity of this criticism could provide indications for future research. If the results favoured *cross-sectional* designs, the research resources needed would be substantially less than if *longitudinal* designs were found to be more appropriate.

d) Lexical Dominance

The literature has reported (e.g. Fishman, Cooper and Ma, 1971; Fantini, 1985) that in some DL communities, the dominance of the *first* language may change after a certain age and thus *shift* to the *second* language. This hypothesis was tested in this study with regards to *lexical* dominance. The factors affecting dominance may be similar to those influencing language development (e.g. amount of exposure to a language, affective factors, etc - See Chapter 2.2), as are the benefits of such an exploration.

The extent of language dominance and how this changes over time has not received much attention in the recent published literature. This could be due to the fact that, as McLaughlin (1985) reports, measures such as *word association* tests and *reaction time*

on picture-naming tasks developed by psycholinguists, are not readily practicable or available to the pedagogue. The importance of considering linguistic dominance in 'bilingual' subjects has been highlighted by Burt and Dulay (1978). They have argued that assessing language dominance is important for initial diagnosis, evaluation of needs, and for planning bilingual educational programmes.

The results of studies in this area will very much depend on the particular socio-linguistic characteristics of the DL community being investigated. Some of these characteristics have already been discussed in Chapter 2.1.3 under the heading of *Typology*. In addition, not only can dominance be measured in a number of ways as already mentioned (Chapter 2.2.4), but several operational definitions of dominance can form the basis of such studies. In this study, a number of quantitative measures of *lexical dominance* have been explored (See Section 4.4.3 (a) (iv)). Generalisations should therefore, not have been made from other studies though similarities may have significance.

e) Correlations Between Linguistic Variables

There is always a possibility that a DL subject's lexical development could take place in one LV, for example, and significantly less *pro rata* development might occur in another LV. Significant positive correlations between pairs of *linguistic variables* (e.g. *L1* v. *CV*, *L2* v. *Bilinguality*) could indicate that development in L1 and/or L2 might result in development in *CV* and/or *Bilinguality*. One implication of a lack of significant positive correlation might be that, whereas lexical development can take place, it does not necessarily enrich the *Conceptual Vocabulary* and/or the subjects' ability to learn the lexicon for referents in *both* languages i.e. *Bilinguality*. If lexical development takes place predominantly in *one* language, or to the exclusion of the other, there could still be a positive correlation between that developing language and *Conceptual Vocabulary* but perhaps not in *Bilinguality*. Similarly, a lack of significant *positive* correlation between L1 and L2 might suggest that, whereas the lexicon may increase in one language, a slowing down or *attrition* may be taking place in the other. This could result in a dominance *shift*, and an increase in the lexical *dominance ratio* between the two languages. So long as the newly acquired lexicon comprises vocabulary for mainly *new* referents rather than *translational equivalents* for the existing lexicon, the *Conceptual Vocabulary* will increase. However, if the new lexicon comprised mainly *translational equivalents,* this could be indicated by positive correlation between the developing language and *Bilinguality*.

f) Conceptual Vocabulary (CV)

This term has already been defined in Sections 2.2.7 and 3.2.4. Measures of CV in fact give a better indicator of a subject's true lexical *repertoire* (or *referential* repertoire) because it considers DL subjects' knowledge of the lexeme for a referent in *any* of the two languages. This in turn may provide more reliable differential diagnoses in terms of communication problems (Abudarham, 1987 - See also Chapter 5.6) than measures of lexical proficiency in only *one* language, or even in *both* languages *independently*. It is not inconceivable for the CV to remain fairly static, or for it to develop more slowly in comparison to the rate at which any one of the two languages develops. As suggested above, this could indicate that the newly acquired lexicon consisted mainly of *translational equivalents* and not of *new* referents. However, if the CV develops at a similar rate to, or faster rate than any one of the other two languages, this could indicate that the lexical as well as the *referential* repertoire were expanding and thus, the vocabulary for *new* referents was being acquired.

g) Lexical Proficiency

The *lexical proficiency* was measured for each language (i.e. L1 and L2) independently, and at each age code, as was the *Conceptual Vocabulary* and *Bilinguality*. Furthermore, whereas the *Conceptual Vocabulary* is indicative of how many ***referents*** are known lexically in any of the two languages, and *Bilinguality* is indicative of how many *referents* are known in *both* languages, these do not necessarily reflect a DL subject's *total* ***lexicon*** i.e. the *total* number of *words* known, (i.e. *word* power, as opposed to *naming* power as measured by the CV). This ***'Total Lexical Repertoire'***, could be a better indicator of '*language-learning potential*' (Abudarham, 1987). This issue will be discussed further in Chapter 5.

A closer look at the relationship between each subject's English and Spanish lexicon was also taken to establish how these linguistic parameters changed with age. If the gap between the lexical repertoire in each language altered significantly with age, this might, as suggested earlier, indicate lexical ***attrition*** (Seliger and Vago, 1991) i.e. loss of vocabulary, or cessation of development, in one of the languages.

h) Bilinguality

This term has already been discussed and defined for the purposes of this study (See Section 2.1.2, above and Chapter 3.2.3, earlier). The degree of *Bilinguality* could provide a measure of how competent a subject might be in *both* languages. In certain contexts, a DL subject's need and ability to borrow and/or code-switch, may be

determined by his *Bilinguality* so that the greater the *Bilinguality* the less dependence on any one of the two languages.

Of interest as well, is how *Bilinguality* develops with age, whether it plateaus after a time and what its relationship is to development in the other linguistic variables. The results of analyses could indicate the type of lexicon which DL subjects acquire at each age, whether it is mainly in L1 and L2 *translational equivalents,* or words for *new* referents, and how this pattern might change with age.

4.3 SECOND LEVEL ANALYSES

The data in Trial 1 lent themselves to two other types of analyses. Whereas the first was not directly relevant to the main aims of this study, they were central to this author's previous work relating to the assessment of the language-learning potential of DL subjects, Dual Language receptive lexicon and the criteria for developing language tests for DL subjects (Abudarham 1976, 1979, 1980a, 1980b, 1987). Since no standardised data existed for the DL subjects in this study, it was not possible to establish how these subjects' performance compared with that of *monoglot* peers. As explained in 4.3.1 below, such comparisons were made, albeit with some qualifications. It was thought that the results of these analyses could have psychometric and clinical implications.

The second type of analyses would provide a socio-linguistic dimension. This comprised an *item analysis*. The *familiarity* in each language of the lexicon under study, would be reflected by the relative percentages of correct responses for each referent, in each language. This measure could also indicate (i) whether *translational equivalents* were being acquired simultaneously or sequentially, (ii) in which language was the word for each referent acquired first, (iii) subjects' use and frequency of use of each language, (iv) whether the measure was a function of subjects' *diglossic* status, and (v) whether the lexicon was likely to be acquired bilingually for some referents, or in only *one* language. These issues are discussed in more detail, later on.

The outcome of these analyses as well could have pedagogical and diagnostic implications.

4.3.1 DL Subjects' Performance v. Monoglots' (BPVS) 'Standard Scores'

The early literature (See Chapter 2.2) claimed that DL children's language was inferior to that of their monoglot peers'. Some speech therapists and educationalists in the field

advocate using tests standardised on English monoglots for DL subjects when no 'bilingual' test is available. However, others advocate that DL subjects are tested in *both* languages and that subjects are credited for correct responses in *either* of the two languages i.e. CV, (Abudarham, 1987). The design of this study demanded that the first 75 items of a test of receptive lexicon (the British Picture Vocabulary Scales) standardised on English monoglots, were included in the 100 referents forming the basis of the experimental lexical corpus.

The subjects in this study were thus, required to respond to 100 items in each of the two languages (i.e. to a total of 200 *lexical stimuli).* These items were drawn from the first 75 BPVS picture plates. A monoglot being tested by the BPVS would have been required to respond until a *ceiling item* was reached. The authors of the BPVS (Dunn et al, 1982) define this as the *last* item of *eight consecutive* responses within which *six* errors have been made. The monoglot would of course, need also to respond to lexical stimuli in only *one* language. The tasks were thus, not comparable in terms of complexity, size, or time needed for completion. In addition, the order in which the stimuli would have been presented if a BPVS was being conducted on a monoglot subject could not be adhered to. This was because responses had to be made to each item in two languages, and the lexical stimuli for each item were not presented consecutively in order to prevent guessing. (***Note:*** There is only *one* version of the BPVS and the instrument does not have two alternative sets of *lexical* test items (cf. Peabody Picture Vocabulary Test) enabling the use of one for one language and the second for the other language (See Saunders' work, 1982 which employed *Forms A* and *B* for each language tested).

All these factors violated the requirements of the prescribed administrative procedures for the BPVS. It could therefore, be argued that using the scoring criteria and system of the BPVS was not a valid exercise. However, it was still thought a useful exercise which might suggest certain trends (Genesee, 1989). All these issues will be discussed further in 4.6 below.

The main objectives of this exercise were to establish:-

a) how the DL subjects' *lexical proficiency* in *English* compared with that of English *monoglots.* This was done by converting the DL subjects' *raw scores* (i.e. the number of correct responses to the first 75 BPVS *test items*) into *'BPVS'*-type *standard scores.* A *standard score* of 85 or more would be considered indicative of a *within normal limits*

lexical proficiency in *English*, comparable with *English monoglots* on which the BPVS was standardised[1] .

b) whether similar comparisons in *Spanish* (i.e. their L1) would make any difference and yield more favourable results.

c) whether BPVS '*normal limit*' would have been more readily achieved if subjects' *Conceptual Vocabulary* was considered.

Only data from Trial 1 (*cross-sectional* design) was employed in these analyses. The BPVS *derived* measures used were *Age Equivalents* and *Standard Scores*. The analyses were conducted for all children pooled together *regardless* of gender or school, within each age code (6 months range).

4.3.2 Item Analyses

The subjects participating in this study enjoyed a *diglossic* as well as a 'bilingual' status; this phenomenon has been reported by several authors, among them Fishman (1967). Clinical observations by this author during his work in Gibraltar as a speech and language therapist, suggested that Gibraltarian children kept the two languages functionally apart on some occasions (i.e. ***diglossia***) and mixed them in others.

In addition, as *sequential* 'bilinguals' (and *diglossics*), they developed some of their lexicon in one language and not the other. Younger children may therefore, develop a lexicon for some *referents* in *Spanish* only, and for some others only in *English*. Lexemes for particular referents may also be acquired in *both* languages but *sequentially*. With time, age and opportunity, the 'bilingual' repertoire develops.

Undoubtedly, socio-cultural, affective, socio-linguistic and educational factors will determine the nature and rate of the DL subjects' lexical development in one or the other language. These factors may also influence their 'bilingual' lexical development. An awareness of the *pattern* of lexical development could have pedagogical, diagnostic and remedial implications (See Abudarham, 1987). This issue is discussed in greater detail in Chapter 5, entitled *Discussion and Practical Implications*.

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[1] It is acknowledged that this criterion is not entirely valid. However, it does reflect the not uncommon practice of using tests standardised on *English monoglots* to assess 'bilingual's' proficiency in *English*. It was anticipated that the results of these comparisons would confirm the extent of the inappropriateness of this practice.

4.4 ANALYSES

4.4.1 Introduction

Samples were grouped according to age codes[2]. There were *two* major levels of analyses. The most important of the two was the first which was designed to predominantly explore subjects' lexical *proficiency* and *development* in each of the four linguistic variables. It also explored other variables such as *lexical dominance* and performance relationships (i.e. *correlations*) of the lexical *proficiency* between linguistic variables. All these analyses were conducted using the whole corpus of 100 referents. Because the lexical stimuli for each referent were presented in two languages i.e. *Spanish* and *English*, there were thus 200 lexical items in the whole task (i.e. 100 *translational equivalents*). Whilst *gender* differences and *school* backgrounds were also explored in many of these analyses, the main focus of the analyses was on ***Whole Group*** data i.e. *disregarding* gender and school background.

The data base comprised subjects' performance as reflected by the number of correct responses made in *each* language to the lexical stimuli presented. Each subject's performance in the whole task was therefore, calculated for each Trial. The means and standard deviations were calculated for each linguistic variable, in each set of analyses, according to age code (6 months age range). As stated earlier, for a number of analyses, the results for neighbouring age codes were concatenated (thus forming samples with a 12 months age range) and analysed (See Sections 4.5.2b, 4.5.3a(ii), 4.5.5b (ii), 4.5.6c, below). Except for analyses of *lexical development* based on data from Trial 1 and all the other trials (*longitudinal* study), only Trial 1 data were used for all the analyses discussed above.

The *second* level of analyses aimed to explore *two* main areas. The *first* comprised comparisons between the performance in *English*, *Spanish* and *Conceptual Vocabulary* of DL subjects participating in this study with the British Picture Vocabulary Scales *norms* based on English *monoglot* subjects. Only correct responses to lexical stimuli corresponding to the first 75 BPVS *test items* were used in these analyses.

The *second* set of analyses comprised an *item analysis* of each of the 100 referents, conducted to establish the (relative) *familiarity* of each word, in each language. The data

[2] **N.B.** Most of the analyses were conducted on samples with age codes comprising *6 months age range* e.g. subjects in Age Code 01 were between 4 years and 4 years 5 months old. When analyses involve age codes with a different age range, it will be clearly stated. So for example, on occasions, the age range of samples was widened to *12 months*. This was achieved by the concatenation of neighbouring age codes e.g. 01+02, 02+03, 03+04, etc.

base for this item analysis comprised the number of correct responses received for each referent in each language i.e. L1 and L2, within each age code, in *Trial 1*. These provided an index of *lexical familiarity* for each referent, in each language. The number of correct responses each referent received in *both* languages was an indication of the degree of *equilingual familiarity*.

4.4.2 Analyses to Establish Gender, School and Interactional Differences

The statistical analyses to determine *gender* and *school* differences were conducted at several levels. **GENDER** and **SCHOOL** differences in the lexical *proficiency* in **EACH LINGUISTIC VARIABLE**, at **EACH AGE CODE**, were explored as indicated below.

(a) **GENDER** differences for *all* subjects disregarding school background (i.e. subjects from **ALL** the **SCHOOLS** were pooled together).
(b) **GENDER** differences within **EACH SCHOOL.**
(c) **SCHOOL** differences (subjects of **BOTH GENDERS** pooled together).
(d) **SCHOOL** differences for **EACH GENDER**.
(e) **INTERACTIONAL EFFECTS** of Gender *and* School were also statistically analysed - these were explored in only the following age codes:-

01(Age 4-4:5 years), 03 (Age 5-5:5 years), 05 (Age 6-6:5 years) and 06 (Age 6:6-7 years)

(See (iv) below for further explanation of this choice).

All these analyses were conducted using only *cross-sectional* data (from *Trial 1*), for samples with a *6 months* age range.

Though the results of these statistical analyses supported the prediction that there would not be substantial *gender* differences, the possibility that the sensitivity of these analyses could also be affected by the very narrow (6 months) age range had to be considered. In order to establish whether samples with a *wider* than 6-months age range might yield a different pattern, another set of analyses was conducted on data as follows:-

(f) From two concatenated (neighbouring) age codes e.g. 01+02, 02+03 etc., disregarding school background; this resulted in *larger* samples comprising an *enlarged* age range of *12* months.

Other than for establishing *interactional effects* (See e) above) a variety of statistical tests were conducted as follows:-

(i) To establish the significance of any **GENDER** difference in each linguistic variable and according to each age code, *disregarding school background* (See a) above) the **Mann-Whitney U test** was used (See Table 4.2, below).

(ii) To determine **GENDER** differences *within* **EACH SCHOOL**, in each linguistic variable and according to age code (See b) above) the **Mann-Whitney U test** was used (See Table 4.4(i), below).

The results could not be statistically analysed for all these samples. Five sub-groups were too small for statistical analyses of *gender* difference *within* each school as follows:-

AGE CODES		SCHOOLS
01	(4-4:5)	"B"
02	(4:6-4:11)	"C"
03	(5-5:5)	"B" & "C"
04	(5:6-5:11)	"C"

(iii) To determine the significance of any **SCHOOL** differences in each linguistic variable, according to each age code but *regardless* of gender (See c) above) the **Kruskal-Wallis One Way Analysis of Variance** was used whenever the samples had been drawn from 3 schools, and the **Mann-Whitney U test** when only 2 schools had been involved (See Table 4.7(i), below).

(iv) To determine the significance of **SCHOOL** differences for **EACH GENDER** (See (d), above), the **Kruskal-Wallis One Way Analysis of Variance** was used (See Table 4.8(i), below). When subjects from only *two* schools participated, the **Mann Whitney U test** was used to statistically analyse the data.

v) **Interactional effects** of *gender* and *school* were statistically analysed. The level of measurement was at best ***ordinal*** therefore, no ***parametric*** two way analysis of variance could be conducted. There is, to this author's knowledge, no suitable ***non-parametric*** two way analysis of variance to calculate ***interactional effects*** between 2 x 2 variables. However, the **Wilson's Distribution-free Analysis of Variance** (Wilson, 1956) is appropriate for 2 x K variables. This test was appropriate only when data was available for the *three* First Schools and for *both* genders. Because subjects from all three first schools were not represented in all age codes, this test could not therefore, be used for Age Codes 02, 04, and 07 upwards because only two schools were represented in these age codes. These analyses were thus, only possible for subjects in the following age codes:-

01 (4-4:5 yrs.), 03 (5-5:5 yrs.), 05 (6-6:5 yrs), 06 (6:6-6:11 yrs).

The results of these analyses are reported in Section 4.5.2(3), entitled *Interactional Effects* below, and indicate the significance of *gender*, *school* ***and*** *interactional* effects.

To establish the existence of *gender* and *school* differences in samples where only *two* schools participated, two options were available. One was to subject the data to **Mann-Whitney U tests** (Siegel, 1956) to establish the significance of differences between genders, and schools, *separately*. One drawback of this option was that the same subjects were being used for both these analyses, within each age group and this could result in Type 1 or 2 errors. The second option was *not* to conduct such analyses, thus avoiding such errors. This second option was rejected however, on the grounds that the results of such analyses might at least give some indication of possible gender and/or school differences. The results of these analyses would of course have to be considered with great caution and no unqualified conclusions could be made. They would at best give an indication of a possible *trend.*

4.4.3 First Level Analyses Conducted

Statistical analyses yielded negligible *Gender* differences in lexical *proficiency* (See '*Results*' in Section 4.5.2.(1), below) and no *consistent* pattern for such differences was indicated. Despite a *small* number of significant *School* differences in a few *sub*-samples, the sample under study was considered to be representative of the *Primary School* population. The reason for this assumption was based on the fact that (i) a *cluster* probability (random) sampling method was employed, (ii) no known bias was used in the final selection of children (See Chapter 3.1.4), (iii) the sample was thought to represent a fair socio-economic cross section of the population (See Section 3.1.4 and Appendix 2.1), and (iv) the large sample size comprised between 13.4 and 15.9 per cent of the Primary School population (See Sections 3.1.4 and 4.2.2). Most of the subsequent major analyses therefore, disregarded *gender* and *school*, and samples were created according to age groups, as indicated below.

a) Whole Group Analyses

The significance of the results of these analyses conducted was determined by the use of appropriate statistical tests on data for *whole* samples (i.e. ***Whole Group*** disregarding *gender* or *school background*), and according to the age codes, as indicated below. Several independent variables were explored as follows.

(i) Lexical Proficiency

The significance of differences between the lexical *proficiency* in each linguistic variable was statistically analysed by subjecting the data to a **Wilcoxon Matched-Pairs Signed-Ranks T test.**

The *proficiency* in each linguistic variable was reflected, *a priori,* by the number of correct responses. However, *lexical proficiency* can also be measured by calculating subjects' *Total Lexical Repertoire* (TLR). This was determined by the *total* number of correct responses given in L1 and L2, *including* correct responses given to the same referent in *both* languages i.e. *translational equivalents.* Such responses would be credited as 2 *words* and not just one.

In order to determine what proportion of the TLR comprised the lexicon in each language (i.e. Spanish and English), the *mean percentage lexicon* in each language was calculated.

A closer look at the relationship between each subject's *English* and *Spanish* lexical *repertoire* was taken to establish how these linguistic parameters changed with age.

The *relationship* between the performance in each language i.e. L1 and L2, and *Bilinguality* was also calculated.

(ii) Lexical Development (Cross-sectional and Longitudinal Analyses)

Lexical *development* in each linguistic variable was calculated using *cross-sectional* data from Trial 1 and *longitudinal* data resulting from Trial 1 and subsequent trials (i.e. T1 v. T2, T1 v. T3, T1 v. T4).

At a *cross-sectional* level, Trial 1 data was used to determine *development* between neighbouring age codes (6 months age range) e.g. 01-->02, 02-->03, 03-->04, etc.. In addition, to test whether an enhanced sensitivity would be indicated by comparing the performance of samples with a greater *age* difference, the performance of subjects between alternate age codes e.g. 01 v. 03, 02 v. 04, etc., was statistically analysed. The age *difference* between the subjects in these age codes was thus, increased to *12* months.

Lexical *development* based on *cross-sectional* data, was analysed using the **Mann-Whitney U test** (Siegel, 1956).

At a *longitudinal* level, lexical *development* was determined by comparing the performance of subjects in Trial 1 with their performance (i.e. of the *same* subjects) in subsequent trials (i.e. *repeated measures* design). Specifically, subjects' lexical *development* was calculated by comparing their performances in (i) Trials 1 and 2 when there was an interval of an average of 6 months between trials, (ii) Trials 1 and 2 when there was an interval of an average of *12* months between trials (See Section 4.5.3 c(iii), below for the rationale for this analysis), (iii) Trials 1 and 3 when there was an interval of an average of *12* months between trials, and (iv) Trials 1 and 4 after intervals of between 17 and 22 months.

Comparisons made using *longitudinal* data were statistically analysed using the **Wilcoxon Matched-Pairs Signed-Ranks T test** (Siegel, 1956).

Statistical analyses were also conducted to establish whether the *pattern* of lexical *development* resulting from *whole group* data (i.e. *disregarding* gender and school background) was different when each gender was considered *separately* (See Sections 4.4.3b, above and 4.5.3b, below).

In order to establish a *quantitative* measure of lexical development related to a base line performance, the ***Percentage Mean Gain*** (PMG) between Trial 1 and each of the three subsequent trials, was calculated for each linguistic variable (LV). These gains were not statistically analysed because the *significance* of any lexical development had already been established in the earlier analyses and the objective now was to obtain a *quantitative* measure reflecting the *extent* of lexical *development.*

(iii) Cross-sectional v. Longitudinal Data

The hypothesis that the results of *longitudinal* studies are more sensitive than those of *cross-sectional* studies was explored.

The results of statistical analyses conducted to determine the significance of lexical *development* (See Section 4.4.3a(ii), above) were used to determine whether significance was achieved more frequently in one of the two designs. The greater sensitivity of a design would be reflected by a higher *incidence* of significant variables.

(iv) Lexical Dominance

Lexical dominance was measured in several major ways. The first aimed to establish in which language there was significant lexical *dominance*, whether this dominance *shifted*

from one language to the other, and if so, at what age. The *means* for the lexical *proficiency* in L1 and L2 were inspected to determine the dominant language.

The significance of the lexical *dominance* (i.e. in L1 or L2) for each linguistic variable was statistically tested using the **Wilcoxon Matched-Pairs Signed-Ranks T test** (Siegel, 1956). This test was also used to establish whether the dominant language would change if *genders* were analysed separately. The *dominance pattern* resulting from pooling data from two *neighbouring* age codes, for *each* gender, was also statistically analysed using the **Wilcoxon Matched-Pairs Signed-Ranks T test**.

Three other strategies were employed to study lexical *dominance*. In one, the *dominance ratio* between the two languages (i.e. Spanish and English) was calculated for each subject. The L1~L2 *mean dominance ratio* was also calculated for each sample according to age code (6 months age range). This measure gave an indication of the *relative* dominance (or dominance *configuration*) of one language over the other.

The *percentage* of the lexicon in each of L1 and L2, in relation to subjects' *Total Lexical Repertoire (TLR)* (i.e. the *total* number of words known) was calculated. These percentages would give an indication of the relative *extent* of lexical *dominance*. They would also help to identify to what extent and in which way lexical *dominance* might change over time, and also the age at which the lexical *dominance* shifted from one language to the other.

The measures of *mean* lexical *dominance* described above relate to group performance and therefore, do not precisely reflect the *subject variability* within each age code i.e. how many subjects within an age code were dominant in one language or the other. A *dominance pattern* can thus, be reflected in the *incidence* of lexical dominance for each language, within each age code. The number of subjects lexically dominant in *each* language, within each age code, was thus calculated. It was predicted that, in a homogeneous sample, the *incidence* pattern of dominance would reflect the dominance pattern resulting from the other analyses.

(v) Correlation Between Linguistic Variables

The hypothesis that there would be significant correlations between each pair of linguistic variables (e.g. English v. Spanish, English v. Bilinguality, Spanish v. Conceptual Vocabulary, etc.) at each age code, was tested using the **Spearman's Rank Order Correlation** (Siegel, 1956). The results would establish whether the development in each linguistic variable proceeded in the same direction and at similar rates.

(vi) Conceptual Vocabulary

It was predicted that the CV would be significantly greater than the lexicon in any of the other linguistic variables (i.e. Spanish, English and Bilinguality). This prediction was tested by comparing the number of correct responses between CV and each of the other linguistic variables. The *means* for the lexical *proficiency* in each linguistic variable were inspected to establish whether CV was superior to the lexical *proficiency* in the other linguistic variables. The **Wilcoxon Matched-Pairs Signed-Ranks T test** was used to determine the statistical significance of the results.

The *extent* of this superiority was also determined by calculating the *ratios* between performance in CV and the other linguistic variables. In addition, the significance of the *development* in *Conceptual Vocabulary* was statistically analysed as mentioned in *(ii)* above.

(vii) Bilinguality

Bilinguality was measured in a number of ways. In the first instance, it related to the number of *referents* known in *both* languages *by each individual*. This was thus, calculated for each subject. Group *means* were calculated for each age code.

A further measure of *Bilinguality* was obtained as a *mean percentage* of the TLR. A high percentage would indicate that the TLR comprised a greater number of *translational equivalents*. As stated before, this could in turn be a reflection that much of the lexicon acquired with age did not relate to names for *new referents* but rather to *translational equivalents* of lexemes already acquired in one of the languages, or acquired *simultaneously* in *both* languages.

The relationship between *Bilinguality* and the other linguistic variables was calculated.

The development of *Bilinguality* with age was also determined (See *(ii)*, above).

(viii) Reliability and Validity

The *reliability* and *external validity* of the task were tested as described in Section 4.2.4b above, the **Mann-Whitney U test** being used for the statistical analyses.

b) Gender Sub-analyses

Though as has already been stated above (See introduction to Section 4.4.3) statistical analyses had indicated *negligible* gender differences in lexical *proficiency*, these tests were based on Trial 1 data only and could not therefore, provide any indication of *gender* differences in other variables such as lexical *development* or lexical *gain*. Furthermore, no analyses had been conducted to explore *gender* differences in other variables such as *dominance*.

Statistical analyses were therefore, conducted to explore the existence of any significant *gender* differences in each linguistic variable, *disregarding* school difference, but according to the age groups indicated below.

The data were subjected to statistical analyses to establish the significance of four variables as follows:

(i) ***Gender dominance*** in each age group for each linguistic variable.

(ii) Gender differences in lexical ***development*** in each linguistic variable. The difference in performance between neighbouring age codes (e.g. 01 v. 02; 03 v. 04; 04 v. 05 etc.) were compared and statistically analysed.

The **Mann-Whitney U test** was used for (i) and (ii) above.

(iii) Lexical ***dominance*** (i.e. English v. Spanish) within each gender, and in each age code. The **Wilcoxon Matched-Pairs Signed-Ranks T test** was used.

(iv) ***Correlation Coefficients*** between every pair of linguistic variables, for each gender, in each age code. The **Spearman's Rank Order Correlation test** was used for these analyses.

c) Age Range Differences

In addition to the *gender* analyses described in b) above, three other sets were conducted. The aim of these analyses was to determine whether samples with a larger age range (i.e. of 12 months) would reveal a greater sensitivity to:

(i) *Gender* differences in lexical *development* in each linguistic variable.
(ii) Differences in lexical *dominance* (English ~ Spanish) *within* each gender.
(iii) *Gender* differences in the *correlations* between linguistic variables.

The **Mann-Whitney U test** was used to test hypothesis (i); the **Wilcoxon Matched-Pairs Signed-Ranks T test** was used to test hypothesis (ii).

The **Spearman's Rank Order Correlation test** was used to test hypothesis (iii).

The wider age range was achieved by concatenating the results of neighbouring age codes (e.g. 01+02, 02+03, 03+04, etc.). The greater sensitivity would be indicated by the greater *incidence* of significant differences/correlations.

4.4.4 Second Level Analyses

a) Comparisons with Monoglot-Standardised Normative Measures

As already described in Section 4.3.1, above, the subjects' lexical *proficiency* in *English, Spanish* and *Conceptual Vocabulary* was compared with that of English *monoglots* as measured by BPVS *'norms'*. It was not appropriate to subject the comparisons to statistical analyses. The main reason for this was that the required data, such as the size of the samples used in the standardisation of the BPVS, were not available.

The *percentage* of subjects (in each age code) whose BPVS *Standard Score* was within BPVS *'normal' limits* in *English, Spanish* and *Conceptual Vocabulary*, was calculated.

b) Lexical Item Analyses

A Computer programme was developed to calculate the number of correct responses given for *each* of the 100 referents (used in the other analyses) to lexical stimuli, in *each* language. The results provided information about the *pattern* of lexical acquisition in each of the two languages, within and across age groups. In addition, the number of correct responses was converted into *percentages* from the total responses possible. This provided a measure of ***lexical familiarity*** in each language for each referent and at each age code. At different ages, the degree of *lexical familiarity* for any one referent might be greater in one language than the other. The significance of these differences was tested for each referent, by means of a **Chi Square** test.

An additional analysis was conducted to establish the number of correct responses for *each* referent in *both* languages, and at different ages. This figure was converted to a *percentage* out of the total responses possible. This provided an *index* of ***equilingual familiarity*** at each age code.

4.5 RESULTS AND THEIR ANALYSES

4.5.1 Introduction

The following is an account of the results of all the statistical analyses. These results are interpreted and discussed later on in Chapter 5 and conclusions arrived at.

In the major part of the study i.e. *First Level* Analyses, the following variables were studied:

Gender Differences (*in Lexical Proficiency*) (Section 4.5.2.1)
School Differences (*in Lexical Proficiency*) (Section 4.5.2.2)
Interactional (Gender/School) Effects (*on Lexical Proficiency*) (Section 4.5.2.3)
Lexical Development (*including Cross-sectional and Longitudinal comparisons*) (Section 4.5.3)
Cross-sectional v. Longitudinal Design (Section 4.5.4)
Lexical Dominance (Section 4.5.5)
Correlation Between Linguistic Variables (Section 4.5.6)
Conceptual Vocabulary (Section 4.5.7)
Lexical Proficiency (*including comparisons of L1 and L2 i.e. Spanish and English, lexical proficiency with Total Lexical Repertoire [TLR]*) (Section 4.5.8)
Bilinguality (Section 4.5.9)
Reliability and Validity (Section 4.5.10)

Second Level Analyses were conducted as follows:

Comparisons of Trial 1 Data with British Picture Vocabulary Scales (BPVS) 'Normalised' Data (Section 4.6)

Item Analyses (Section 4.7)

- **Lexical Familiarity (Section 4.7.1)** i.e. the percentage correct responses given for *each* of 100 referents in ***each*** language i.e. *Spanish* (L1) and *English* L2.

- **Equilingual Familiarity (Section 4.7.2)** i.e. the percentage correct responses given in ***both*** *Spanish* and *English*, for *each* of 100 referents.

The first results reported are the ones regarding the *Gender* and *School* differences in lexical *proficiency* in each linguistic variable, i.e. *English*, *Spanish*, *Bilinguality* and *Conceptual Vocabulary*, and according to age code as specified.

4.5.2 Gender and School Differences (in Lexical Proficiency)

Gender differences in lexical *proficiency* were analysed statistically at two levels. At the first, the results for ***all*** schools (pooled together), according to age code (6 and 12 months age range), and for each linguistic variable, were analysed. At the second level, *gender* differences ***within*** each school were statistically analysed.

1. Gender Differences in Lexical Proficiency

a) Age Code Range of 6 months

i) Gender differences in lexical proficiency regardless of school

The results of Trial 1 for ***all*** schools were concatenated. Table 4.1, below provides details of means and standard deviations for each linguistic variable, according to *gender*, for *all* schools pooled together.

Table 4.2 below, gives details of *gender* differences in lexical *proficiency*, *dominant* gender, *Mann-Whitney U* test values and significance levels.

Summary

Significant Gender differences in lexical *proficiency* were indicated only as follows:-

Age Code 02 (Age 4:6-4:11 years) in *Spanish* and *Conceptual Vocabulary*, 07 (Age 7-7:5 years) in *All* Linguistic Variables (LVs)

In *both* these, *Males* were dominant. In Age Code 02 (Age 4:6-4:11 years), the sample size for each gender only differed by one and in Age Code 07 (Age 7-7:5 years), the sample size was the same for each gender. Sample size could therefore, not account for these differences.

TABLE 4.1 MEANS AND STANDARD DEVIATIONS FOR LEXICAL PROFICIENCY ACCORDING TO LINGUISTIC VARIABLE, GENDER AND AGE CODE (FOR ALL SCHOOLS)

AGE CODES	SEX	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
01 (4-4:5)	M	9	X	37.00	43.89	22.00	58.8
			sd	8.97	6.57	8.77	7.23
	F	11	X	43.09	44.00	25.73	61.36
			sd	10.20	10.65	9.16	7.87
02 (4:6-4:11)	M	6	X	42.17	54.83	29.83	67.17
			sd	8.59	7.76	8.71	7.69
	F	7	X	38.00	38.43	21.71	54.71
			sd	11.54	9.07	10.14	10.31
03 (5-5:5)	M	6	X	43.67	48.17	29.00	62.83
			sd	10.06	7.22	7.70	8.75
	F	5	X	40.60	55.80	30.00	66.40
			sd	3.01	5.53	2.19	3.88
04 (5:6-5:11)	M	8	X	29.38	38.75	18.50	49.63
			sd	11.21	11.36	9.79	13.32
	F	5	X	41.80	47.40	25.60	63.60
			sd	9.87	7.81	9.56	7.23
05 (6-6:5)	M	12	X	51.00	54.58	36.58	69.00
			sd	13.67	9.99	10.99	9.69
	F	17	X	43.47	46.94	29.71	60.71
			sd	15.92	10.21	11.35	13.57
06 (6:6-6:11)	M	21	X	57.24	55.38	41.52	71.09
			sd	17.53	10.38	13.64	11.58
	F	18	X	54.72	55.94	39.44	71.22
			sd	13.12	6.95	9.95	8.94
07 (7-7:5)	M	13	X	62.69	62.46	47.15	78.00
			sd	13.02	10.22	9.77	10.69
	F	13	X	50.00	53.46	34.85	68.62
			sd	11.95	8.50	9.00	9.48
08 (7:6-7:11)	M	16	X	56.50	60.06	43.88	72.69
			sd	9.30	7.39	9.71	7.10
	F	15	X	53.33	59.33	41.00	71.67
			sd	10.69	9.96	10.76	9.63

Table 4.1 (Continued)

AGE CODES	SEX	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
09 (8-8:5)	M	11	X	72.91	68.73	56.09	85.55
			sd	11.11	9.40	12.85	6.16
	F	12	X	71.83	64.33	53.08	83.17
			sd	12.28	7.49	11.78	7.24
10 (8:6-8:11)	M	14	X	66.86	66.43	52.93	80.36
			sd	11.95	9.67	12.17	8.86
	F	20	X	64.80	62.55	49.00	78.35
			sd	17.59	12.61	15.17	14.20
11 (9-9:5)	M	17	X	72.94	67.65	57.24	83.35
			sd	8.89	8.53	8.79	7.27
	F	13	X	70.92	67.39	56.62	81.69
			sd	11.64	10.15	11.29	10.25
12 (9:6-9:11)	M	11	X	75.73	70.00	59.64	86.09
			sd	9.34	10.40	11.06	7.18
	F	15	X	79.33	73.67	64.93	88.07
			sd	11.05	9.10	13.47	6.55
13 (10-10:5)	M	9	X	83.33	80.00	72.00	91.33
			sd	6.25	8.26	10.77	3.62
	F	14	X	78.43	72.71	64.43	86.71
			sd	9.19	10.16	12.51	5.73
14 (10:6-10:11)	M	10	X	82.40	77.60	68.00	92.00
			sd	8.26	5.92	10.55	4.07
	F	11	X	85.82	81.64	75.27	92.18
			sd	8.26	9.18	12.77	4.49
15 (11-11:5)	M	10	X	87.60	80.30	74.00	93.90
			sd	5.24	9.36	9.85	3.45
	F	21	X	83.38	77.67	71.19	89.86
			sd	9.88	7.01	10.59	5.83
16 (11:6-11:11)	M	10	X	86.50	80.00	74.20	92.30
			sd	6.28	8.04	9.24	4.08
	F	8	X	86.25	75.63	69.63	92.25
			sd	7.05	7.91	10.05	3.49

KEY M = MALE; F = FEMALE; N = SAMPLE SIZE; X = Mean; sd = Standard Deviation; ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY; CV = CONCEPTUAL VOCABULARY

TABLE 4.2 RESULTS OF STATISTICAL ANALYSES RELATING TO GENDER DIFFERENCES (ALL SCHOOLS INCLUDED) IN LEXICAL PROFICIENCY, ACCORDING TO AGE CODE AND TO EACH LINGUISTIC VARIABLE

AGE CODES	SEX (M/F)		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV	CONCLUSIONS
01# (4-4:5)	9/11	DG	F	F	F	F	FEMALE dominance in All LVs but NOT significant
		U	34	49	33.5	38.5	
		p	NS	NS	NS	NS	
02 (4:6-4:11)	6/7	DG	M	M	M	M	MALE dominance in All LVs but ONLY significant in SPANISH and CV
		U	13.5	4	8	5	
		p	NS	=.02	NS	=.022	
03# (5-5:5)	6/5	DG	M	F	F	F	FEMALE dominance in CV, Bilinguality & Spanish NOT significant. Male dominance in English NOT significant
		U	15	5	13	12.5	
		p	NS	NS	NS	NS	
04 (5:6-5:11)	8/5	DG	F	F	F	F	FEMALE dominance in All LVs but NONE significant
		U	8.5	11	12.5	8.5	
		p	NS	NS	NS	NS	
05# (6-6:5)	12/17	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	70	61	68.5	60.5	
		p	NS	NS	NS	NS	
06# (6:6-6:11)	21/18	DG	M	F	M	F	MALE dominance in English and Bilinguality; FEMALE dominance in CV & Spanish. NONE significant
		U	163.5	177.5	156.5	183	
		p	NS	NS	NS	NS	
07 (7-7:5)	13/13	DG	M	M	M	M	MALE dominance in All LVs - ALL SIGNIFICANT
		U	40	42	29.5	43	
		p	<.05	<.05	<.01	<.05	
08 (7:6-7:11)	16/15	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	93.5	113.5	90	107	
		p	NS	NS	NS	NS	
09 (8-8:5)	11/12	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	59	51	60.5	56	
		p	NS	NS	NS	NS	
10 (8:6-8:11)	14/20	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	132.5	130	125.5	137	
		p	NS	NS	NS	NS	
11 (9-9:5)	17/13	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	98.5	110	108	100.5	
		p	NS	NS	NS	NS	

Table 4.2 (Continued)

AGE CODES	SEX (M/F)		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV	CONCLUSIONS
12 (9:6-9:11)	11/15	DG	F	F	F	F	FEMALE dominance in ALL but NONE significant
		U	65	71	63	75.5	
		p	NS	NS	NS	NS	
13 (10-10:5)	9/14	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	45	39	42	35	
		p	NS	NS	NS	NS	
14 (10:6-10:11)	10/11	DG	F	F	F	F	FEMALE dominance in All LVs but NONE significant
		U	41.5	30	36	55	
		p	NS	NS	NS	NS	
15 (11-11:5)	10/21	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	80	80	88	59.9	
		p	NS	NS	NS	NS	
16 (11:6-11:11)	10/8	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	40	27	29.5	38.5	
		p	NS	NS	NS	NS	

See Results in Section below entitled *Interactional Effects*

KEY M = MALE; F = FEMALE; ENG = ENGLISH; SPAN = SPANISH
BIL = BILINGUALITY; CV = CONCEPTUAL VOCABULARY;
DG = DOMINANT GENDER; U = MANN-WHITNEY U TEST VALUE
p = Probability (2 Tailed); NS = NOT SIGNIFICANT

(ii) Gender difference in lexical proficiency *within* each school

A similar diet of statistical analyses were conducted for *gender* differences in lexical *proficiency*, *within* each school. Table 4.3 below gives the means and standard deviations obtained for each *gender* in *each* school.

Significant Gender differences in lexical *proficiency* were indicated as shown in Table 4.4(ii) below:

Summary

The sample size in several age codes was too small (See Tables 4.3 and 4.4(i), below) for meaningful statistical analysis. It would seem that *gender* differences in lexical *proficiency* were *significant* in only a *small* number of cases, and even in these cases,

gender did *not* affect lexical *proficiency* in *all* the linguistic variables, within the age codes concerned.

As can be seen in Table 4.4(ii) below, *Males* attending FIRST SCHOOLS performed significantly better than *Females* but only in *three* different age codes. Furthermore, they did not attend the same school. Thus, no identifiable pattern regarding the involvement of one particular school was reflected in these results.

Regarding subjects attending MIDDLE SCHOOLS, *gender* differences were indicated in only *two* out of the *nine* age codes but in only *one* linguistic variable in each. The same school was implicated in both cases.

In all cases but one when *gender* differences were significant, *Male* dominance was indicated (See Table 4.4.(ii), below). *Female* dominance was indicated only in *English* for Age Code 12 subjects in School E, a Middle School.

Table 4.4(i) below shows the results of these statistical analyses and provides *Mann-Whitney U* test values and significance levels.

TABLE 4.3 MEANS AND STANDARD DEVIATIONS OF LEXICAL PROFICIENCY, ACCORDING TO AGE CODE, GENDER (SEX), SCHOOL AND LINGUISTIC VARIABLE

FIRST SCHOOLS

AGE CODES	SEX	SCHOOL	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
01 (4-4:5)	M	A	7	X	39.71	44.43	23	61.14
				sd	7.85	7.29	9.07	6.64
		B	1	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
		C	1	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
	F	A	5	X	36.2	48	21.6	62.6
				sd	7.14	6.54	3.56	7.61
		B	1	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
		C	5	X	47.4	39.2	27.4	59.2
				sd	8.69	12.83	11.04	8.23
02 (4:6-4:11)	M	A	2	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
		B	3	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
		C	1	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
	F	A	4	X	31.5	37.25	16.75	52
				sd	3.78	2.28	4.27	3.94
		B	3	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
03 (5-5:5)	M	A	4	X	42.25	50.5	27.75	65
				sd	7.39	7.67	6.26	8.92
		B	1	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
		C	1	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
	F	A	2	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
		B	1	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
		C	2	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
04 (5:6-5:11)	M	A	6	X	26.5	34.67	16.17	45
				sd	11.6	10.26	10.25	12.26
		C	2	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
	F	A	3	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
		C	2	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		

Table 4.3 (Continued)

AGE CODES	SEX	SCHOOL	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
05 (6-6:5)	M	A	4	X	43.5	50.25	32.75	61
				sd	15.01	10.49	13.16	11.89
		B	4	X	64.25	52.5	41.25	75.5
				sd	7.39	7.69	10.92	2.59
		C	4	X	45.25	61	35.75	70.5
				sd	3.96	8.12	5.76	5.03
	F	A	9	X	34	40.33	22	52.33
				sd	10.1	8.51	7.12	11.37
		B	4	X	67.75	55.5	45.5	77.75
				sd	6.38	8.01	6.8	6.02
		C	4	X	40.5	53.25	31.25	62.5
				sd	2.5	1.92	1.48	2.06
06 (6:6-6:11)	M	A	5	X	42.4	52.4	31.2	63.6
				sd	12.29	11.69	13.7	10.74
		B	10	X	70	58.2	50.1	78.1
				sd	7.17	10.57	8.79	5.64
		C	6	X	48.33	53.17	35.83	65.67
				sd	18.17	7.15	11.07	12.91
	F	A	5	X	41.4	55.88	32	65.2
				sd	4.88	6.24	7.21	6.65
		B	7	X	61.43	53.71	41.86	73.29
				sd	9.93	6.49	6.22	8.43
		C	6	X	58	58.67	42.83	73.83
				sd	13.06	7.06	11.99	8.82
07 (7-7:5)	M	A	6	X	64.67	64.5	47	82.17
				sd	10.78	9.93	6.61	6.67
		C	7	X	61	60.71	47.29	74.43
				sd	14.45	10.14	11.83	12.11
	F	A	5	X	55	57.6	40	72.6
				sd	8.53	7.81	7.1	9.0
		C	8	X	46.88	50.88	31.63	66.13
				sd	12.69	7.87	8.56	8.89
08 (7:6-7:11)	M	A	5	X	66.2	68.4	54.8	79.8
				sd	5.15	4.59	5.12	5.67
		C	11	X	52.09	56.27	38.91	69.46
				sd	7.18	4.9	6.82	5.03
	F	A	6	X	57.5	64	44.17	77.33
				sd	7.68	6.11	6.89	6.94
		C	9	X	50.56	56.22	38.89	67.89
				sd	11.48	10.79	12.26	9.31

Table 4.3 (Continued)

MIDDLE SCHOOLS

AGE CODES	SEX	SCHOOL	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
09 (8-8:5)	M	D	4	X	73.75	69	57.5	85.25
				sd	11.88	11.11	13.12	8.87
		E	7	X	72.43	68.57	55.29	85.71
				sd	10.61	8.26	12.62	3.81
	F	D	4	X	77	67.75	59.75	85
				sd	11.81	7.76	12.99	6.75
		E	8	X	69.25	62.63	49.75	82.25
				sd	11.68	6.73	9.51	7.31
10 (8:6-8:11)	M	D	4	X	61.25	57.75	45.5	73.5
				sd	4.02	2.86	5.5	0.87
		E	10	X	69.1	69.9	55.9	83.1
				sd	13.26	9.25	12.83	9.13
	F	D	9	X	54.44	53.22	40.22	67.56
				sd	17.58	11.95	15.78	13.34
		E	11	X	73.27	70.18	56.18	87.27
				sd	12.26	6.55	9.99	6.51
11 (9-9:5)	M	D	9	X	72.67	68.11	56.67	84.11
				sd	10.29	7.16	8.64	6.95
		E	8	X	73.25	67.13	57.88	82.5
				sd	6.99	9.82	8.92	7.52
	F	D	7	X	72	67.14	56.24	83
				sd	7.52	5.94	6.13	6.46
		E	6	X	69.67	67.67	57.17	80.17
				sd	14.99	13.49	15.24	13.21
12 (9:6-9:11)	M	D	7	X	74.71	67.43	56.29	85.86
				sd	10.59	11.29	11.71	8.58
		E	4	X	77.5	74.5	65.5	86.5
				sd	6.23	6.54	6.54	3.57
	F	D	9	X	78.33	68.56	57	84.89
				sd	10.02	8.1	11.82	5.88
		E	6	X	88.3	81.33	76.83	92.83
				sd	4.42	3.3	2.79	4.18
13 (10-10:5)	M	D	3	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
		E	6	X	85.33	84	76.67	92.67
				sd	4.42	4.83	5.34	3.09
	F	D	3	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
		E	11	X	81.46	75.55	68.64	88.36
				sd	7.76	9.58	10.64	5.21

Table 4.3 (Continued)

MIDDLE SCHOOLS

AGE CODES	SEX	SCHOOL	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
14 (10:6-10:11)	M	D	8	X	79.75	75.63	64.38	91
				sd	7.08	4.87	8.53	3.97
		E	2	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
	F	D	3	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		
		E	8	X	89	86	81.25	93.75
				sd	5.85	3	5.89	2.82
15 (11-11:5)	M	D	5	X	84.2	78.6	71	91.8
				sd	4.96	5.31	7.13	3.49
		E	5	X	91	82	77	96
				sd	2.68	11.88	11.19	1.67
	F	D	8	X	77.38	74.13	64.63	86.88
				sd	11.51	6.86	10.75	7.41
		E	13	X	87.08	79.85	75.23	91.69
				sd	6.35	6.15	8.22	3.52
16 (11:6-11:11)	M	D	6	X	87.17	79.17	73.67	92.67
				sd	6.52	9.17	10.18	4.23
		E	4	X	85.5	81.25	75	91.75
				sd	5.77	5.72	7.55	3.77
	F	D	5	X	83.8	74	66	91.8
				sd	7.54	4.56	7.77	3.54
		E	3	X		SAMPLE TOO SMALL		
				sd		SAMPLE TOO SMALL		

KEY M = MALE; F = FEMALE; N = SAMPLE SIZE; X = Mean; sd = STANDARD DEVIATION; ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY; CV = CONCEPTUAL VOCABULARY

TABLE 4.4(i) RESULTS OF STATISTICAL ANALYSES TO ESTABLISH SIGNIFICANCE OF GENDER DIFFERENCES *WITHIN* EACH SCHOOL

FIRST SCHOOLS

AGE CODES	SCHOOLS	M/F N1/N2		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
01# (4-4:5)	A	7/5	U	9	12	13.5	13
			p	NS	NS	NS	NS
	B	1/1	U	SAMPLE TOO SMALL			
	C	1/5	U	0	1	2.5	2
			p	NS	NS	NS	NS
02 (4:6-4:11)	A	2/4	U	0.5	0	0	0
			p	NS	NS	NS	NS
	B	3/3	U	4	2	3	2
			p	NS	NS	NS	NS
	C	1/0	U	SAMPLE TOO SMALL			
03# (5-5:5)	A	4/2	U	4	0	3	4
			p	NS	NS	NS	NS
	B	1/1	U	SAMPLE TOO SMALL			
	C	1/2	U	SAMPLE TOO SMALL			
04 (5:6-5:11)	A	6/3	U	2.5	2	5.5	2
			p	NS	NS	NS	NS
	C	2/2	U	SAMPLE TOO SMALL			
05# (6-6:5)	A	4/9	U	12	8.5	10	11
			p	NS	NS	NS	NS
	B	4/4	U	5.5	6.5	6	6.5
			p	NS	NS	NS	NS
	C	4/4	U	2.5	4	4.5	2.5
			p	NS	NS	NS	NS
06# (6:6-6:11)	A	5/5	U	9.5	11	10.5	10.5
			p	NS	NS	NS	NS
	B	10/7	U	17	23.5	14	24.5
			p	NS	NS	=.05	NS
	C	6/6	U	13	8	14	10.5
			p	NS	NS	NS	NS
07 (7-7:5)	A	6/5	U	7.5	7.5	6.5	5
			p	NS	NS	NS	NS
	C	7/8	U	10	12	5.5	18
			p	=.04	NS	=.008	NS
08 (7:6-7:11)	A	5/6	U	6	8.5	3	13
			p	NS	NS	=.03	NS
	C	11/9	U	37.5	43.5	36.5	35
			p	NS	NS	NS	NS
09 (8-8:5)	D	4/4	U	8	8	6	7
			p	NS	NS	NS	NS
	E	7/8	U	23.5	16.5	27.5	23
			p	NS	NS	NS	NS

Table 4.4(i) (Continued)

MIDDLE SCHOOLS

AGE CODES	SCHOOLS	M/F N1/N2		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
09	D	4/4	U	8	8	6	7
(8-			p	NS	NS	NS	NS
8:5)	E	7/8	U	23.5	16.5	27.5	23
			p	NS	NS	NS	NS
10	D	4/9	U	12	16	13	12
(8:6-			p	NS	NS	NS	NS
8:11)	E	10/11	U	50	52.5	54.5	41.5
			p	NS	NS	NS	NS
11	D	9/7	U	28.5	28	31.5	27.5
(9-			p	NS	NS	NS	NS
9:5)	E	8/6	U	23	19.5	21.5	21.5
			p	NS	NS	NS	NS
12	D	7/9	U	28	26.5	29.5	24
(9:6-			p	NS	NS	NS	NS
9:11)	E	4/6	U	2	8	2.5	2.5
			p	=.038	NS	NS	NS
13	D	3/3	U	1	2	2	0
(10-			p	NS	NS	NS	NS
10:5)	E	6/11	U	25.5	14.5	18	17
			p	NS	NS	NS	NS
14	D	8/3	U	10	7.5	6	8
(10:6-			p	NS	NS	NS	NS
10:11)	E	2/8	U	5	5.5	8	3
			p	NS	NS	NS	NS
15	D	5/8	U	11	12	12	11.5
(11-			p	NS	NS	NS	NS
11:5)	E	5/13	U	20	22.5	25.5	7
			p	NS	NS	NS	=.01
16	D	6/5	U	11	8.5	7.5	12.5
(11:6-			p	NS	NS	NS	NS
11:11)	E	4/3	U	3	5.5	6	5
			p	NS	NS	NS	NS

#N.B. The data within these age codes were also subjected to a non-parametric *two way analysis of variance* (*Wilson's Distribution-Free Analysis of Variance*) - See comments in section below entitled ***'Interactional Effects'***.

KEY U = MANN-WHITNEY U VALUE; p = Probability (2 Tailed);
NS = NOT SIGNIFICANT; M = MALE; F = FEMALE; N = SAMPLE SIZE
ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY;
CV = CONCEPTUAL VOCABULARY

SCHOOL	AGE CODES	DOMINANT GENDER	LINGUISTIC VARIABLES
(First)			
B	06 (6:6-6:11)	M	BILINGUALITY
C	07 (7-7:5)	M	ENGLISH and BILINGUALITY
A	08 (7:6-7:11)	M	BILINGUALITY
(Middle)			
E	12 (9:6-911)	F	ENGLISH
E	15 (11-11:5)	M	CONCEPTUAL VOCABULARY

TABLE 4.4(ii) SUMMARY OF SIGNIFICANT GENDER DIFFERENCES IN LEXICAL PROFICIENCY, INDICATING RELEVANT SCHOOL, AGE CODES AND LINGUISTIC VARIABLES

b) Age Code Range of 12 months

In order to establish whether analyses based on the results of a *wider* age range would be more sensitive in yielding *gender* differences in lexical *proficiency*, the results of neighbouring age codes (e.g. 01+02, 02+03) were concatenated so that the age range of the concatenated groups was doubled to *twelve* months. These data were statistically analysed. In these analyses the performance of subjects from *all* the schools were pooled together. Table 4.5 (below) provides the means and standard deviations.

Table 4.6(i) below shows the results of the statistical analyses (*Mann-Whitney U* tests) conducted to establish the significance of *gender* differences in lexical *proficiency*, and which gender was *dominant*.

Significant *gender* differences in lexical *proficiency* were indicated only as shown in Table 4.6(ii) below.

Summary

There was a *trend* indicating a higher incidence of *non-significant* Male dominance in lexical *proficiency* over Females. Significant *Male* dominance was indicated more often than Female dominance but even so, this only happened significantly in two age-code-

concatenated samples, i.e. 06+07 and 07+08 (Ages 6:6-7:5 years and 7-7:11 years, respectively). In the former sample, such a dominance was only indicated in *one* LV, this being *Bilinguality*. In the latter sample, the dominance was only reflected in *English* and *Bilinguality*. *Female* dominance was indicated in Age Codes 03+04 (Ages 5-5:11 years), but in *Spanish* only.

The results showed that there is *no* identifiable pattern of *gender* differences in lexical *proficiency*. When they do occur, they are *not* reflected in all linguistic variables and within any *one* age code. The results of analyses when compared to the results of analyses of the smaller groups with 6 months age range, also suggest that a wider range was (or for that matter, larger samples) *not* necessarily more sensitive in revealing *gender* differences in lexical *proficiency*.

TABLE 4.5 MEANS AND STANDARD DEVIATIONS FOR LEXICAL PROFICIENCY, IN EACH LINGUISTIC VARIABLE, ACCORDING TO GENDER, IN SAMPLES WITH AN AGE RANGE OF 12 MONTHS

AGE CODES	SEX	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
01 + 02 (4-4:11)	M	15	X	39.07	48.27	25.13	62.20
			sd	9.18	8.87	9.55	8.46
	F	18	X	41.11	41.83	24.17	58.78
			sd	11.03	10.43	9.75	9.47
02 + 03 (4:6-5:5)	M	12	X	42.92	51.50	29.42	65.00
			sd	9.39	8.20	8.23	8.52
	F	12	X	39.08	45.67	25.17	59.58
			sd	9.12	11.58	8.87	10.07
03 + 04 (5-5:11)	M	14	X	35.50	42.79	23.00	55.29
			sd	12.86	10.85	10.35	13.30
	F	10	X	41.20	51.60	27.80	65.00
			sd	7.32	7.97	7.28	5.97
04 + 05 (5:6-6:5)	M	20	X	42.35	48.25	29.35	61.25
			sd	16.57	13.10	13.76	14.75
	F	22	X	43.09	47.05	28.77	61.36
			sd	14.78	9.72	11.07	12.48
05 + 06 (6-6:11)	M	33	X	54.97	55.09	39.73	70.33
			sd	16.51	10.25	12.96	10.98
	F	35	X	49.26	51.57	34.71	66.11
			sd	15.59	9.78	11.71	12.58
06 + 07 (6:6-7:5)	M	34	X	59.32	58.09	43.68	73.73
			sd	16.18	10.88	12.61	11.74
	F	31	X	52.74	54.90	37.52	70.13
			sd	12.86	7.74	9.83	9.26
07 + 08 (7-7:11)	M	29	X	59.28	61.14	45.35	75.07
			sd	11.54	8.85	9.88	9.28
	F	28	X	51.79	56.61	38.14	70.25
			sd	11.41	9.76	10.45	9.68

Table 4.5 (Continued)

AGE CODES	SEX	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
08 + 09 (7:6-8:5)	M	27	X	63.19	63.59	48.85	77.93
			sd	12.90	9.30	12.62	9.23
	F	27	X	61.56	61.56	46.37	76.79
			sd	14.66	9.29	12.73	10.37
09 + 10 (8-8:11)	M	25	X	69.52	67.44	54.32	82.64
			sd	11.97	9.62	12.58	8.20
	F	32	X	67.44	63.22	50.53	80.16
			sd	16.17	11.01	14.13	12.30
10 + 11 (8:6-9:5)	M	31	X	70.19	67.09	55.29	82.07
			sd	10.82	9.08	10.68	8.12
	F	33	X	67.21	64.46	52.00	79.67
			sd	15.81	11.94	14.27	12.89
11 + 12 (9-9:11)	M	28	X	74.04	68.57	58.18	84.43
			sd	9.18	9.38	9.82	7.36
	F	28	X	75.43	70.75	61.07	85.11
			sd	12.08	10.10	13.18	9.05
12 + 13 (9:6-10:5)	M	20	X	79.15	74.50	65.20	88.45
			sd	8.94	10.72	12.54	6.41
	F	29	X	78.89	73.21	64.69	87.41
			sd	10.21	9.64	13.02	6.20
13 + 14 (10-10:11)	M	19	X	82.84	78.74	69.89	91.68
			sd	7.39	7.23	10.84	3.88
	F	25	X	81.68	76.64	69.20	89.12
			sd	9.53	10.69	13.73	5.88
14 + 15 (10:6-11:5)	M	20	X	85.00	78.95	71.00	92.95
			sd	7.39	7.95	10.64	3.89
	F	32	X	84.22	79.03	72.59	90.66
			sd	9.43	8.05	11.56	5.52
15 + 16 (11-11:11)	M	20	X	87.05	80.15	74.10	93.10
			sd	5.81	8.73	9.55	3.86
	F	29	X	84.17	77.10	70.76	90.52
			sd	9.28	7.32	10.47	5.39

KEY M = MALE; F = FEMALE; N = SAMPLE SIZE; X = MEAN; sd = STANDARD DEVIATION; ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY CV = CONCEPTUAL VOCABULARY

TABLE 4.6(i) RESULTS OF STATISTICAL ANALYSES RELATING TO GENDER DIFFERENCES IN LEXICAL PROFICIENCY, BETWEEN SAMPLES WITH AN AGE RANGE OF 12 MONTHS

AGE			LINGUISTIC VARIABLES				
CODES	N(M/F)		ENG	SPAN	BIL	CV	CONCLUSIONS
01+02 (4-4:11)	15/18	DG	F	M	M	M	MALE dominance in All LVs but English but NONE significant
		U	128.5	83.5	126.5	111.5	
		p	NS	NS	NS	NS	
02+03 (4:6-5:5)	12/12	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	58	51.5	51.5	49.5	
		p	NS	NS	NS	NS	
03+04 (5-5:11)	14/10	DG	F	F	F	F	FEMALE dominance in All LVs but ONLY *significant* in SPANISH
		U	49	35	49	42	
		p	NS	<.05	NS	NS	
04+05 (5:6-6:5)	20/22	DG	F	M	F	F	FEMALE dominance in English, Bilinguality & Conceptual Vocabulary Male dominance in Spanish. NONE significant
		U	217	200.5	216	203.5	
		p	NS	NS	NS	NS	
05+06 (6-6:11)	33/35	DG	M	M	M	M	MALE dominance in all LVs but NONE significant
		U	464	481	447	463.5	
		p	NS	NS	NS	NS	
06+07 (6:6 7:5)	34/31	DG	M	M	M	M	MALE dominance in all LVs but ONLY *significant* in BILINGUALITY
		U	382	430.5	343.5	414	
		p	NS	NS	=.016	NS	
07+08 (7-7:11)	29/28	DG	M	M	M	M	MALE dominance in All LVs but *significance* ONLY in ENGLISH and BILINGUALITY
		U	258.5	285	232	289.5	
		p	=.018	NS	=.005	NS	
08+09 (7:6-8:5)	27/27	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	336	333	315.5	347	
		p	NS	NS	NS	NS	
09+10 (8-8:11)	25/32	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	372.5	347	366	380	
		p	NS	NS	NS	NS	
10+11 (8:6-9:5)	31/33	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	465.5	469	469.5	484.5	
		p	NS	NS	NS	NS	
11+12 (9-9:11)	28/28	DG	F	F	F	F	FEMALE dominance in ALL LVs. NONE significant
		U	364.5	349.5	346	381	
		p	NS	NS	NS	NS	
12+13 (9:6-10:5)	20/29	DG	M	M	M	M	MALE dominance in All LVs. NONE significant
		U	288	258.5	281	250.5	
		p	NS	NS	NS	NS	

Table 4.6(i) (Continued)

AGE CODES	N(M/F)		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV	CONCLUSIONS
13+14 (10-10:11)	19/25	DG	M	M	M	M	MALE dominance in All LVs. NONE significant
		U	226.5	230	235	180	
		p	NS	NS	NS	NS	
14+15 (10:6-11:5)	20/32	DG	M	F	F	M	MALE dominance in English & Conceptual Vocabulary. Female dominance in Spanish and Bilinguality. NONE significant
		U	317	313.5	290.5	242	
		p	NS	NS	NS	NS	
15+16 (11-11:11)	20/29	DG	M	M	M	M	MALE dominance in All LVs but NONE significant
		U	245	219.5	236.5	208	
		p	NS	NS	NS	NS	

KEY N (M/F) = SAMPLE SIZE FOR MALES (M) & FEMALES (F)

ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY;

CV = CONCEPTUAL VOCABULARY; DG = DOMINANT GENDER (M = MALE;

F = FEMALE) U = MANN-WHITNEY U TEST VALUES; p = Probability (2 Tailed)

NS = NOT SIGNIFICANT

AGE CODES	DOMINANT GENDER	LINGUISTIC VARIABLE
03+04 (5-5:11)	F	SPANISH
06+07 (6:6-7:5)	M	BILINGUALITY
07+08 (7-7:11)	M M	ENGLISH BILINGUALITY

TABLE 4.6(ii) SUMMARY OF SIGNIFICANT GENDER DIFFERENCES AND DOMINANCE IN LEXICAL PROFICIENCY, RELEVANT CONCATENATED AGE CODES AND LINGUISTIC VARIABLES

2. School Differences

Two major sets of statistical analyses were conducted. In the first, the results of Trial 1 for *both* genders were *concatenated*. Table 4.7(i) below, shows the means and standard deviations (for lexical *proficiency*) for *each* school (*disregarding* gender), in each linguistic variable and for all age codes. It also shows the results of statistical analyses, providing appropriate statistical test values (*Kruskal-Wallis One Way Analysis of*

Variance H, and *Mann-Whitney U* test values) and significance levels. It has already been established that *Gender* differences in lexical *proficiency* were at best *negligible*. Concatenation of the *genders* allowed larger samples for statistical analyses, thus providing results which are more likely to approximate the normal distribution.

Table 4.7(ii) below summarises the results of these analyses indicating in which age code and linguistic variable significant difference in lexical *proficiency* resulted, and which *school* was superior in each linguistic variable.

Summary

There was no consistent pattern of significant lexical *superiority* involving any one of the *First* schools though subjects in Age Codes 05 and 06 (Age 6-6:11 years) attending School B (located in the south of the City and in which reside many white collar and professional people) showed some dominance in most cases when significance was indicated (See Table 4.7(ii), below). Ranking second was School C (located in the north, with a mainly working class population). School A (located in the City with a mixed socio-economic residency) ranked third. This ranking was not entirely unexpected given the socio-economic demography.

For the *Middle* schools, school "E" showed a lexical superiority at most ages and in nearly all linguistic variables. This superiority was reflected *significantly*, as follows:

In *all* linguistic variables at Age Codes 10 (Age 8:6-8:11 years) and 14 (Age 10:6-10:11 years); in *all but* CV at Age Code 12 (Age 9:6-9:11 years); in all *but* English at Age Code 13 (Age 10-10:5 years); in *only* English and Bilinguality at Age Code 15 (Age 11-11:5 years); and in *no* linguistic variable at Age Code 16 (Age 11:6-12 years). School D showed a *non-significant* superiority in *all* linguistic variables at Age Code 09 (Age 8-8:5 years), and in all *but* Bilinguality in Age Code 11 (Age 9-9:5 years).

Whereas the lexical superiority of one school over the other was more common in the *Middle* schools, there were only two of these, and the superiority was *not* always significant in *all* linguistic variables. There was thus, *not* a clear pattern of lexical superiority. It is therefore, not possible to make any general conclusions about the superiority of one school over another.

The second battery of statistical tests was conducted on the data for *each gender* (See Table 4.8(i), below) *across* schools to establish if there were any significant *school* differences for each gender.

TABLE 4.7(i) MEANS AND RESULTS OF STATISTICAL ANALYSES FOR COMPARISONS OF LEXICAL PROFICIENCY, ACROSS SCHOOLS (DISREGARDING GENDER), ACCORDING TO LINGUISTIC VARIABLE AND AGE CODE

		LINGUISTIC VARIABLES											
		ENG			SPAN			BIL			CV		
AGE		FIRST SCHOOLS											
CODES		A	B	C	A	B	C	A	B	C	A	B	C
01#													
N1=12	X	38.3	39	45	45.9	44	40	22.4	25	27	61.8	58	58
N2=2†	H		1.338			3.028			2.099			0.63	
N3=6	+p		NS			NS			NS			NS	
02													
N1=6	X	34.8	44.7	42	43.5	47.2	54	21.5	28.8	54	56.8	63	67
N2=6	H		2.077			0.78			1.589			2.055	
N3=1†	p		NS			NS			NS			NS	
03#													
N1=6	X	41.7	50	38.3	54	49	40.7	28.7	35	27.3	67	64	59.7
N2=2†	H		1.911			1.016			1.256			2.053	
N3=3†	p		NS			NS			NS			NS	
04													
N1=9	X	30.6	-	42.3	38.2	-	50.8	18.3	-	27.8	50.4	-	65.3
	U		6			8			8			6.5	
N3=4	p		NS			NS			NS			NS	
05#													
N1=13	X	36.9	66	49.9	43.4	54	57.1	25.3	43.4	33.5	55	76.6	66.5
N2=8	H		15.96			9.521			11.97			14.89	
N3=8	p		.0003			.0086			.0025			.0006	
06#													
N1=10	X	41.9	66.5	53.2	54.1	56.4	55.9	31.6	46.7	39.3	64.4	76.1	69.8
N2=17	H		16.89			0.304			10.31			8.629	
N3=12	p		.0003			NS			.0058			.0134	
07													
N1=11	X	60.3	-	53.5	61.4	-	55.5	43.8	-	38.9	77.8	-	70
	U		52.5			57			58			41.5	
N3=15	p		NS			NS			NS			<.05	
08													
N1=11	X	61.5	-	51.4	66	-	56.3	49	-	38.9	78.5	-	68.8
	U		41			33			41			35.5	
N3=20	p		.002			.001			.002			.001	

† THOUGH THESE SAMPLES ARE TOO SMALL FOR THEIR *MEANS* TO BE MEANINGFUL, THE KRUSKAL-WALLIS TEST ALLOWS FOR THE ANALYSIS OF SAMPLES AS SMALL AS THESE (See Miller, 1984)

Table 4.7(i) (Continued)

AGE CODES		LINGUISTIC VARIABLES: ENG D	ENG E	SPAN D	SPAN E	BIL D	BIL E	CV D	CV E
		MIDDLE SCHOOLS							
09									
N1= 8	X	75.4	70.7	68.4	65.4	58.6	52.3	85.1	83.9
N2=15	U	48.5		54.5		46		55.5	
	p	NS		NS		NS		NS	
10									
N1=13	X	56.5	71.3	54.6	70.0	41.8	56.0	69.4	85.3
N2=21	U	61		32.5		58		32	
	p	.004		<.001		.003		.000	
11									
N1=16	X	72.4	71.7	67.7	67.4	56.4	57.6	83.6	81.5
N2=14	U	111		104		99		106	
	p	NS		NS		NS		NS	
12									
N1=16	X	73.9	84	68.1	78.6	56.7	72.3	85.3	90.3
N2=10	U	35		25.5		22		44	
	p	<.02		<.02		<.002		NS	
13									
N1= 6	X	73.3	82.8	67.2	78.5	55.8	71.5	84.7	89.9
N2=17	U	22.5		17		15		21.5	
	p	NS		<.02		<.02		<.05	
14									
N1=11	X	79.1	89.8	74.1	85.9	63	81.5	90.2	94.2
N2=10	U	14.5		5		5.5		26	
	p	<.02		<.002		<.002		<.05	
15									
N1=13	X	80	88.2	75.8	80.4	67.1	75.7	88.8	92.9
N2=18	U	57		76		61		68	
	p	<.02		NS		<.05		NS	
16									
N1=11	X	85.6	87.6	76.8	80	70.2	75.3	92.3	92.3
N2= 7	U	33.5		29		28		37	
	p	NS		NS		NS		NS	

#**N.B.** The data within these age codes were also subjected to a non-parametric two way analysis of variance (*Wilson's Distribution-Free Analysis of Variance*) - See comments in section below entitled ***Interactional Effects.***

KEY N = SAMPLE SIZE; X = MEAN; H = KRUSKAL-WALLIS TEST VALUE; U = MANN-WHITNEY TEST VALUE; p = Probability (2 Tailed); ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY; CV = CONCEPTUAL VOCABULARY

FIRST SCHOOLS RANKED# ACCORDING TO MEANS					
AGE CODES	LINGUISTIC VARIABLES ENG	SPAN	BIL	CV	SIGNIFICANT
05 (6-6:5)	B,C,A	C,B,A	B,C,A	B,C,A	IN ALL LVs
06 (6:6-6:11)	B,C,A	B,C,A	B,C,A	B,C,A	IN All except Spanish
07† (7-7:5)	SCHOOL "A" HAD LARGER MEANS THAN SCHOOL "C". BUT SIGNIFICANCE WAS ONLY INDICATED IN THE				In CV Only
08† (7:6-7:11)	LVs INDICATED IN RIGHT HAND COLUMN.				IN ALL LVs
MIDDLE SCHOOLS					
10 (8:6-8:11)					IN ALL LVs
12 (9:6-9:11)	SCHOOL "E" HAD SIGNIFICANTLY LARGER				IN All except CV
13 (10-10:5)	MEANS THAN "D" IN LVs INDICATED IN				IN All except Eng
14 (10:6-10:11)	RIGHT HAND COLUMN OF THIS TABLE				IN ALL LVs
15 (11-11:11)					In ENG & BIL

#Ranked in order of greatness. †Only two schools in this age code

TABLE 4.7(ii) SUMMARY OF SCHOOL DOMINANCE, RELEVANT LINGUISTIC VARIABLE AND AGE CODE

Summary

The incidence of *School* differences in lexical *proficiency* seem to be higher than *Gender* differences. However, there does *not* seem to be a consistent pattern in the resultant *school* differences in lexical *proficiency* which can be attributed to *all* linguistic variables, for *both* genders, in any *one* particular age group.

Significant differences in lexical *proficiency*, in *at least one* linguistic variable were noted in 9 age groups; *seven* others, therefore, were not affected. Within the former, *both* genders were implicated in only 3 age groups (06 - Age 6:6-6:11 years; 10 - Age 8:6-8:11 years; and 14 - Age 10:6-10:11 years). However, *all* LVs were affected in only Age Codes 05 (Age 6-6:5 years) for *Females*, in 08 (Age 7:6-7:11 years) for *Males*, in Age Code 10 (Age 8:6-8:11 years) for *Females* and in Age Code 12 (Age 9:6-9:11 years) for *Females*.

TABLE 4.8(i) RESULTS OF STATISTICAL ANALYSES SHOWING SCHOOL DIFFERENCES IN LEXICAL PROFICIENCY ACCORDING TO GENDER

		FIRST SCHOOLS				LINGUISTIC VARIABLES			
AGE		A	B	C					
CODES	SEX	N1	N2	N3		ENG	SPAN	BIL	CV
01# (4-4:5)	M	7	1	1	H	3.381	0.845	3.352	2.228
					p	NS	NS	NS	NS
	F	5	1	5	H	5.284	2.74	0.922	0.248
					p	<.046	NS	NS	NS
02 (4:6-4:11)	M	2	3	1	H	0.429	0.95	0.429	0.11
					p	NS	NS	NS	NS
	F	4	3	-	U	2	4	2	4
					p	NS	NS	NS	NS
03# (5-5:5)	M	4	1	1	H	3.571	1.415	2.823	2.143
					p	NS	NS	NS	NS
	F	2	1	2	H	0	3	0.158	3.158
					p	NS	NS	NS	NS
04 (5:6-5:11)	M	6	-	2	U	2	2	2	2
					p	NS	NS	NS	NS
	F	3	-	2	U	1	2	2	2
					p	NS	NS	NS	NS
05# (6-6:5)	M	4	4	4	H	5.278	2.423	0.782	3.533
					p	NS	NS	NS	NS
	F	9	4	4	H	9.475	8.914	11.079	9.542
					p	<.01	<.02	<.01	<.01
06# (6:6-6:11)	M	5	10	6	H	9.791	1.352	7.777	7.269
					p	<.01	NS	<.05	<.05
	F	5	7	6	H	8.046	1.904	4.094	3.247
					p	<.02	NS	NS	NS
07 (7-7:5)	M	6	-	7	U	13	15.5	20.5	10
					p	NS	NS	NS	NS
	F	5	-	8	U	11	11	11	10.5
					p	NS	NS	NS	NS
08 (7:6-7:11)	M	5	-	11	U	3	2.5	2	5
					p	<.01	<.01	=.002	<.02
	F	6	-	9	U	12	13	13.5	11.5
					p	NS	NS	NS	NS

See Results in next Section entitled ***Interactional Effects***

Table 4.8(i) (Continued)

MIDDLE SCHOOLS

AGE CODES	SEX	D N1	E N2		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
09 (8-8:5)	M	4	7	U	12	13	13.5	14
				p	NS	NS	NS	NS
	F	4	8	U	12	11	10.5	13.5
				p	NS	NS	NS	NS
10 (8:6-8:11)	M	4	10	U	12	5	10	4.5
				p	NS	=.05	NS	<.05
	F	9	11	U	19.5	11	22	10
				p	<.05	<.01	<.05	=.002
11 (9-9:5)	M	9	8	U	34	36	33.5	35
				p	NS	NS	NS	NS
	F	7	6	U	20	19.5	19.5	14
				p	NS	NS	NS	NS
12 (9:6-9:11)	M	7	4	U	12	8	7	12.5
				p	NS	NS	NS	NS
	F	9	6	U	6	5	6	6.5
				p	<.02	=.01	<.02	<.02
13 (10-10:5)	M	3	6	U	5	2	2.5	3
				p	NS	NS	NS	NS
	F	3	11	U	3	4.5	1.5	3.5
				p	=.05	NS	<.05	NS
14 (10:6-10:11)	M	8	2	U	0	0.5	0	1
				p	=.044	NS	=.044	NS
	F	3	8	U	4	1.5	1.5	5
				p	NS	=.036	=.036	NS
15 (11-11:5)	M	5	5	U	4.5	7	7	4.5
				p	NS	NS	NS	NS
	F	8	13	U	24.5	29.5	23.5	30.5
				p	NS	NS	<.05	NS
16 (11:6-11:11)	M	6	4	U	9.5	11	11	9
				p	NS	NS	NS	NS
	F	5	3	U	4	5	3	6
				p	NS	NS	NS	NS

KEY M = MALE; F = FEMALE; U = MANN-WHITNEY U TEST VALUE; H = KRUSKAL-WALLIS TEST VALUE; p = Probability (2 Tailed); NS = NOT SIGNIFICANT; ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY; CV = CONCEPTUAL VOCABULARY

Significant *school* differences in *each* gender have been indicated as shown in Table 4.8(ii), below.

SCHOOLS	AGE CODES	SEX	LVs
FIRST	01 (4-4:5)	F	ENG
	#05 (6-6:5)	F	ALL LVs
	#06 (6:6-6:11)	M F	ENG, BIL, CV ENG
	08 (7:6-7:11)	M	ALL LVs
MIDDLE	10 (8:6-8:11)	M F	SPAN & CV ALL LVs
	12 (9:6-9:11)	F	ALL LVs
	13 (10-10:5)	F	ENG & BIL
	14 (10:6-10:11)	M F	ENG & BIL SPAN & BIL
	15 (11-11:5)	F	BIL

#N.B. See results of analyses to establish *Interactional Effects* between *Gender* and *School.*

TABLE 4.8(ii) SUMMARY OF SIGNIFICANT SCHOOL DIFFERENCES IN LEXICAL PROFICIENCY FOR EACH GENDER

3. Interactional Effects

Results of the *Wilson's Distribution-Free Analysis of Variance* conducted on Age Codes 01, 03, 05, 06 indicated *no* significant *Gender* differences in lexical *proficiency*, in any linguistic variable. Significant *School* differences in lexical *proficiency* are indicated for Age Codes 05 (Age 6-6:5 years) in *all* linguistic variables, and in Age Code 06 (Age 6:6-6:11 years) in *English*, *Bilinguality* and *Conceptual Vocabulary*. Both these sets of results concurred with those obtained by employing The *Mann-Whitney U* test (See Table 4.2, earlier) and the *Kruskal-Wallis One-Way Analysis of Variance* (See Table 4.7(i)) to establish the statistical significance of *gender* and *school* differences, respectively. However, significant *Interactional Effects* were indicated *only* in Age Code 06 (Age 6:6-6:11 years) and in only *Conceptual Vocabulary*. This might be an indication that much of the independent *gender* differences and *school* differences cancel each other out as a result of their interaction with each other.

These results indicated that there was *no* clear pattern of *school* or *gender* differences in lexical *proficiency*, when related to either age code or linguistic variable.

4.5.3 Lexical Development (Cross-sectional Study based on Trial 1, and Longitudinal Study based on Several Trials)

Lexical *development* was measured in *two* major ways. The means between *neighbouring* age codes in Trial 1 (i.e. *cross-sectional* study), were compared (See Tables 4.1 earlier, and 4.9, 4.10(i), below). The significance of any differences was established by employing three sets of analyses. The first *two* sets involved the samples comprising *both* genders (i.e. the whole group, *disregarding* gender differences). Comparisons were made between (a) *neighbouring* age codes of 6 months difference, e.g. 01 v. 02, and (b) *alternate* age codes e.g. 01 v. 03, of 12 months difference (See Table 4.11(i), below). The *third* set of analyses allowed for *gender* comparisons (See Table 4.12(i), below).

Lexical *development* was also statistically analysed using *longitudinal* data. The means for the *four* trials were calculated and the differences statistically analysed.

a) Lexical Development for the Whole Group (Cross-sectional Study)

(i) 6 Months Interval

The means of the *whole* group/sample, within each age code, were inspected (Table 4.9, below) to determine whether they increased with age. This would indicate lexical *development* with age (See Table 4.10 (i), following 4.9, below).

Summary

(i) The general *trend* indicated that lexical *development* did occur with age. This was evident for *all* linguistic variables in 9 of the 15 comparisons (See Table 4.10(ii), below), though statistical significance was *not* always indicated.

(ii) Where lexical development with age was indicated in *all* linguistic variables, it was statistically significant in only *four* cases, these being between the following age codes: 05 (Age 6-6:5 years) and 04 (Age 5:6-5:11 years); Age Codes 06 (Age 6:6-6:11 years) and 05 (Age 6-6:5 years); Age Code 09 (Age 8-8:5) and 08 (Age 7:6-7:11); Age Codes 12 (Age 9:6-9:11 years) and 11 (Age 9-9:5 years).

(iii) In another two comparisons, development with age was indicated in 3 out of the 4 linguistic variables, as follows: between Age Codes 02 (Age 4:6-4:11 years) and 01 (Age 4-4:5 years) in *all* linguistic variables *but English*, and between Age Codes 15 (Age 11-11:5 years) and 15 (Age 11-11:5 years) in *all* linguistic variables *but Spanish*. In neither of these two comparisons however, was the development statistically significant.

(iv) Development in only *two* linguistic variables was indicated as follows: between Age Codes 08 (Age 7:6-7:11 years) and 07 (Age 7-7:5 years) in *Spanish and Bilinguality*, and between Age Codes 16 (Age 11:6-11:11 years) and 14 (Age 10:6-10:11 years) in *English and Bilinguality*.

(v) Only in two out of the fifteen comparisons did the *younger* subjects seem to have performed better than the *older* ones in *all* linguistic variables. This occurred between Age Codes 03 (Age 5-5:5 years) and 04 (Age 5:6-5:11 years), and between Age Codes 09 (Age 8-8:8:5 years) and 10 (Age 8:6-8:11 years), respectively. However, these results were statistically significant in only *one* case when the *Conceptual Vocabulary* of subjects in Age Code 03 (Age 5-5:5 years) was superior to that of subjects in Age Code 04 (Age 5:6-5:11 years).

			LINGUISTIC VARIABLES			
AGE CODES	N		ENG	SPAN	BIL	CV
01	20	X	40.35	43.95	24.05	60.25
(4-4:5)		sd	10.13	9.05	9.17	7.69
02	13	X	39.92	46.00	25.46	60.46
(4:6-4:11)		sd	10.49	11.79	10.33	11.09
03	11	X	42.27	51.64	29.46	64.46
(5-5:5)		sd	7.85	7.54	5.89	7.19
04	13	X	34.15	42.08	21.23	55.00
(5:6-5:11)		sd	12.3	10.98	10.29	13.25
05	29	X	46.59	50.10	32.55	64.14
(6-6:5)		sd	15.48	10.80	11.71	12.79
06	39	X	56.08	55.64	40.56	71.15
(6:6-6:11)		sd	15.70	8.96	12.12	10.44
07	26	X	56.35	57.96	41.00	73.31
(7-7:5)		sd	14.01	10.42	11.23	11.14
08	31	X	54.97	59.71	42.48	72.19
(7:6-7:11)		sd	10.12	8.74	10.34	8.44
09	23	X	72.35	66.44	54.52	84.30
(8-8:5)		sd	11.75	8.74	12.39	6.85
10	34	X	65.65	64.15	50.62	79.18
(8:6-8:11)		sd	15.55	11.65	14.14	12.33
11	30	X	72.07	67.53	56.97	82.63
(9-9:5)		sd	10.22	9.27	9.96	8.72
12	26	X	77.81	72.12	62.69	87.23
(9:6-9:11)		sd	10.51	9.84	12.78	6.89
13	23	X	80.35	75.57	67.39	88.52
(10-10:5)		sd	8.51	10.11	12.42	5.49
14	21	X	84.19	79.71	71.81	92.09
(10:6-10:11)		sd	8.43	8.05	12.31	4.29
15	31	X	84.74	78.52	72.09	91.16
(11-11:5)		sd	8.88	7.94	10.45	5.52
16	18	X	86.39	78.06	72.17	92.28
(11:6-11:11)		sd	6.63	8.27	9.87	3.83

TABLE 4.9 MEANS AND STANDARD DEVIATIONS FOR TRIAL 1 LEXICAL PROFICIENCY IN EACH LINGUISTIC VARIABLE FOR ALL CHILDREN, ACCORDING TO EACH AGE CODE

Figure 2.1 below, illustrates graphically the development of lexical proficiency in each linguistic variable between neighbouring age codes (6 months interval) in Trial 1 (*cross-sectional* study)

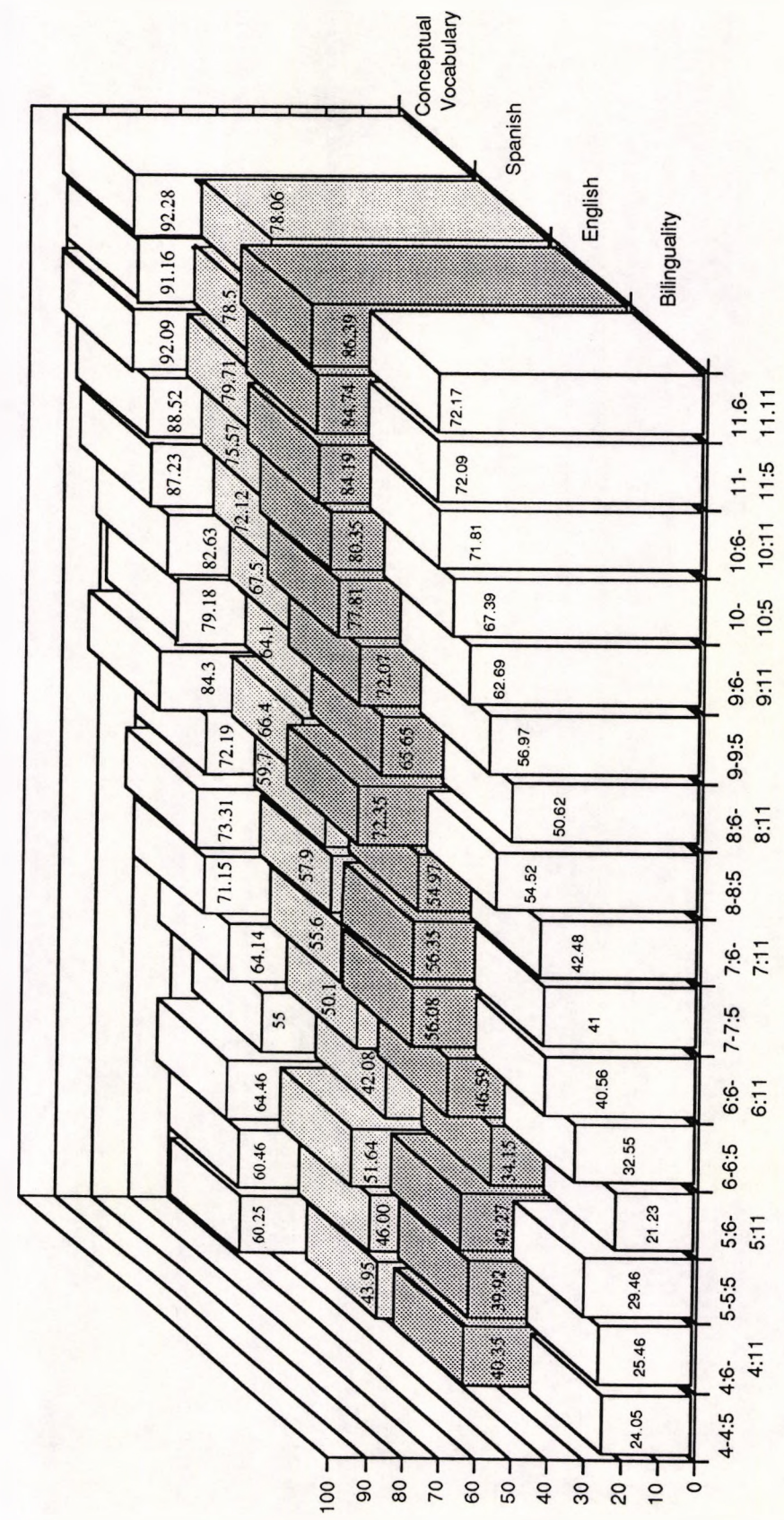


FIGURE 2.1 MEAN LEXICAL PROFICIENCY IN EACH LINGUISTIC VARIABLE FOR EACH AGE CODE

TABLE 4.10(i) RESULTS OF STATISTICAL ANALYSES RELATING TO LEXICAL DEVELOPMENT BETWEEN NEIGHBOURING AGE CODES (TRIAL 1) FOR ALL SUBJECTS

AGE CODES	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV	CONCLUSIONS
01/02 (4-4:11)	20/13	D.A.	01	02	02	02	Development with age in Spanish, Bilinguality and Conceptual Vocabulary (CV) but NONE significant
		U	123	120.5	125.5	130	
		p	NS	NS	NS	NS	
02/03 (4:6-5:5)	13/11	D.A.	03	03	03	03	Development with age in all Linguistic Variables (LVs) but NONE significant
		U	55	50	44	54	
		p	NS	NS	NS	NS	
03/04 (5-5:11)	11/13	D.A.	03	03	03	03	Superiority in *younger* age for all but *significant* ONLY in ENGLISH, SPANISH and BILINGUALITY
		U	42	36	38.5	44	
		p	=.05	<.025	<.05	NS	
04/05 (5:6-6:5)	13/29	D.A.	05	05	05	05	SIGNIFICANT development with age in ALL LVs
		U	102.5	120	95.5	116.5	
		p	=.0096	=.0307	=.0057	=.025	
05/06 (6-6:11)	29/39	D.A.	06	06	06	06	SIGNIFICANT development with age in ALL LVs
		U	376	408.5	355.5	382	
		p	=.0094	=.0256	=.0045	=.0113	
06/07 (6:6-7:5)	39/26	D.A.	07	07	07	07	Development with age in all LVs but NONE significant.
		U	487	446	505.5	448	
		p	NS	NS	NS	NS	
07/08 (7-7:11)	26/31	D.A.	07	08	08	07	Development with age in Spanish and Bilinguality but NOT significant
		U	381	363	381	372	
		p	NS	NS	NS	NS	
08/09 (7:6-8:5)	31/23	D.A.	09	09	09	09	SIGNIFICANT development with age in ALL LVs
		U	98.5	212	165.5	102	
		p	<.00003	=.0057	=.0005	<.00003	
09/10 (8-8:11)	23/34	D.A.	09	09	09	09	Superiority in *younger* age in All LVs but NONE significant
		U	292.5	364	352	307	
		p	NS	NS	NS	NS	
10/11 (8:6-9:5)	34/30	D.A.	11	11	11	11	SIGNIFICANT development with age in All LVs
		U	392	425.5	388.5	446.5	
		p	NS	NS	NS	NS	
11/12 (9-9:11)	30/26	D.A.	12	12	12	12	SIGNIFICANT development with age in ALL LVs
		U	277.5	279.5	275.5	271.5	
		p	=.0322	=.0344	=.0301	=.0256	

Table 4.10(i) (Continued)

AGE CODES	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV	CONCLUSIONS
12/13 (9:6-10:5)	26/23	D.A.	13	13	13	13	Development with age in All LVs but NONE significant
		U	260.5	242	238	263.5	
		p	NS	NS	NS	NS	
13/14 (10-10:11)	23/21	D.A.	14	14	14	14	Development with age in All LVs but ONLY *significant* in Conceptual Vocabulary
		U	183	180.5	188	144.5	
		p	NS	NS	NS	=.011	
14/15 (10:6-11:5)	21/31	D.A.	15	14	15	14	Development with age in English and Bilinguality but NOT significant
		U	310	289.5	320.5	296	
		p	NS	NS	NS	NS	
15/16 (11-11:11)	31/18	D.A.	16	15	16	16	Development with age in all but Spanish but NONE significant
		U	256	274	275	260	
		p	NS	NS	NS	NS	

KEY ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY

CV = CONCEPTUAL VOCABULARY; D.A. = DOMINANT AGE

U = MANN-WHITNEY U TEST VALUE; p = Probability (1 Tailed);

NS = NOT SIGNIFICANT

Figure 2.2 overleaf, illustrates graphically the development in lexical proficiency across the ages for each linguistic variable.

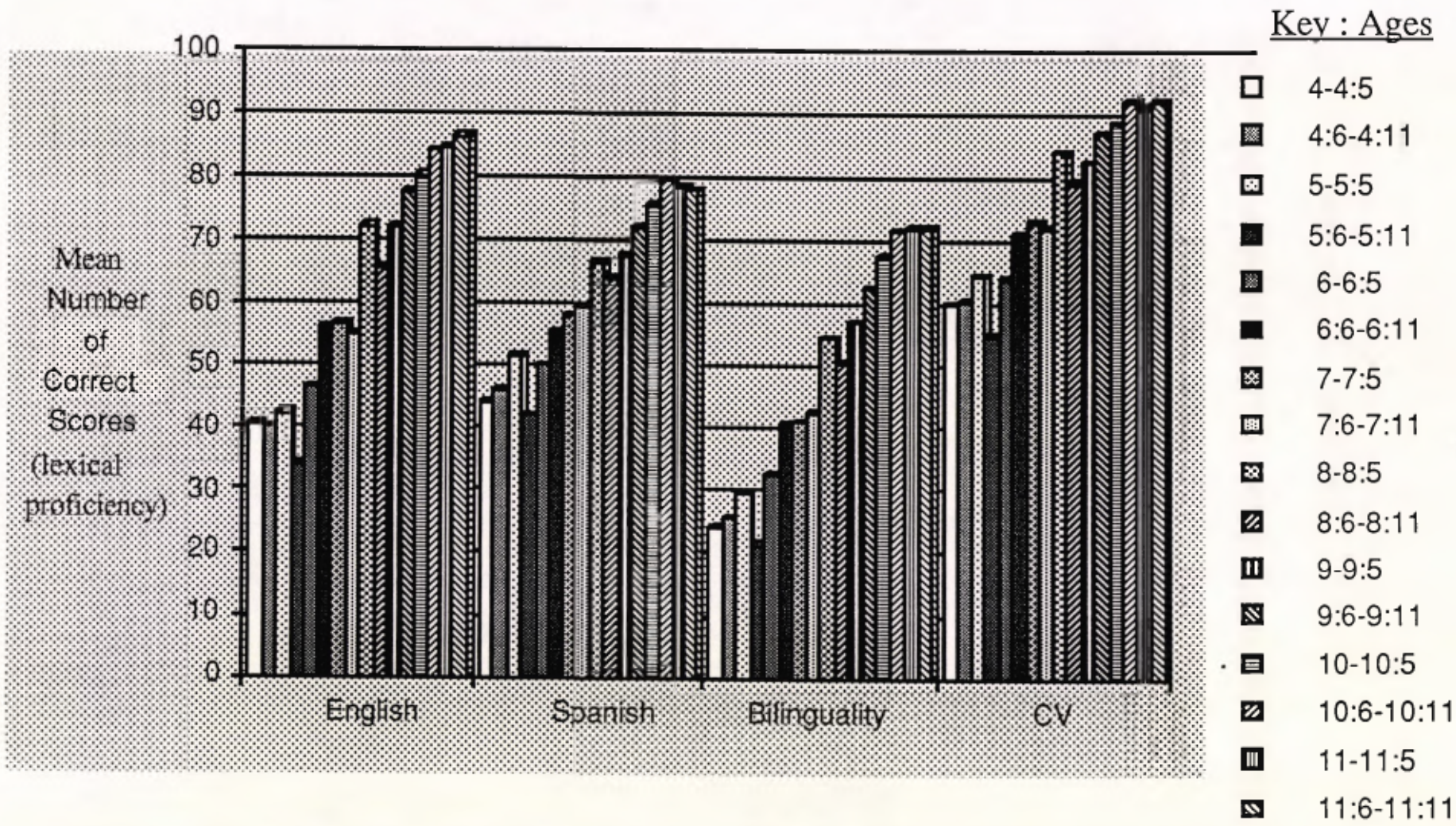


FIGURE 2.2 MEAN LEXICAL PROFICIENCY AT EACH AGE CODE WITHIN EACH LINGUISTIC VARIABLE

Statistically significant development was indicated as shown in Table 4.10(ii) below.

AGE DOMINANCE	LINGUISTIC VARIABLES	SIGNIFICANT
02 >01	In all but English	NO
03 >02	IN all LVs	NO
(03 >04	Dominance of 03 in all LVs)	Except for CV
05 >04	IN ALL LVs	YES
06 >05	IN ALL LVs	YES
07 >06	In all LVs	NO
08 >07	In Spanish and Bilinguality	NO
(07 08	In English and CV	No)
09 >08	IN ALL LVs	YES
(09 >10	Dominance of 09 in All LVs	No)
11 >10	In all LVs	NO
12 >11	IN ALL LVs	YES
13 >12	In all LVs	NO
14 >13	In all LVs	IN CV ONLY
15 >14	In English and Bilinguality	NO
(14 >15	In Spanish and CV	No)
16 >15	In all LVs but Spanish	NO

TABLE 4.10(ii) SUMMARY OF LEXICAL DEVELOPMENT WITH AGE (over 6 months intervals) IN EACH LINGUISTIC VARIABLE, AND SIGNIFICANCE (X >Y indicates superiority of X)

(ii) 12 Months Interval

Similar statistical analyses were conducted for comparisons between *alternate* age codes (e.g. 01 v. 03) *separated* by 12 months. Table 4.11(i) below, provides full details of the dominant *age* in each pair of age codes compared. Development with age is indicated, of course, when the *higher* age code of the pair is dominant.

Summary

As can be seen from Table 4.11(ii) below, significant lexical *development* with age is indicated in the *great* majority of linguistic variables throughout the different age groups, though this occurs *less* frequently in the earlier age codes (i.e. 01-05) than in the older ones.

AGE CODES	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
01/03	20/11	D.A.	03	03	03	03
(4-4:5/		U	91.5	61	56	76
5-5:5)		p	NS	.021	.013	NS
02/04	13/13	D.A.	02	02	02	02
(4:6-4:11/		U	63	66.5	64	66.5
5:6-5:11)		p	NS	NS	NS	NS
03/05	11/29	D.A	05	03	05	03
(5-5:5/		U	139.5	150	135.5	152
6-6:5)		p	NS	NS	NS	NS
04/06	13/39	D.A.	06	06	06	06
(5:6-5:11/		U	72.5	95.5	61.5	89
6:6-6:11)		p	<.001	.001	<.001	.000
05/07	29/26	D.A.	07	07	07	07
(6-6:5/		U	247	230.5	225	233.5
7-7:5)		p	.014	.007	.005	.008
06/08	39/31	D.A	06	08	08	08
(6:6-6:11/		U	545.5	471.5	578	591.5
7:6-7:11)		p	NS	NS	NS	NS
07/09	26/23	D.A	09	09	09	09
(7-7:5/		U	107	174.5	123.5	127
8-8:5)		p	<.001	.006	<.001	.000
08/10	31/34	D.A.	10	10	10	10
(7:6-7:11/		U	304.5	376.5	333.5	316.5
8:6-8:11)		p	.002	.024	.006	.003
09/11	23/30	D.A.	09	11	11	09
(8-8:5/		U	332.5	296	280.5	312
9-9:5)		p	NS	NS	NS	NS
10/12	34/26	D.A.	12	12	12	12
(8:6-8:11/		U	237.5	263.5	240.5	264.5
9:6-9:11)		p	.001	.004	.002	.004
11/13	30/23	D.A.	13	13	13	13
(9-9:5/		U	183	199.5	180	197.5
10-10:5)		p	.002	.005	.002	.004
12/14	26/21	D.A.	14	14	14	14
(9:6-9:11/		U	181	144.5	162	149.5
10:6-10:11)		p	.024	.003	.009	.004
13/15	23/31	D.A.	15	15	15	15
(10-10:5/		U	247.5	310.5	287	249
11-11:5)		p	.028	NS	NS	.029
14/16	21/18	D.A.	16	14	16	16
(10:6-10:11/		U	162	169	186.5	189
11:6-11:11)		p	NS	NS	NS	NS

KEY N= SAMPLE SIZE; D.A. = DOMINANT AGE; ENG = ENGLISH;

SPAN = SPANISH; BIL = BILINGUALITY; CV = CONCEPTUAL VOCABULARY;

U= MANN-WHITNEY U TEST VALUE; p = Probability (1 tailed)

TABLE 4.11(i) RESULTS OF STATISTICAL ANALYSES RELATING TO LEXICAL DEVELOPMENT BETWEEN AGE CODES SEPARATED BY A 12-MONTH INTERVAL

Of the *fourteen* comparisons between age codes with 12 months intervals, lexical *development* in *all* linguistic variables was indicated in *nine*, *7* of which were statistically significant. Again there are a few comparisons which indicate a *superior* performance by the *younger* subjects (See Table 4.11(ii) below) but in *none* of these cases is there any statistical significance. There was a greater *incidence* of significant lexical *development* over intervals of *12* months than there has been over intervals of 6 months (See Table 4.10(ii), earlier).

AGE DOMINANCE	LINGUISTIC VARIABLES	SIGNIFICANT
03>01	In All LVs	In Spanish and Bilinguality
(02>04	In all LVs	NO)
05>03	English and Bilinguality	NO
(03>05	Spanish and CV	NO)
06>04	IN ALL LVs	YES
07>05	IN ALL LVs	YES
08>06	In Spanish, CV and Bilinguality	NO
(06>08	In English	NO)
09>07	IN ALL LVs	YES
10>08	IN ALL LVs	YES
11>09	In Spanish and Bilinguality	NO
(09>11	In English and CV	NO)
12>10	IN ALL LVs	YES
13>11	IN ALL LVs	YES
14>12	IN ALL LVs	YES
15>13	In All LVs	In English and CV
16>14	In English, CV and Bilinguality	NO
(14>16	In Spanish	NO)

TABLE 4.11(ii) SUMMARY OF LEXICAL DEVELOPMENT WITH AGE (i.e. between alternate age codes separated by a 12 month interval) IN EACH LINGUISTIC VARIABLE, AND SIGNIFICANCE (X >Y indicates superiority of X)

b) Lexical Development in Each Gender (Cross-sectional Study)

Lexical *development* by *each* gender was indicated as shown in Table 4.12(i) below. The results are summarised in Table 4.12(ii), below.

Summary

There would seem to be *no* clear or unequivocal pattern regarding a *gender* difference in lexical *development* between neighbouring age codes (separated by a mean age of 6 months). On several occasions, the lexical *proficiency* in the *preceding* age group was *higher* than in the *older* age group. However, most these differences were *not* significant.

The incidence of significant lexical *development* in any of the linguistic variables was almost the same for each gender but at different points. Where lexical development *was* statistically significant, the pattern regarding the particular gender and linguistic variable involved was *not* consistent. It can therefore, *not* be claimed that *generally*, there were *gender* differences affecting lexical *development*.

TABLE 4.12(i) RESULTS OF STATISTICAL ANALYSES RELATING TO LEXICAL DEVELOPMENT WITH AGE (6 MONTHS INTERVAL) IN EACH LINGUISTIC VARIABLE, AND IN EACH GENDER

AGE			LINGUISTIC VARIABLES				
CODES	SEX	N	ENG	SPAN	BIL	CV	CONCLUSIONS
01/02 (4-4:11)	M	9/6 DA	02	02	02	02	Development with Age in All LVs - ONLY significant in SPANISH and BILINGUALITY.
		U	16	8	11.5	14	
		p	NS	<.025	<.05	NS	
	F	11/7 DA	01	01	01	01	No development with age. 01 dominance throughout but NOT significant.
		U	26	26	22	25	
		p	NS	NS	NS	NS	
02/03 (4:6-5:5)	M	6/6 DA	03	02	02	02	Development with Age only in English. 02 dominance in other LVs. NONE significant.
		U	18	9.5	17.5	14	
		p	NS	NS	NS	NS	
	F	7/5 DA	03	03	03	03	DEVELOPMENT with Age in all LVs and SIGNIFICANT in ALL but English.
		U	10.5	3	5	5	
		p	NS	=.01	=.025	=.025	

Table 4.12(i) (Continued)

AGE CODES	SEX	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV	CONCLUSIONS
03/04 (5-5:11)	M	6/8	DA	03	03	03	03	NO development with Age in any LV. 03 Dominance *significant* ONLY in English.
			U	10	12.5	11	10.5	
			p	<.041	NS	NS	NS	
	F	5/5	DA	04	03	03	03	Superiority in earlier age in all but English. NONE significant.
			U	11.5	4.5	10	10.5	
			p	NS	NS	NS	NS	
04/05 (5:6-6:5)	M	8/12	DA	05	05	05	05	DEVELOPMENT with Age in ALL LVs - ALL SIGNIFICANT.
			U	10.5	16	11	10.5	
			p	<.005	<.01	<.01	<.005	
	F	5/17	DA	05	04	05	04	DEVELOPMENT with Age in English and Bilinguality. 04 dominance in Spanish and Con. Vocab.NONE Significant
			U	40.5	42.5	36.5	38.5	
			p	NS	NS	NS	NS	
05/06 (6-6:11)	M	12/21	DA	06	06	06	06	Development with Age in All LVs but NONE Significant.
			U	97	123	100	104	
			p	NS	NS	NS	NS	
	F	17/18	DA	06	06	06	06	DEVELOPMENT with Age in ALL LVs and ALL SIGNIFICANT.
			U	86.5	75	75.5	85	
			p	<.025	=.005	<.01	<.025	
06/07 (6:6-7:5)	M	21/13	DA	07	07	07	07	Development with Age for All LVs but ONLY *significant* for SPANISH & CONCEPTUAL VOCABULARY.
			U	130	86	108	83.5	
			p	NS	=.0367	NS	=.0301	
	F	18/13	DA	06	06	06	06	Superiority in earlier age in all LVs but NONE significant
			U	94.5	98	86.5	99.5	
			p	NS	NS	NS	NS	
07/08 (7-7:11)	M	13/16	DA	07	07	07	07	Superiority in earlier age for all LVs but *significant* ONLY in CONCEPTUAL VOCABULARY.
			U	78.5	85	86	64	
			p	NS	NS	NS	<.05	
	F	13/15	DA	08	08	08	08	Development with age in All LVs but NONE significant.
			U	83.5	68.5	70.5	79.5	
			p	NS	NS	NS	NS	
08/09 (7:6-8:5)	M	16/11	DA	09	09	09	09	SIGNIFICANT development with age in ALL LVs.
			U	25	43.5	42	18.5	
			p	<.001	<.025	<.025	<.001	
	F	15/12	DA	09	09	09	09	*Significant* development with age in ALL LVs EXCEPT Spanish
			U	26	63	37.5	32.5	
			p	<.001	NS	<.01	<.005	

Table 4.12(i) (Continued)

AGE CODES	SEX	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV	CONCLUSIONS
09/10 (8-8:11)	M	11/14	DA	09	09	09	09	Superiority in earlier age in all LVs but NONE significant.
			U	56	65.5	64.5	48.5	
			p	NS	NS	NS	NS	
	F	12/20	DA	09	09	09	09	Superiority in early age in All LVs but NONE significant.
			U	91.5	118.5	115.5	103.5	
			p	NS	NS	NS	NS	
10/11 (8:6-9:5)	M	14/17	DA	11	11	11	11	Development with age in All LVs but none significant.
			U	86	108.5	91.5	101.5	
			p	NS	NS	NS	NS	
	F	20/13	DA	11	11	11	11	Development with age in All LVs but NONE significant.
			U	106.5	104	98	118.5	
			p	NS	NS	NS	NS	
11/12 (9-9:11)	M	17/11	DA	12	12	12	12	Development with age in All LVs but NONE significant.
			U	75	74	72.5	73	
			p	NS	NS	NS	NS	
	F	13/15	DA	12	12	12	12	Development with age in All LVs but ONLY *significant* in ENGLISH and BILINGUALITY.
			U	60.5	67	61	62.5	
			p	<.05	NS	<.05	NS	
12/13 (9:6-10:5)	M	11/9	DA	13	13	13	13	SIGNIFICANT Development with age in ALL LVs.
			U	25.5	20	15	26.5	
			p	<.05	<.025	<.005	<.05	
	F	5/14	DA	12	12	12	12	Superiority of earlier age in All LVs but NONE significant.
			U	96	100.5	103	93	
			p	NS	NS	NS	NS	
13/14 (10-10:11)	M	9/10	DA	13	13	13	14	Superiority of earlier age in all LVs but Conceptual Vocabulary. NONE significant.
			U	42.5	30.5	34	37	
			p	NS	NS	NS	NS	
	F	14/11	DA	14	14	14	14	SIGNIFICANT Development in ALL LVs.
			U	43.5	33	42	33.5	
			p	<.05	<.01	<.05	<.01	
14/15 (10:6-11:5)	M	10/10	DA	15	15	15	15	Development with age in All LVs but NONE significant.
			U	33	37	33	35	
			p	NS	NS	NS	NS	
	F	11/21	DA	14	14	14	14	Superiority of earlier age but ONLY *significant* in SPANISH.
			U	99.5	68	82	84.5	
			p	NS	=.0294	NS	NS	

Table 4.12(i) (Continued)

AGE CODES	SEX	N		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV	CONCLUSIONS
15/16 (11-11:11)	M	10/10	DA	15	15	16	15	Superiority of earlier age in all but Bilinguality. NONE significant.
			U	46	47.5	47.5	38.5	
			p	NS	NS	NS	NS	
	F	21/8	DA	16	15	15	16	Development with age in English and Conceptual Vocabulary. NONE significant
			U	71	78	77.5	66.5	
			p	NS	NS	NS	NS	

KEY ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY; CV = CONCEPTUAL VOCABULARY; DA = DOMINANT AGE; U = MANN-WHITNEY TEST VALUE; p = Probability (1 Tailed); NS = NOT SIGNIFICANT

TABLE 4.12(ii) SUMMARY OF RESULTS OF STATISTICAL ANALYSES OF LEXICAL DEVELOPMENT WITH AGE (6 MONTHS INTERVAL) RELEVANT TO GENDER AND LINGUISTIC VARIABLE

AGE DOMINANCE	GENDER	LINGUISTIC VARIABLES	SIGNIFICANT
02 >01	MALES	In all LVs	In SPANISH and BILINGUALITY
(01 >02	Females	In all LVs	No)
03 >02	MALES	In English	NO
	FEMALES	In All LVs	In All *but* English
(02 >03	Males	In all but English	No)
04 >03	FEMALES	In English	NO
(03>04	Males	In all LVs	Only in English)
	Females	In all but English	No)
05 >04	MALES	In ALL LVs	YES
	FEMALES	In English and Bilinguality	NO
(04 >05	Females	In Spanish & CV	No)
06 >05	BOTH GENDERS	In ALL LVs	In All LVs *but* for FEMALES only
07 >06	MALES	In All LVs	In SPANISH and CV
(06 > 07	Females	In all LVs	No)
08 >07	FEMALES	In All LVs	NO
(07>08	Males	In all LVs	Only in CV)
09 >08	BOTH GENDERS	In All LVs	In All LVs *except* in Spanish for Females

Table.12(ii) (Continued)

AGE DOMINANCE	GENDER	LINGUISTIC VARIABLES	SIGNIFICANT
(09>10	Both Genders	In all LVs	No)
11 >10	BOTH GENDERS	In All LVs	NO
12 >11	BOTH GENDERS	In All LVs	In ENGLISH and BILINGUALITY for FEMALES
13 >12	MALES	In ALL LVs	YES
(12>13	Females	In all LVs	No)
14 >13	MALES	In CV	NO
	FEMALES	In ALL LVs	YES
(13>14	Males	In all but CV	No)
15 >14	MALES	In All LVs	NO
(14>15	FEMALES	In all LVs	Only in Spanish)
16 >15	MALES	In BILINGUALITY	NO
	FEMALES	In ENGLISH and CV	NO
(15>16	Males	In English, Spanish and CV	No)
	(Females	Spanish and Bilinguality	No)

c) Lexical Development (Longitudinal Study)

Lexical *development* was also studied for subjects completing a number of Trials. All comparisons of performance in Trials 2, 3 and 4 were made in relation to Trial 1.

(i) Comparisons Between Trials 1 and 2 (6-8 months interval)

The *means* for each linguistic variable were calculated for each Trial (See Table 4.13.1(i), below). *Repeated measures* comparisons between subjects' performance in Trial 1 and the same subjects' performance in Trial 2 were statistically analysed by the *Wilcoxon Matched-Pairs Signed-Ranks T* test. Significance was indicated as indicated in Table 4.13.1(ii), below.

Summary

Almost without exception, performance in Trial 2 was *superior* to that in Trial 1. A developmental *trend* was therefore, indicated. However, not all differences were statistically significant. A *lack* of statistically *significant* development in *any* linguistic variable was noted in only *one* inter-trial sample (i.e. Age Code 03 - Age 5-5:5 years, at Trial 1 ; Age Code 04 i.e. Age 5:6-5:11 years, at Trial 2).

Statistically significant lexical *development* in only *one* linguistic variable (i.e. *Bilinguality*) was indicated in only *one* sample, this being 08 at Trial 1 (Age 7-7:5 years - Age Code 09 at Trial 2, i.e. Age 7:6-7:11 years).

It is of interest to note that there was statistically significant lexical *development* between Trials 1 and 2 in *English* and *Bilinguality* in *all* age codes (except between samples aged 5-5:5 at Trial 1) up to Age Code 07 at Trial 1 (Age 7-7:5 years or Age Code 08 at Trial 2 i.e. Age 7:6-7:11 years). However, similar differences in *Spanish* are not indicated (except at Age Code 04 in Trial 1 i.e. Age Code 05 in Trial 2). After Age Code 06 at Trial 1 (i.e. Age 6:6-6:11 years; Age Code 07 at Trial 2 i.e. Age 7-7:5 years) and with only *three* exceptions out of the *ten* age codes statistically analysed, significant lexical *development* is indicated between the two trials, in *all* linguistic variables.

TABLE 4.13.1(i) MEANS AND RESULTS OF STATISTICAL ANALYSES, ACCORDING TO AGE CODE, TO ESTABLISH LEXICAL DEVELOPMENT IN EACH LINGUISTIC VARIABLE FOR SUBJECTS COMPLETING TRIALS 1 & 2

				LINGUISTIC VARIABLES							
#AGE				ENG		SPAN		BIL		CV	
CODE	N	T/L		T1	T2	T1	T2	T1	T2	T1	T2
01	11	8m	X	38.6	43.5	45.8	48.7	22.6	27.4	61.8	64.8
			T	10.5		19.5		13		23.5	
			p	<.05		NS		<.05		NS	
02	10	7m	X	35.6	44.3	41.8	46.2	21.1	26.8	56.3	63.7
			T	10		15.5		6		13	
			p	<.05		NS		<.025		NS	
03	6	7m	X	41.1	43	48.7	48.3	27.7	28.5	62.2	62.8
			T	9		9		10		6	
			p	NS		NS		NS		NS	
04	10	7m	X	37.1	41.8	45.4	50	23.5	31.2	59	60.6
			T	10		10		4.5		18	
			p	<.05		<.05		<.01		NS	
05	16	7m	X	49.6	60.9	49.4	60.3	33.8	45.9	65.3	75.3
			T	5.5		6.5		0		11	
			p	<.005		<.005		<.005		<.005	
06	21	7m	X	60.9	69.5	55.9	64.8	44.2	51.8	72.6	82.6
			T	0		11		13.5		0	
			p	<.005		<.005		<.005		<.005	
07	9	8m	X	60.9	70.4	60.6	70	43.6	56.2	77.9	84.1
			T	3		3		0		7	
			p	=.01		=.01		<.005		<.05	

Table 4.13.1(i) Continued

#AGE CODE	N	T/L		LINGUISTIC VARIABLES ENG T1	ENG T2	SPAN T1	SPAN T2	BIL T1	BIL T2	CV T1	CV T2
08	12	8m	X	63	68.5	67.2	69.6	50.8	57.4	79.4	80.7
			T	19		27		15.5		25	
			p	NS		NS		<.05		NS	
09	3	6m	X	SAMPLE TOO SMALL FOR MEANINGFUL STATISTICAL ANALYSIS							
10	7	6m	X	56.7	65.6	56.1	68	42.6	54.9	70.1	79.7
			T	0		0		0		0	
			p	=.01		=.01		=.01		=.01	
11	10	6m	X	71	75.7	66.3	72.6	54.8	60.7	82.5	87.6
			T	9.5		0		8		0	
			p	NS		<.005		=.05		<.005	
12	10	7m	X	67.3	77.2	64.4	73.2	51.1	63.2	80.6	87.2
			T	10		0		0		2	
			p	<.05		<.005		<.005		<.005	
13	5	7m	X	74	78.4	68.4	80.2	58	69.2	84.4	89.4
			T	0		0		0		0	
			p	<.05		<.05		<.05		<.05	
14	10	7m	X	78.4	79.7	74.3	78.1	63.1	67.2	89.6	90.6
			T	21		8		7		19	
			p	NS		=.025		<.025		NS	
15	11	8m	X	79.6	88.1	75.2	83.2	66.5	77.9	88.3	93.4
			T	1		0		0		0	
			p	<.005		<.005		<.005		<.005	
16	9	8m	X	86.3	93.2	78	86.5	77.7	83.8	92.7	95.9
			T	0		3		2		0	
			p	=.005		=.01		=.005		=.005	

#AGE CODE AT TRIAL 1

KEY N = SAMPLE SIZE; T/L = TIME LAPSE IN MONTHS, BETWEEN TRIALS T1 & T2 = TRIALS ONE & TWO; X = MEAN; T = WILCOXON T TEST VALUE; p = Probability (1 Tailed); NS = NOT SIGNIFICANT

Figures 3.1a-3.1d overleaf, illustrate graphically the development of lexical proficiency in each linguistic variable between Trials 1 and 2, after an interval of 6-8 months (longitudinal study).

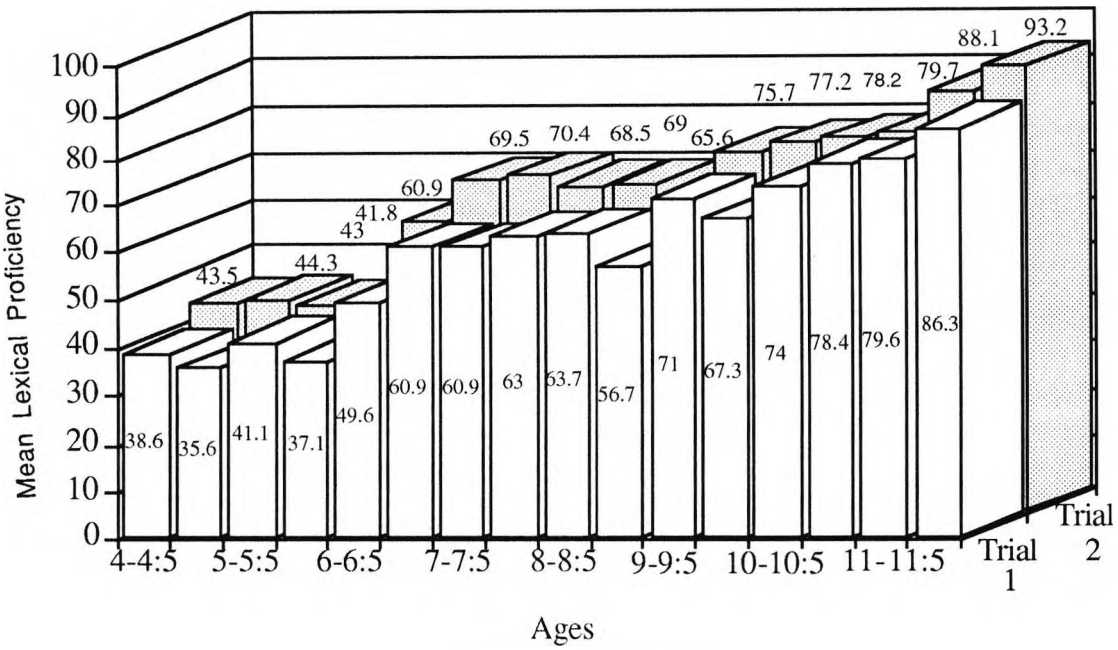


FIGURE 3.1a DEVELOPMENT OF LEXICAL PROFICIENCY IN ENGLISH BETWEEN TRIALS 1 & 2 (6-8 months interval)

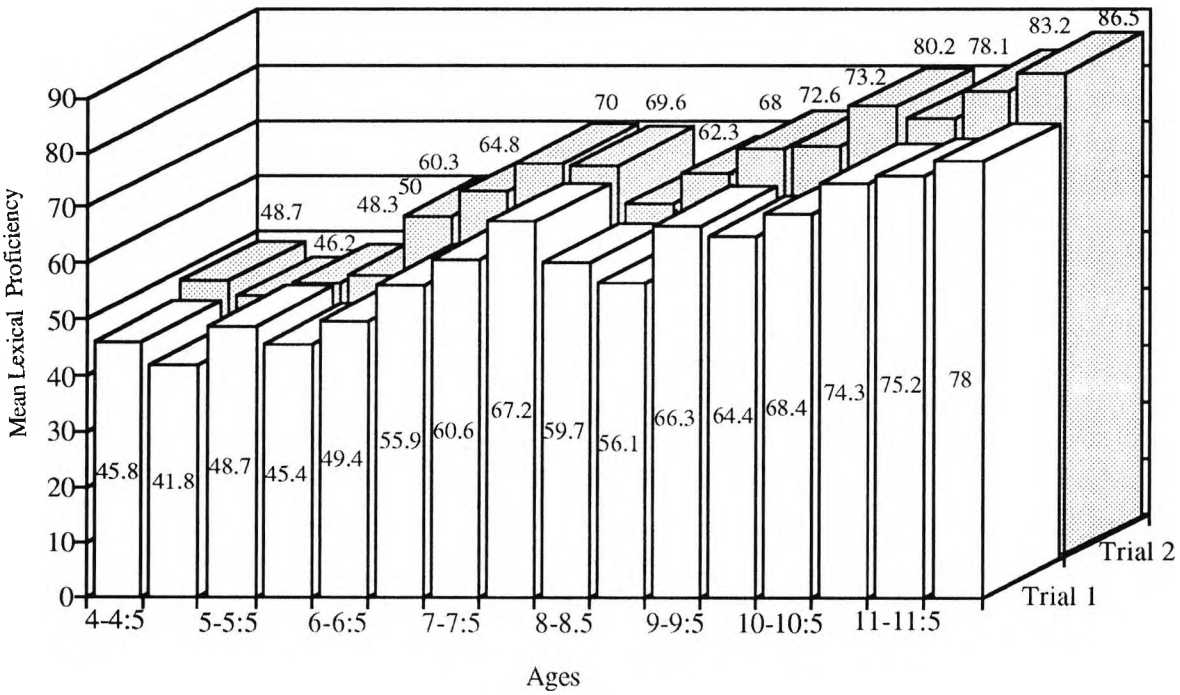


FIGURE 3.1b DEVELOPMENT OF LEXICAL PROFICIENCY IN SPANISH BETWEEN TRIALS 1 & 2 (6-8 months interval)

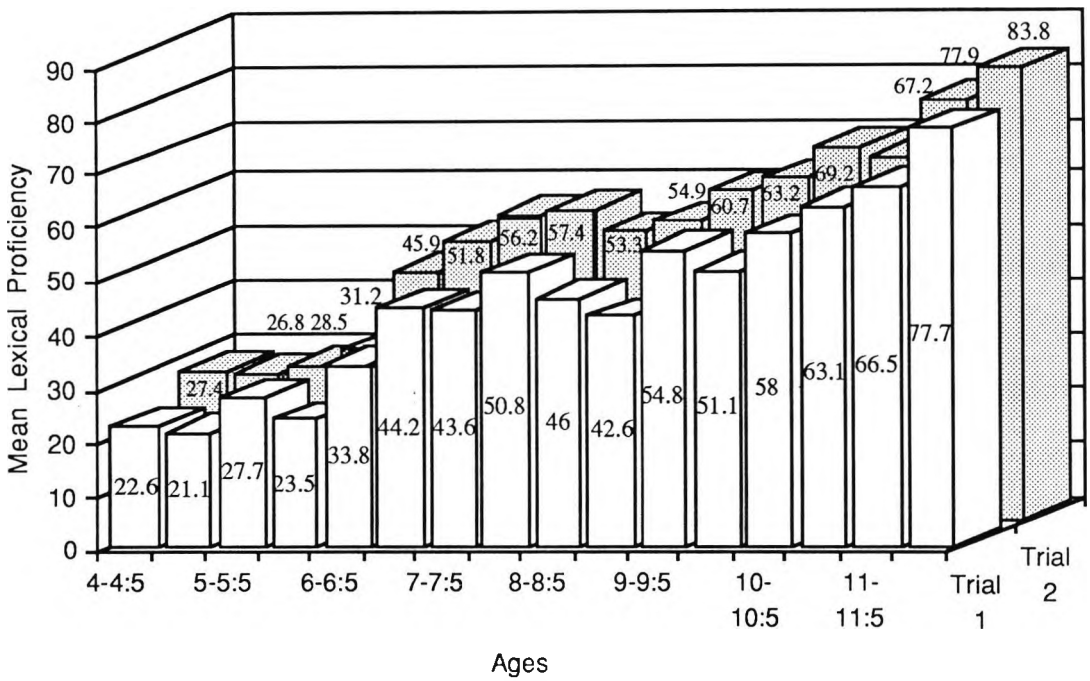


FIGURE 3.1c DEVELOPMENT OF LEXICAL PROFICIENCY IN BILINGUALITY BETWEEN TRIALS 1 & 2 (6-8 months interval)

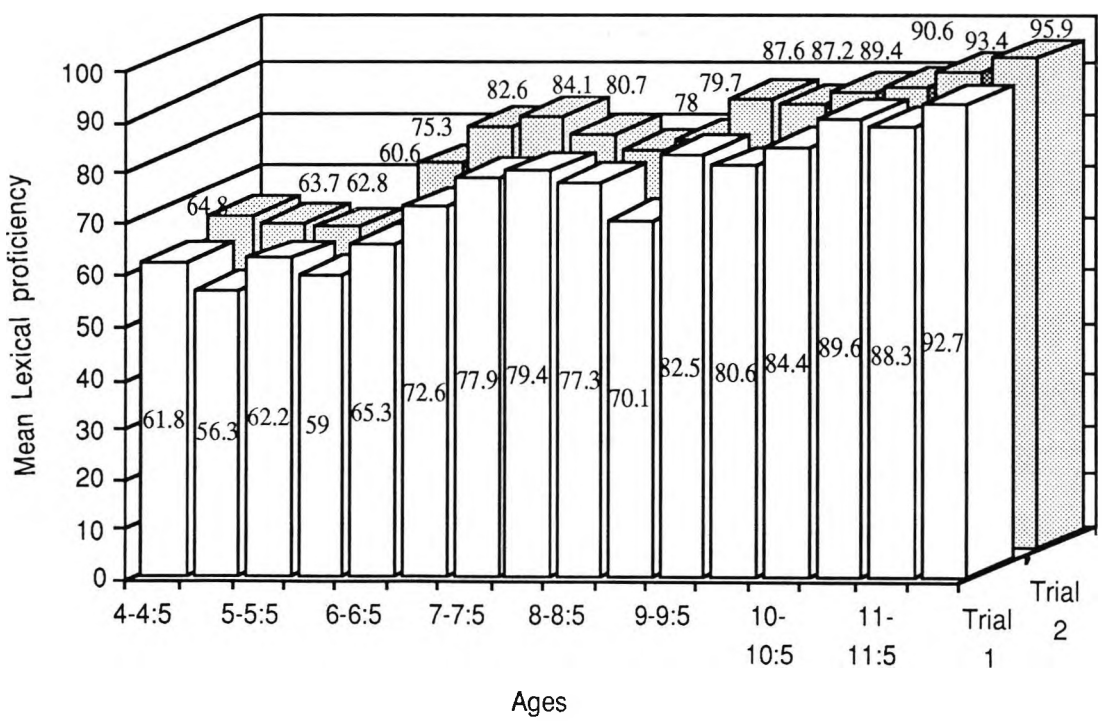


FIGURE 3.1d DEVELOPMENT OF LEXICAL PROFICIENCY IN CONCEPTUAL VOCABULARY BETWEEN TRIALS 1 & 2 (6-8 months interval)

AGE CODE AT TRIAL 1	LINGUISTIC VARIABLES
01 (4-4:5)	ENG. & BIL.
02 (4:6-4:11)	ENG. & BIL.
03 (5-5:5)	-
04 (5:6-5:11)	ENG., SPAN. & BIL.
05 (6-6:5)	ALL LVs
06 (6:6-6:11)	ALL LVs
07 (7-7:5)	ALL LVs
08 (7:6-7:11)	BIL.
09 (8-8:5)	(SAMPLE TOO SMALL)
10 (8:6-8:11)	ALL LVs
11 (9-9:5)	SPAN., BIL. & CV.
12 (9:6-9:11)	ALL LVs
13 (10-10:5)	ALL LVs
14 (10:6-10:11)	SPAN. & BIL.
15 (11-11:5)	ALL LVs
16 (11:6-11:11)	ALL LVs

TABLE 4.13.1(ii) SUMMARY OF SIGNIFICANT LEXICAL DEVELOPMENT BETWEEN TRIALS 1 & 2 (AFTER 6-8 MONTHS INTERVAL)

(ii) Comparisons Between Trials 1 and 3 (10-13 months interval)

Comparisons were made between Trials 1 and 3 as were made between Trials 1 and 2, and statistically analysed. Most subjects participating in Trial 3 did so 10-13 months after Trial 1. Table 4.13.2 below, shows means obtained in Trials 1 and 3 in each linguistic variable, at each age code. It also shows *Wilcoxon Matched-Pairs Signed-Ranks T* test and significance values.

Summary

Generally speaking, *significant* development was indicated in *all* linguistic variables, in *all* samples containing more than 4 subjects, with only *one exception*, this being in CV and at Trial 1-Age Code 01. The samples not containing enough subjects for meaningful statistical analysis were Age Codes 03 (Age 5-5:5 years) and 09 (Age 8-8:5 years) contained only 3 subjects, and Age Codes 13 (Age 10-10:5 years) and 15 (Age 11-11:5 years) contained four.

TABLE 4.13.2 MEANS AND RESULTS OF STATISTICAL ANALYSES, ACCORDING TO AGE CODE, TO ESTABLISH LEXICAL DEVELOPMENT IN EACH LINGUISTIC VARIABLE FOR SUBJECTS COMPLETING TRIALS 1 & 3

			LINGUISTIC VARIABLES							
#AGE			ENG		SPAN		BIL		CV	
CODE	N	T/L	T1	T3	T1	T3	T1	T3	T1	T3
01	5	12m X	37.2	50.6	48	59.4	20.4	39.6	64.8	70.4
		T	1		0		0		4	
		p	=.05		<.05		<.05		NS	
02	9	12m X	35.9	50.6	42.4	55.4	20.9	34.9	57.4	71.1
		T	1		0		1		0	
		p	<.005		<.005		<.005		<.005	
03	3	12m X	SAMPLE TOO SMALL FOR MEANINGFUL STATISTICAL ANALYSIS							
04	7	12m X	31.3	52.1	40.1	57.1	19.7	39.3	51.7	70
		T	1		1		0		3	
		p	<.025		<.025		=.01		<.05	
05	12	12m X	47.6	67.8	47.7	67.8	32.3	54.9	63	80.7
		T	0		0		0		1	
		p	<.005		<.005		<.005		<.005	
06	18	12m X	59.2	75.4	54.8	68.7	41.7	58.6	72.3	85.6
		T	0		3.5		2		0	
		p	<.005		<.005		<.005		<.005	
07	8	12m X	60.5	73.6	59.9	71.3	42.9	61.6	77.1	83.3
		T	0		0		0		2	
		p	=.005		=.005		=.005		=.01	
08	8	13m X	64.3	75.1	58.6	74.8	52.8	64.8	80.1	85.1
		T	1		0		0		4	
		p	<.01		=.005		=.005		=.025	
09	3	12m X	SAMPLE TOO SMALL FOR MEANINGFUL STATISTICAL ANALYSIS							

Table 4.13.2 (Continued)

#AGE			LINGUISTIC VARIABLES							
			ENG		SPAN		BIL		CV	
CODE	N	T/L	T1	T3	T1	T3	T1	T3	T1	T3
10	7	10m X	56.1	71.4	55.7	74.8	41.7	56.4	70.1	84.6
		T	0		0		1		0	
		p	=.01		=.01		<.025		=.01	
11	7	11m X	73	89.6	67.6	80.1	56.4	75.6	84.1	94.1
		T	0		0		0		0	
		p	=.01		=.01		=.01		=.01	
12	9	12m X	70.1	80.4	67.4	79.1	54.3	70.2	83.2	89.3
		T	1		0		0		2	
		p	<.005		<.005		<.005		=.005	
13	4	12m X	74.5	86.3	70	84	59.8	76.5	84.8	93.8
			SAMPLE TOO SMALL FOR MEANINGFUL STATISTICAL ANALYSIS							
14	8	12m X	78.6	87.3	73.5	83.9	62.4	76.8	89.8	94.4
		T	0		0		0		0	
		p	=.005		=.005		=.005		=.005	
15	4	12m X	79.5	92	74	84.3	65	80.5	88.5	95.8
			SAMPLE TOO SMALL FOR MEANINGFUL STATISTICAL ANALYSIS							

#AGE CODE AT TRIAL 1

KEY N = SAMPLE SIZE; T/L = TIME LAPSE IN MONTHS, BETWEEN TRIALS

T1 & T3 = TRIAL ONE & THREE; X = MEAN; T = WILCOXON T TEST VALUE;

p = Probability (1 Tailed); NS = NOT SIGNIFICANT

Figures 3.2a-3.2d overleaf, illustrate graphically the development of lexical proficiency in each linguistic variable between Trials 1 and 3, after an interval of 10-13 months (longitudinal study).

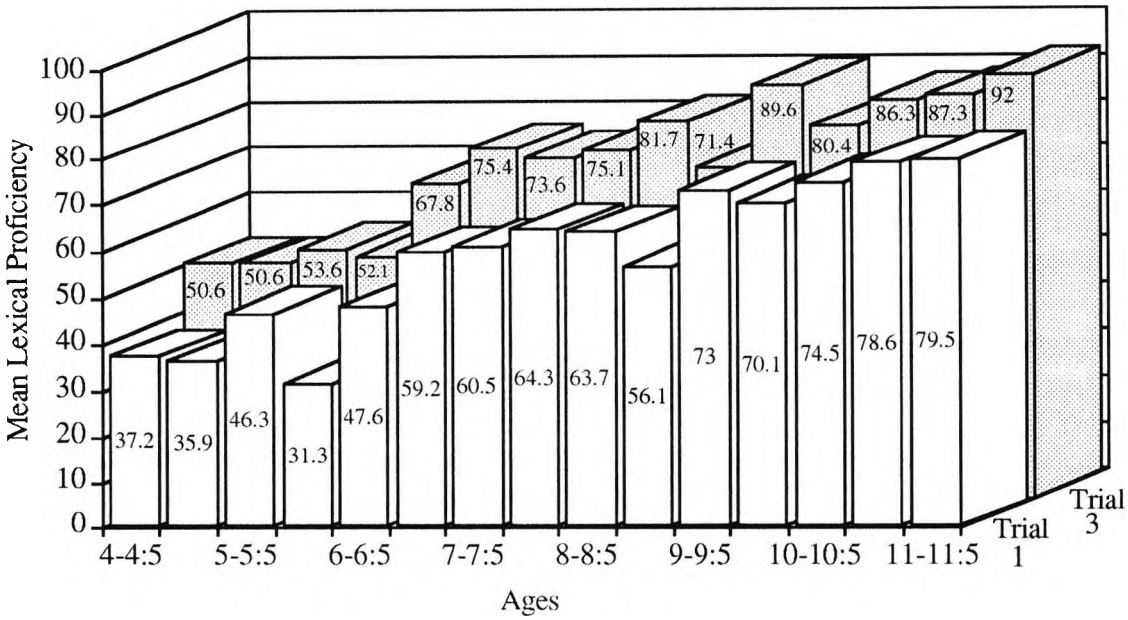


FIGURE 3.2 a DEVELOPMENT OF LEXICAL PROFICIENCY IN ENGLISH BETWEEN TRIALS 1 AND 3 (10-13 months interval)

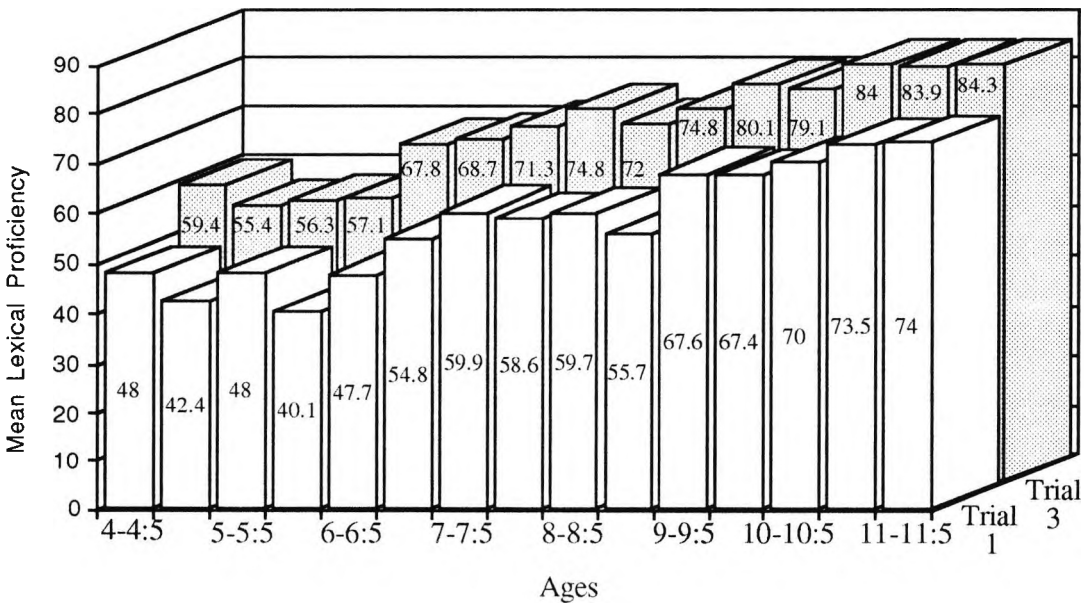


FIGURE 3.2b DEVELOPMENT OF LEXICAL PROFICIENCY IN SPANISH BETWEEN TRIALS 1 AND 3 (10-13 months intervals)

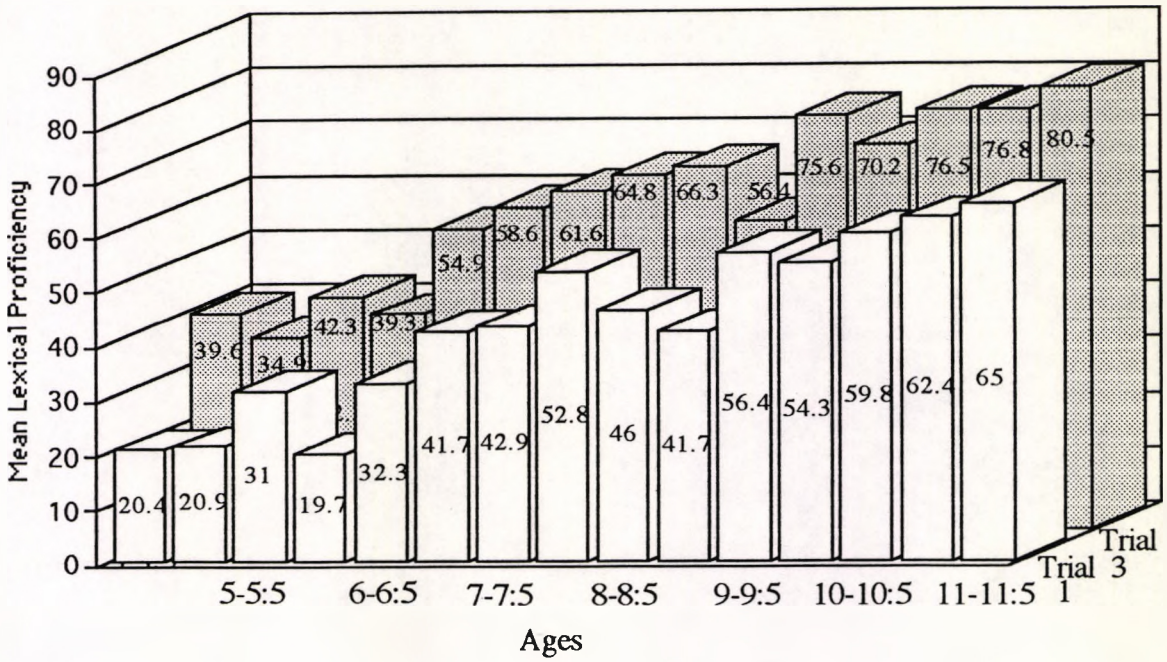


FIGURE 3.2c DEVELOPMENT OF LEXICAL PROFICIENCY IN BILINGUALITY BETWEEN TRIALS 1 AND 3 (10-13 months interval)

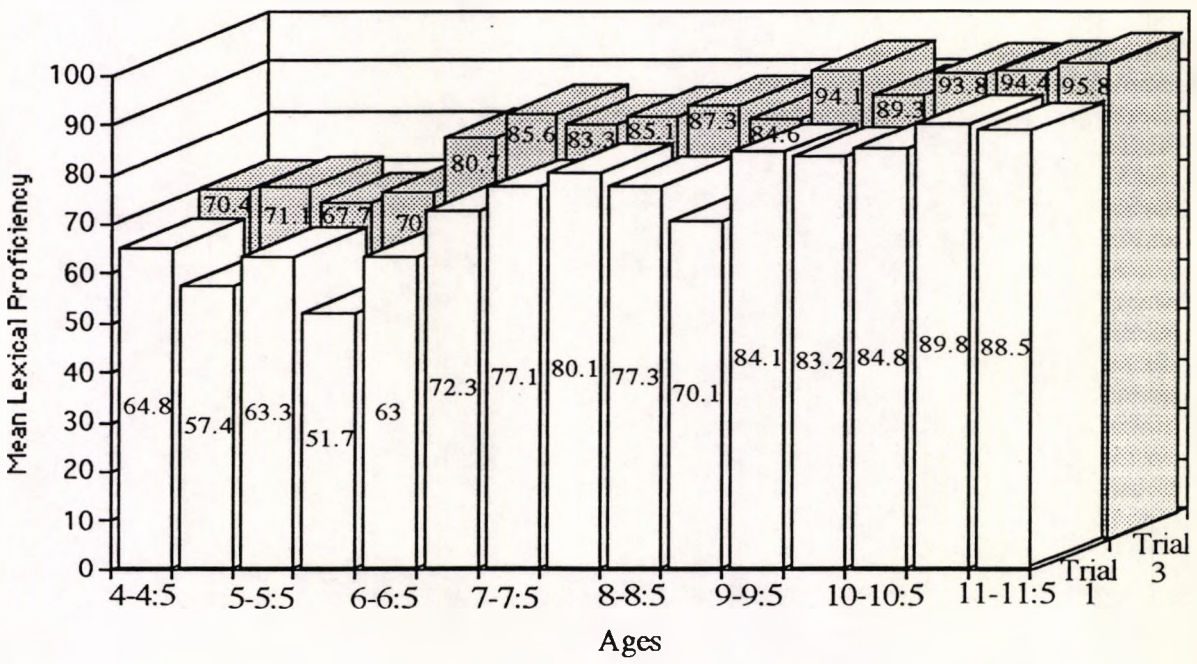


FIGURE 3.2d DEVELOPMENT OF LEXICAL PROFICIENCY IN CONCEPTUAL VOCABULARY BETWEEN TRIALS 1 & 3 (10-13 months interval)

(iii) Comparisons Between Trials 1 and 2 (12 months interval)

Some subjects did not participate in Trial 2 until 12 months after Trial 1. These were in Age Codes 09 (Age 8-8:5 years) to 14 (Age 10:6-10:11 years), inclusive.

Table 4.13.3(i) below, shows means and the results of statistical analyses (*Wilcoxon Matched-Pairs Signed-Ranks T* test) for these subjects.

Summary

The sample in Age Code 09 (Age 8-8:5 years) was too small for statistical analysis. Analyses for samples in the rest of the age codes revealed significant *development* after an interval of *12* months, between Trials 1 and 2, as shown in Table 4.13.3(ii) below.

Table 4.13.3(ii) below, summarises in which linguistic variables lexical *development* between Trials 1 and 2 was indicated after intervals of *12* months. Whereas in all but Age Codes 13 (Age 10-10:5 years) and 14 (Age 10:6-10:11 years), there was development in *all* linguistic variables, this development was *not* always statistically significant in all linguistic variables.

			LINGUISTIC VARIABLES							
#AGE			ENG		SPAN		BIL		CV	
CODE	N		T1	T2	T1	T2	T1	T2	T1	T2
09	2		SAMPLE TOO SMALL FOR MEANINGFUL STATISTICAL ANALYSIS							
10	11	X	75.46	83.55	69.73	73.55	59	67.36	86.18	89.73
		T	1		10.5		1.5		12.5	
		p	<.005		<.05		<.005		NS	
11	10	X	68.9	85.8	62.8	76.4	53.1	69.5	78.6	92.7
		T	0		1		0		0	
		p	<.005		<.005		<.005		<.005	
12	7	X	80.71	84.43	76.71	83	69.57	73.57	87.86	93.86
		T	6		1		3		0	
		p	NS		<.025		<.05		<.025	
13	12	X	82.08	87.08	80.08	79.75	72.67	72.67	89.5	94.17
		T	9		29		31		3	
		p	<.01		NS		NS		<.005	
14	6	X	92.67	94.83	87.5	86.67	84.5	84.17	95.7	97.33
		T	2.5		7		4		1.5	
		p	NS		NS		NS		NS	

#AGE CODE AT TRIAL 1

KEY N = SAMPLE SIZE; T1 = TRIAL 1; T2 = TRIAL 2; ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY; CV = CONCEPTUAL VOCABULARY X = MEAN; T = WILCOXON T TEST VALUE; p = Probability (1 Tailed)

TABLE 4.13.3(i) MEANS AND RESULTS OF STATISTICAL ANALYSES, ACCORDING TO AGE CODE, TO ESTABLISH LEXICAL DEVELOPMENT IN EACH LINGUISTIC VARIABLE FOR SUBJECTS COMPLETING TRIALS 1 AND 2 AFTER AN INTERVAL OF 12 MONTHS

Figures 3.3a-3.3d overleaf, illustrate graphically the development of lexical proficiency in each linguistic variable between Trials 1 and 2 after an interval of 12 months (longitudinal study).

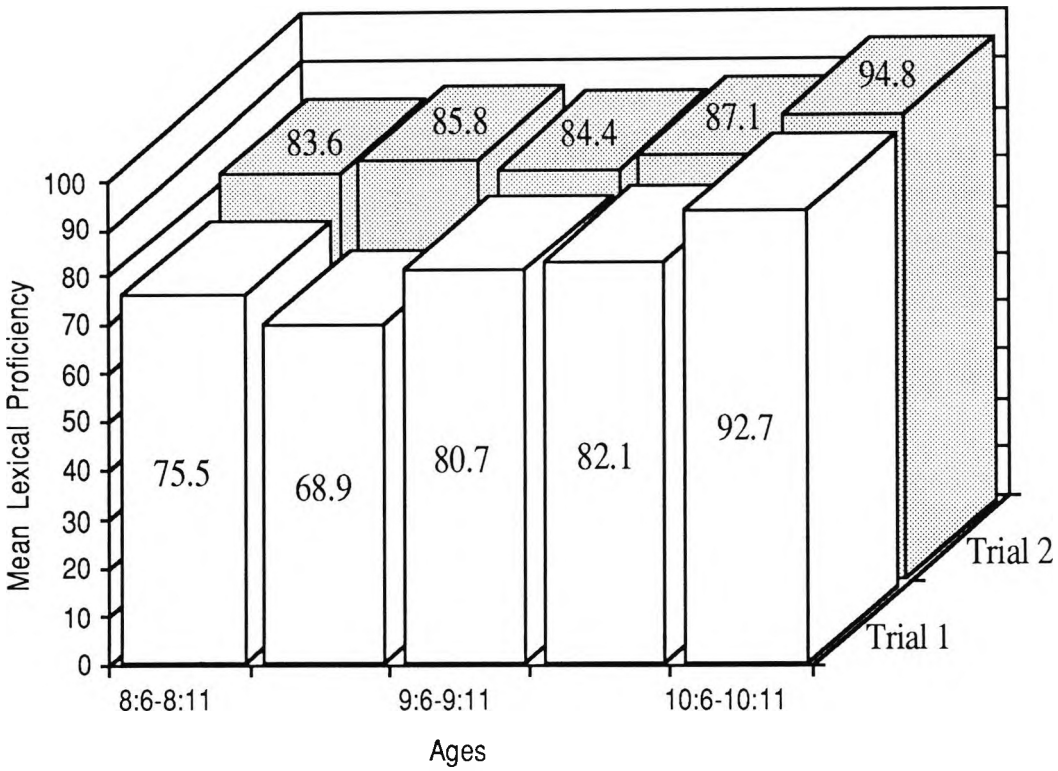


FIGURE 3.3a DEVELOPMENT OF LEXICAL PROFICIENCY IN ENGLISH BETWEEN TRIALS 1 & 2 (12 months interval)

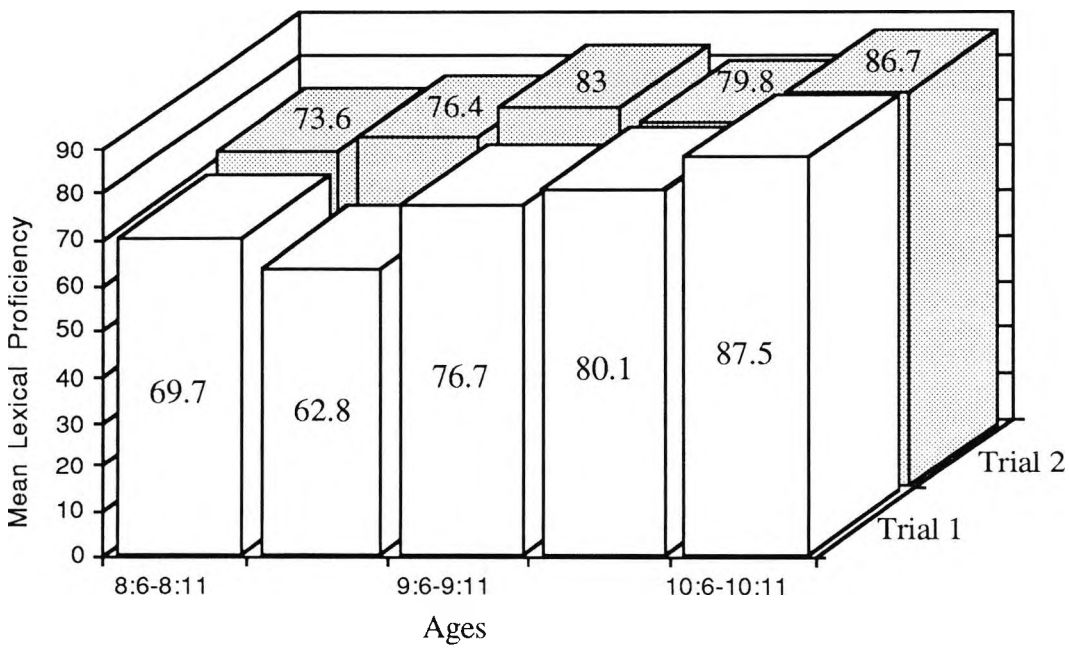


FIGURE 3.3b DEVELOPMENT OF LEXICAL PROFICIENCY IN SPANISH BETWEEN TRIALS 1 & 2 (12 months interval)

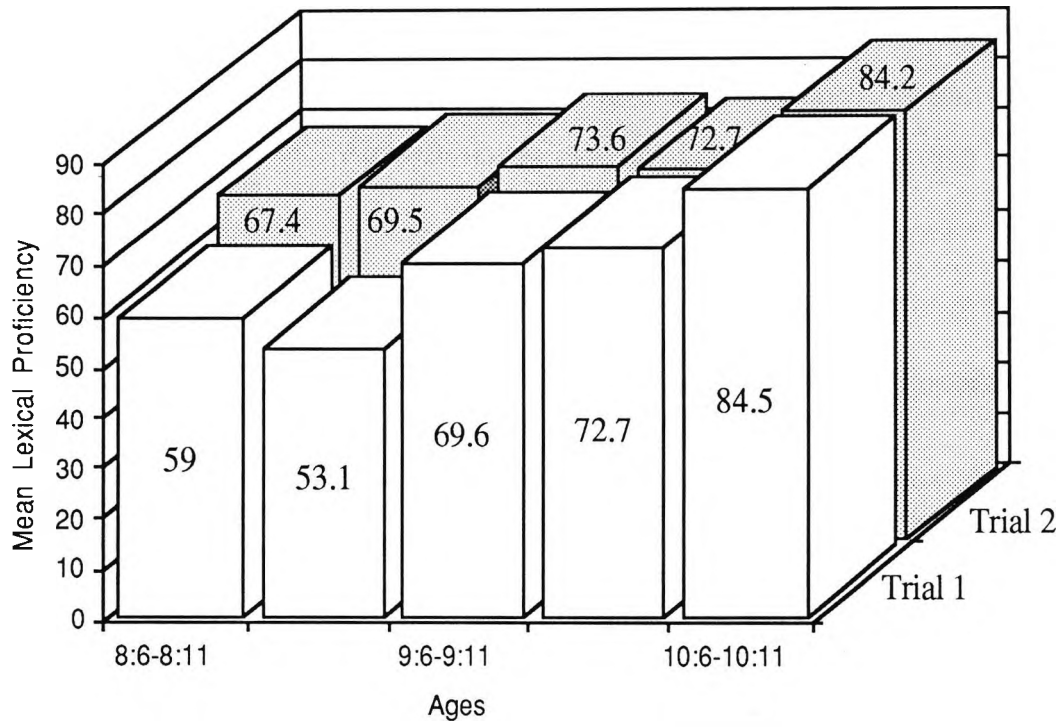


FIGURE 3.3c DEVELOPMENT OF LEXICAL PROFICIENCY IN BILINGUALITY BETWEEN TRIALS 1 & 2 (12months interval)

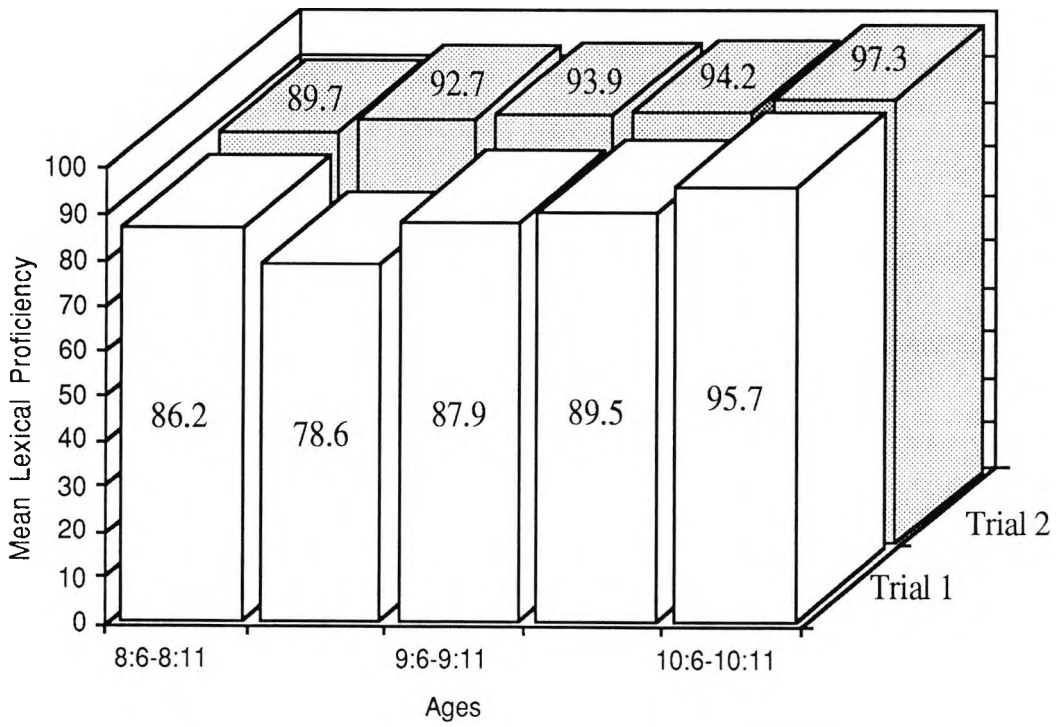


FIGURE 3.3d DEVELOPMENT OF LEXICAL PROFICIENCY IN CONCEPTUAL VOCABULARY BETWEEN TRIALS 1 & 2 (12 months interval)

AGE CODE AT TRIAL ONE	DEVELOPMENT IN LINGUISTIC VARIABLES	SIGNIFICANT
10	All LVs	In All but CV
11	All LVs	YES
12	All LVs	In All but English
13	ENG. & CV	YES
14	ENG. & CV	NO

TABLE 4.13.3(ii) SUMMARY OF LEXICAL DEVELOPMENT IN LINGUISTIC VARIABLES BETWEEN TRIALS 1 and 2 AFTER 12 MONTHS INTERVAL, AND SIGNIFICANCE

(iv) Comparisons Between Trials 1 and 4 (17-22 months interval)

Subjects who participated in Trial 4 did so after an interval of between 17 and 22 months after Trial 1. Table 4.13.4 below, shows means for Trials 1 and 4, for each linguistic variable, at each age code; it also shows *Wilcoxon Matched-Pairs Signed-Ranks T* values and significance levels.

Summary

Significant development was indicated between Trials 1 and 4 (with intervals of between 17 and 22 months) in *all* linguistic variables at *all* age codes analysed *except* in *Spanish* at Age Code 03 (Age 5-5:5 years in Trial 1). Samples in Trial 1-Age Codes 07 (Age 7-7:5 years) and 13 (Age 10-10:5 years) were too small for meaningful statistical analysis. There were no subjects in Age Codes 08 (Age 7:6-7:11 years) and 14-17 (Ages 10:6-12+ years).

TABLE 4.13.4 MEANS AND RESULTS OF STATISTICAL ANALYSES, ACCORDING TO AGE CODE, TO ESTABLISH LEXICAL DEVELOPMENT IN EACH LINGUISTIC VARIABLE FOR SUBJECTS COMPLETING TRIALS 1 & 4.

				LINGUISTIC VARIABLES							
#AGE				ENG		SPAN		BIL		CV	
CODE	N	T/L		T1	T4	T1	T4	T1	T4	T1	T4
01	5	20m	X	37.2	60.8	48	65.2	20.4	49.2	64.8	76.8
			T	0		0		0		0	
			p	<.05		<.05		<.05		<.05	
02	8	20m	X	34.5	59.4	43.9	59.5	21	41.5	57.4	75.1
			T	0		0		0		0	
			p	=.01		=.005		=.005		=.005	
03	6	22m	X	44.7	57.8	50.7	58.1	30.7	42.8	64.7	73.2
			T	0		3		0		2	
			p	<.025		NS		<.025		=.05	
04	11	22m	X	35.3	61.6	44	64.4	22.6	50.4	56.6	75.6
			T	1		1		0		2	
			p	<.005		<.005		<.005		<.005	
05	7	20m	X	33.4	75.6	40.4	72.9	21.4	64	52.4	84.6
			T	0		0		0		0	
			p	=.01		=.01		=.01		=.01	
06	5	20m	X	39	78.8	52.8	79.8	29.6	68	62.2	89.4
			T	0		0		0		0	
			p	<.05		<.05		<.05		<.05	
07	2	20m		SAMPLE TOO SMALL FOR MEANINGFUL STATISTICAL ANALYSIS							
08	-			NO SUBJECTS IN THIS AGE CODE COMPLETED BOTH TRIALS							
09	1	17m		SAMPLE TOO SMALL FOR MEANINGFUL STATISTICAL ANALYSIS							
10	6	17m	X	59.3	79.3	57.5	73.2	44.5	62.5	72.3	90
			T	0		0		0		0	
			p	<.025		<.025		<.025		<.025	
11	7	17m	X	73	87.6	67.6	83.1	56.6	75.1	84.1	95.6
			T	0		0		0		0	
			p	=.01		=.01		=.01		=.01	
12	8	18m	X	70	85.9	66.4	82.1	53.5	75.3	82.9	92.8
			T	0		0		0		0	
			p	=.005		=.005		=.005		=.005	
13	3	18m		SAMPLE TOO SMALL FOR MEANINGFUL STATISTICAL ANALYSIS							

#AGE CODES AT TRIAL 1

KEY N = SAMPLE SIZE; T/L = TIME LAPSE IN MONTHS, BETWEEN TRIALS

T1 & T4 = TRIALS ONE & FOUR; X = MEAN; p = Probability (1 Tailed)

T = WILCOXON T TEST VALUE; NS = NOT SIGNIFICANT

Figures 3.4a-3.4d below, graphically illustrate the development of lexical proficiency in each linguistic variable between Trials 1 and 4 after 17-22 months interval (longitudinal study)

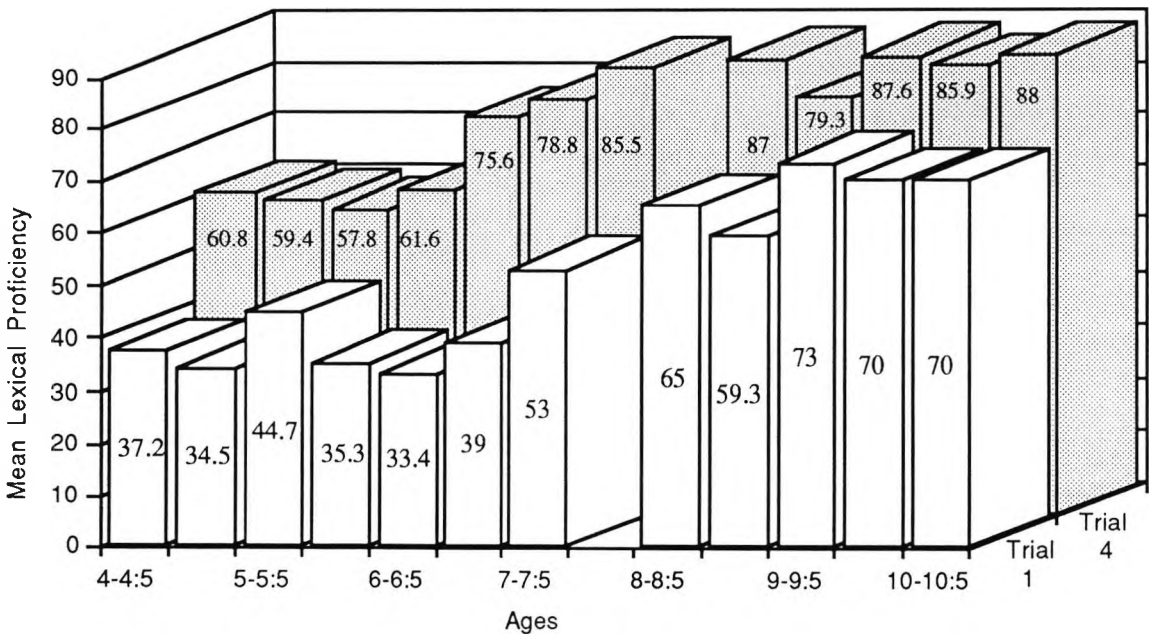


FIGURE 3.4 a DEVELOPMENT OF LEXICAL PROFICIENCY IN ENGLISH BETWEEN TRIALS 1 & 4 (17-22 months interval)

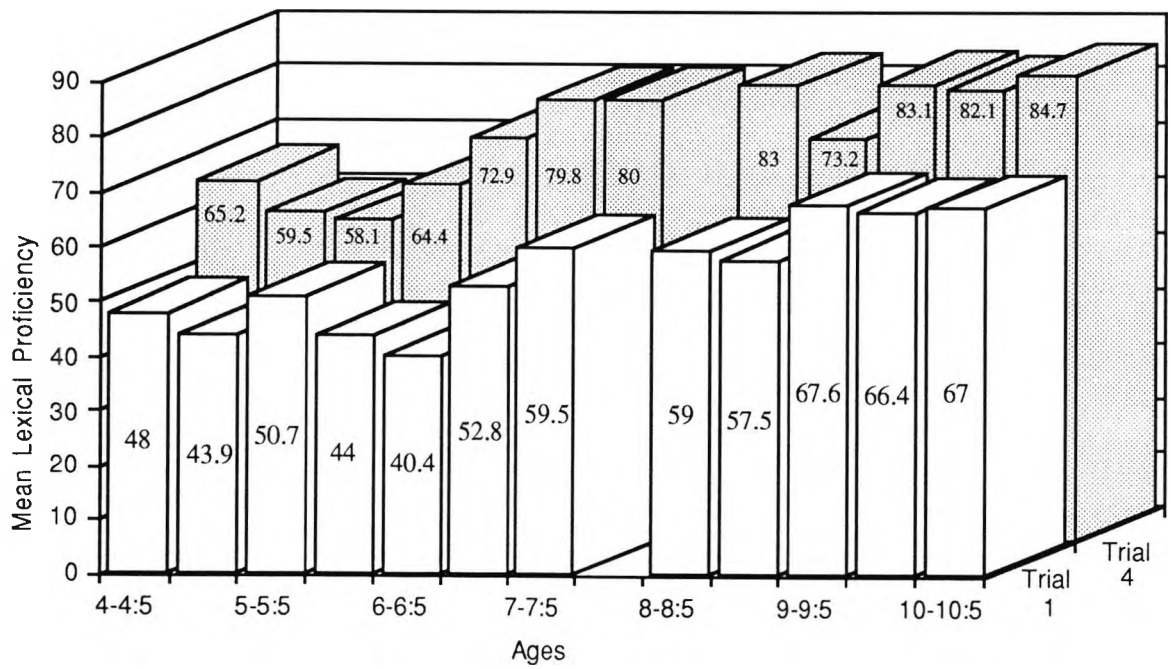


FIGURE 3.4 b DEVELOPMENT OF LEXICAL PROFICIENCY IN SPANISH BETWEEN TRIALS 1 & 4 (17-22 months interval)

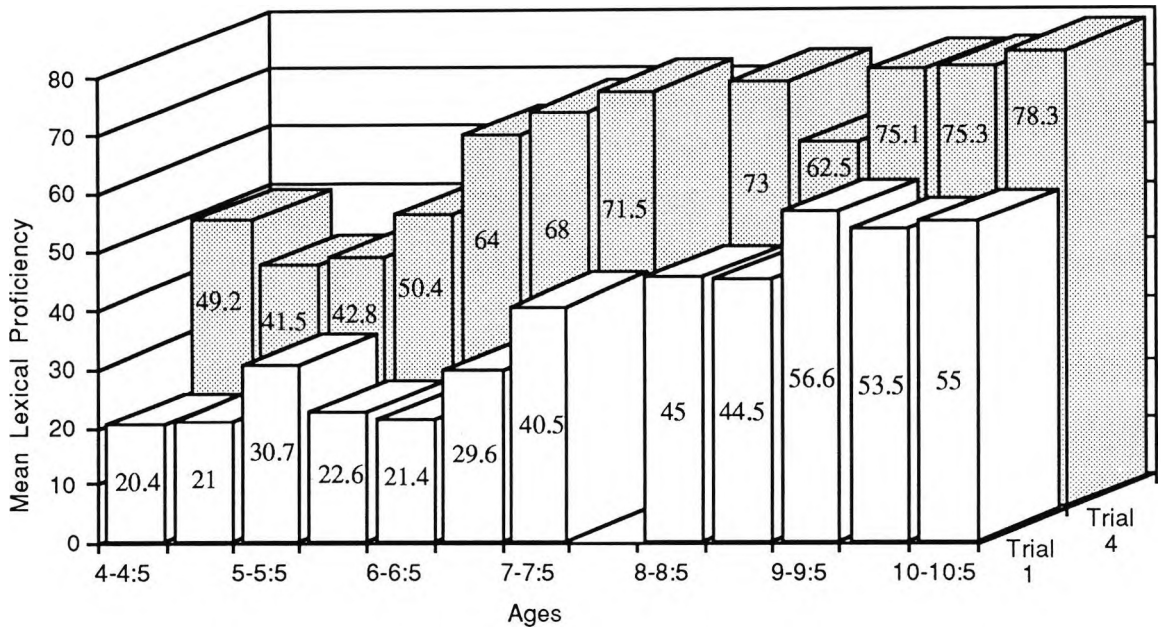


FIGURE 3.4c DEVELOPMENT OF LEXICAL PROFICIENCY IN BILINGUALITY BETWEEEN TRIALS 1 & 4 (17-22 months interval)

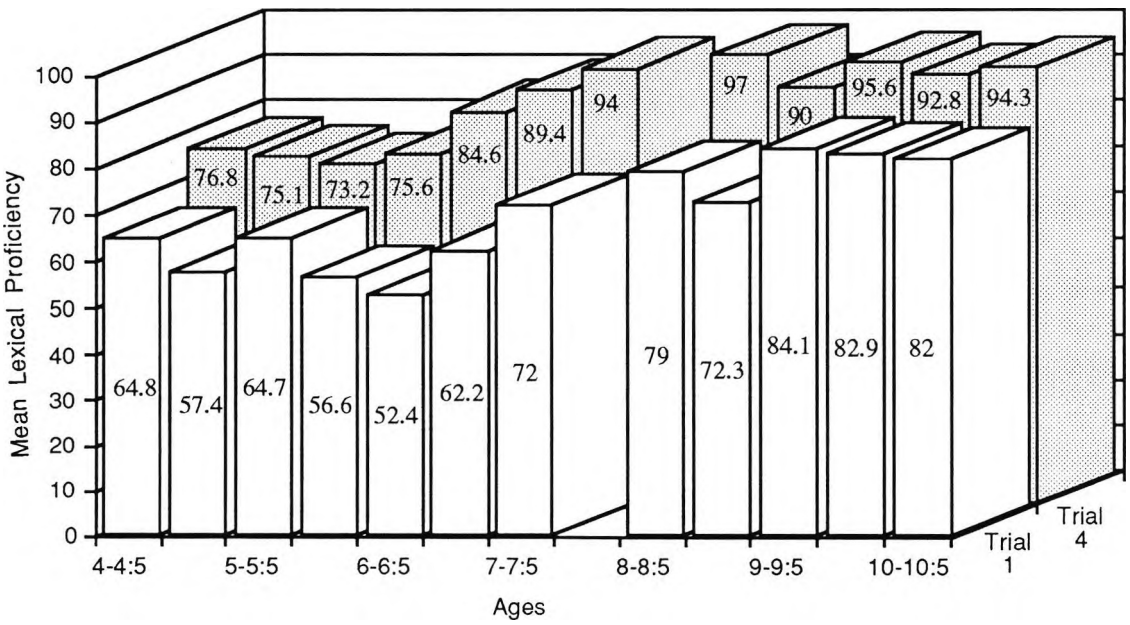


FIGURE 3.4d DEVELOPMENT OF LEXICAL PROFICIENCY IN CONCEPTUAL VOCABULARY BETWEEN TRIALS 1 & 4 (17-22 months interval)

Conclusion

Generally speaking, *development* between successive trials was indicated. Though the development between Trials 1 and 2 was *not* always significant in all linguistic variables and/or in *all* age codes, significant progress was much more unequivocal at all levels between Trials 1 and 3 and between Trials 1 and 4. This might suggest that an interval of 6 months is *not* sensitive enough to reveal lexical *development*, when this particular lexical corpus and research design is employed. It is also possible that the *natural* lexical development over a period of 6 months is negligible.

d) Percentage Mean Gain (PMG) in Lexical Development

Having established whether there had been any lexical *development* between trials, and the statistical significance of this development (See previous section), it was then necessary to calculate the *extent* of this development. There being no norms for this task, a *quantitative* measure of lexical *development* was arrived at by calculating each subject's *percentage gain* between Trial 1 and subsequent trials. Each sample's *percentage mean gain* (PMG) between these trials was thus, calculated for *each* linguistic variable (See Tables 4.14.1-4.14.3, below).

Summary

As can be seen from the data presented in Table 4.14.1 below, there were *positive* gains made between Trials 1 and 2 at all age codes and in *all* linguistic variables, with a negligible exception in Spanish at Age Code 03 (Age 5-5:5 years). The significance of these gains have already been established (See Tables 4.13.1(i) and 4.13.1(ii), above).

From the data in Table 4.14.1, it can be seen that almost without exception (i.e. in Age Codes 03 and 16- Ages 5-5:5 years and 11:6-11:11 years, respectively), a *greater* PMG between Trials 1 and 2 (inter-trial intervals ranged between 6 and 8 months) was indicated in *Bilinguality* than in any other linguistic variable. With the exception of Age Codes 02 (Age 4:6-4:11 years) and 03 (Age 5-5:5 years), the linguistic variable showing the *least* PMG between Trials 1 and 2 (6-8 months interval), was *Conceptual Vocabulary*. It must be borne in mind however, that achievement in *Bilinguality* was always *lower* than in *Conceptual Vocabulary*. This could account for the greater relative *gain* in *Bilinguality*.

The *percentage mean gains* made between Trials 1 and 3 appear in Table 4.14.2, below. *Positive* gains were indicated at *all* levels (inter-trial intervals ranged between 10 and 13 months).

#AGE CODES	N	T/L	LINGUISTIC VARIABLES ENG	SPAN	BIL	CV	Significance (See Table 4.13.1i)
01 (4-4:5)	11	8m	12.7	6.3	21.2	4.9	ENGLISH & BILINGUALITY
02 (4:6-4:11)	10	7m	24.4	10.5	27	13.1	ENGLISH & BILINGUALITY
03 (5-5:5)	6	7m	4.6	-0.8	2.9	0.9	NONE
04 (5:6-5:11))	10	7m	12.7	10.1	32.8	2.7	All except CV
05 (6-6:5)	16	7m	22.8	22.1	35.8	15.3	ALL LVs
06 (6:6-6:11))	21	7m	14.1	15.9	17.2	13.8	ALL LVs
07 (7-7:5)	9	8m	15.6	15.5	28.9	7.9	ALL LVs
08 (7:6-7:11))	12	8m	8.7	3.6	13	1.6	BILINGUALITY ONLY
09 (8-8:5)	3	6m	SAMPLE TOO SMALL				SAMPLE TOO SMALL
10 (8:6-8:11))	7	6m	15.7	21.2	28.9	13.7	ALL LVs
11 (9-9:5)	10	6m	6.6	9.5	10.8	6.2	All except English
12 (9:6-9:11)	10	7m	14.7	13.7	23.7	8.2	ALL LVs
13 (10-10:5)	5	7m	5.9	17.3	19.3	5.9	ALL LVs
14 (10:6-10:11)	10	7m	1.7	5.1	6.5	1.1	SPANISH & BILINGUALITY
15 (11-11:5)	11	8m	10.7	10.6	17.1	5.8	ALL LVs
16 (11:6-11:11)	9	8m	8	10.9	7.9	3.5	ALL LVs

#AGE CODES AT TRIAL 1

KEY N = SAMPLE SIZE; T/L = TIME LAPSE IN MONTHS BETWEEN TRIALS

ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY;

CV = CONCEPTUAL VOCABULARY

TABLE 4.14.1 PERCENTAGE MEAN GAIN IN LEXICAL DEVELOPMENT BETWEEN TRIALS 1 AND 2 IN EACH LINGUISTIC VARIABLE, FOR EACH AGE CODE

The *incidence* of statistically significant *percentage mean gains* made in *all* LVs is *higher* between Trials 1 and 3 (inter-trial intervals of between 10 and 13 months) than those seen between Trials 1 and 2. The *greatest* PMG was indicated in *Bilinguality* (with only one exception at Age Code 08). The *least* PMG was indicated in *Conceptual Vocabulary* (Table 4.14.2, below). Again, one has to bear in mind that performance in *Bilinguality* in the early years was lower than in *Conceptual Vocabulary*.

#AGE			LINGUISTIC VARIABLES				Significance
CODES	N	T/L	ENG	SPAN	BIL	CV	(See Table 4.13.2)
01	5	12m	36	23.8	94.1	8.6	All except CV
02	9	12m	40.9	30.7	67	23.9	ALL LVs
03	3	12m	SAMPLE TOO SMALL				SAMPLE TOO SMALL
04	7	12m	66.4	42.4	99.5	35.4	ALL LVs
05	12	12m	42.4	42.1	70	28.1	ALL LVs
06	18	12m	27.4	25.4	40.5	18.4	ALL LVs
07	8	12m	21.7	19	43.6	8	ALL LVs
08	8	13m	16.8	27.6	22.7	6.2	ALL LVs
09	3	12m	SAMPLE TOO SMALL				SAMPLE TOO SMALL
10	7	10m	27.3	34.3	35.3	20.7	ALL LVs
11	7	11m	22.7	18.5	34	11.9	ALL LVs
12	9	12m	14.7	17.4	29.3	7.3	ALL LVs
13	4	12m	15.8	20	27.9	10.6	SAMPLE TOO SMALL
14	8	12m	11.1	14.1	23.1	5.1	ALL LVs
15	4	12m	15.7	13.9	23.8	8.2	SAMPLE TOO SMALL

#AGE CODES AT TRIAL 1

KEY N = SAMPLE SIZE; T/L = TIME LAPSE IN MONTHS, BETWEEN TRIALS.

TABLE 4.14.2 PERCENTAGE MEAN GAIN IN LEXICAL DEVELOPMENT BETWEEN TRIALS 1 AND 3 IN EACH LINGUISTIC VARIABLE, FOR EACH AGE CODE

Table 4.14.3 (below) gives details of *percentage mean gains* made between Trials 1 and 4.

Summary

The *percentage mean gains* made in lexical *development* between Trials 1 and 4 (inter-trial intervals ranged between 17 and 22 months) were substantially *larger* than those made between Trials 1 and 3. As for comparisons between Trials 1 and 2, and Trials 1 and 3, the *greatest* percentage mean gain between Trials 1 and 4 were, without exception, in *Bilinguality*, and the smallest in *Conceptual Vocabulary,* though as stated before, in the early years, performance in the *CV* was *greater* than in *Bilinguality.*

#AGE CODES	N	T/L	LINGUISTIC VARIABLES ENG	SPAN	BIL	CV	Significance (See Table 4.13.4)
01	5	20m	63.4	35.8	141.2	18.5	ALL LVs
02	8	20m	72.2	35.5	97.6	30.8	ALL LVs
03	6	22m	29.3	14.6	39.4	13.1	All except Spanish
04	11	22m	74.5	46.4	123	33.6	ALL LVs
05	7	20m	126.3	80.4	199.1	61.5	ALL LVs
06	5	20m	102.1	51.1	129.7	43.7	ALL LVs
07	2	20m	SAMPLE TOO SMALL				SAMPLE TOO SMALL
08	NO SUBJECTS IN THIS AGE CODE COMPLETED BOTH TRIALS						
09	1	17m	SAMPLE TOO SMALL				SAMPLE TOO SMALL
10	6	17m	33.7	27.3	40.4	24.5	ALL LVs
11	7	17m	20	22.9	32.7	13.7	ALL LVs
12	8	18m	22.7	23.6	40.7	11.9	ALL LVs
13	3	18m	SAMPLE TOO SMALL				SAMPLE TOO SMALL

#AGE CODES AT TRIAL 1

KEY N = SAMPLE SIZE; T/L = TIME LAPSE IN MONTHS, BETWEEN TRIALS 1 & 4

TABLE 4.14.3 PERCENTAGE MEAN GAIN IN LEXICAL DEVELOPMENT BETWEEN TRIALS 1 AND 4 IN EACH LINGUISTIC VARIABLE, FOR EACH AGE CODE

4.5.4 Cross-sectional v. Longitudinal Design

Table 4.15 below shows comparisons of significant lexical *development* indicated by analyses based on c*ross-sectional* (Trial 1) and *longitudinal* (Trial 1->Trial 2) data.

Summary

The results of analyses have shown that, though *not* always significant, lexical *development* between Trials 1 and 2 (*longitudinal* study) was indicated for *all* linguistic variables in *all* age codes. There was in fact, *significant* development in *all* linguistic variables in *eight* cases. In *six* others, there was significant lexical development in at least *one* linguistic variable. The incidence of significant *development* resulting from similar analyses of *cross-sectional* data (6 months interval), was much *lower*. S*ignificant* development in *all* LVs was indicated between *four* sets of *neighbouring* age codes. Significant development in at least *one* linguistic variable was indicated in *one* set of

neighbouring age codes. There was *no* significant development in *any* of the four linguistic variables, in no less than *ten* cases.

As predicted, these results show that *longitudinal* studies are *more* sensitive than *cross-sectional* ones.

AGE CODES COMPARED	LINGUISTIC VARIABLES INDICATING SIGNIFICANCE IN CROSS-SECTIONAL ANALYSIS	LINGUISTIC VARIABLES INDICATING SIGNIFICANCE IN LONGITUDINAL ANALYSIS
01->02	-	ENG & BIL
02->03	-	ENG & BIL
03->04	(No Development)	-
04->05	ALL LVs	ENG, SPAN & BIL
05->06	ALL LVs	ALL LVs
06->07	-	ALL LVs
07->08	-	ALL LVs
08->09	ALL LVs	BIL
09->10	(No Development)	-
10->11	-	ALL LVs
11->12	ALL LVs	SPAN, BIL & CV
12->13	-	ALL LVs
13->14	CV	ALL LVs
14->15	-	SPAN & BIL
15->16	-	ALL LVs
16->17	-	ALL LVs

TABLE 4.15 COMPARISON OF SIGNIFICANT LEXICAL DEVELOPMENT BASED ON CROSS-SECTIONAL AND LONGITUDINAL DATA

(X->Y Indicates development between Age Codes X and Y)

4.5.5 Lexical Dominance

Dominance can be determined in a number of ways (See Sections 4.2.4d and 4.4.3a(iii), earlier). In this study, it was determined, in the *first* instance, by calculating the *means* of the number of correct responses obtained in *Spanish* and in *English*, in Trial 1, at each age code. The lexical *dominance* would, of course, be indicated by the *larger* mean.

Three sets of statistical analyses were then conducted to establish the *significance* of this dominance. The *first* investigated *dominance* (*English/Spanish*) at each age code with a 6 months range, using Trial 1 data for ***whole samples/groups*** (i.e. *disregarding* gender and school - See Table 4.16, below). The *second* set of analyses was conducted according to *gender*, and age codes with a 6 months range (See Tables 4.17(i) and (ii), below). The *third* was conducted according to *gender*, for *concatenated* neighbouring age codes (i.e. 01+02, 02+03, 03+04 etc. - See Tables 4.18(i) and (ii), below); this last one resulted in larger groups with a *12* months age range.

In addition, so as to establish the *incidence* of L1~L2-L2~L1 lexical *dominance* within each age code, the *number of subjects* who were dominant in each language, respectively, was calculated (See Tables 4.19 and 4.20.1, below).

Two other measures were used to determine the *extent* of lexical dominance in each language. The *first* was the *dominance ratio* between L1 and L2 in each age code (6 months age range). The *second* was the relative *percentage lexical repertoire* in each language (at each age code with a 6 months age range) calculated from the *Total Lexical Repertoire* (See Tables 4.21 and 4.22.2, below).

a) Lexical Dominance for Whole Group (*Cross-sectional Analysis*)

Age Code Range 6 Months

The first set of analyses involved *all* children in *all* schools (Table 4.16, below).

Summary

The lexical *dominance* was determined from the *means* in Table 4.9. In this case, *Spanish* (L1) was *significantly* dominant in *all* age codes from 02 (Age 4:6-4:11 years) up to and *including* 08 (Age 7:6-7:11 years) with the *exception* of 06 (Age 6:6-6:11 years) which showed *non-significant* dominance in *English*. *Spanish* was dominant at Age Code 01, but *not* significantly so.

English (L2) dominance is shown from Age Code 09 (Age 8-8:5 years) up to and including 16 (Age 11:6-11:11 years) and these are *all* significant, with the exception of Age Code 10 (Age 8:6-8:11 years).

The *trend* in *Spanish* (L1) dominance in the early ages and in *English* (L2) just after the age of 8 years, is unambiguous.

AGE CODES	N	DOM. LANG.	T	z	p
01 (4-4:5)	20	SPAN	67.5	-	NS
02 (4:6-4:11)	13	SPAN	14	-	=.025
03 (5-5:5)	11	SPAN	8	-	<.025
04 (5:6-5:11)	13	SPAN	2.5	-	<.005
05 (6-6:5)	29	SPAN	140	-1.68	=.0465
06 (6:6-6:11)	39	ENG	355.5	-0.22	NS
07 (7-7:5)	26	SPAN	99	-	<.05
08 (7:6-7:11)	31	SPAN	47.5	-3.54	=.00023
09 (8-8:5)	23	ENG	58	-	<.01
10 (8:6-8:11)	34	ENG	268.5	-0.5	NS
11 (9-9:5)	30	ENG	62.5	-3.2	<.00007
12 (9:6-9:11)	26	ENG	40	-	<.005
13 (10-10:5)	23	ENG	33	-	<.005
14 (10:6-10:11)	21	ENG	9.5	-	<.005
15 (11-11:5)	31	ENG	24	-4.29	<.00003
16 (11:6-11:11)	18	ENG	5.5	-	<.005
17 (12-12:5)	4	ENG	Sample too small		

KEY L1 = SPANISH; L2 = ENGLISH; DOM. LANG. = DOMINANT LANGUAGE; N = SAMPLE SIZE; T = WILCOXON MATCHED-PAIRS SIGNED-RANKS T TEST VALUE; Z = z SCORE; p = Probability (1 tailed)

TABLE 4.16 RESULTS OF STATISTICAL ANALYSES FOR L1-L2 or L2-L1 LEXICAL DOMINANCE FOR ALL CHILDREN, WITHIN EACH AGE CODE

b) Lexical Dominance Regarding Gender

i) Age Code Range 6 Months

Lexical *dominance* in one language over the other was established by inspection of the relevant means (Table 4.1). The results of the analyses appearing in Table 4.17(i) below, indicate that *Spanish* was dominant for *both* genders in *all* age codes up to and *including* 05 (Age 6-6:5 years) though *not* always significantly so.

Summary

Lexical *dominance* in the *same* language and by *both* genders, was indicated in 7 age codes out of 16, as shown in Table 4.17(i) below. Excluding *Males* in Age Code 06 (Age 6:6-6:11 years) and 07 (Age 7-7:5 years) when *English* was (non-significantly) dominant, there was a *trend* suggesting *Spanish* (L1) dominance by *both* genders in *all* Age Codes up to and including 08 (Age 7:6-7:11 years). Statistical significance was however, *only* indicated for *Males* in Age Codes 01 (Age 4-4:5 years), 02 (Age 4:6-4:11 years) and 04 (Age 5:6-5:11 years), and for *Females* in Age Code 03 (Age 5-5:5 years).

The dominance then changes radically after this age, a certain ambivalence being revealed in Age Codes 06 (Age 6:6-6:11 years) and 07 (Age 7-7:5 years), and *English* (L2) assumes dominance. Even at Age Codes 09 (Age 8-8:5 years) and 10 (Age 8:6-8:11 years), an ambivalence is indicated because the L2 dominance is *not* statistically significant, except for *Females* in Age Code 09 (Age 8-8:5 years). However, from Age Code 11 (Age 9-9:5 years) to 16 (Age 11:6-11:11 years), the English (L2) *dominance* for *both* genders becomes *unequivocal*. A summary of *significant* lexical *dominance* according to *gender* appears in Table 4.17(ii), below.

AGE CODES	SEX	N	DOM. LANG.	T	p
01	M	9	SPAN	6	=.025
(4-4:5)	F	11	SPAN	30.5	NS
02	M	6	SPAN	0	<.025
(4:6-4:11)	F	7	SPAN	9.5	NS
03	M	6	SPAN	6	NS
(5-5:5)	F	5	SPAN	0	<.05
04	M	8	SPAN	0	=.005
(5:6-5:11)	F	5	SPAN	2	NS
05	M	12	SPAN	28	NS
(6-6:5)	F	17	SPAN	44	NS
06	M	21	ENG	107	NS
(6:6-6:11)	F	18	SPAN	63	NS
07	M	13	ENG	28	NS
(7-7:5)	F	13	SPAN	24.5	NS
08	M	16	SPAN	23	<.01
(7:6-7:11)	F	15	SPAN	4	<.005
09	M	11	ENG	20	NS
(8-8:5)	F	12	ENG	12	<.025
10	M	14	ENG	48.5	NS
(8:6-8:11)	F	20	ENG	96.5	NS
11	M	17	ENG	20	<.01
(9-9:5)	F	13	ENG	13.5	<.025
12	M	11	ENG	13	<.05
(9:6-9:11)	F	15	ENG	6	<.005
13	M	9	ENG	7	<.05
(10-10:5)	F	14	ENG	7.5	<.005
14	M	10	ENG	5	=.01
(10:6-10:11)	F	11	ENG	1	<.01
15	M	10	ENG	0	<.005
(11-11:5)	F	21	ENG	16	<.005
16	M	10	ENG	0	<.005
(11:6-11:11)	F	8	ENG	2	=.01

KEY M = MALE; F = FEMALE; DOM.LANG. = DOMINANT LANGUAGE;

p = Probability (1 tailed) T = WILCOXON T-VALUE; NS = NOT SIGNIFICANT;

E = ENGLISH; SPAN = SPANISH

TABLE 4.17(i) RESULTS OF STATISTICAL ANALYSES IN RELATION TO L1~L2 LEXICAL DOMINANCE FOR EACH AGE CODE AND EACH GENDER

AGE CODES	DOMINANT LANGUAGE	GENDER
01 (4-4:5)	SPANISH	MALES
02 (4:6-4:11)	SPANISH	MALES
03 (5-5:5)	SPANISH	FEMALES
04 (5:6-5:11)	SPANISH	MALES
08 (7:6-7:11)	SPANISH	BOTH GENDERS
09 (8-8:5)	ENGLISH	FEMALES
11 to 16 (9 to 11:11)	ENGLISH	BOTH GENDERS

TABLE 4.17(ii) SUMMARY OF SIGNIFICANT L1~L2 LEXICAL DOMINANCE RELEVANT TO AGE CODE AND GENDER

ii) Age Code Range 12 Months

The hypothesis that samples with a *wider* age range may reveal lexical *dominance* more sensitively was tested by conducting appropriate statistical analyses on data from samples with a *12* months age range. These were formed by concatenating pairs of *neighbouring* age codes.

Table 4.5 shows the means and standard deviations of such data and Table 4.18(i) shows the results of the statistical tests (*Wilcoxon Matched-Pairs Signed-Ranks T* test) and significance obtained.

Summary

Spanish was *significantly* dominant for *both* genders in samples comprising the following *concatenated* age codes: 02+03, 03+04, 04+05 (Ages 4:6-5:11 years), 07+08 (Ages 7-7:11 years). However, *significant* dominance in *Spanish* in concatenated Age Codes 01+02 (Ages 4-4:11 years) and 05+06 (Ages 6-6:11 years), was indicated *only* for *Males* in the former sample, and *only* for *Females* in the latter.

It was not until concatenated Age Codes 09+10 (Ages 8-8:11 years) that a significant *English* dominance was indicated, and then it was *only* for *Females*, and *only* for *Males* in concatenated Age Codes 10+11 (Ages 10:6-11:5 years). For the rest of the groups, *English* was dominant for *both* genders.

The results of the analyses would suggest that lexical *dominance* is best revealed in samples with a *larger* age range (i.e. in this case, *12* months as opposed to 6 months).

Generally speaking, the dominance pattern was similar in all three analyses (as indicated in Sections 4.5.5a, 4.5.5b(i) and 4.5.5b(ii), earlier), inasmuch as a change of dominant language takes place in the middle of the primary school years.

If the results of both sets of analyses (for samples with 6 months and 12 months age range, respectively) are studied, some agreement is evident that *Females* may achieve significant *English* dominance as early as Age Code 09 (Age 8-8:5 years) and *Males* at Age Code 11 (Age 9-9:5 years) a *year* later.

Table 4.18(ii) below summarises those outcomes which were statistically significant.

TABLE 4.18(i) RESULTS OF STATISTICAL ANALYSES IN RELATION TO L1~L2 LEXICAL DOMINANCE FOR EACH AGE CODE WITH 12 MONTHS AGE RANGE, AND GENDER

AGE CODES	SEX	N	DOM. LANG.	T	p
01 + 02	M	15	SPAN	6	<.005
(4-4:11)	F	18	SPAN	70.5	NS
02 + 03	M	12	SPAN	10	=.01
(4:6-5:5)	F	12	SPAN	12.5	<.05
03 + 04	M	14	SPAN	14	<.01
(5-5:11)	F	10	SPAN	3	=.005
04 + 05	M	20	SPAN	48	<.025
(5:6-6:5)	F	22	SPAN	62	<.05
05 + 06	M	33	SPAN	265	NS
(6-6:11)	F	35	SPAN	208	<.05
06 + 07	M	34	ENG	270	NS
(6:6-7:5)	F	31	SPAN	167	NS
07 + 08	M	29	SPAN	105.5	=.013
(7-7:11)	F	28	SPAN	48	<.005
08 + 09	M	27	SPAN	163.5	NS
(7:6-8:5)	F	27	-	148	NS
09 + 10	M	25	ENG	120.5	NS
(8-8:11)	F	32	ENG	152	=.0183
10 + 11	M	31	ENG	135	=.0222
(8:6-9:5)	F	33	ENG	186	NS
11 + 12	M	28	ENG	61	=.001
(9-9:11)	F	28	ENG	37.5	<.00023
12 + 13	M	20	ENG	39.5	<.01
(9:6-10:5)	F	29	ENG	27	=.00003

Table 4.18(i) (Continued)

AGE CODES	SEX	N	DOM. LANG.	T	p
13 + 14 (10-10:11)	M	19	ENG	22	<.005
	F	25	ENG	12	<.005
14 + 15 (10:6-11:5)	M	20	ENG	9.5	<.005
	F	32	ENG	22	<.00003
15 + 16 (11-11:11)	M	20	ENG	0	<.005
	F	29	ENG	30	<.00005

KEY M = MALE; F = FEMALE; DOM.LANG. = DOMINANT LANGUAGE

T = WILCOXON T-VALUE; p = Probability (1 tailed); NS = NOT SIGNIFICANT

AGE CODES	DOMINANT LANGUAGE	GENDER
01+02 (4-4:11)	SPANISH	M
02+03 (4:6-5:5)	SPANISH	BOTH GENDERS
03+04 (5-5:11)	SPANISH	BOTH GENDERS
04+05 (5:6-6:5)	SPANISH	BOTH GENDERS
05+06 (6-6:11)	SPANISH	F
07+08 (7-7:11)	SPANISH	BOTH GENDER
09+10 (8-8:11)	ENGLISH	F
10+11 (8:6-9:5)	ENGLISH	M
ALL OTHERS (9:6 to 12)	ENGLISH	BOTH GENDERS

TABLE 4.18(ii) SUMMARY OF SIGNIFICANT L1~L2 LEXICAL DOMINANCE RELEVANT TO AGE CODE WITH 12 MONTHS AGE RANGE, AND GENDER

c) Incidence of Lexical Dominance

Language *dominance* sometimes reflects the frequency with which a language is spoken (See Chapter 2.2.4). However, *dominance* can also be determined by other factors, not least by the linguistic nature of the task. If the *referents* employed in the task are biased towards *one* language, a *spurious* dominance in that language may present. So far, lexical *dominance* has been determined by calculating subjects' *relative* proficiency in *each* language.

Another interesting variation of this measure relates to the *incidence* of lexical dominance at each age code. In a normally distributed population, one would expect a positive relationship between the number of subjects demonstrating a lexical *dominance* in one of the languages and the *degree* of dominance. Though this relationship was not statistically analysed, it was interesting to study the *incidence* pattern of dominance across the ages.

The Answer Sheet used in this investigation incorporated a short questionnaire designed to elicit subjects' judgements about the language(s) most used at home (See Appendix 3). This might suggest a *perceived* dominance (some of the controversy regarding this issue has been discussed earlier in Chapter 2). There were five optional responses related to the language spoken at home.

These were:

Do you speak
(i) Spanish *only*
(ii) English *only*
(iii) English and Spanish, *equally* so
(iv) English *mainly* and some Spanish
(v) Spanish *mainly* and some English

Most children within Age Codes 01-04 (Ages 4-5:11 years) were not able to provide this information without the help of their teachers. Teachers knew the children and their families reasonably well, Gibraltar being such a small community, but one has to wonder how reliable their information was. The reliability of the information provided by the older children, regarding language spoken at home, is also queried. Many gave ambiguous answers after the first trial which did not agree with the information given six months earlier. In retrospect, and had it been logistically feasible, reliable information could only have been obtained through personal interview with each parent. Meara's view (1982) about the unreliability of the information given by respondents in this area, has already been recorded in an earlier chapter. Because the information thus given was considered to be unreliable, it was decided not to conduct any statistical analyses on it.

It was anticipated however, that an analysis of each child's performance in Trial 1 of the present study would indicate not only which language was lexically *dominant*, and the extent of this dominance, but also how many subjects within each age code were lexically dominant in L1 or L2. These details are provided in Tables 4.19 (i)-(xvii), below.

Summaries of these data appear in Tables 4.20.1 and 4.20.2, below. Table 4.20.1 below summarises the ***Incidence*** of *dominance* in each language within each age code.

Summary

(i) The majority of subjects were dominant in *Spanish* in *every* age code from 01 (Age 4-4:5 years) to 08 (Age 7:6-7:11 years) inclusive, with the *exception* of Age Code 06 (Age 6:6-6:11 years) when there was an *equal* number of subjects dominant in English as in Spanish.

With *two* exceptions, the majority in most age codes is *substantial* i.e. below 60% (See Table 4.20.1, above).

(ii) The majority of children are dominant in *English* in *every* age code from 09 (Age 8-8:5 years) onwards .

With one exception, the majority is *substantial* i.e. 70% or above, in *most* age codes.

These results would seem to support the observations made following the statistical analyses in the previous section (See Table 4.16, above) that lexical *dominance* can be said to *shift* from Spanish *to* English at about Age Code 09 (Age 8-8:5 years). The fact that the majority of *Spanish* dominant subjects before Age Code 09 (Age 8-8:5 years) was in most cases above 60%, would strengthen this claim.

TABLES 4.19(i)-(xvii) SHOWING DOMINANT LANGUAGE, DOMINANCE RATIO, TOTAL LEXICAL REPERTOIRE (TLR), PERCENTAGE OF L1 and L2 FROM TLR

KEY DOM. LANG. = DOMINANT LANGUAGE

DOM. RATIO L1~L2 = RATIO OF DOMINANCE OF THE DOMINANT OVER THE NON-DOMINANT LANGUAGE

#TOTAL LEXICAL REPERTOIRE = TOTAL NUMBER OF WORDS KNOWN IN BOTH LANGUAGES (**N.B.** Correct responses for a referent in BOTH Languages i.e. Bilingual responses, count as 2 words - cf. for estimating CV when "bilingual responses" only count as ONE)

Table 4.19(i) AGE CODE - 01 (4-4:5); N = 20

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
130	ENG	1.11	78	52.6	47.4
131	SPAN	1.18	87	45.9	54.1
135	SPAN	1.34	82	42.7	57.3
133	ENG	1.10	65	52.3	47.7
150	ENG	1.06	111	51.4	48.6
153	SPAN	1.25	90	44.4	55.6
154	SPAN	1.45	76	40.8	59.2
171	SPAN	1.82	62	35.5	64.5
164	SPAN	1.33	77	42.9	57.1
136	SPAN	1.5	85	40	60
137	SPAN	1.6	94	38.3	61.7
134	ENG	1.07	95	51.6	48.4
151	SPAN	1.34	82	42.7	57.3
152	SPAN	1.41	65	41.5	58.5
170	ENG	1.17	104	53.8	46.2
001	ENG	1.67	96	62.5	37.5
160	ENG	1.09	69	52.2	47.8
161	SPAN	1.21	117	45.3	54.7
162	ENG	1.08	75	52	48
163	ENG	1.81	76	64.5	35.5
MEANS	ENG	1.24	84.3	48.7	51.3
	SPAN	1.31			

Summary:

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 9

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 11

DOMINANCE RATIO: Maximum - 1.82; Minimum - 1.06

LEXICAL REPERTOIRE: Maximum - 117; Minimum - 65; Mean - 84.3

ENGLISH PERCENTAGE OF TLR: Maximum - 64.5; Minimum - 35.5; Mean - 48.7

SPANISH PERCENTAGE OF TLR: Maximum - 64.5; Minimum - 35.5; Mean - 51.3

Table 4.19(ii) AGE CODE - 02 (4:6-4:11); N = 13

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
071	SPAN	1.37	109	42.2	57.8
073	SPAN	1.32	86	43	57
041	SPAN	1.32	79	43	57
043	SPAN	1.46	86	40.7	59.3
173	SPAN	1.14	126	46.8	53.2
002	SPAN	1.29	96	43.8	56.2
070	--	1.00	74	50	50
072	SPAN	1.46	69	40.6	59.4
074	SPAN	1.25	63	44.4	55.6
138	SPAN	1.09	69	47.8	52.2
042	ENG	1.03	61	50.8	49.2
177	ENG	1.52	78	60.3	39.7
172	ENG	1.05	121	51.2	48.8
MEANS	ENG	1.2	85.9	46.5	53.5
	SPAN	1.3			

Summary:

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 3

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 9

No. of SUBJECTS SHOWING DOMINANCE IN NEITHER - 1

DOMINANCE RATIO: Maximum - 1.46; Minimum- 1.00

LEXICAL REPERTOIRE: Maximum - 126; Minimum - 61; Mean - 85.9

ENGLISH PERCENTAGE OF TLR: Maximum - 60.3; Minimum - 40.6; Mean - 46.5

SPANISH PERCENTAGE OF TLR: Maximum - 59.4; Minimum - 39.7; Mean - 53.5

Table 4.19(iii) AGE CODE - 03 (5-5:5); N = 11

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
075	SPAN	1.11	112	47.3	52.7
076	SPAN	1.27	102	44.1	55.9
078	SPAN	1.21	75	45.3	54.7
139	SPAN	1.22	82	45.1	54.9
044	ENG	1.30	106	56.6	43.4
004	SPAN	1.24	74	44.6	55.4
077	SPAN	1.39	103	41.7	58.3
140	SPAN	1.63	100	38	62
174	SPAN	1.30	92	43.5	56.5
165	SPAN	1.04	92	48.9	51.1
166	SPAN	1.57	97	38.9	61.1
MEANS	ENG	1.3 (N=1)	93.9	44.9	55.1
	SPAN	1.29			

Summary:

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 1

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 10

DOMINANCE RATIO: Maximum - 1.63; Minimum - 1.04

LEXICAL REPERTOIRE: Maximum - 112; Minimum - 74; Mean - 93.9

ENGLISH PERCENTAGE OF TLR: Maximum - 48.9; Minimum - 38; Mean - 44.9

SPANISH PERCENTAGE OF TLR: Maximum - 62; Minimum - 43.4; Mean - 55.1

Table 4.19(iv) AGE CODE - 04 (5:6-5:11); N = 13

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
079	SPAN	1.39	55	41.8	58.2
081	SPAN	1.17	50	46	54
082	SPAN	1.22	51	45.1	53.9
083	SPAN	1.62	55	38.2	61.8
084	SPAN	1.09	109	47.7	52.3
087	SPAN	1.76	47	36.2	63.8
005	SPAN	1.34	89	42.7	57.3
006	SPAN	1.34	89	42.7	57.3
086	SPAN	1.06	68	48.5	51.5
088	SPAN	1.39	74	41.9	58.1
132	SPAN	1.12	110	47.3	52.7
007	ENG	1.08	106	51.9	48.1
008	SPAN	1.32	88	43.2	56.7
MEANS	ENG	1.08 (N=1)	76.2	44.1	55.9
	SPAN	1.32			

Summary:

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 1

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 12

DOMINANCE RATIO: Maximum - 1.76; Minimum - 1.06

LEXICAL REPERTOIRE: Maximum - 110; Minimum - 47; Mean - 76.2

ENGLISH PERCENTAGE OF TLR: Maximum - 51.9; Minimum - 36.2; Mean - 44.1

SPANISH PERCENTAGE OF TLR: Maximum - 63.8; Minimum - 48.1; Mean - 55.9

Table 4.19(v) AGE CODE - 05 (6-6:5); N = 29

Ss	DOM. LANG.	DOM. RATIO L1-L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
092	SPAN	1.50	80	40	60
097	SPAN	1.21	64	45.3	64.7
143	SPAN	1.17	100	46	54
144	ENG	1.05	131	51.1	48.9
045	ENG	1.44	100	59	41
048	ENG	1.22	129	51.9	48.1
049	ENG	1.55	107	52.3	47.7
181	ENG	1.06	131	57.3	42.7
010	SPAN	1.37	102	42.2	57.8
012	SPAN	1.25	117	44.4	55.6
014	SPAN	1.69	113	37.2	62.8
016	SPAN	1.11	93	47.3	52.6
089	SPAN	1.25	45	44.4	55.6
090	SPAN	1.47	74	40.5	59.5
091	ENG	1.02	83	50.6	49.4
093	SPAN	1.36	52	42.3	57.6
094	SPAN	1.33	77	42.9	57.1
095	SPAN	1.35	80	42.3	57.6
096	ENG	1.02	87	50.6	49.4
141	SPAN	1.04	108	49.1	50.9
142	SPAN	1.25	63	44.4	55.6
046	ENG	1.05	127	51.2	48.8
047	ENG	1.51	118	60.2	39.8
050	ENG	1.17	141	53.9	46.1
051	ENG	1.23	107	55.1	44.9
011	SPAN	1.18	96	45.8	54.2
013	SPAN	1.38	88	42	58
015	SPAN	1.40	96	41.7	58.3
017	SPAN	1.32	95	43.2	56.8
MEANS	ENG	1.21	96.6	47.4	52.6
	SPAN	1.31			

Summary: (Table 4.19(v) Age Code 05)

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 11

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 18

DOMINANCE RATIO: Maximum - 1.69; Minimum - 1.02

LEXICAL REPERTOIRE: Maximum - 141; Minimum - 45; Mean - 96.6

ENGLISH PERCENTAGE OF TLR: Maximum - 60.2; Minimum - 37.2; Mean - 47.4

SPANISH PERCENTAGE OF TLR: Maximum - 64.7; Minimum - 39.8; Mean - 52.6

Table 4.19(vi) AGE CODE - 06 (6:6-6:11); N = 39

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
099	SPAN	1.33	70	42.9	57.1
100	SPAN	1.47	106	40.6	59.4
103	SPAN	1.24	74	44.6	55.4
105	SPAN	1.19	90	45.6	55.4
145	SPAN	1.06	134	48.5	51.5
052	ENG	1.08	125	52	48
053	ENG	1.01	155	50.3	49.7
055	ENG	2.05	113	67.3	32.7
056	ENG	1.62	131	61.8	38.2
058	ENG	1.29	126	56.3	43.7
060	ENG	1.25	128	55.5	44.5
061	ENG	1.06	144	51.4	48.6
063	ENG	1.27	116	56	44
067	SPAN	1.05	125	48.8	51.2
182	SPAN	1.05	119	48.7	51.3
018	ENG	1.05	125	51.2	48.8
020	ENG	1.10	122	52.5	47.5
021	SPAN	1.64	66	37.9	62.1
023	ENG	1.34	117	57.3	62.7
026	SPAN	2.04	73	32.9	67.1
180	SPAN	1.30	106	43.4	56.6

Table 4.19(vi) (Continued)

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
101	SPAN	1.37	102	42.2	57.8
102	SPAN	1.33	107	42.9	57.1
106	SPAN	1.41	106	41.5	59.5
146	SPAN	1.21	93	45.2	54.8
147	SPAN	1.44	78	41	59
054	ENG	1.18	111	54.1	45.9
057	ENG	1.60	125	61.6	38.4
059	ENG	1.17	128	53.9	46.1
062	ENG	1.04	137	51.1	48.9
065	ENG	1.40	105	50.5	49.5
068	ENG	1.04	96	51	49
183	--	1.00	104	50	50
019	SPAN	1.10	122	47.5	52.5
022	SPAN	1.26	79	44.3	55.7
024	ENG	1.15	133	53.4	46.6
025	SPAN	1.11	120	47.5	52.5
027	SPAN	1.08	108	48.1	51.9
179	ENG	1.19	138	54.3	45.7
MEANS	ENG	1.26	111.7	49.4	50.6
	SPAN	1.29			

Summary:

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 19
No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 19
No. of SUBJECTS SHOWING DOMINANCE IN NEITHER - 1
DOMINANCE RATIO: Maximum - 2.05; Minimum - 1.0
LEXICAL REPERTOIRE: Maximum - 138; Minimum - 66; Mean - 111.7
ENGLISH PERCENTAGE OF TLR:Maximum - 67.3; Minimum - 32.9; Mean - 49.4
SPANISH PERCENTAGE OF TLR:Maximum - 67.1; Minimum - 38.2; Mean - 50.6

Table 4.19(vii) AGE CODE - 07 (7-7:5); N = 26

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
109	SPAN	1.13	134	47	53
111	ENG	1.83	130	64.6	35.4
112	SPAN	1.14	126	46.8	53.2
113	SPAN	1.09	140	47.9	52.1
114	SPAN	1.09	140	47.9	52.1
148	SPAN	1.19	105	45.7	54.3
028	SPAN	1.16	125	46.4	53.6
031	-	1.00	108	50	50
032	ENG	1.21	168	54.8	45.2
033	ENG	1.06	128	51.6	48.4
158	ENG	1.05	113	51.3	48.7
501	SPAN	1.05	84	48.8	51.2
503	SPAN	1.17	126	46	54
107	SPAN	1.18	96	45.8	54.2
108	SPAN	1.08	129	48.1	51.9
110	ENG	1.02	95	50.5	49.5
117	ENG	1.04	110	49.1	50.9
149	ENG	1.02	133	50.4	49.6
029	ENG	1.47	121	59.5	40.5
030	SPAN	1.25	119	44.5	55.5
034	SPAN	1.14	109	46.8	53.2
159	SPAN	1.29	87	43.7	56.3
500	ENG	1.04	102	50.9	49.1
502	ENG	1.08	77	51.9	48.1
505	SPAN	1.81	73	35.6	64.4
506	SPAN	1.19	94	45.7	54.3
MEANS	ENG	1.19	120	48.9	51.1
	SPAN	1.11			

Summary: (Table 4.19(vii) Age Code 07)

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 9

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 16

No. of SUBJECTS SHOWING DOMINANCE IN NEITHER - 1

DOMINANCE RATIO: Maximum - 1.83; Minimum - 1.0

LEXICAL REPERTOIRE: Maximum - 168; Minimum - 73; Mean - 120

ENGLISH PERCENTAGE OF TLR: Maximum - 64.6; Minimum - 43.7; Mean - 48.9

SPANISH PERCENTAGE OF TLR: Maximum - 64.4; Minimum - 35.4; Mean - 51.1

Table 4.19(viii) AGE CODE - 08 (7:6-7:11); N = 31

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
122	ENG	1.01	141	50.4	49.6
124	SPAN	1.05	117	48.7	51.3
125	ENG	1.03	140	50.7	49.3
126	SPAN	1.06	134	48.5	51.5
127	SPAN	1.10	141	47.5	52.5
035	ENG	1.24	114	55.3	44.7
036	SPAN	1.11	95	47.4	52.6
040	SPAN	1.18	111	45.9	54.1
186	SPAN	1.16	106	46.2	53.8
190	SPAN	1.05	115	48.7	51.3
191	ENG	1.02	107	50.5	49.5
192	SPAN	1.08	127	48	52
193	SPAN	1.41	99	41.4	58.6
194	SPAN	1.06	105	48.6	51.4
197	SPAN	1.02	121	49.6	50.4
198	SPAN	1.19	92	45.7	54.3
118	SPAN	1.16	121	46.3	53.7
119	SPAN	1.26	97	44.3	55.7
120	SPAN	1.06	142	48.6	51.4
121	SPAN	1.19	127	45.7	54.3

Table 4.19(viii) (Continued)

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
123	SPAN	1.07	122	48.4	51.6
156	-	1.00	120	50	50
170	-	1.00	160	50	50
039	SPAN	1.30	84	45.2	54.8
184	SPAN	1.46	101	40.6	59.4
185	-	1.00	90	50	50
187	SPAN	1.17	102	46.1	53.9
188	SPAN	1.04	104	49	51
189	SPAN	1.15	101	46.5	53.5
195	SPAN	1.24	121	44.6	55.4
196	ENG	1.13	98	53.1	46.9
MEANS	ENG	1.08	117.9	47.8	52.2
	SPAN	1.15			

Summary:

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 5

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 23

No. of SUBJECTS SHOWING DOMINANCE IN NEITHER - 3

DOMINANCE RATIO: Maximum - 1.41; Minimum - 1.0

LEXICAL REPERTOIRE: Maximum - 160; Minimum - 84; Mean - 117.9

ENGLISH PERCENTAGE OF TLR: Maximum - 55.3; Minimum - 40.6; Mean - 47.8

SPANISH PERCENTAGE OF TLR: Maximum - 58.6; Minimum - 44.7; Mean - 52.2

Table 4.19(ix) AGE CODE - 09 (8-8:5); N = 23

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
200	ENG	1.10	124	52.4	47.6
201	ENG	1.21	128	54.7	45.3
279	SPAN	1.01	173	49.7	50.3
286	ENG	1.20	152	54.6	45.4
300	ENG	1.06	169	51.5	49.5
303	ENG	1.16	151	53.6	46.4
305	ENG	1.02	133	50.4	49.6
414	SPAN	1.07	149	48.3	51.7
415	SPAN	1.29	119	43.7	56.3
417	ENG	1.25	142	55.6	44.4
419	ENG	1.25	124	55.6	44.4
287	ENG	1.05	131	51.1	48.9
288	ENG	1.21	150	54.7	45.3
289	ENG	1.18	174	54	46
301	ENG	1.06	148	51.4	48.6
304	ENG	1.16	138	53.6	46.4
411	ENG	1.24	141	55.3	44.7
412	ENG	1.21	137	54.7	45.3
413	ENG	1.13	130	53.1	46.9
416	ENG	1.09	149	52.3	47.7
418	ENG	1.29	112	56.3	43.7
420	SPAN	1.44	100	41	59
128	SPAN	1.11	118	47.5	52.5
MEANS	ENG	1.16	138.8	51.9	48
	SPAN	1.18			

Summary: (Table 4.19(ix) Age Code 09)

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 18

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 5

DOMINANCE RATIO: Maximum - 1.44; Minimum - 1.01

LEXICAL REPERTOIRE: Maximum - 174; Minimum - 100; Mean - 138.8

ENGLISH PERCENTAGE OF TLR:Maximum - 56.8; Minimum - 41; Mean - 51.9

SPANISH PERCENTAGE OF TLR:Maximum - 59; Minimum - 43.7; Mean - 48

Table 4.19(x) AGE CODE - 10 (8:6-8:11); N = 34

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
204	ENG	1.05	123	51.2	48.8
209	SPAN	1.03	118	49.2	50.8
212	ENG	1.08	110	51.8	48.2
214	ENG	1.16	125	53.6	46.4
306	ENG	1.01	165	50.3	49.7
307	SPAN	1.01	163	49.7	50.3
309	ENG	1.11	133	52.6	47.4
313	ENG	1.10	145	52.4	47.6
314	SPAN	1.17	100	46	54
315	SPAN	1.16	151	46.4	53.6
316	ENG	1.16	158	53.8	46.2
425	ENG	1.09	144	52.1	47.9
430	SPAN	1.13	111	46.8	53.2
432	SPAN	1.26	120	44.2	55.8
203	SPAN	1.22	82	45.1	54.9
205	SPAN	1.03	79	49.4	50.6
206	ENG	1.04	110	50.9	49.1
207	ENG	1.13	130	53.1	46.9
208	SPAN	1.09	115	47.8	52.2
211	SPAN	1.20	88	45.5	54.5
213	ENG	1.06	68	51.5	48.5

Table 4.19(x) (Continued)

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
290	ENG	1.03	138	50:7	49.3
292	ENG	1.27	159	55.9	44.1
310	SPAN	1.08	137	48.2	51.8
311	ENG	1.55	153	60.8	39.2
312	ENG	1.28	162	56.2	43.8
421	ENG	1.08	135	51.9	48.1
422	ENG	1.07	149	51.7	48.3
424	ENG	1.03	154	50.6	49.4
426	SPAN	1.03	130	49.2	50.8
427	SPAN	1.11	156	47.4	52.6
428	SPAN	1.09	140	47.9	52.1
429	ENG	1.04	155	50.9	49.1
431	SPAN	1.28	107	43.9	56.1
MEANS	ENG	1.12	133.2	50.3	49.7
	SPAN	1.13			

Summary:

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 19

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 15

DOMINANCE RATIO: Maximum - 1.28; Minimum - 1.01

LEXICAL REPERTOIRE: Maximum - 165; Minimum - 68; Mean - 133.2

ENGLISH PERCENTAGE OF TLR:Maximum - 60.8; Minimum - 43.9; Mean - 50.3

SPANISH PERCENTAGE OF TLR:Maximum - 56.1; Minimum - 39.2; Mean - 49.7

Table 4.19(xi) AGE CODE - 11 (9-9:5); N = 30

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
215	ENG	1.46	138	59.4	40.6
217	ENG	1.03	134	50.7	49.3
218	SPAN	1.03	154	49.4	50.6
220	SPAN	1.16	110	46.4	53.6
222	SPAN	1.02	127	49.6	50.4
223	ENG	1.14	158	53.2	46.7
224	ENG	1.01	137	50.4	49.6
293	ENG	1.08	158	51.9	48.1
294	ENG	1.09	151	52.3	47.7
317	ENG	1.30	115	56.5	43.5
318	ENG	1.21	117	54.7	45.3
320	ENG	1.03	132	50.8	49.2
321	ENG	1.16	158	53.8	46.2
326	SPAN	1.01	153	49.7	50.3
328	ENG	1.07	141	51.8	48.2
329	ENG	1.07	155	51.6	48.4
433	-	1.00	152	50	50
216	ENG	1.03	136	50.7	49.3
219	ENG	1.16	119	53.8	46.2
221	ENG	1.15	142	53.5	46.5
284	ENG	1.11	137	52.6	47.4
295	ENG	1.16	162	53.7	45.6
296	ENG	1.04	143	51	49
333	SPAN	1.14	135	46.7	53.3
319	ENG	1.09	174	52.3	47.7
322	-	1.00	156	50	50
324	ENG	1.08	135	51.9	48.1
325	SPAN	1.04	92	48.9	51.1
331	SPAN	1.03	156	49.4	50.6
434	ENG	1.06	111	51.4	48.6
MEANS	ENG	1.12	139.6	51.7	48.3
	SPAN	1.06			

Summary: (Table 4.19(xii) Age Code 12)

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 21

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 7

No. of SUBJECTS SHOWING DOMINANCE IN NEITHER - 2

DOMINANCE RATIO: Maximum - 1.46; Minimum - 1.0

LEXICAL REPERTOIRE: Maximum - 174; Minimum - 92; Mean - 139.6

ENGLISH PERCENTAGE OF TLR:Maximum - 59.4; Minimum - 46.4; Mean - 51.7

SPANISH PERCENTAGE OF TLR:Maximum - 53.5; Minimum - 40.6; Mean - 48.3

Table 4.19(xii) AGE CODE 12 (9-9:5); N = 26

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
225	SPAN	1.14	141	46.8	53.2
226	ENG	1.06	136	51.5	48.5
229	ENG	1.26	158	55.7	44.3
232	ENG	1.33	98	57.1	42.9
282	ENG	1.03	150	50.7	49.3
299	ENG	1.24	148	55.4	44.6
498	ENG	1.08	164	51.8	48.2
337	SPAN	1.14	152	46.7	53.3
338	ENG	1.07	168	51.8	48.2
342	ENG	1.06	142	51.4	48.6
344	ENG	1.18	146	54.1	45.9
227	SPAN	1.07	147	48.3	51.7
228	ENG	1.08	129	51.9	48.1
230	ENG	1.02	125	50.4	49.6
233	ENG	1.02	117	50.4	49.6
234	ENG	1.04	147	51	49
235	ENG	1.09	138	52.2	47.8
297	ENG	1.18	142	54.2	45.7
298	ENG	1.16	151	53.6	46.4

Table 4.19(xii) (Continued)

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
499	ENG	1.10	181	52.5	47.5
334	ENG	1.15	168	53.6	46.4
336	ENG	1.13	177	53.1	43.7
339	ENG	1.13	168	52.9	47.1
340	ENG	1.05	160	51.3	48.7
341	-	1.00	166	50	50
343	ENG	1.06	179	51.4	48.6
MEANS	ENG	1.11	149.9	53.9	46.1
	SPAN	1.12			

Summary:

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 22

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 3

No. of SUBJECTS SHOWING DOMINANCE IN NEITHER - 1

DOMINANCE RATIO: Maximum - 1.33; Minimum - 1.0

LEXICAL REPERTOIRE: Maximum - 181; Minimum - 98; Mean - 149.9

ENGLISH PERCENTAGE OF TLR:Maximum - 57.1; Minimum - 46.7; Mean - 53.9

SPANISH PERCENTAGE OF TLR:Maximum - 53.3; Minimum - 42.9; Mean - 46.1

Table 4.19(xiii) AGE CODE - 13 (10-10:5); N = 23

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
238	ENG	1.05	156	51.3	48.7
240	ENG	1.11	167	52.7	47.3
285	ENG	1.15	131	53.4	46.6
346	ENG	1.11	158	52.5	47.5
351	ENG	1.06	179	51.4	48.6
352	SPAN	1.03	160	49.4	50.6
356	SPAN	1.04	167	49.1	50.9
362	SPAN	1.03	177	49.2	50.8
363	ENG	1.03	175	50.9	49.1
236	ENG	1.05	121	51.2	48.8
237	ENG	1.03	134	50.7	49.3
239	ENG	1.16	134	53.7	46.3
345	ENG	1.08	127	51.9	48.1
353	SPAN	1.01	173	49.7	50.3
354	ENG	1.04	173	50.9	49.1
355	SPAN	1.03	160	49.4	50.6
357	ENG	1.09	171	52	47
358	ENG	1.05	172	51.2	48.8
359	ENG	1.03	148	50.7	49.3
361	ENG	1.02	168	50.6	49.4
347	SPAN	1.01	139	49.6	50.4
348	ENG	1.32	146	56.8	43.2
349	ENG	1.42	150	58.7	41.3
MEANS	ENG	1.11	155.9	51.6	48.4
	SPAN	1.03			

Summary:

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 17

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 6

DOMINANCE RATIO: Maximum - 1.42; Minimum - 1.01

LEXICAL REPERTOIRE: Maximum - 179; Minimum - 121; Mean - 155.9

ENGLISH PERCENTAGE OF TLR:Maximum - 58.7; Minimum - 49.1; Mean - 51.6

SPANISH PERCENTAGE OF TLR:Maximum - 50.9; Minimum - 41.3; Mean - 48.4

Table 4.19(xiv) AGE CODE - 14 (10:6-10:11); N = 21

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
241	ENG	1.03	140	50.7	49.3
243	ENG	1.06	173	51.4	48.6
246	ENG	1.04	151	50.9	49.1
247	ENG	1.04	159	50.9	49.1
249	ENG	1.08	152	51.9	48.4
250	SPAN	1.07	141	48.2	51.8
251	ENG	1.06	169	51.5	49.5
283	ENG	1.19	158	54.4	45.6
364	ENG	1.11	177	52.5	47.4
369	ENG	1.07	180	51.7	48.3
242	ENG	1.16	138	53.6	46.4
244	ENG	1.05	172	51.2	48.8
245	ENG	1.13	132	53	47
365	ENG	1.08	185	51.9	48.1
366	-	1.00	158	50	50
367	ENG	1.02	178	50.6	49.3
368	ENG	1.06	181	51.4	49.6
370	ENG	1.13	183	53	47
371	-	1.00	174	50	50
372	SPAN	1.01	167	49.7	50.3
374	-	1.00	174	50	50
MEANS	ENG	1.08	159.1	51.4	48.6
	SPAN	1.04 (N=2)			

Summary:

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 16

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 2

No. of SUBJECTS SHOWING DOMINANCE IN NEITHER - 3

DOMINANCE RATIO: Maximum - 1.19; Minimum - 1.0;

LEXICAL REPERTOIRE: Maximum - 185; Minimum - 132, Mean - 159.1

ENGLISH PERCENTAGE OF TLR:Maximum - 53.6; Minimum - 48.2; Mean - 51.4

SPANISH PERCENTAGE OF TLR:Maximum - 51.8; Minimum - 47; Mean - 48.6

Table 4.19(xv) AGE CODE - 15 (11-11:5); N = 31

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
254	ENG	1.12	150	52.7	47.3
258	ENG	1.06	167	51.5	48.5
260	ENG	1.07	180	51.7	48.3
264	ENG	1.08	158	51.9	41.1
266	ENG	1.04	159	50.9	49.1
378	ENG	1.09	165	52.1	47.9
383	ENG	1.53	152	60.5	39.5
385	ENG	1.02	186	50.5	49.5
387	ENG	1.02	180	50.6	49.4
390	ENG	1.02	182	50.5	49.5
253	ENG	1.06	140	51.4	48.6
257	-	1.00	144	50	50
259	ENG	1.07	157	51.6	49.4
261	SPAN	1.17	117	46.2	53.8
262	ENG	1.04	153	50.9	49.1
263	ENG	1.57	179	53.6	46.4
265	ENG	1.11	150	52.7	47.3
267	ENG	1.02	172	50.6	49.4
376	ENG	1.05	187	51.3	49.7
377	ENG	1.02	172	50.6	49.4
379	ENG	1.11	158	52.5	47.5
380	ENG	1.12	172	52.9	47.1
381	ENG	1.15	157	53.5	46.5
382	ENG	1.07	174	51.7	48.3
384	ENG	1.04	153	50.9	49.1
386	ENG	1.18	172	54.1	45.9
388	ENG	1.04	173	50.9	49.1
389	ENG	1.07	178	51.7	48.3
391	ENG	1.28	164	56.1	43.9
392	ENG	1.03	142	50.7	49.3
393	ENG	1.05	168	51.2	49.7
MEANS	ENG	1.11	163.3	51.9	48.1
	SPAN	1.17 (N=1)			

Summary: (Table 4.19(xv) Age Code 15)

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 29

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 1

No. of SUBJECTS SHOWING DOMINANCE IN NEITHER - 1

DOMINANCE RATIO: Maximum - 1.57; Minimum - 1.0

LEXICAL REPERTOIRE: Maximum - 187; Minimum - 117; Mean - 163.3

ENGLISH PERCENTAGE OF TLR:Maximum - 60.5; Minimum - 46.2; Mean - 51.9

SPANISH PERCENTAGE OF TLR:Maximum - 53.8; Minimum - 39.5; Mean - 48.1

Table 4.19(xvi) AGE CODE - 16 (11:6-11:11); N = 18

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
268	ENG	1.06	165	51.5	48.5
269	ENG	1.09	171	52	48
271	-	1.00	184	50	50
272	ENG	1.37	154	57.8	42.2
276	ENG	1.06	144	51.4	48.6
277	ENG	1.09	180	52.2	47.8
398	ENG	1.01	169	50.3	49.7
400	ENG	1.03	158	50.6	49.4
402	ENG	1.11	156	52.6	47.4
403	ENG	1.07	184	51.6	48.4
270	ENG	1.08	158	51.9	48.1
273	ENG	1.23	167	55.1	44.9
274	ENG	1.25	146	55.5	44.5
275	ENG	1.19	169	54.4	45.6
281	SPAN	1.07	149	48.3	51.7
394	ENG	1.44	154	59.1	40.9
396	ENG	1.02	170	50.6	49.4
399	ENG	1.07	182	51.6	48.4
MEANS	ENG	1.14	164.4	52.6	47.4
	SPAN	1.07 (N=1)			

Summary: (Table 4.19(xvi) Age Code 16)

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 16

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 1

No. of SUBJECTS SHOWING DOMINANCE IN NEITHER - 1

DOMINANCE RATIO: Maximum - 1.44; Minimum - 1.44

LEXICAL REPERTOIRE: Maximum - 184; Minimum - 144; Mean - 164.4

ENGLISH PERCENTAGE OF TLR:Maximum - 59.1; Minimum - 48.3; Mean - 52.6

SPANISH PERCENTAGE OF TLR:Maximum - 51.7; Minimum - 40.9; Mean - 47.4

Table 4.19(xvii) AGE CODE - 17 (12-12:5); N = 4

Ss	DOM. LANG.	DOM. RATIO L1~L2	#TOTAL LEXICAL REPERTOIRE(TLR)	% L1 & L2 of TLR ENG	SPAN
278	ENG	1.14	158	53.2	46.8
407	-	1.00	170	50	50
405	SPAN	1.01	183	49.7	50.3
406	ENG	1.14	137	53.3	46.7
MEANS	ENG	1.14 (N=2)	162	51.5	48.5
	SPAN	1.01 (N=1)			

Summary:

No. of SUBJECTS SHOWING DOMINANCE IN ENGLISH - 2

No. of SUBJECTS SHOWING DOMINANCE IN SPANISH - 1

No. of SUBJECTS SHOWING DOMINANCE IN NEITHER - 1

DOMINANCE RATIO: Maximum - 1.14; Minimum - 1.0

LEXICAL REPERTOIRE: Maximum - 183; Minimum - 137; Mean - 162

ENGLISH PERCENTAGE OF TLR:Maximum - 53.3; Minimum - 49.7; Mean - 51.5

SPANISH PERCENTAGE OF TLR:Maximum - 50.3; Minimum - 46.7; Mean - 48.5

AGE CODES	NUMBER OF SUBJECTS WHO WERE DOMINANT IN: ENG	SPAN	NONE
01	9 (45%)	11 (55%)	0
02	3 (23%)	9 (69%)	1 (8%)
03	1 (9%)	10 (91%)	0
04	1 (8%)	12 (92%)	0
05	11 (38%)	18 (62%)	0
06	19 (49%)	19 (49%)	1 (2%)
07	9 (35%)	16 (62%)	1 (3%)
08	5 (17.2%)	23 (79.3%)	1 (3.4%)
09	18 (78%)	5 (22%)	0
10	19 (56%)	15 (44%)	0
11	21 (70%)	7 (23%)	2 (7%)
12	22 (85%)	3 (11%)	1 (4%)
13	17 (74%)	6 (26%)	0
14	16 (76%)	2 (10%)	3 (14%)
15	29 (94%)	1 (3%)	1 (3%)
16	16 (89%)	1 (5.5%)	1 (5.5%)

TABLE 4.20.1 SUMMARY OF NUMBER OF SUBJECTS WITH DOMINANT L1~L2 IN EACH AGE CODE

d) Dominance Ratio

To obtain a more precise *quantitative* measure of the *extent* of the lexical *dominance* in relation to a subject's *total* lexicon, the *relative* percentage L1 and L2 lexicon, taken from the *Total Lexical Repertoire,* was calculated for each subject. The *mean percentage* in each age code was also calculated.

Another *quantitative* measure of *dominance* was expressed in terms of *ratios*. This gave a clearer indication of the extent of *relative* dominance between the two languages. The ratios were calculated for each subject. Because not all subjects within a particular age code were dominant in the same language, *two* sets of *mean ratios*, one for L1~L2 and the other for L2~L1 dominance had to be calculated for many age codes.

Table 4.20.2 below, provides a summary of the *mean percentages* in L1 and L2 taken from the TLR, and the *mean dominance ratios* for each language. Full details for each subject can be found in Tables 4.19 (i)-(xvii), above.

Summary

(i) The percentage distribution between L1 and L2 lexicon did not differ substantially. The *lowest English* percentage was indicated at Age Code 04 (Age 5:5-5:11 years), this being 44.1% (therefore, 55.9% in *Spanish*) and the *lowest* in *Spanish* was at Age Code 12 (Age 9:5-9:11 years), this being 46.1% (therefore, 53.9% in *English*).

(ii) The *superiority* changed from Spanish *to* English at Age Code *09* i.e. age 8-8:5 years.

(iii) *Not* all subjects within a particular age code were dominant in the same language, though dominance in only *one* language (i.e. *English*) was almost unanimous from Age Code 15 (Age 11-11:5 years) onwards.

(iv) The *mean dominance ratio* never exceeded 1.32:1 and this occurred at Age Code 04 (Age 5:6-5:11 years) for those subjects who were dominant in *Spanish*. The dominance of one language over the other was thus, always *less* than one third greater.

(v) The dominance pattern reflected by using *ratios* is generally the same as the one resulting from other measures of dominance already described above.

(vi) From Age Code 15 (Ages 11-11:5 years) there were over 85% of subjects who were *English* dominant.

AGE CODES	MEAN TOTAL LEXICAL REPERTOIRE	MEAN PERCENTAGE OF L1 & L2 FROM TLR		MEAN RATIO	
		ENG	SPAN	ENG	SPAN
01	84.3	48.7	51.3	1.24	1.31
02	85.9	46.5	53.5	1.2	1.3
03	93.9	44.9	55.1	1.3	1.29
04	76.2	44.1	55.9	1.08	1.32
05	96.6	47.4	52.6	1.21	1.31
06	111.7	49.4	50.6	1.26	1.29
07	120	48.9	51.1	1.19	1.11
08	117.9	47.8	52.2	1.08	1.15
09	138.8	51.9	48.1	1.16	1.18
10	133.2	50.3	49.7	1.12	1.13
11	139.6	51.7	48.3	1.12	1.06
12	149.9	53.9	46.1	1.11	1.12
13	155.9	51.6	48.4	1.11	1.03
14	159.1	51.4	48.6	1.08	1.04
15	163.3	51.9	48.1	1.11	1.17
16	164.4	52.6	47.4	1.14	1.07

TABLE 4.20.2 SUMMARY OF MEAN PERCENTAGE OF L1 AND L2 LEXICON, TAKEN FROM THE TOTAL LEXICAL REPERTOIRE (TLR), AND MEAN RATIOS FOR EACH LANGUAGE IN EACH AGE CODE

4.5.6 Correlation Between Linguistic Variables

Correlational relationships were calculated using Trial 1 data between each possible dyad combination of linguistic variables. These analyses were conducted at *three* levels; the first was for the whole group *disregarding* gender and for each age code with 6 months age range; the *second* and *third*, taking *gender* into account and for each age code, with 6 months age range and with *12* months range, respectively.

a) Correlations Between Linguistic Variables for Each Age Code (6 months age range)

The results of the *Spearman's Rank Order Correlation* test for this analysis appear in Table 4.21, below.

Summary

Significant correlations were indicated between *all* dyads of linguistic variables (Table 4.21), in all age codes, with the *exception* of the following:-

Between *English* and *Spanish* in Age Codes 01 (Age 4-4:5 years) and 03 (Age 5-5:5 years) and *Spanish* and *Bilinguality* in Age Code 01 (Age 4-4:5 years).

TABLE 4.21 CORRELATIONS BETWEEN LINGUISTIC VARIABLES FOR *ALL* CHILDREN IN EACH AGE CODE (6 months age range)

AGE CODES	N		LINGUISTIC VARIABLES E/S	E/B	E/CV	S/B	S/CV	B/CV	CONCLUSIONS
01 (4-4:5)	20	r	.174	.759	.606	.365	.719	.519	All but E/S and S/B correlate SIGNIFICANTLY
		p	NS	<.001	=.002	NS (.057)	<.001	=.009	
02 (4:6-4:11)	13	r	.623	.767	.815	.790	.927	.786	ALL LVs correlate SIGNIFICANTLY
		p	=.012	=.001	<.001	=.001	<.001	=.001	
03 (5-5:5)	11	r	.403	.734	.800	.594	.783	.663	All but E/S correlate SIGNIFICANTLY
		p	NS	=.005	=.002	=.027	=.002	=.013	
04 (5:6-5:11)	13	r	.881	.836	.965	.891	.910	.808	All LVs correlate SIGNIFICANTLY
		p	<.001	<.001	<.001	<.001	<.001	<.001	
05 (6-6:5)	29	r	.612	.879	.931	.868	.784	.913	"
		p	<.001	<.001	<.001	<.001	<.001	<.001	
06 (6:6-6:11)	39	r	.384	.835	.868	.684	.592	.725	"
		p	=.008	<.001	<.001	<.001	<.001	<.001	
07 (7-7:5)	26	r	.602	.894	.911	.825	.762	.864	"
		p	=.001	<.001	<.001	<.001	<.001	<.001	
08 (7:6-7:11)	31	r	.748	.918	.854	.850	.909	.805	"
		p	<.001	<.001	<.001	<.001	<.001	<.001	
09 (8-8:5)	23	r	.690	.928	.865	.812	.849	.819	"
		p	<.001	<.001	<.001	<.001	<.001	<.001	
10 (8:6-8:11)	34	r	.774	.941	.913	.898	.861	.876	"
		p	<.001	<.001	<.001	<.001	<.001	<.001	
11 (9-9:5)	30	r	.734	.858	.912	.918	.861	.844	"
		p	<.001	<.001	<.001	<.001	<.001	<.001	

Table 4.21 (Continued)

AGE CODES	N		LINGUISTIC VARIABLES E/S	E/B	E/CV	S/B	S/CV	B/CV	CONCLUSIONS
12 (9:6-9:11)	26	r	.738	.890	.917	.937	.816	.853	All LVs correlate SIGNIFICANTLY
		p	<.001	<.001	<.001	<.001	<.001	<.001	
13 (10-10:5)	23	r	.711	.821	.931	.977	.850	.905	"
		p	<.001	<.001	<.001	<.001	<.001	<.001	
14 (10:6-10:11)	21	r	.849	.948	.885	.951	.662	.770	"
		p	<.001	<.001	<.001	<.001	=.001	<.001	
15 (11-11:5)	31	r	.708	.842	.911	.956	.802	.847	"
		p	<.001	<.001	<.001	<.001	<.001	<.001	
16 (11:6-11:11)	18	r	.498	.731	.878	.911	.504	.608	"
		p	=.018	<.001	<.001	<.001	=.016	=.004	

KEY E/S = ENGLISH v SPANISH; E/B = ENGLISH v BILINGUALITY;
E/CV = ENGLISH v CONCEPTUAL VOCABULARY; S/B = SPANISH v BILINGUALITY;
S/CV = SPANISH v CONCEPTUAL VOCABULARY;
B/CV = BILINGUALITY v CONCEPTUAL VOCABULARY;
r = SPEARMAN's RANK ORDER CORRELATION CO-EFFICIENT;
p = Probability; LVs = LINGUISTIC VARIABLES

b) Correlations Between Linguistic Variables for Each Gender (6 months age range)

The *second* set of analyses aimed to establish whether each *gender* might determine significant correlations in a different way. The results of these analyses appear in Table 4.22, below.

Summary

There are *significant correlations* between *all* linguistic variables except as follows:

For E/S, E/B, S/B and B/CV for *Males* in Age Code 01 (Age 4-4:5 years);
For E/S, E/CV, S/B for *Females* in Age Code 01;
For E/S, E/CV, S/B, S/CV, B/CV for *Females* in Age Code 02 (Age 4:6-4:11 years);
For E/S, S/B, B/CV for *Males* in Age Code 03 (Age 5-5:5) years;
For no LV dyads, for *Females* in Age Code 03;
For B/CV for *Males* in Age Code 04 (Age 5:5-5:11 years);

For E/S, E/B, E/CV for *Females* in Age Code 04;
Between English and Spanish for *Males* in Age Codes 05 (Age 6-6:5 years), 06 (Age 6:6-6:11 years), 12 (Age 9:6-9:11 years);
For E/S, S/CV, and B/CV for *Females* in Age Code 16 (Age 11:6-11:11 years);
For Age Codes 16 (Age 11:6-11:11 years), significant correlations were indicated for *Males*, between *all* combinations of linguistic variables, but for *Females*, only for *English/Bilinguality*, *English/Conceptual Vocabulary* and *Spanish/Bilinguality* combinations.

It was thus, in the *earlier* age codes (i.e. 01-04) that a *consistent* pattern of *significant* correlations between all LV dyads was *not* indicated for *both* genders. *Significant* correlations between *all* dyad combinations of linguistic variables were indicated for *both* genders (Table 4.22) in *all* age codes between 05 (Age 6-6:5 years) and 15 (Age 11-11:5 years) with the *exceptions* already mentioned.

TABLE 4.22 CORRELATIONS BETWEEN LINGUISTIC VARIABLES WITHIN EACH AGE CODE (6 months age range) FOR EACH GENDER

				LINGUISTIC VARIABLES					
AGE CODES	SEX	N		E/S	E/B	E/CV	S/B	S/CV	B/CV
01	M	9	r	.466	.494	.681	.561	.861	.377
(4-4:5)			p	NS	NS	<.05	NS	<.01	NS
	F	11	r	-.064	.888	.463	.279	.677	.554
			p	NS	<.001	NS	NS	=.011	=.039
02	M	6	r	.943	1.0	.899	.943	.986	.899
(4:6-4:11)			p	=.01	<.01	<.05	=.01	<.01	<.05
	F	7	r	.234	.764	.703	.162	.571	.234
			p	NS	<.05	NS	NS	NS	NS
03	M	6	r	.812	.941	.829	.770	.986	.759
(5-5:5)			p	NS	<.05	=.05	NS	<.01	NS
	F	5	r	-.5	-.667	.41	.462	.564	-.289
			p	NS	NS	NS	NS	NS	NS
04	M	8	r	.679	.696	.902	.788	.723	.533
(5:6-5:11)			p	<.05	<.05	<.01	<.05	<.05	NS
	F	5	r	.800	.800	.872	1.0	.975	.975
			p	NS	NS	NS	=.025	<.05	<.05
05	M	12	r	.298	.742	.813	.802	.667	.876
(6-6:5)			p	NS	=.003	=.001	=.001	=.009	<.001
	F	17	r	.707	.890	.978	.897	.801	.915
			p	=.001	<.001	<.001	<.001	<.001	<.001
06	M	21	r	.320	.709	.890	.779	.528	.716
(6:6-6:11)			p	NS	<.001	<.001	<.001	=.007	<.001
	F	18	r	.473	.896	.795	.569	.755	.687
			p	=.024	<.001	<.001	=.007	<.001	=.001

Table 4.22 (Continued)

				LINGUISTIC VARIABLES					
AGE CODES	SEX	N		E/S	E/B	E/CV	S/B	S/CV	B/CV
07	M	13	r	.591	.714	.953	.844	.666	.644
(7-7:5)			p	=.017	=.003	<.001	<.001	=.006	=.009
	F	13	r	.615	.949	.924	.778	.847	.979
			p	=.013	<.001	<.001	=.001	<.001	<.001
08	M	16	r	.765	.921	.832	.846	.893	.749
(7:6-7:11)			p	<.001	<.001	<.001	<.001	<.001	<.001
	F	15	r	.750	.893	.886	.886	.898	.839
			p	=.001	<.001	<.001	<.001	<.001	=.001
09	M	11	r	.673	.961	.799	.774	.868	.812
(8-8:5)			p	=.012	<.001	=.002	=.003	<.001	=.001
	F	12	r	.830	.926	.919	.933	.814	.807
			p	<.001	<.001	<.001	<.001	=.001	=.001
10	M	14	r	.815	.936	.816	.894	.935	.837
(8:6-8:11)			p	<.001	<.001	<.001	<.001	<.001	<.001
	F	20	r	.721	.925	.914	.850	.803	.858
			p	<.001	<.001	<.001	<.001	<.001	<.001
11	M	17	r	.599	.821	.889	.831	.828	.840
(9-9:5)			p	=.006	<.001	<.001	<.001	<.001	<.001
	F	13	r	.817	.899	.933	.895	.880	.806
			p	<.001	<.001	<.001	<.001	<.001	<.001
12	M	11	r	.342	.807	.816	.770	.558	.730
(9:6-9:11)			p	NS	=.001	=.001	=.003	=.037	=.005
	F	15	r	.910	.943	.961	.987	.906	.923
			p	<.001	<.001	<.001	<.001	<.001	<.001
13	M	9	r	.650	.782	.874	.975	.899	.953
(10-10:5)			p	<.05	<.05	<.01	<.01	<.01	<.01
	F	14	r	.676	.841	.937	.945	.807	.886
			p	=.004	<.001	<.001	<.001	<.001	<.001
14	M	10	r	.817	.982	.815	.865	.585	.756
(10:6-10:11)			p	<.01	<.01	<.01	<.01	<.05	<.01
	F	11	r	.803	.932	.943	.936	.725	.846
			p	=.001	<.001	<.001	<.001	=.006	=.001
15	M	10	r	.634	.646	.840	.988	.730	.699
(11-11:5)			p	<.05	<.05	<.01	<.01	<.05	<.05
	F	21	r	.749	.918	.939	.928	.833	.909
			p	<.001	<.001	<.001	<.001	<.001	<.001
16	M	10	r	.707	.783	.945	.985	.806	.851
(11:6-11:11)			p	<.05	<.01	<.01	<.01	<.01	<.01
	F	8	r	.283	.695	.830	.766	.042	.253
			p	NS	<.05	<.05	<.05	NS	NS

KEY E/S = ENGLISH v SPANISH; E/B = ENGLISH v BILINGUALITY
E/CV = ENGLISH v CONCEPTUAL VOCABULARY; S/B = SPANISH v BILINGUALITY
S/CV = SPANISH v CV; B/CV = BILINGUALITY v CV; M = MALE; F = FEMALE
r = SPEARMAN's RANK ORDER CORRELATION COEFFICIENT p = Probability;
NS = NOT SIGNIFICANT

In **summary,** *significant* correlations between *all* dyad combinations of linguistic variables were indicated for *both* genders (See Table 22, above) in *all* age codes between 05 (Age 6-6:5 years) and 15 (Age 11-11:5 years), with the *exceptions* shown in Table 4.22.

c) Correlations Between Linguistic Variables, for Each Gender (12 months age range)

A *third* set of statistical analyses was conducted, according to *gender*, on samples with an age range of *12* months, resulting from concatenating neighbouring age codes (See Table 4.23, below).

Summary

It would seem that samples comprising *wider* age ranges, yield a *higher* incidence of significant correlations. There are significant correlations between *all* LVs, in each gender, in *all* age groups *except*:

> Between English and Spanish for *Females* in age groups 01+02 (4-4:11), 02+03 (4:6-5:55) and 03+04 (5-5:11).

The general pattern, disregarding which variables were used in the analyses, indicated *high* and *significant* correlations between the linguistic variables. Gender analyses of data from samples with *wider* age ranges (i.e. *12* months as opposed to 6 months) did increase the *incidence* of statistically significant correlations, especially in the earlier ages.

TABLE 4.23 CORRELATIONS BETWEEN LINGUISTIC VARIABLES WITHIN EACH AGE CODE (12 months age range) FOR EACH GENDER

				LINGUISTIC VARIABLES					
AGE CODES	SEX	N		E/S	E/B	E/CV	S/B	S/CV	B/CV
01 + 02 (4-4:11)	M	15	r	.746	.729	.819	.808	.893	.616
			p	=.001	=.001	<.001	<.001	<.001	=.007
	F	18	r	.242	.822	.664	.468	.733	.578
			p	NS	<.001	=.001	=.025	<.001	=.006
02 + 03 (4:6-5:5)	M	12	r	.748	.943	.861	.755	.944	.824
			p	=.003	<.001	<.001	=.002	<.001	<.001
	F	12	r	.432	.655	.791	.761	.865	.765
			p	NS	=.01	=.001	=.002	<.001	=.002
03 + 04 (5-5:11)	M	14	r	.874	.937	.942	.883	.938	.860
			p	<.001	<.001	<.001	<.001	<.001	<.001
	F	10	r	.335	.704	.890	.701	.638	.819
			p	NS	<.025	<.005	<.025	<.05	<.005
04 + 05 (5:6-6:5)	M	20	r	.730	.907	.934	.899	.849	.912
			p	<.001	<.001	<.001	<.001	<.001	<.001
	F	22	r	.730	.902	.970	.890	.809	.909
			p	<.001	<.001	<.001	<.001	<.001	<.001
05 + 06 (6-6:11)	M	33	r	.381	.819	.895	.762	.569	.788
			p	=.014	<.001	<.001	<.001	<.001	<.001
	F	35	r	.670	.937	.904	.780	.833	.852
			p	<.001	<.001	<.001	<.001	<.001	<.001
06 + 07 (6:6-7:5)	M	34	r	.362	.694	.842	.808	.642	.713
			p	=.018	<.001	<.001	<.001	<.001	<.001
	F	31	r	.551	.918	.856	.680	.811	.806
			p	=.001	<.001	<.001	<.001	<.001	<.001
07 + 08 (7-7:11)	M	29	r	.667	.852	.875	.833	.770	.709
			p	<.001	<.001	<.001	<.001	<.001	.<.001
	F	28	r	.688	.916	.908	.846	.871	.894
			p	<.001	<.001	<.001	<.001	<.001	<.001
08 + 09 (7:6-8:5)	M	27	r	.744	.935	.870	.820	.877	.786
			p	<.001	<.001	<.001	<.001	<.001	<.001
	F	27	r	.734	.945	.937	.881	.843	.918
			p	<.001	<.001	<.001	<.001	<.001	<.001
09 + 10 (8-8:11)	M	25	r	.747	.937	.851	.853	.903	.846
			p	<.001	<.001	<.001	<.001	<.001	<.001
	F	32	r	.726	.907	.921	.898	.788	.851
			p	<.001	<.001	<.001	<.001	<.001	<.001

Table 4.23 (Continued)

AGE CODES	SEX	N		LINGUISTIC VARIABLES E/S	E/B	E/CV	S/B	S/CV	B/CV
10 + 11 (8:6-9:5)	M	31	r	.712	.913	.885	.882	.891	.878
			p	<.001	<.001	<.001	<.001	<.001	<.001
	F	33	r	.746	.916	.925	.885	.830	.851
			p	<.001	<.001	<.001	<.001	<.001	<.001
11 + 12 (9-9:11)	M	28	r	.565	.816	.880	.867	.770	.828
			p	=.001	<.001	<.001	<.001	<.001	<.001
	F	28	r	.874	.939	.956	.959	.889	.896
			p	<.001	<.001	<.001	<.001	<.001	<.001
12 + 13 (9:6-10:5)	M	20	r	.636	.836	.881	.924	.715	.806
			p	=.001	<.001	<.001	<.001	<.001	<.001
	F	29	r	.785	.890	.961	.964	.844	.904
			p	<.001	<.001	<.001	<.001	<.001	<.001
13 + 14 (10-10:11)	M	19	r	.780	.905	.836	.954	.636	.715
			p	<.001	<.001	<.001	<.001	<.001	<.001
	F	25	r	.785	.888	.941	.961	.872	.909
			p	<.001	<.001	<.001	<.001	<.001	<.001
14 + 15 (10:6-11:5)	M	20	r	.730	.834	.839	.953	.722	.756
			p	<.001	<.001	<.001	<.001	<.001	<.001
	F	32	r	.770	.911	.937	.947	.827	.892
			p	<.001	<.001	<.001	<.001	<.001	<.001
15 + 16 (11-11.11)	M	20	r	.664	.732	.895	.974	.772	.752
			p	=.001	<.001	<.001	<.001	<.001	<.001
	F	29	r	.608	.811	.912	.917	.640	.729
			p	<.001	<.001	<.001	<.001	<.001	<.001

KEY E = ENGLISH; S = SPANISH; B = BILINGUALITY;
CV = CONCEPTUAL VOCABULARY; M = MALE; F = FEMALE;
r = SPEARMAN'S RANK ORDER CORRELATION COEFFICIENT;
p = Probability; NS = NOT SIGNIFICANT

4.5.7 Conceptual Vocabulary (CV)

It was predicted that given the nature of Gibraltarian children's 'bilingualism' (i.e. *sequential* and *diglossic*), *Conceptual Vocabulary* would be *superior* to the lexicon in any of the other linguistic variables. Table 4.24 below, provides details of the statistical analyses conducted on Trial 1 data to determine the significance of this superiority. Analyses of the *means* of number of correct responses obtained in CV supported the prediction that it was *superior* to the lexicon in any of the other linguistic variables. *Conceptual Vocabulary* also increased by 50% over eight years. Its rate of development

and how it compares with the development of other linguistic variables, has been discussed in Section 4.5.3. Table 4.24 below, is a summary of the results of statistical tests (*Wilcoxon Matched-Pairs Signed-Ranks T* test) conducted to determine the significance of this superiority.

It has already been concluded (See Table 4.9) that *Conceptual Vocabulary* (CV) i.e. the number of items/concepts for which correct responses were given in *either* of the two languages, *increased* with age (as indeed did all the other linguistic variables, i.e. *English, Spanish* and *Bilinguality*). The development between one age code and the next was in most cases *not* significant when the mean interval between each age code was *6* months. A more sensitive measure of development was obtained when comparisons were made between age codes separated by a mean difference of *12* months.

Between Age Codes 01 (Age 4-4:5 years) and 16 (Age 11:6-11:11 years), i.e. over a period of nearly *eight* years, the CV has increased by 53% (*English* by 114% and *Spanish* by 77.6% and *Bilinguality* by 200%).

The most significant aspect of the results of these analyses was that CV was substantially *greater* than *any other* linguistic variable, at all times.

Table 4.25 below shows the ratio of CV to the *other* linguistic variables.

Summary

(i) The greatest *ratios* were indicated for subjects in the *First* Schools (Age Codes 01-08; Ages 4-7:11 years) and *decreased* with age.

(ii) Up to Age Code 08 (Age 7:6-7:11 years) the CV/E ratios were *larger* than the CV/S ratios for each equivalent age code. This pattern is *reversed* as from Age Code 09 (Age 8-8:5 years).

(iii) The *ratio* between *Conceptual Vocabulary* and *Bilinguality* ranged from 2.59 at Age Code 04 (Age 5:6-5:11 years) to 1.28 at Age Code 16 (Age 11:6-11:11 years) having started at 2.51 at Age Code 01 (Age 4-4:5 years). This means that the size of the *Conceptual Vocabulary* could be as much as *two and a half times* that of the *Bilinguality*. Similarly, the *Conceptual Vocabulary* can be up to *half as much* as the *English* vocabulary and up to a *third* as much of the *Spanish* vocabulary.

AGE CODES	N		SUPERIORITY OF CV OVER: ENG	SPAN	BIL
01 (4-4:5)	20	T	0	0	0
		p	<.005	<.005	<.005
02 (4:5-4:11)	13	T	0	0	0
		p	<.005	<.005	<.005
03 (5-5:5)	11	T	0	0	0
		p	<.005	<.005	<.005
04 (5:6-5:11)	13	T	0	0	0
		p	<.005	<.005	<.005
05 (6-6:5)	29	T	0	0	0
		p	<.005	<.005	<.005
06 (6:6-6:11)	39	Z	5.44	5.44	5.44
		p	<.00003	<.00003	<.00003
07 (7-7:5)	26	Z	4.4	4.4	4.4
		p	<.00003	<.00003	<.00003
08 (7:6-7:11)	32	Z	4.94	4.94	4.94
		p	<.00003	<.00003	<.00003
09 (8-8:5)	23	T	0	0	0
		p	<.005	<.005	<.005
10 (8:6-8:11)	34	Z	5.09	5.09	5.09
		p	<.00003	<.00003	<.00003
11 (9-9:5)	30	Z	4.78	4.78	4.78
		p	<.00003	<.00003	<.00003
12 (9:6-9:11)	26	Z	4.46	4.46	4.46
		p	<.00003	<.00003	<.00003
13 (10-10:5)	23	T	0	0	0
		p	<.005	<.005	<.005
14 (10:6-10:11)	21	T	0	0	0
		p	<.005	<.005	<.005
15 (11-11:5)	31	Z	4.78	4.78	4.78
		p	<.00003	<.00003	<.00003
16 (11:6-11:11)	18	T	0	0	0
		p	<.005	<.005	<.005

KEY N = SAMPLE SIZE; ENG = ENGLISH; SPAN = SPANISH; BIL = BILINGUALITY

T = WILCOXON MATCHED-PAIRS SIGNED-RANKS T VALUE;

p = Probability (1 Tailed); Z = z SCORE FOR T VALUES

TABLE 4.24 RESULTS OF STATISTICAL ANALYSES CONDUCTED TO ESTABLISH THE SUPERIORITY OF CONCEPTUAL VOCABULARY (CV) OVER THE LEXICAL PROFICIENCY IN THE OTHER LINGUISTIC VARIABLES, AND STATISTICAL SIGNIFICANCE

AGE CODES	LINGUISTIC VARIABLES		
	CV/E(L2)	CV/S(L1)	CV/BIL
01	1.49	1.37	2.51
02	1.51	1.31	2.37
03	1.52	1.25	2.19
04	1.61	1.31	2.59
05	1.38	1.28	1.97
06	1.27	1.28	1.75
07	1.30	1.26	1.79
08	1.31	1.21	1.69
09	1.17	1.27	1.55
10	1.21	1.23	1.56
11	1.15	1.22	1.45
12	1.12	1.21	1.35
13	1.10	1.17	1.31
14	1.09	1.16	1.28
15	1.08	1.16	1.26
16	1.07	1.18	1.28

TABLE 4.25 RATIO OF NUMBER OF CORRECT RESPONSES OBTAINED IN THE CONCEPTUAL VOCABULARY TASK TO THOSE OBTAINED IN OTHER LINGUISTIC VARIABLES, WITHIN EACH AGE CODE

4.5.8 Lexical Proficiency

a) Lexical Proficiency in L1/L2 v. Conceptual Vocabulary

The difference between the *Conceptual Vocabulary* (CV) and *Lexical Proficiency* (LP) in L1 or L2 is that the *former* is a measure of how many *referents* are known, by name i.e. *lexically*, and the LP was measured by calculating the *Total Lexical Repertoire* (TLR) i.e. a ***total*** 'word' count. The TLR may include words which refer to the same referent but are known in *both* languages (i.e. *translational equivalents*). The practical usefulness of this concept will be discussed in Chapter 5.

b) Percentage L1 and L2 of Total Lexical Repertoire (TLR)

As discussed in Section 4.5.5 (d), above, the *mean Total Lexical Repertoire* (TLR) in Trial 1, for each age code was calculated. The relative distribution of L1 and L2 lexemes within the *Total Lexical Repertoire* (TLR) was calculated in *percentage* terms. The *mean percentages* appear in Table 4.20.2, above. The mean percentage *Bilinguality* in the TLR were also calculated (See Table 4.26, below, under Section 4.5.9).

Summary

The following conclusions were reached following a close inspection of these data.

(i) The *Mean Total Lexical Repertoire* ***increased*** with age.

(ii) The *Mean Percentage* of *Spanish* lexical items known (as taken from the TLR) was *superior* during the early ages, up to and including age 7:11 years after which *English* is *superior*.

(iii) The *Mean Percentage* of *English* lexical items known (as taken from the TLR) *increased* with age but, from Age Code 01 to 16, by only between 3.9 and 9.8 percentage points. The percentage in *Spanish* therefore, *decreased* over the same period by the same number of points.

(iv) Generally speaking, the TLR *increased* with age and almost *doubled* (95% increase) by Age Code 16 (Age 11:6-11:11 years). This suggests that the extent of the increase in lexical *development* is not reflected by the increase in *Conceptual Vocabulary* which, as mentioned in the previous section, increases by 53% over the same period of time.

As will be discussed in Chapter 5, these results may have practical implications.

4.5.9 Bilinguality

The degree of 'bilingualism', or as referred to in this study *Bilinguality*, has been amply discussed in the literature and a generous terminology has been attributed to the phenomenon (See Chapter 2.1). It is not always made clear in the literature whether *Bilinguality* is predominantly a *referential* rather than a *lexical* concept; in other words, does it refer to the number of ***referents*** for which *translational equivalents* are known, or does it refer to the number of *lexemes* that these comprise. The latter thus, would be double the former as each set of *translational equivalent* words would count as *two* words (e.g. 10 *translational equivalent* = *20 words*). This measure could be referred to as *bilingual lexicon* in order to make the contrast with the term *Bilinguality* as used in the present study. The *bilingual lexicon* calculated in this way may also be expressed as a *percentage* of a DL subject's *Total Lexical Repertoire*. Since both *Bilinguality* and *Conceptual Vocabulary* refer to the number of *referents* known and not the number of *words*, a similar relationship can be expressed between these two measures.

The *referential* measure of *Bilinguality* is reflected in tables earlier on in this chapter (e.g. See Tables 4.9, 4.10(i), 4.13). These show the *mean* number of *referents* known 'bilingually' at each age code.

The *development* of *Bilinguality* over the eight years is large. From Age Code 01 (Age 4-4:5 years - See Table 4.9) to 16 (Age 11:6-11:11 years), the *mean* number of correct responses for *Bilinguality* increased at least *threefold*, reaching a maximum of **72.17** (from 24.05 at Age Code 01 - Age 4-4:5 years). In other words 72 and 24 referents, respectively, were known in *both* languages.

This represents an increase of 200% at Age Code 16 (Age 11:6-11:11 years) as compared to Age Code 01 (Age 4-4:5 years). There is a comparative *low* degree of *Bilinguality* in the earlier years but it increases with age.

Other measures of '*bilinguality*' appear in Table 4.26 which provides details of subjects' *bilingual lexicon* in Trial 1, expressed as a *mean percentage* of their *Total Lexical Repertoire*. It also shows the percentage *Bilinguality* taken from the *Conceptual Vocabulary*. As expected, the percentage *bilingual lexicon* increased as lexical *development* progresses in *English* and in *Spanish*. Comparisons between the *mean TLR* (See Table 4.20.2) and the *mean bilingual lexicon*, indicates that the latter comprises 57.1% of the TLR at Age Code 01 and by Age Code 16 (Age 11:6-11:11 years) has increased to 87.8% of the TLR (See Table 4.26, below). However, if an individual's degree of '*bilinguality*' is measured by taking the number of *referents* known

'bilingually' and expressing this as a percentage of the *Conceptual Vocabulary*, the *mean 'bilinguality'* at Age Code 01 is 39.9% and this *increases* to 78.2% by Age Code 16 (Age 11:6-11:11 years).

Summary

One can thus see that a person's 'bilingual' proficiency can be expressed in different ways and the resultant measures/indices can vary significantly depending on the operational definition adopted.

AGE CODES	N	[1]MEAN PERCENTAGE BILINGUALITY	[2]MEAN PERCENTAGE BILINGUAL LEXICON	[3]MEAN PERCENTAGE BILINGUALITY
01	20	24.05	57.1	39.9
02	13	25.46	53.3	42.1
03	11	29.46	62.7	45.7
04	13	21.23	55.7	38.6
05	29	32.55	67.4	50.8
06	39	40.56	72.6	57
07	26	41.00	68.3	55.9
08	31	42.48	72.1	58.8
09	23	54.52	78.6	64.7
10	34	50.62	76	63.9
11	30	56.97	81.6	68.9
12	26	62.69	83.6	71.9
13	23	67.39	86.5	76.1
14	21	71.81	90.3	78 12
15	31	72.09	88.3	79.1
16	18	72.17	87.8	78.2

Note: [1]Task Related [2]Calculated from the TLR [3]Calculated from the CV

TABLE 4.26 SUMMARY OF MEAN PERCENTAGE 'BILINGUAL' LEXICON TAKEN FROM THE TLR, AND MEAN BILINGUALITY TAKEN FROM THE CONCEPTUAL VOCABULARY, FOR ALL CHILDREN, WITHIN EACH AGE CODE (6 months age range)

4.5.10 Reliability and Validity

The performance of all children who participated in Trial 1 (See Table 4.27(i) below, for means and standard deviations) within each age code, was compared with peers in *equivalent* age codes in Trial 2 to establish the existence of a *rehearsal* or *practice effect* which might threaten the *external validity* and ***reliability*** of the task.

The results of statistical analyses comparing the performance of subjects in *equivalent* age codes in Trials 1 and 2 are summarised in Table 4.27(ii) below.

Summary

Significant differences in *all* LVs were indicated ***only*** for Trial 1, Age Code 07 (Age 7-7:5 years), and in *all* LVs *except* Spanish for Trial 1, Age Code 08 (Age 7:5-7:11 years). In Trial 1, Age Code 17 (Age 12-12:5) years, a *significant* difference was indicated *only* in English. These results would suggest that there was a *negligible* (if any) *rehearsal* or *practice* effect in *most* of the age groups. The results also suggest that the task could generally be considered to be *reliable*.

TABLE 4.27(i) MEANS AND STANDARD DEVIATIONS OF LEXICAL PROFICIENCY IN EACH LINGUISTIC VARIABLE, FOR EQUIVALENT AGE CODES IN TRIALS 1 & 2

#AGE			ENG		SPAN		BIL		CV	
CODES	N1/N2		T1	T2	T1	T2	T1	T2	T1	T2
02	13 5	X	39.9	44.8	46	47.6	25.5	28.2	60.5	64.2
		sd	10.5	5.0	11.8	5.4	10.3	6.7	11.1	5.6
03	11 16	X	42.3	46.3	51.6	48.6	29.5	28.4	64.5	66.1
		sd	7.9	10.8	7.5	8.5	5.9	8.8	7.2	9.0
04	13 7	X	34.2	45	42.1	48.4	21.2	29.9	55	63.6
		sd	12.3	8.6	10.9	6.7	10.3	5.6	13.2	6.7
05	29 12	X	46.6	44.1	50.0	49.1	32.6	32.6	64.1	60.6
		sd	15.5	13.9	10.8	10.2	11.8	13.1	12.8	11.5
06	39 13	X	56.1	58.2	55.6	58.8	40.6	43.5	71.2	73.5
		sd	15.7	16.4	8.9	9.9	12.1	13.7	10.4	12.4
07	26 29	X	56.3	65.9	57.9	63.2	41.0	45.6	73.3	79.6
		sd	14.0	13.7	10.4	9.1	11.2	11.7	11.1	9.3
08	31 23	X	54.9	62.9	59.7	63.8	42.5	49.5	72.2	77.3
		sd	10.1	12.2	8.7	7.7	10.3	9.7	8.4	9.2
09	23 14	X	72.3	67.6	66.4	67.6	54.5	55.3	84.3	80.0
		sd	11.7	14.7	8.7	8.8	12.4	13.5	6.8	8.9
10	34 12	X	65.6	68.6	64.1	66.6	50.6	55.2	79.2	80.0
		sd	15.5	9.2	11.7	7.2	14.1	8.5	12.3	7.7

Table 4.27(i) (Continued)

#AGE CODES	N1/N2		ENG T1	ENG T2	SPAN T1	SPAN T2	BIL T1	BIL T2	CV T1	CV T2
11	30 10	X	72.1	71.2	67.5	70.2	56.9	58.1	82.6	83.3
		sd	10.2	11.9	9.3	6.7	9.9	9.9	8.7	7.7
12	26 18	X	77.1	80.9	72.2	73.1	62.7	65.0	87.2	89.0
		sd	10.5	11.3	9.8	8.9	12.8	11.1	6.9	7.1
13	23 23	X	80.3	79.9	75.6	74.6	67.4	64.8	88.5	89.6
		sd	8.5	12.2	10.1	7.9	12.4	12.4	5.5	7.4
14	21 13	X	84.2	81.6	79.7	80.1	71.8	70.5	92.1	91.2
		sd	8.4	9.3	8.1	5.6	12.3	8.5	4.3	5.5
15	31 23	X	83.4	84.0	75.2	79.8	68.6	70.9	90.0	92.9
		sd	12.2	10.4	15.1	7.7	16.9	11.9	8.5	6.0
16	18 17	X	86.4	89.6	78.1	82.2	72.2	77.5	92.3	94.3
		sd	6.6	8.5	8.3	8.9	9.9	12.1	3.8	5.1
17	4 11	X	83.3	91.9	78.8	86.2	72.8	82.3	89.3	95.7
		sd	6.5	4.3	10.6	3.9	12.1	5.9	5.4	2.7

KEY N1/N2 = SAMPLES FOR TRIALS 1 & 2 (T1;T2); X = MEAN;

sd = STANDARD DEVIATION #AGE CODES AT TRIAL 1

Figures 4.1a-4-1d below, illustrate graphically comparisons of lexical proficiency in each linguistic variable between subjects participating in Trial 1 and their peers in Trial 2 (6-8 months interval).

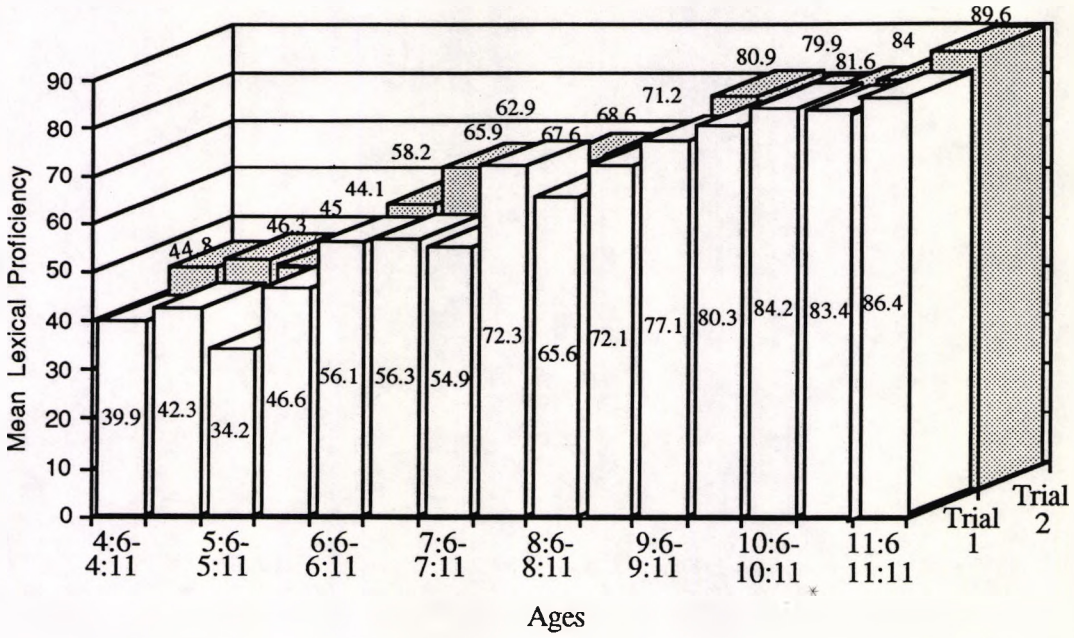


FIGURE 4.1a MEAN LEXICAL PROFICIENCY IN ENGLISH FOR SUBJECTS IN TRIAL 1 AND PEERS IN TRIAL 2 (6-8 months interval)

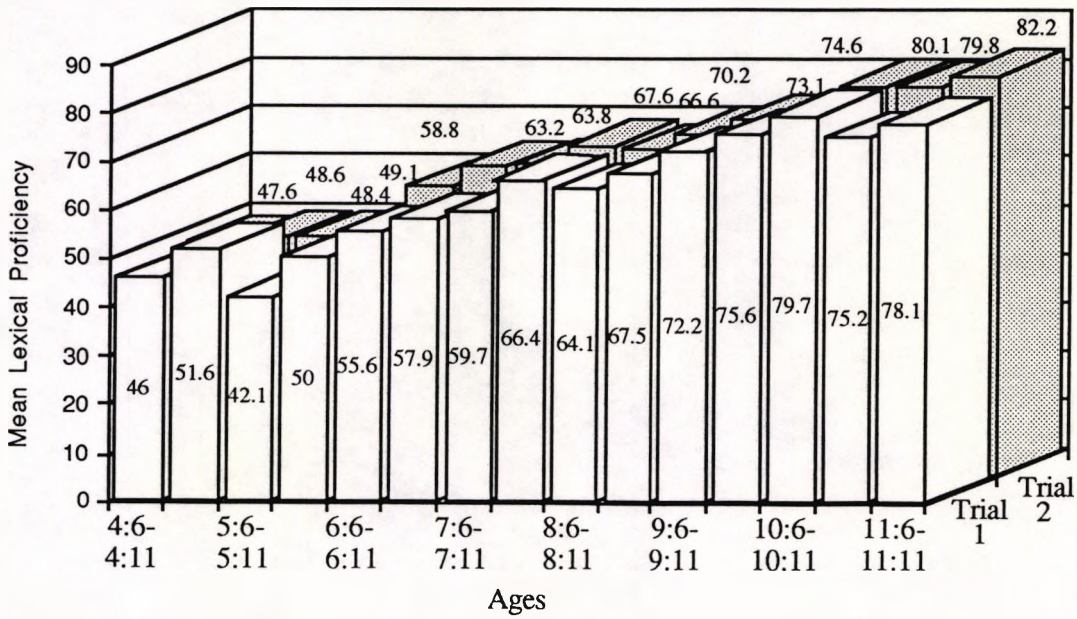


FIGURE 4.1b MEAN LEXICAL PROFICIENCY IN SPANISH FOR SUBJECTS IN TRIAL 1 AND PEERS IN TRIAL 2 (6-8 months interval)

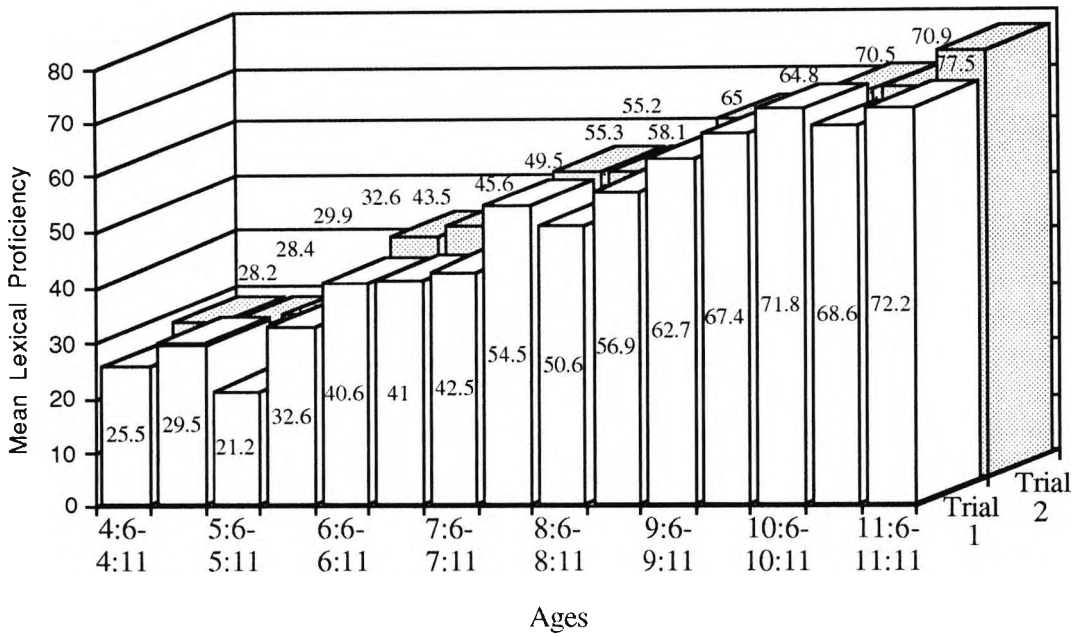


FIGURE 4.1c MEAN LEXICAL PROFICIENCY IN BILINGUALITY FOR SUBJECTS IN TRIAL 1 AND PEERS IN TRIAL 2 (6-8 months interval)

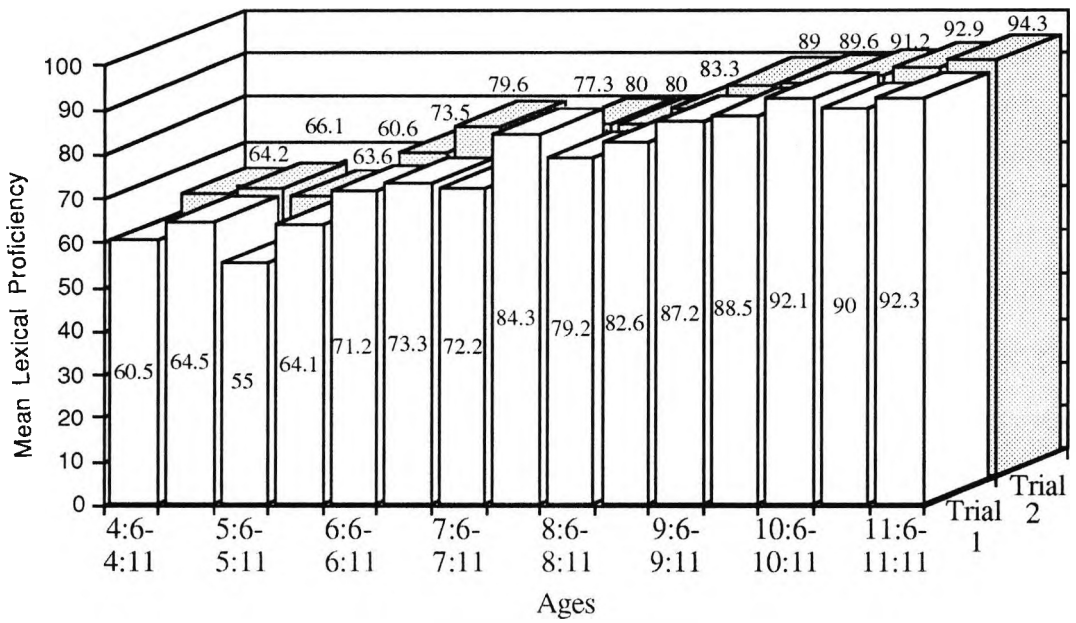


FIGURE 4.1d MEAN LEXICAL PROFICIENCY IN CONCEPTUAL VOCABULARY FOR SUBJECTS IN TRIAL 1 AND PEERS IN TRIAL 2 (6-8 months interval)

U-and-p VALUES FOR EACH LINGUISTIC VARIABLE

AGE CODES	N1(T1) N2(T2)		LINGUISTIC VARIABLES ENG	SPAN	BIL	CV
02	13	U	19	27.5	24	24
(4:5-4:11)	5	p	NS	NS	NS	NS
03	11	U	68	75	87	72.5
(5-5:5)	16	p	NS	NS	NS	NS
04	13	U	21	28.5	24	30
(5:5-5:11)	7	p	NS	NS	NS	NS
05	29	U	157	149	163	143
(6-6:5)	12	p	NS	NS	NS	NS
06	39	U	235	201.5	222.5	212.5
(6:5-6:11)	13	p	NS	NS	NS	NS
07	26	U	226.5	259	223.5	245
(7-7:5)	29	p	=.011	=.0466	=.0096	=.0258
08	31	U	218	250	214	234.5
(7:5-7:11)	23	p	=.0156	NS	=.0124	=.0324
09	23	U	139	161	153	117.5
(8-8:5)	14	p	NS	NS	NS	NS
10	34	U	184	184.5	172	201
(8:5-8:11)	12	p	NS	NS	NS	NS
11	30	U	139	125	149.5	150
(9-9:5)	10	P	NS	NS	NS	NS
12	26	U	188	230	207	195.5
(9:5-9:11)	18	p	NS	NS	NS	NS
13	23	U	260	234.5	229.5	234
(10-10:5)	23	p	NS	NS	NS	NS
14	21	U	113.5	128.5	117	119.5
(10:5-10:11)	13	p	NS	NS	NS	NS
15	31	U	331.5	351	308	303
(11-11:5)	23	p	NS	NS	NS	NS
16	18	U	100.5	100.5	98.5	96.5
(11:5-11:11)	17	p	NS	NS	NS	NS
17	4	U	6	14	11.5	6.5
(12-12:5)	11	p	=.05	NS	NS	NS

KEY N1 = SAMPLE SIZE FOR SUBJECTS OF AGE CODE INDICATED IN TRIAL 1; N2 = SAMPLE SIZE FOR SUBJECTS OF SAME AGE CODE AS FOR N1 IN TRIAL 2; T1 = TRIAL ONE; T2 = TRIAL TWO; U = MANN-WHITNEY U TEST VALUE; p = Probability; NS = NOT SIGNIFICANT

TABLE 4.27(ii) COMPARISONS OF LEXICAL PROFICIENCY BETWEEN SAMPLES WITH EQUIVALENT AGE CODE IN TRIAL 1 (T1) AND TRIAL 2 (T2) TO ESTABLISH IF A REHEARSAL EFFECT IS INDICATED

Another set of analyses was conducted to establish the study's ***external validity.*** As shown in Tables 3.1a and 3.1b (See Chapter 3) some subjects (Cohort 2) participated and completed Trial 1, six months after the first cohort (Cohort 1). A lack of statistically significant differences between the performance of these two cohorts would indicate that the study had *external validity*. Tables 4.28(i) and (ii) below, show the results of this analysis.

Summary

The results of statistical analyses shown (See Table 4.28(ii), below) indicate that there were *no* significant differences between the performance of Cohorts 1 and 2, with the exception of subjects in Age Code 07 and 08 (Ages 7-7:11 years) where there were significant differences for *all* linguistic variables. In Age Code 10 (Age 8:6-8:11 years) there was a significant difference in *Spanish* only.

These results would suggest that *generally* speaking, the task had *external validity.*

The issue of *construct validity* is discussed further in Chapter 5.4.8.

AGE CODES	N1/N2		LINGUISTIC VARIABLES							
			ENG		SPAN		BIL		CV	
			C1	C2	C1	C2	C1	C2	C1	C2
01	14/6	X	40.1	41	43.1	46	25.1	21.7	58.1	65.3
(4-4:5)		sd	10.6	8.9	9.5	7.7	10.5	4.1	7.9	3.9
02	-		NO COHORT 2 SUBJECTS IN THIS AGE CODE							
03	5/6	X	39.4	44.7	52.8	50.7	28	30.7	64.2	64.7
(5-5:5)		sd	3.0	9.6	6.4	8.2	3.6	7.1	3.8	9.1
04	-		NO COHORT 2 SUBJECTS IN THIS AGE CODE							
05	5/24	X	53.8	45.1	52.8	49.5	39.4	31.1	67.2	63.5
(6-6:5)		sd	16.4	14.8	9.6	10.9	12.7	10.9	12.6	12.7
06	10/29	X	53.3	57.0	56.5	55.3	41.6	40.2	68.2	72.2
(6:6-6:11)		sd	11.6	16.8	7.5	9.4	11.0	12.5	8.1	10.9
07	10/16	X	47.1	62.1	52.3	61.5	33.9	45.4	65.5	78.2
(7-7:5)		sd	11.4	12.3	9.1	9.6	10.2	9.4	9.4	9.2
08	19/12	X	51.6	60.3	57.1	63.9	39.2	47.8	69.5	76.5
(7:6-7:11)		sd	9.4	8.9	8.1	8.0	9.8	8.9	7.7	7.7
09	14/9	X	71.0	74.4	65.4	68.1	52.6	57.6	84.5	85.1
(8-8:5)		sd	12.0	11.0	8.9	8.1	11.3	13.3	6.6	6.1
10	13/21	X	68.8	63.7	69.5	60.9	54.2	48.4	84.1	76.1
(8:6-8:11)		sd	11.7	17.2	6.2	12.9	11.4	15.2	6.3	14.1
11	6/24	X	75.7	71.2	70.5	66.8	60.5	56.1	85.7	81.9
(9-9:5)		sd	9.4	10.2	7.7	9.5	8.8	10.0	8.2	8.7
12	6/20	X	82.7	76.4	73.3	71.8	64.5	62.2	91.5	85.9
(9:6-9:11)		sd	6.3	11.1	7.4	10.4	9.6	13.6	3.8	7.1

N.B. THERE WERE NO COHORT 2 SUBJECTS IN AGE CODES 13-16

KEY N1/N2 = SAMPLE SIZES IN COHORT 1 & 2 RESPECTIVELY; C1 = COHORT 1; C2 = COHORT 2 (who participated in Trial 1 six months later); X = MEAN; sd = STANDARD DEVIATION; NS = NOT SIGNIFICANT

TABLE 4.28(i) MEANS AND STANDARD DEVIATIONS FOR LEXICAL PROFICIENCY IN EACH LINGUISTIC VARIABLE IN EACH AGE CODE FOR COHORT 1 COMPLETING TRIAL 1, AND FOR COHORT 2 PARTICIPATING IN TRIAL 1 SIX MONTHS LATER

Figures 4.2a-4.2d overleaf, illustrate graphically the differences in lexical proficiency between Cohorts 1 and 2 (Trial 1).

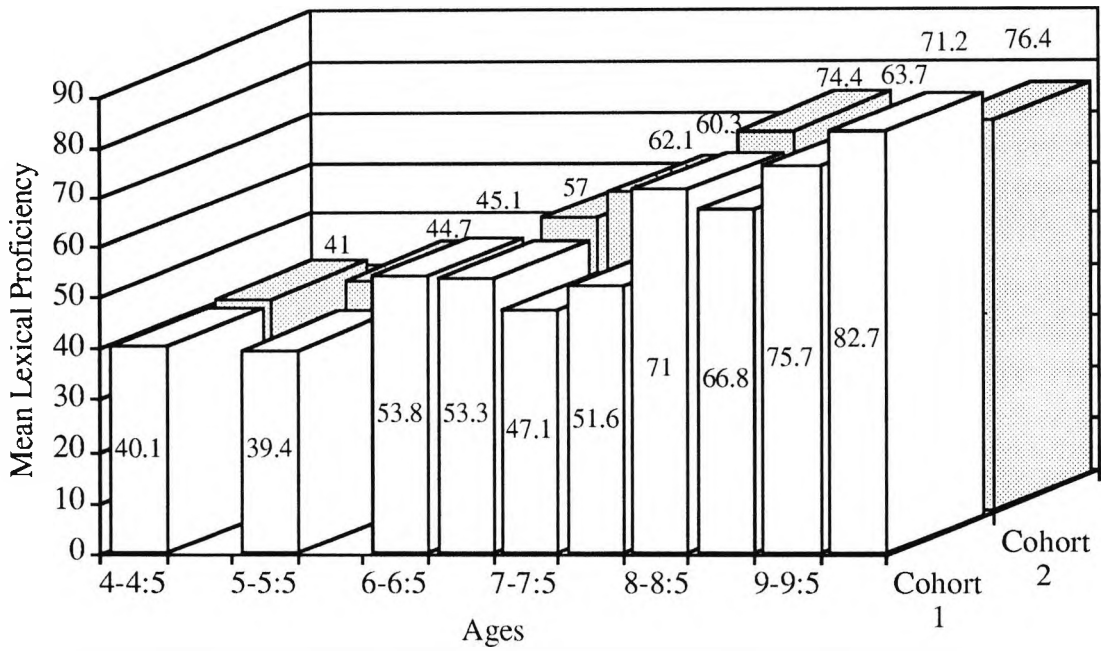


FIGURE 4.2a MEAN LEXICAL PROFICIENCY IN ENGLISH FOR COHORTS 1 & 2 (Trial 1)

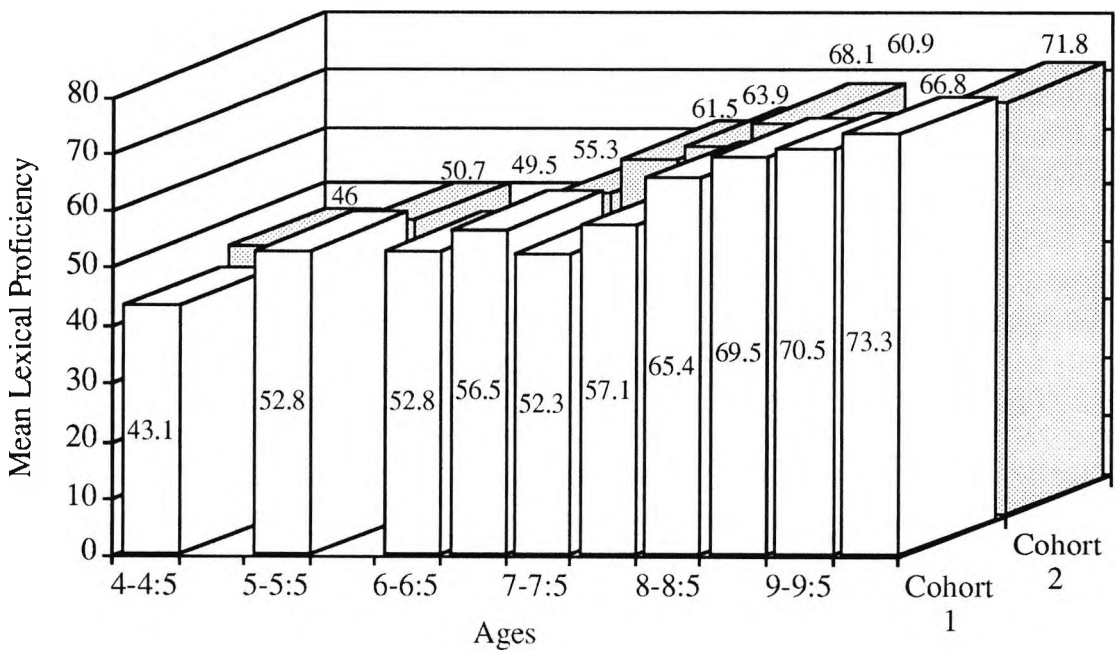


FIGURE 4.2b MEAN LEXICAL PROFICIENCY IN SPANISH FOR COHORTS 1 & 2 (Trial 1)

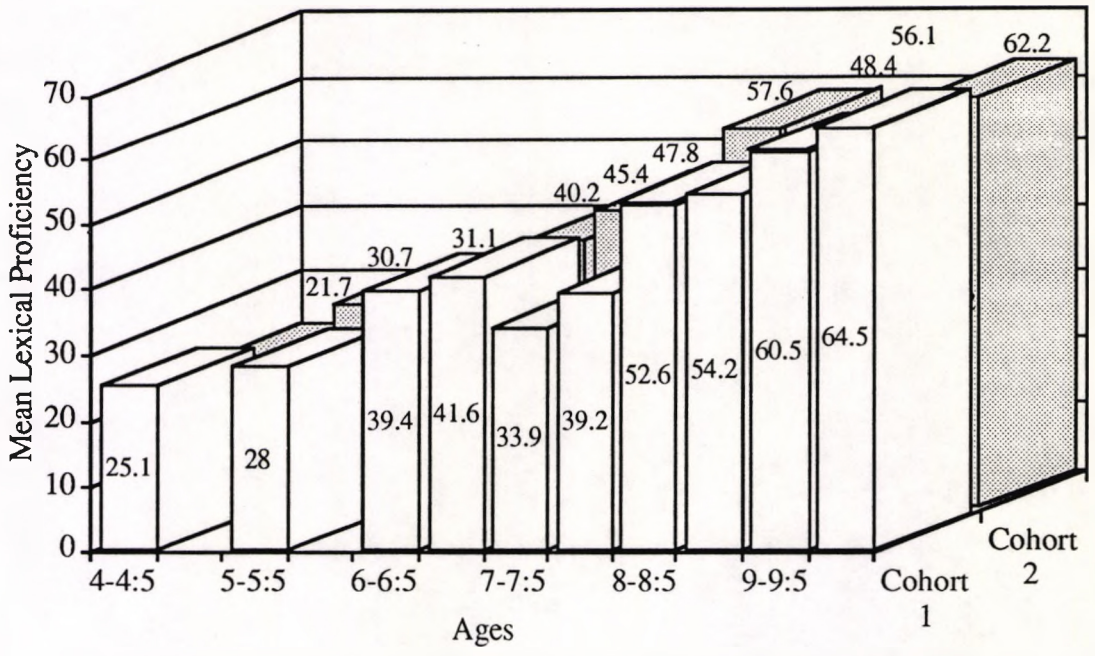


FIGURE 4.2c MEAN LEXICAL PROFICIENCY IN BILINGUALITY FOR COHORTS 1 & 2 (Trial 1)

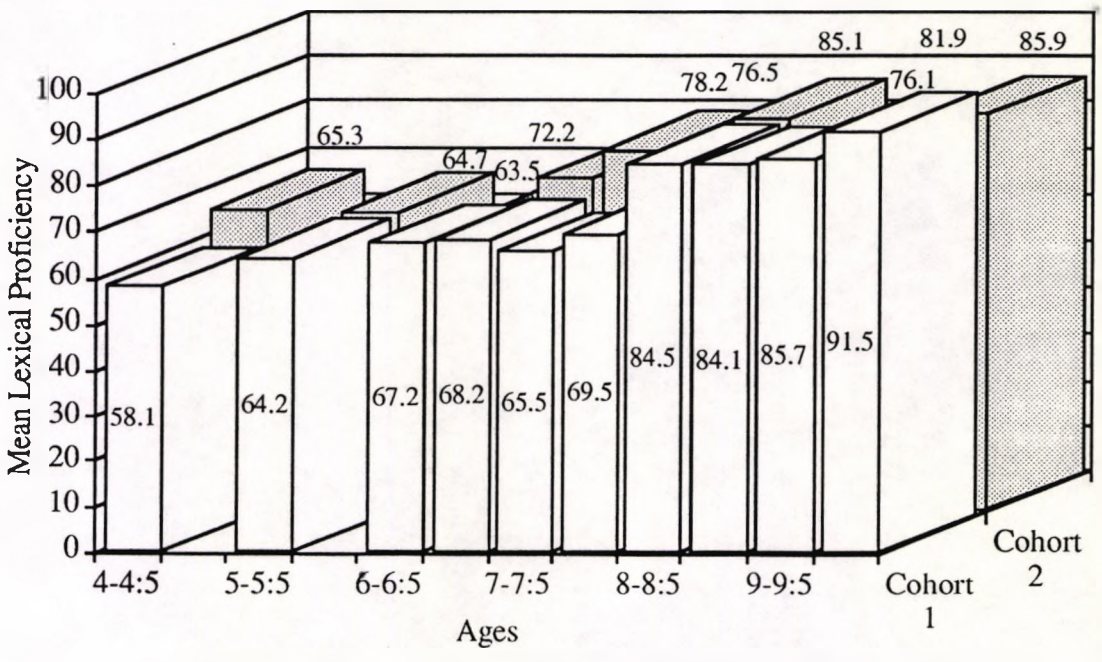


FIGURE 4.2d MEAN LEXICAL PROFICIENCY IN CONCEPTUAL VOCABULARY FOR COHORTS 1 & 2 (Trial 1)

The results of statistical analyses of these data appear in Table 4.28(ii), below.

AGE CODES	N1/N2		LINGUISTIC VARIABLE ENG	SPAN	BIL	CV	COMMENTS
01 (4-4:5)	14/6	U	36	32.5	36.5	21.5	No Significance
		p	NS	NS	NS	NS	
02	-		NO COHORT 2 SUBJECTS IN THIS AGE CODE				
03 (5-5:5)	5/6	U	11.5	12.0	11	12.0	No Significance
		p	NS	NS	NS	NS	
04	-		NO COHORT 2 SUBJECTS IN THIS AGE CODE				
05 (6-6:5)	5/24	U	40.5	45.5	35.5	45.0	‡For alpha=.05,
		‡z	-1.13	-0.84	-1.42	-0.87	critical value
		p	NS	NS	NS	NS	of z is 1.96
06 (6:6-6:11)	10/29	U	118.5	130	136.5	105	‡As Above
		‡z	-0.85	-0.48	-0.27	-1.29	
		p	NS	NS	NS	NS	
07 (7-7:5)	10/16	U	29.5	41.5	33.5	26.5	Significant
		p	<.02	<.05	<.02	<.02	for ALL LVs
08 (7:6-7:11)	19/12	U	52.0	60.0	52.0	61.5	Significant
		p	<.02	<.05	<.02	<.05	for ALL LVs
09 (8-8:5)	14/9	U	57.5	52.5	51.0	61.0	None signifi-
		p	NS	NS	NS	NS	cant
10 (8:6-8:11)	13/21	U	11.5	79.0	105	88.5	Significant in
		‡z	-0.89	-2.04	-1.12	-1.7	Spanish only
		p	NS	=.0207	NS	NS	
11 (9-9:5)	6/24	U	50.5	54.0	49.0	50.5	No Significance
		‡z	-1.12	-0.93	-1.2	-1.01	
		p	NS	NS	NS	NS	
12 (9:6-9:11)	6/20	U	39.5	59.0	57.0	31.5	No Significance
		‡z	-1.25	-0.06	-0.18	-1.74	
		p	NS	NS	NS	NS	

KEY: N1/N2 = SAMPLE SIZES OF COHORTS 1 & 2; U = MANN-WHITNEY VALUE
z = z-score; p = Probability (2 tailed test); NS = NOT SIGNIFICANT

TABLE 4.28(ii) U-VALUES AND SIGNIFICANCE IN EACH LINGUISTIC VARIABLE FOR EACH AGE CODE FOR COMPARISONS BETWEEN COHORT 1 COMPLETING TRIAL 1, AND FOR COHORT 2 PARTICIPATING IN TRIAL 1 SIX MONTHS LATER

4.6 COMPARISONS WITH BPVS 'NORMALISED' DATA

The point has already been made that because the execution of the task did not conform with procedures laid down for the British Picture Vocabulary Scales, no generalisations can be made regarding the performance of DL subjects in comparison with *monoglot* subjects. However, such comparisons may indeed suggest *trends* and offer directions for future research in this area. This issue is discussed further in Chapter 6.3. Tables 4.29.1(i) - (xvii) provide the following details for each subject completing Trial 1.

(i) Subject's Age.
(ii) The number of correct responses (CRs) obtained for BPVS test items only, in English, Spanish and Conceptual Vocabulary.
(iii) BPVS *Age Equivalents* for each CR in (ii) above.
(iv) BPVS *Standard Scores* (SS) for each CR.
(v) How many linguistic variables, for each subject, had SSs which would be *within BPVS 'normal limits'*.

Age Equivalents and *Standard Scores* were arrived at by consultation with the appropriate tables in the BPVS manual.

The means for (i) - (iv) above were calculated for each age code.

Table 4.29.2 summarises the results for each linguistic variable, in each age code.

Summary

Only those items employed in the BPVS (as *test* items) were considered in these analyses. The same ceiling item criteria prescribed by the BPVS were applied and *Raw Scores* were calculated for each subject in the same way as one would when using the BPVS. Once the *Raw Scores* were calculated, the appropriate BPVS tables were used to calculate *Age Equivalents* and *Standard Scores* for each subject (See Tables 4.29.1 (i)-xvii), below). In addition to this, the mean *Raw Score*, *Age Equivalents* and *Standard Scores* were calculated (See Table 4.29.2 , below).

Generally speaking, BPVS-related *Raw Scores* in the three linguistic variables under consideration (i.e. English, Spanish and Conceptual Vocabulary) *increased* with age, as did *Age Equivalents*. However, *Standard Scores* decreased with age. This indicated that the DL subjects were not developing like their *monoglot* peers according to BPVS criteria and *norms*.

A mean *Standard Score* in *Conceptual Vocabulary*, equivalent to BPVS *within 'normal' limits* (i.e. 85 or more) was attained by *all* age groups up to Age Code 09 (Age 8-8:5 years), *except* for Age Code 08 (Age 7:6-7:11 years). A SS of 85 or more was achieved in *Spanish* for the *first three* age codes only (i.e. up to age 5-5:5 years) and in *English* up to Age Code 02 (Age 4:6-4:11 years).

TABLES 4.29.1(i)-(xvii) SUBJECTS' GENDER AND LIFE AGE, *BPVS-RELATED* RAW SCORES (RS), AGE EQUIVALENT (AE) AND STANDARD SCORES (SS) (TRIAL 1)

KEY Ss = INDIVIDUAL SUBJECT'S CODE NUMBER; RS = *BPVS RELATED* RAW SCORE AE = BPVS "AGE EQUIVALENT"; SS = BPVS "STANDARD SCORE" BPVS "NORMAL LIMITS"# i.e. BPVS Standard Score 85 or more

Table 4.29.1(i) AGE CODE - 01 (4-4:5); N = 20

												LVs within BPVS
		MEAN	ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			"Normal
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	Limits"#
160	F	4:1	27	3:3	91	28	3:4	93	43	4:8	110	ALL
130	M	4:2	29	3:5	91	28	3:4	89	41	4:6	105	ALL
131	M	4:2	33	3:9	95	32	3:8	94	46	5:0	110	ALL
150	M	4:2	39	4:4	102	43	4:8	107	48	5:2	112	ALL
151	F	4:2	28	3:4	89	39	4:4	102	47	5:1	111	ALL
152	F	4:2	21	2:8	79	30	3:6	92	38	4:3	101	SPAN & CV
153	M	4:3	32	3:8	94	40	4:5	103	52	5:7	117	ALL
154	M	4:3	25	3:0	85	31	3:7	93	39	4:4	102	ALL
01	F	4:4	45	4:11	109	30	3:6	92	53	5:9	118	ALL
135	M	4:4	25	3:0	85	35	4:0	98	49	5:3	113	ALL
136	F	4:4	23	2:10	82	37	4:2	100	46	5:0	110	SPAN & CV
137	F	4:4	28	3:4	89	45	4:11	109	54	5:10	119	ALL
161	F	4:4	41	4:6	105	50	5:5	115	55	5:11	120	ALL
162	F	4:5	30	3:6	90	31	3:7	91	41	4:6	102	ALL
163	F	4:5	39	4:4	100	20	2:7	76	41	4:6	102	ENG & CV
164	M	4:5	28	3:4	87	35	4:0	95	42	4:7	103	ALL
133	M	4:5	25	3:0	83	21	2:8	77	35	4:0	100	CV
134	F	4:5	38	4:3	90	40	4:5	101	55	5:11	118	ALL
170	F	4:5	45	4:11	107	39	4:4	100	52	5:7	114	ALL
171	M	4:5	17	2:4	71	33	3:9	93	39	4:4	100	SPAN & CV
MEANS		4:4	30.9	3:7	91.2	34.4	3:9	96	45.8	5:0	109.4	

Summary:

ALL LVs with in BPVS Normal Limits for FIFTEEN (75%) subjects

SPANISH & CV for THREE (15%) subjects

ENGLISH & CV for ONE (5%) subject; ONLY CV for ONE (5%) subject

Table 4.29.1(ii) AGE CODE - 02 (4:6-4:11); N = 13

		MEAN	ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS "Normal
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	Limits"#
70	F	4:6	25	3:0	83	29	3:5	88	40	4:5	101	SPAN & CV
71	M	4:6	33	3:9	93	46	5:0	108	52	5:7	114	ALL
41	M	4:6	29	3:5	88	37	4:2	98	48	5:2	110	ALL
72	F	4:7	19	2:6	74	35	4:0	95	43	4:8	104	SPAN & CV
02	M	4:7	33	3:9	93	42	4:7	103	52	5:7	114	ALL
138	F	4:8	23	2:10	76	27	3:3	81	33	3:9	88	CV
42	F	4:8	24	2:11	77	25	3:0	78	32	3:8	87	CV
73	M	4:9	31	3:7	86	38	4:3	94	46	5:0	103	ALL
177	F	4:9	37	4:2	93	22	2:9	74	44	4:9	101	ENG & CV
172	F	4:9	45	4:11	102	45	4:11	102	57	6:2	115	ALL
173	M	4:10	43	4:8	100	48	5:2	105	59	6:4	117	ALL
74	F	4:10	19	2:6	70	26	3:1	80	37	4:2	93	CV
43	F	4:10	27	3:3	81	36	4:1	92	47	5:1	104	SPAN & CV
MEANS		4:9	29.8	3:6	85.8	35.1	4:0	92.2	45.4	4:11	104	

Summary:

ALL LVs within BPVS Normal Limits for SIX (46.2%) Subjects

SPANISH & CV for FOUR (30.8%) Subjects

ENGLISH & CV for ONE (7.7%) Subject

ONLY CV for TWO (15.3%) Subjects

Table 4.29.1(iii) AGE CODE - 03 (5-5:5); N = 11

		MEAN	ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS "Normal
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	Limits"#
44	M	5:0	50	5:5	105	37	4:2	90	53	5:9	108	ALL
174	F	5:1	30	3:6	82	41	4:6	95	47	5:1	101	SPAN & CV
139	M	5:1	29	3:5	81	33	3:9	86	45	4:11	99	SPAN & CV
140	F	5:1	29	3:5	81	47	5:1	101	52	5:7	107	SPAN & CV
165	F	5:2	33	3:9	83	39	4:4	90	50	5:5	102	SPAN & CV
166	F	5:3	30	3:6	79	45	4:11	96	47	5:1	98	SPAN & CV
75	M	5:4	38	4:3	89	46	5:0	97	56	6:0	106	ALL
76	M	5:4	35	4:0	85	39	4:4	90	51	5:6	103	ALL
77	F	5:4	34	3:10	84	44	4:9	95	54	5:10	106	SPAN & CV
78	M	5:5	26	3:1	71	32	3:8	79	40	4:5	88	CV
04	M	5:5	26	3:1	71	32	3:8	72	40	4:5	88	CV
MEANS		5:3	32.7	3:9	82.8	39.5	4:5	90.1	48.6	5:3	100.5	

Summary:

ALL LVs within BPVS Normal Limits for THREE (27.3%) Subjects

SPANISH & CV for SIX (54.5%) Subjects

ONLY CV for TWO (18.2%) Subjects

Table 4.29.1(iv) AGE CODE - 04 (5:6-5:11); N = 13

			ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS "Normal
		MEAN										
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	Limits"#
79	M	5:6	19	2:6	61	30	3:6	76	37	4:2	79	NONE
132	F	5:6	36	4:1	83	40	4:5	88	53	5:9	102	SPAN & CV
07	F	5:7	44	4:9	92	37	4:2	85	54	5:10	103	ALL
81	M	5:7	16	2:3	56	18	2:5	60	32	3:8	79	NONE
82	M	5:8	20	2:7	60	23	2:10	65	30	3:6	74	NONE
83	M	5:9	19	2:6	59	26	3:1	69	32	4:2	76	NONE
84	M	5:9	40	4:5	86	44	4:9	90	54	5:10	101	ALL
86	F	5:10	25	3:0	67	27	3:3	70	44	4:9	90	CV
87	M	5:10	15	2:1	52	25	3:0	67	28	3:4	71	NONE
05	M	5:10	30	3:6	74	41	4:6	87	48	5:2	94	SPAN & CV
06	M	5:10	31	3:7	75	38	4:3	83	48	5:2	94	CV
08	F	5:10	29	3:5	73	36	4:1	81	46	5:0	92	CV
88	F	5:11	23	2:10	62	34	3:10	76	44	4:9	88	CV
MEANS		5:9	26.7	3:2	69.2	32.2	3:11	76.7	42.3	4:3	87.9	

Summary:

ALL LVs within BPVS Normal Limits for TWO (15.4%) Subjects

SPANISH & CV for TWO (15.4%) Subjects

ONLY CV for FOUR (30.8%) Subjects

NONE for FIVE (38.4%) Subjects

Table 4.29.1(v) AGE CODE - 05 (6-6:5); N = 29

Ss	SEX	MEAN AGE	ENGLISH RS	ENGLISH AE	ENGLISH SS	SPANISH RS	SPANISH AE	SPANISH SS	CONCEPTUAL VOCABULARY RS	CONCEPTUAL VOCABULARY AE	CONCEPTUAL VOCABULARY SS	LVs within BPVS "Normal Limits"#
45	M	6:1	42	4:7	86	32	3:8	74	52	5:7	103	ENG & CV
10	M	6:1	30	3:6	71	47	5:1	91	53	5:9	98	SPAN & CV
11	F	6:2	36	4:1	79	45	4:11	87	55	5:11	98	SPAN & CV
89	F	6:2	20	2:7	55	25	3:0	63	35	4:0	75	NONE
90	F	6:2	26	3:1	64	34	3:10	71	39	4:4	80	NONE
91	F	6:2	33	3:9	73	31	3:7	80	44	4:9	86	CV
181	M	6:3	54	5:10	97	45	4:11	87	57	6:2	101	ALL
141	F	6:3	40	4:5	81	44	4:9	86	54	5:10	97	SPAN & CV
142	F	6:3	23	2:10	60	33	3:9	73	38	4:3	79	NONE
143	M	6:4	38	4:3	79	38	4:3	79	47	5:1	89	CV
12	M	6:4	39	4:4	82	48	5:2	90	53	5:9	96	SPAN & CV
13	F	6:4	28	3:4	67	37	4:2	78	44	4:9	86	CV
92	M	6:4	25	3:0	63	39	4:4	80	42	4:7	83	NONE
93	F	6:4	20	2:7	55	24	2:11	61	31	3:7	71	NONE
94	F	6:4	26	3:1	64	35	4:0	75	43	4:8	85	CV
46	F	6:4	49	5:3	91	50	5:5	92	62	6:8	106	ALL
47	F	6:4	51	5:6	94	38	4:3	79	54	5:10	97	ENG & CV
48	M	6:4	52	5:7	95	47	5:1	89	59	6:4	103	ALL
95	F	6:5	29	3:5	65	37	4:2	75	43	4:8	82	NONE
96	F	6:5	34	3:10	72	32	3:8	69	48	5:2	88	CV
97	M	6:5	25	3:0	60	28	3:4	64	37	4:2	75	NONE
49	M	6:5	43	4:8	82	41	4:6	80	56	6:0	99	CV
50	F	6:5	55	5:11	96	49	5:3	89	62	6:8	104	ALL
51	F	6:5	40	4:5	79	39	4:4	78	52	5:7	92	CV
144	M	6:5	49	5:3	89	49	5:3	89	56	6:0	97	ALL
14	M	6:5	35	4:0	73	53	5:9	94	58	6:3	99	SPAN & CV
15	F	6:5	33	3:9	70	48	5:2	88	54	5:10	95	SPAN & CV
16	M	6:5	34	3:10	72	40	4:5	79	50	5:5	90	CV
17	F	6:5	34	3:10	72	44	4:9	83	52	5:7	92	CV
MEANS		6:4	35.9	4:1	75.4	39.7	4:5	80.1	49.3	5:8	91.2	

Summary (Table 4.29.1(v) - Age Code 05)

ALL LVs within BPVS Normal Limits for FIVE (17.2%) Subjects

SPANISH & CV for SIX (20.7%) Subjects

ENGLISH & CV for TWO (6.9%) Subjects

ONLY CV for NINE (31%) Subjects

NONE for SEVEN (24.1%) Subjects

Table 4.29.1(vi) AGE CODE - 06 (6:6-6:11); N = 39

			ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS
		MEAN										"Normal
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	Limits"#
52	M	6:6	46	5:0	86	40	4:5	79	50	5:5	90	ENG & CV
18	M	6:6	47	5:1	87	45	4:11	84	57	6:2	98	ENG & CV
19	F	6:6	43	4:8	82	49	5:3	89	59	6:4	101	SPAN & CV
145	M	6:6	48	5:9	88	52	5:7	95	59	6:4	101	ALL
182	M	6:6	44	4:9	83	48	5:2	88	53	5:9	94	SPAN & CV
146	F	6:7	33	3:9	70	42	4:7	81	44	4:9	83	NONE
99	M	6:7	26	3:1	61	32	3:8	69	39	4:4	78	NONE
100	F	6:7	32	3:8	69	45	4:11	84	51	5:6	91	CV
101	F	6:7	30	3:6	67	46	5:0	86	51	5:6	91	SPAN & CV
53	M	6:7	57	6:2	98	60	6:5	102	65	7:0	108	ALL
20	M	6:7	49	5:3	89	46	5:0	86	58	6:3	98	ALL
21	M	6:8	20	2:7	50	35	4:0	70	37	4:2	72	NONE
22	F	6:8	29	3:5	63	35	4:0	70	44	4:9	80	NONE
183	F	6:8	40	4:5	76	42	4:7	78	55	5:11	93	CV
102	F	6:8	35	4:0	70	49	5:3	86	53	5:9	90	SPAN & CV
54	F	6:8	46	5:0	82	44	4:9	80	57	6:2	95	CV
55	M	6:8	56	6:0	94	28	3:4	61	58	6:3	96	ENG & CV
56	M	6:8	58	6:3	96	38	4:3	73	61	6:7	100	ENG & CV
57	F	6:8	56	6:0	94	38	4:3	73	59	6:4	97	ENG & CV
58	M	6:8	52	5:7	89	43	4:8	79	59	6:4	97	ENG & CV
59	F	6:8	50	5:5	87	46	5:0	82	59	6:4	97	ENG & CV

Table 4.29.1(vi) (Continued)

			MEAN ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS "Normal
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	Limits"#
180	M	6:8	37	4:2	72	46	5:0	82	49	5:3	86	CV
103	M	6:9	28	3:4	61	32	3:8	66	43	4:8	79	NONE
105	M	6:9	32	3:8	66	42	4:7	78	52	5:7	89	CV
23	M	6:9	50	5:5	87	39	4:4	75	59	6:4	97	ENG & CV
60	M	6:10	53	5:9	90	47	5:1	84	58	6:3	96	ENG & CV
24	F	6:10	55	5:11	93	50	5:5	87	59	6:4	97	ALL
25	F	6:10	46	5:0	82	49	5:3	86	62	6:8	101	SPAN & CV
26	M	6:10	23	2:10	54	41	4:6	77	45	4:11	81	NONE
106	F	6:11	35	4:0	67	46	5:0	79	54	5:10	88	CV
61	M	6:11	54	5:10	88	56	6:0	91	66	7:1	102	ALL
62	F	6:11	52	5:7	86	50	5:5	84	64	6:11	100	ENG & CV
63	M	6:11	50	5:5	84	40	4:5	73	53	5:9	87	CV
65	F	6:11	41	4:6	74	41	4:6	74	49	5:3	83	NONE
67	M	6:11	47	5:1	80	51	5:6	85	58	6:3	93	SPAN & CV
68	F	6:11	39	4:4	71	39	4:4	71	49	5:3	83	NONE
179	F	6:11	54	5:10	88	46	5:0	79	59	6:4	94	ENG & CV
27	F	6:11	41	4:6	74	40	4:5	72	55	5:11	89	CV
147	F	6:11	24	2:11	53	37	4:2	69	46	5:0	79	NONE
MEANS		6:9	42.5	4:8	78.2	43.5	4:9	79.6	54.1	5:9	91.6	

Summary:

ALL LVs within BPVS Normal Limits for FIVE (12.8%) Subjects

SPANISH & CV for SIX (15.4%) Subjects

ENGLISH & CV for ELEVEN (28.2%) Subjects

CV ONLY for EIGHT (20.5%) Subjects

NONE for NINE (23.1%) Subjects

Table 4.29.1(vii) AGE CODE - 07 (7-7:5); N = 26

			MEAN	ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	"Normal Limits"#
107	F	7:0	35	4:0	67	42	4:7	75	50	5:5	84	NONE
148	M	7:0	39	4:4	71	46	5:0	79	55	5:11	89	CV
108	F	7:1	49	5:3	83	49	5:3	83	61	6:7	96	CV
109	M	7:1	48	5:2	82	53	5:9	87	61	6:7	96	SPAN & CV
110	F	7:2	37	4:2	66	38	4:3	68	50	5:5	81	NONE
111	M	7:2	65	7:0	98	37	4:2	66	68	7:4	101	ENG & CV
112	M	7:2	45	4:11	75	51	5:6	82	63	6:9	95	CV
113	M	7:2	51	5:6	82	55	5:11	86	63	6:9	95	SPAN & CV
114	M	7:3	51	5:6	82	55	5:11	86	65	7:0	98	SPAN & CV
28	M	7:3	44	4:9	74	52	5:7	83	61	6:7	93	CV
158	M	7:3	43	4:8	73	42	4:7	72	52	5:7	83	NONE
159	F	7:3	33	3:9	62	40	4:5	70	49	5:3	80	NONE
500	F	7:3	42	4:7	72	38	4:3	68	50	5:5	81	NONE
501	M	7:4	33	3:9	62	35	4:0	64	43	4:8	73	NONE
502	F	7:4	33	3:9	62	27	3:3	54	42	4:7	72	NONE
503	M	7:4	46	5:0	76	51	5:6	82	59	6:4	91	CV
29	F	7:4	55	5:11	86	40	4:5	70	59	6:4	91	ENG & CV
30	F	7:4	43	4:8	73	51	5:6	82	62	6:8	94	CV
31	M	7:4	43	4:8	73	42	4:7	72	50	5:5	81	NONE
32	M	7:4	69	7:5	102	60	6:5	92	72	7:9	102	ALL
149	F	7:4	46	5:0	76	49	5:3	80	62	6:8	94	CV
117	F	7:5	39	4:4	66	41	4:6	68	53	5:9	81	NONE
33	M	7:5	48	5:2	76	50	5:5	78	59	6:4	88	CV
34	F	7:5	40	4:5	67	43	4:8	70	52	5:7	80	NONE
505	F	7:5	21	2:8	43	38	4:3	65	46	5:0	73	NONE
506	F	7:5	33	3:9	59	39	4:4	66	47	5:1	74	NONE
MEANS		7:3	43.5	4:9	73.4	44.8	4:11	74.9	55.9	6:1	87.2	

Summary: (Table 4.29.1(vii) - Age Code 07)

ALL LVs within BPVS Normal Limits for ONE (3.9%) Subject

SPANISH & CV for THREE (11.5%) Subjects

ENGLISH & CV for TWO (7.7%) Subjects

ONLY CV for EIGHT (30.8%) Subjects

NONE for TWELVE (46.2%) Subjects

		MEAN	ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS "Normal
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	Limits"#
118	F	7:6	42	4:7	69	49	5:3	77	57	6:2	86	CV
35	M	7:6	47	5:1	74	38	4:3	65	55	5:11	83	NONE
36	M	7:6	37	4:2	76	39	4:4	66	48	5:2	76	NONE
119	F	7:7	37	4:2	64	42	4:7	69	50	5:5	78	NONE
120	F	7:7	48	5:2	76	51	5:6	79	63	6:9	92	CV
39	F	7:7	33	3:9	59	39	4:4	66	48	5:2	76	NONE
40	M	7:7	41	4:6	68	46	5:0	73	54	5:10	82	NONE
184	F	7:7	32	3:8	58	46	5:0	73	49	5:3	77	NONE
121	F	7:8	39	4:4	64	51	5:6	77	58	6:3	85	CV
197	M	7:8	43	4:8	68	45	4:11	70	55	5:11	81	NONE
198	M	7:8	34	3:10	58	43	4:8	68	51	5:6	77	NONE
122	M	7:9	51	5:6	77	52	5:7	78	62	6:8	89	CV
178	F	7:9	60	6:5	87	60	6:5	87	68	7:4	96	ALL
195	F	7:9	40	4:5	65	53	5:9	79	57	6:2	84	NONE
196	F	7:9	40	4:5	65	36	4:1	60	45	4:11	70	NONE
123	F	7:10	48	5:2	74	51	5:6	77	62	6:8	89	CV
156	F	7:10	46	5:0	71	49	5:3	75	63	6:9	90	CV
190	M	7:10	42	4:7	67	46	5:0	71	52	5:7	78	NONE
191	M	7:10	44	4:9	69	44	4:9	69	54	5:10	79	NONE
192	M	7:10	46	5:0	71	49	5:3	75	58	6:3	85	CV
193	M	7:10	32	3:8	56	42	4:7	67	53	5:9	79	NONE

Table 4.29.1(viii) (Continued)

			MEAN	ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS "Normal
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	Limits"#
194	M	7:10	41	4:6	66	43	4:8	68	52	5:7	78	NONE
124	M	7:11	41	4:6	64	46	5:0	69	53	5:9	77	NONE
125	M	7:11	53	5:9	77	52	5:7	76	58	6:3	83	NONE
185	F	7:11	36	4:1	59	35	4:0	57	49	5:3	73	NONE
186	M	7:11	41	4:6	64	47	5:1	71	56	6:0	81	NONE
187	F	7:11	37	4:2	60	42	4:7	65	51	5:6	75	NONE
188	F	7:11	41	4:6	68	45	4:11	72	53	5:9	77	NONE
189	F	7:11	37	4:2	64	43	4:8	68	53	5:9	77	NONE
126	M	7:11	46	5:0	69	51	5:6	75	57	6:2	82	NONE
127	M	7:11	48	5:2	72	56	6:0	81	64	6:11	89	CV
MEANS		7:9	42	4:7	67.7	46.2	5:2	71.7	55.1	5:11	81.4	

Summary:

ALL LVs within BPVS Normal Limits for ONE (3.22%) Subject

ONLY CV for EIGHT (25.81%) Subjects

NONE for TWENTY TWO (70.97%) Subjects

Table 4.29.1(ix) AGE CODE - 09 (8-8:5); N = 23

			MEAN ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	"Normal Limits"#
128	M	8:0	44	4:9	67	48	5:2	72	60	6:5	85	CV
300	M	8:1	65	7:0	91	60	6:5	85	68	7:4	94	ALL
301	F	8:1	55	5:11	79	57	6:2	82	65	7:0	91	CV
279	M	8:1	65	7:0	91	66	7:1	92	73	7:10	99	ALL
411	F	8:2	57	6:2	80	47	5:1	69	66	7:1	90	CV
286	M	8:2	62	6:8	85	52	5:7	74	69	7:5	93	ENG & CV
303	M	8:3	62	6:8	85	53	5:9	75	67	7:2	91	ENG & CV
412	F	8:3	57	6:2	80	47	5:1	69	63	6:9	86	CV
287	F	8:3	55	5:11	78	53	5:9	75	63	6:9	86	CV
288	F	8:3	61	6:7	84	53	5:9	75	67	7:2	91	CV
304	F	8:4	55	5:11	78	52	5:7	74	66	7:1	90	CV
200	F	8:4	49	5:3	71	43	4:8	64	58	6:3	81	NONE
201	M	8:4	51	5:6	73	43	4:8	64	55	5:11	78	NONE
413	F	8:4	51	5:6	73	42	4:7	63	60	6:5	83	NONE
414	M	8:4	51	5:6	73	62	6:8	85	68	7:4	92	SPAN & CV
305	M	8:5	50	5:5	70	50	5:5	70	64	6:11	86	CV
415	M	8:5	38	4:3	57	51	5:6	71	61	6:7	82	NONE
416	F	8:5	57	6:2	78	53	5:9	73	66	7:1	88	CV
417	M	8:5	57	6:2	78	48	5:2	68	61	6:7	82	NONE
418	F	8:5	47	5:1	67	39	4:4	58	54	5:10	74	NONE
419	M	8:5	49	5:3	69	40	4:5	59	59	6:4	80	NONE
420	F	8:5	34	3:10	52	48	5:2	68	55	5:11	76	NONE
289	F	8:5	73	7:10	95	63	6:9	85	73	7:10	95	ALL
MEANS		8:3	54.1	5:10	76.3	50.9	5:6	72.6	63.5	6:10	86.7	

Summary: (Table 4.29.1(ix) - Age Code 09)

ALL LVs within BPVS Normal Limits for THREE (13%) Subjects
SPANISH & CV for ONE (4.3%) Subject
ENGLISH & CV for TWO (8.7%) Subjects
CV ONLY for NINE (39.1%) Subjects
NONE for EIGHT (34.8%) Subjects

Table 4.29.1(x) AGE CODE - 10 (8:6-8:11); N = 34

		MEAN	ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS "Normal
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	Limits"#
306	M	8:6	62	6:8	83	61	6:7	82	70	7:7	92	CV
307	M	8:6	59	6:4	80	60	6:5	81	66	7:1	88	CV
203	F	8:6	32	3:8	50	37	4:2	56	46	5:0	66	NONE
204	M	8:6	50	5:5	70	48	5:2	68	57	6:2	78	NONE
205	F	8:6	35	4:0	54	32	3:8	50	45	4:11	65	NONE
206	F	8:6	43	4:8	62	43	4:8	62	51	5:6	71	NONE
421	F	8:6	55	5:11	76	48	5:2	68	62	6:8	83	NONE
422	F	8:7	59	6:4	80	55	5:11	76	63	6:9	85	CV
290	F	8:7	57	6:2	78	55	5:11	76	62	6:8	83	NONE
309	M	8:8	53	5:9	71	49	5:3	67	63	6:9	82	NONE
310	F	8:8	52	5:7	70	57	6:2	70	64	6:11	83	NONE
311	F	8:8	68	7:4	88	42	4:7	59	71	7:8	91	ENG & CV
207	F	8:8	54	5:10	72	44	4:9	61	59	6:4	78	NONE
208	F	8:8	43	4:8	60	44	4:9	61	53	5:9	71	NONE
209	M	8:8	44	4:9	61	45	4:11	62	55	5:11	73	NONE
312	F	8:9	68	7:4	88	54	5:10	72	74	8:0	94	ENG & CV
424	F	8:9	59	6:4	78	55	5:11	73	67	7:2	87	CV
425	M	8:9	56	6:0	74	52	5:7	70	65	7:0	84	NONE
426	F	8:9	47	5:1	65	48	5:2	66	62	6:8	81	NONE
292	F	8:9	67	7:2	87	55	5:11	73	70	7:7	90	ENG & CV
313	M	8:10	55	5:11	73	52	5:7	70	65	7:0	84	NONE
211	F	8:10	35	4:0	51	37	4:2	54	46	5:0	63	NONE

Table 4.29.1(x) (Continued)

			MEAN	ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	"Normal Limits"#
427	F	8:10	58	6:3	77	63	6:9	82	72	7:9	92	CV
428	F	8:10	51	5:6	69	56	6:0	74	65	7:0	84	NONE
429	F	8:10	56	6:0	74	56	6:0	74	66	7:1	85	CV
314	M	8:11	37	4:2	52	42	4:7	57	48	5:2	64	NONE
315	M	8:11	52	5:7	68	59	6:4	76	66	7:1	83	NONE
316	M	8:11	63	6:9	80	55	5:11	71	67	7:2	84	NONE
212	M	8:11	42	4:7	57	38	4:3	53	52	5:7	68	NONE
213	F	8:11	32	3:8	46	29	3:5	43	41	4:6	56	NONE
214	M	8:11	52	5:7	68	45	4:11	60	57	6:2	74	NONE
430	M	8:11	40	4:5	55	44	4:9	59	59	6:4	76	NONE
431	F	8:11	38	4:3	53	47	5:1	63	59	6:4	76	NONE
432	M	8:11	39	4:4	54	52	5:7	68	57	6:2	74	NONE
MEANS		8:9	50.4	5:6	68.4	48.8	5:3	66.4	60.1	6:3	79.1	

Summary:

ENGLISH & CV within BPVS Normal Limits for THREE (8.8%) Subjects

CV only for SIX (17.7%) Subjects

NONE for TWENTY FIVE (73.5%) Subjects

Table 4.29.1(xi) AGE CODE - 11 (9-9:5); N = 30

Ss	SEX	MEAN AGE	ENGLISH RS	ENGLISH AE	ENGLISH SS	SPANISH RS	SPANISH AE	SPANISH SS	CONCEPTUAL VOCABULARY RS	CONCEPTUAL VOCABULARY AE	CONCEPTUAL VOCABULARY SS	LVs within BPVS "Normal Limits"#
317	M	9:0	44	4:9	59	36	4:1	51	50	5:5	66	NONE
318	M	9:0	49	5:3	65	44	4:9	59	54	5:10	70	NONE
319	F	9:0	66	7:1	83	62	6:8	79	73	7:10	91	CV
320	M	9:0	50	5:5	66	47	5:1	63	58	6:3	75	NONE
433	M	9:0	58	6:3	75	59	6:4	76	67	7:2	84	NONE
434	F	9:0	46	5:0	61	44	4:9	59	55	5:11	71	NONE
321	M	9:1	65	7:0	82	51	5:6	67	69	7:5	86	CV
322	F	9:1	55	5:11	71	57	6:2	74	65	7:0	82	NONE
324	F	9:1	54	5:10	70	50	5:5	66	60	6:5	77	NONE
325	F	9:1	35	4:0	50	39	4:4	54	47	5:1	63	NONE
326	M	9:1	59	6:4	76	59	6:4	76	67	7:2	84	NONE
215	M	9:1	62	6:8	79	45	4:11	60	65	7:0	82	NONE
216	F	9:1	54	5:10	70	53	5:9	69	61	6:7	78	NONE
328	M	9:2	53	5:9	67	50	5:5	64	61	6:7	76	NONE
218	M	9:2	55	5:11	69	55	5:11	69	65	7:0	80	NONE
293	M	9:2	65	7:0	80	59	6:4	74	71	7:8	86	CV
294	M	9:2	59	6:4	74	55	5:11	69	65	7:0	80	NONE
217	M	9:3	52	5:7	66	51	5:6	65	60	6:5	75	NONE
329	M	9:3	61	6:7	76	57	6:2	71	67	7:2	82	NONE
219	F	9:3	49	5:3	63	43	4:8	56	55	5:11	69	NONE
220	M	9:3	41	4:6	54	48	5:2	62	55	5:11	69	NONE
221	F	9:3	60	6:5	75	54	5:10	68	68	7:4	83	NONE
331	M	9:4	62	6:8	77	60	6:5	75	66	7:1	81	NONE
295	F	9:4	62	6:8	77	56	6:0	70	70	7:7	85	CV
333	M	9:5	44	4:9	55	52	5:7	64	59	6:4	71	NONE
284	F	9:5	53	5:9	65	47	5:1	58	57	6:2	69	NONE
222	M	9:5	46	5:0	57	52	5:7	64	62	6:8	75	NONE
223	M	9:5	63	6:9	76	55	5:11	67	69	7:5	82	NONE
224	M	9:5	52	5:7	64	57	6:2	69	64	6:11	77	NONE
296	F	9:5	58	6:3	70	57	6:2	69	68	7:4	81	NONE
MEANS		9:2	54.4	5:10	69.1	51.8	5:7	66.2	62.4	6:9	77.7	

Summary: (Table 4.29.1(xi) - Age Code 11)

ONLY CV within BPVS Normal Limits for FOUR (13.3%) Subjects

NONE for TWENTY SIX (86.7%) Subjects

Table 4.29.1(xii) AGE CODE - 12 (9:6-9:11); N = 26

			MEAN	ENGLISH			SPANISH			CONCEPTUAL VOCABULARY			LVs within BPVS "Normal
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS	Limits"#
334	F	9:6	67	7:2	80	61	6:7	74	69	7:5	82	NONE
225	M	9:6	51	5:6	63	56	6:0	68	64	6:11	77	NONE
226	M	9:6	53	5:9	65	50	5:5	62	60	6:5	72	NONE
227	F	9:6	52	5:7	64	59	6:4	71	65	7:0	78	NONE
297	F	9:6	61	6:7	74	50	5:5	62	67	7:2	80	NONE
228	F	9:7	51	5:6	63	46	5:0	57	59	6:4	70	NONE
336	F	9:8	70	7:7	81	62	6:8	73	74	8:0	85	CV
337	M	9:8	54	5:10	64	60	6:5	71	64	6:11	75	NONE
338	M	9:8	65	7:0	76	61	6:7	72	68	7:4	79	NONE
339	F	9:8	66	7:1	77	58	6:3	69	68	7:4	79	NONE
229	M	9:8	64	6:11	75	49	5:3	59	65	7:0	76	NONE
230	F	9:8	47	5:1	57	48	5:2	58	59	6:4	70	NONE
298	F	9:8	61	6:7	72	57	6:2	68	69	7:5	80	NONE
299	M	9:8	61	6:7	72	52	5:7	62	69	7:5	80	NONE
498	M	9:8	65	7:0	76	58	6:3	69	72	7:9	83	NONE
340	F	9:9	62	6:8	73	60	6:5	71	66	7:1	77	NONE
232	M	9:9	45	4:11	55	35	4:0	44	54	5:10	64	NONE
233	F	9:9	48	5:2	58	44	4:9	54	58	6:3	69	NONE
341	F	9:10	61	6:7	72	62	6:8	73	66	7:1	77	NONE
342	M	9:10	56	6:0	67	52	5:7	62	63	6:9	74	NONE
343	F	9:10	71	7:8	82	66	7:1	77	74	8:0	85	CV
234	F	9:10	56	6:0	67	51	5:6	61	62	6:8	73	NONE
282	M	9:10	57	6:2	68	55	5:11	65	69	7:5	80	NONE
344	M	9:11	57	6:2	66	52	5:7	61	64	6:11	74	NONE
235	F	9:11	56	6:0	65	48	5:2	57	62	6:8	72	NONE
499	F	9:11	71	7:8	81	65	7:0	75	73	7:10	83	NONE
MEANS		9:8	58.8	6:4	69.7	54.5	5:11	65.2	65.5	7:1	76.7	

Summary: (Table 4.29.1(xii) - Age Code 12)

ONLY CV within BPVS Normal Limits for TWO (7.7%) Subjects

NONE for TWENTY FOUR (92.3%) Subjects

Table 4.29.1(xiii) AGE CODE - 13 (10-10:5); N = 23

			MEAN	ENGLISH			SPANISH		CONCEPTUAL VOCABULARY		
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS
345	F	10:0	54	5:10	63	49	5:3	58	60	6:5	70
346	M	10:0	61	6:7	71	59	6:4	68	68	7:4	78
236	F	10:0	49	5:3	58	45	4:11	54	59	6:4	68
237	F	10:0	52	5:7	61	47	5:1	56	60	6:5	70
347	F	10:0	52	5:7	61	52	5:7	61	62	6:8	72
351	M	10:1	72	7:9	82	68	7:4	76	74	8:0	84
348	F	10:1	63	6:9	73	51	5:6	60	67	7:2	77
349	F	10:1	65	7:0	50	50	5:5	67	67	7:2	77
238	M	10:1	61	6:7	71	56	6:0	65	66	7:1	76
352	M	10:2	60	6:5	68	61	6:7	69	66	7:1	74
353	F	10:2	62	6:8	70	63	6:9	71	67	7:2	75
354	F	10:2	66	7:1	74	61	6:7	69	70	7:7	78
355	F	10:2	59	6:4	67	62	6:8	70	65	7:0	73
356	M	10:2	59	6:4	67	62	6:8	70	65	7:0	73
357	F	10:3	65	7:0	73	59	6:4	67	69	7:5	77
358	F	10:4	64	6:11	72	60	6:5	68	68	7:4	76
359	F	10:4	56	6:0	64	57	6:2	65	63	6:9	71
361	F	10:4	62	6:8	70	60	6:5	68	67	7:2	75
239	M	10:4	56	6:0	68	50	5:5	57	65	7:0	73
362	M	10:5	64	6:11	71	67	7:2	74	70	7:7	77
363	M	10:5	64	6:11	71	63	6:9	70	69	7:5	76
240	M	10:5	67	7:2	74	58	6:3	64	70	7:7	77
285	M	10:5	52	5:7	56	46	5:0	50	65	7:0	70
MEANS		10:2	60.2	6:6	67.6	56.8	6:1	65.1	66.2	7:1	74.7

Summary:

No LV within BPVS Normal Limits

Table 4.29.1(xiv) AGE CODE - 14 (10:6-10:11); N = 21

									CONCEPTUAL		
		MEAN	ENGLISH			SPANISH			VOCABULARY		
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS
364	M	10:6	71	7:8	78	62	6:8	69	72	7:9	79
365	F	10:6	71	7:8	78	67	7:2	74	71	7:8	78
241	M	10:7	55	5:11	61	52	5:7	58	64	6:11	71
242	F	10:7	57	6:2	63	47	5:1	53	64	6:11	71
243	M	10:7	67	7:2	74	63	6:9	70	72	7:9	79
244	F	10:7	67	7:2	74	63	6:9	70	72	7:9	79
245	F	10:8	55	5:11	60	47	5:1	51	62	6:8	67
246	M	10:8	57	6:2	62	53	5:9	57	68	7:4	73
366	F	10:8	57	6:2	62	58	6:3	63	65	7:0	70
367	F	10:8	66	7:1	71	66	7:1	71	69	7:5	74
368	F	10:8	70	7:7	75	67	7:2	72	71	7:8	76
369	M	10:8	69	7:5	76	65	7:0	70	71	7:8	76
370	F	10:9	72	7:9	77	64	6:11	69	73	7:10	78
371	F	10:9	64	6:11	69	65	7:0	70	69	7:5	74
247	M	10:9	60	6:5	65	55	5:11	60	67	7:2	72
283	M	10:9	63	6:9	70	54	5:10	64	72	7:9	79
372	F	10:10	60	6:5	65	62	6:8	67	66	7:1	71
249	M	10:10	57	6:2	62	52	5:7	56	67	7:2	72
250	M	10:11	56	6:0	59	55	5:11	58	67	7:2	70
251	M	10:11	62	6:8	65	61	6:7	64	67	7:2	70
374	F	10:11	64	6:11	67	65	7:0	68	71	7:8	74
MEANS		10:8	62.9	6:9	68.2	59.2	6:4	64.5	68.6	7:5	74

Summary:

No LV within BPVS Normal Limits

Table 4.29.1(xv) AGE CODE - 15 (11-11:5); N = 31

		MEAN	ENGLISH			SPANISH			CONCEPTUAL VOCABULARY		
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS
377	F	11:0	65	7:0	68	64	6:11	67	70	7:7	73
376	F	11:1	72	7:9	75	68	7:4	71	72	7:9	75
378	M	11:1	64	6:11	67	61	6:7	64	69	7:5	72
253	F	11:1	57	6:2	60	51	5:6	54	64	6:11	67
254	M	11:1	60	6:5	63	53	5:9	56	67	7:2	70
260	M	11:1	69	7:5	72	65	7:0	64	73	7:10	76
257	F	11:2	53	5:9	54	53	5:9	54	62	6:8	64
258	M	11:2	63	6:9	65	61	6:7	63	68	7:4	70
259	F	11:2	61	6:7	63	57	6:2	59	67	7:2	69
261	F	11:2	43	4:8	44	47	5:1	48	55	5:11	56
262	F	11:2	61	6:7	63	58	6:3	60	68	7:4	70
379	F	11:2	64	6:11	66	57	6:2	59	66	7:1	68
380	F	11:2	67	7:2	69	63	6:9	65	71	7:8	73
381	F	11:2	63	6:9	65	56	6:0	58	67	7:2	69
382	F	11:3	64	6:11	66	63	6:9	65	70	7:7	72
383	M	11:3	67	7:2	69	47	5:1	48	70	7:7	72
384	F	11:3	61	6:7	63	55	5:11	56	65	7:0	67
385	M	11:3	69	7:5	71	68	7:4	70	72	7:9	73
263	F	11:3	71	7:8	73	64	6:11	66	72	7:9	73
264	M	11:3	62	6:8	64	58	6:3	60	66	7:1	68
265	F	11:4	60	6:5	62	58	6:3	60	67	7:2	69
266	M	11:4	61	6:7	63	63	6:9	65	71	7:8	73
386	F	11:4	70	7:7	72	59	6:4	61	71	7:8	73
387	M	11:4	68	7:4	70	69	7:5	71	74	8:0	75
388	F	11:4	65	7:0	67	64	6:11	66	68	7:4	70
389	F	11:4	68	7:4	70	62	6:8	64	69	7:5	71
390	M	11:4	68	7:4	70	69	7:5	71	73	7:10	73
391	F	11:5	69	7:5	69	54	5:10	54	70	7:7	70
392	F	11:5	57	6:2	57	52	5:7	52	64	6:11	64
393	F	11:5	62	6:8	62	62	6:8	62	68	7:4	68
267	F	11:5	64	6:11	64	64	6:11	64	71	7:8	71
MEANS		11:3	63.5	6:10	65.4	59.5	6:5	61.2	68.4	7:4	70.1

Summary: (Table 4.29.1(xv) - Age Code 15)

No LV within BPVS Normal Limits

Table 4.29.1(xvi) AGE CODE - 16 (11:6-11:11); N = 18

			ENGLISH			SPANISH			CONCEPTUAL VOCABULARY		
Ss	SEX	MEAN AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS
394	F	11:6	67	7:2	67	49	5:3	49	70	7:7	70
268	M	11:6	64	6:11	64	61	6:7	61	69	7:5	69
269	M	11:7	69	7:5	69	61	6:7	61	72	7:9	72
270	F	11:7	60	6:5	60	56	6:0	56	64	6:11	64
271	M	11:7	68	7:4	68	69	7:5	69	72	7:9	72
396	F	11:7	63	6:9	63	61	6:7	61	65	7:0	65
398	M	11:8	63	6:9	62	64	6:11	63	68	7:4	67
399	F	11:8	68	7:4	67	67	7:2	66	72	7:9	71
400	M	11:8	60	6:5	59	59	6:4	58	67	7:2	66
402	M	11:9	63	6:9	62	56	6:0	55	66	7:1	65
272	M	11:9	68	7:4	67	53	5:9	52	71	7:8	70
273	F	11:10	70	7:7	69	59	6:4	58	73	7:10	71
274	F	11:10	59	6:4	58	53	5:9	52	69	7:5	68
281	F	11:10	52	5:7	51	55	5:11	54	65	7:0	64
403	M	11:11	71	7:8	68	66	7:1	63	73	7:10	71
275	F	11:11	67	7:2	64	59	6:4	57	69	7:5	66
276	M	11:11	54	5:10	52	52	5:7	50	62	6:8	60
277	M	11:11	70	7:7	67	64	6:11	62	72	7:9	69
MEANS		11:9	64.2	6:11	63.3	59.1	6:4	58.2	68.8	7:5	67.8

Summary:

No LV within BPVS Normal Limits

Table 4.29.1(xvii) AGE CODE - 17 (12-12:5); N = 4

		MEAN	ENGLISH			SPANISH			CONCEPTUAL VOCABULARY		
Ss	SEX	AGE	RS	AE	SS	RS	AE	SS	RS	AE	SS
405	F	12:0	67	7:2	64	68	7:4	65	71	7:8	68
406	F	12:0	58	6:3	56	47	5:1	42	60	6:5	58
407	M	12:0	62	6:8	60	64	6:11	62	66	7:1	63
278	M	12:1	63	6:9	61	55	5:11	53	69	7:5	66
MEANS		12:1	62.5	6:9	60.3	58.5	6:4	55.5	66.5	7:2	63.8

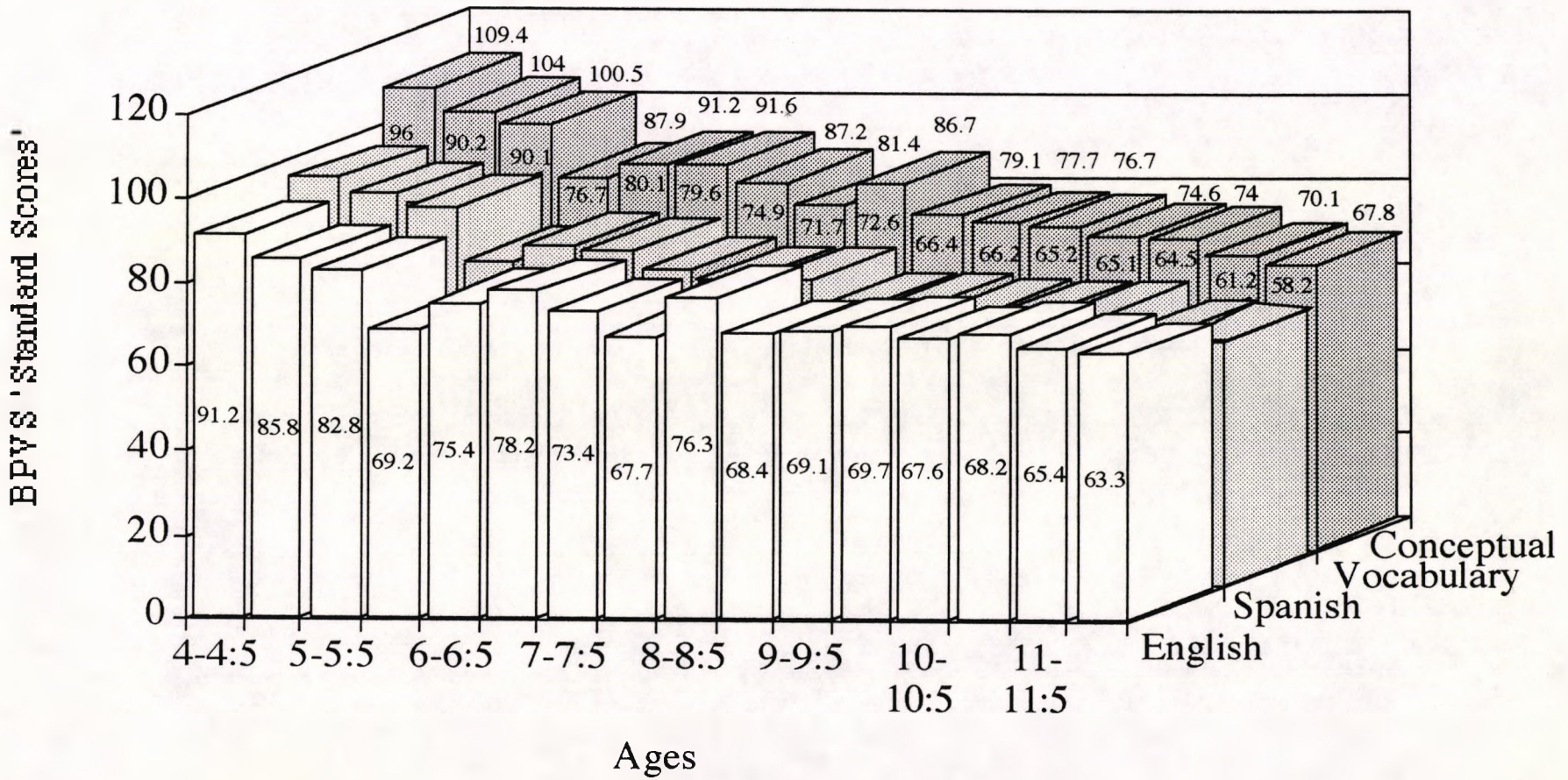
Summary:

No LV within BPVS Normal Limits

			LINGUISTIC VARIABLES								
									CONCEPTUAL		
AGE	MEAN		ENGLISH			SPANISH			VOCABULARY		
CODE	AGE	N	RS	AE	SS	RS	AE	SS	RS	AE	SS
01 (4-4:4)	4:4	20	30.9	3:7	91:2	34.4	3:11	96	45.8	5:0	109.4
02 (4:6-4:11)	4:9	13	29.8	3:6	85.8	35.1	4:0	92.2	45.4	4:11	104
03 (5-5:5)	5:3	11	32.7	3:9	82:8	39.5	4:5	90.1	48.6	5:3	100.5
04 (5:6-5:11)	5:9	13	26.7	3:2	69.2	32.2	3:11	76.7	42.3	4:3	87.9
05 (6-6:5)	6:4	29	35.9	4:1	75.4	39.7	4:5	80.1	49.3	5:8	91.2
06 (6:6-6:11)	6:9	39	42.5	4:8	78.2	43.5	4:9	79.6	54.1	5:9	91.6
07 (7-7:5)	7:3	26	43.5	4:9	73.4	44.8	4:11	74.9	55.9	6:1	87.2
08 (7:6-7:11)	7:9	31	42	4:7	67.7	46.2	5:2	71.7	55.1	5:11	81.4
09 (8-8:5)	8:3	23	54.1	5:10	76.3	50.9	5:6	72.6	63.5	6:10	86.7
10 (8:6-8:11)	8:9	34	50.4	5:6	68.4	48.8	5:3	66.4	60.1	6:3	79.1
11 (9-9:5)	9:2	30	54.4	5:10	69.1	51.8	5:7	66.2	62.4	6:9	77.7
12 (9:6-9:11)	9:8	26	58.8	6:4	69.7	54.5	5:11	65.2	65.5	7:1	76.7
13 (10-10:5)	10:2	23	60.2	6:6	67.6	56.8	6:1	65.1	66.2	7:1	74.7
14 (10:6-10:11)	10:8	21	62.9	6:9	68.2	59.2	6:4	64.5	68.6	7:5	74
15 (11-11:5)	11:3	31	63.5	6:10	65.4	59.5	6:5	61.2	68.4	7:4	70.1
16 (11:6-11:11)	11:9	18	64.2	6:11	63.3	59.1	6:4	58.2	68.8	7:5	67.8
17 (12-12:5)	12:1	4	62.5	6:9	60.3	58.5	6:4	55.5	66.5	7:2	63.8

TABLE 4.29.2 MEANS OF AGES, NUMBER OF CORRECT RESPONSES FOR BPVS ITEMS (RS), BPVS '*STANDARD SCORES*' (SS) AND '*AGE EQUIVALENTS*' (AE), FOR ENGLISH, SPANISH AND CONCEPTUAL VOCABULARY, IN EACH AGE CODE

Figure 5 overleaf, illustrates graphically the 'BPVS' *Standard Score equivalents* for lexical proficiency in English, Spanish and Conceptual Vocabulary (based on Trial 1 data, only).



(Note: The figures for Spanish are shown on the front face of the back row bars)

FIGURE 5. 'BPVS' STANDARD SCORES EQUIVALENTS FOR LEXICAL PROFICIENCY IN ENGLISH, SPANISH AND CONCEPTUAL VOCABULARY (Based on Trial 1 data only)

Tables 4.29.3 below, provides details of the number and percentage of subjects in each age code whose BPVS *Standard Score* (SS) was within *'Normal Limits'*. This information is provided for *English*, *Spanish* and *Conceptual Vocabulary*.

Summary

The following observations are made regarding the number (and percentage) of children who achieved BPVS *'Standard Scores'* which were *within* BPVS *'Normal Limits'*.

(i) There was a general *trend* showing that the percentage of subjects achieving a *Standard Score* of 85 or more i.e. a BPVS *within 'normal' limits score* (WNLS) *decreased* with age.

(ii) Up to Age Code 07 (Age 7-7:5 years) and with only *one* exception at Age Code 06 (Age 6:6-6:11 years), a *greater* percentage of subjects achieved a WNLS in *Spanish* than in English. As from Age Code 09 (Age 7:6-7:11 years), this trend was *reversed* though the percentages were *negligible*.

(iii) *Without* exception, a *higher* percentage of subjects achieved a WNLS in *Conceptual Vocabulary* than in English or Spanish, in any one age code.

(iv) *No* subject above the age of 8:5 years obtained a WNLS for ALL LVs.

(v) With an *insignificant* exception at age 8-8:5 years, *no* subjects obtained a WNLS for Spanish and CV as from age 7:6 years.

(vi) From age 9:0 onwards, *no* subjects obtained a WNLS for English and CV.

(vii) As from age 8:6 onwards, *no* subjects obtained a WNLS for Spanish.

(viii) As from age 9:0 onwards, *no* subjects obtained a WNLS for English.

(ix) As from age 10:0 onwards, *no* subjects obtained a WNLS in any LV

AGE CODES	N	ENGLISH n	%	SPANISH n	%	CV n	%
01 (4-4:5)	20	16	80	18	90	20	100
02 (4:6-4:11)	13	7	54	9	69	13	100
03 (5-5:5)	11	3	27	9	82	11	100
04 (5:6-5:11)	13	2	15	4	31	8	62
05 (6-6:5)	29	7	24	11	38	22	76
06 (6:6-6:11)	39	16	41	11	28	30	77
07 (7-7:5)	26	3	12	4	15	14	54
08 (7:6-7:11)	31	1	3	1	3	9	29
09 (8-8:5)	23	5	22	4	17	15	65
10 (8:6-8:11)	34	3	9	0	0	9	26
11 (9-9:5)	30	0	0	0	0	4	13
12 (9:6-9:11)	26	0	0	0	0	2	8

N.B. NO SUBJECTS ATTAINED THE EQUIVALENT OF WITHIN BPVS 'NORMAL LIMITS' SCORES AFTER AGE CODE 12 (AGE 9:6-9:11)

TABLE 4.29.3 PERCENTAGE OF SUBJECTS ACHIEVING EQUIVALENT OF WITHIN BPVS '*NORMAL LIMITS*' SCORES (SS = 85+) IN EACH LINGUISTIC VARIABLE, IN EACH AGE CODE

4.7 ITEM ANALYSES

4.7.1 Lexical Familiarity in L1 and L2

A very important aspect of DL lexicon and lexical development is the relationship between the acquisition of a lexeme in *each* language.

Only Trial 1 data was used for this part of the study. The number of correct responses given for each *lexical stimulus*, in each language, i.e. *English* and *Spanish*, was calculated at each age code. The *percentages* from the possible total were also calculated. These relative percentages indicated the *degree of familiarity* with which each *word* was known in each language, and in which language the word was most familiar.

These data appear in Appendices 5.1a-d.

The data at *each* age code were then subjected to *Chi Square (2x2)* tests to establish whether there was a significant difference as measured by the *frequency* of correct responses given for a particular item in English and in Spanish. Tables 4.30(i) and 4.30(ii) summarise the results. The language in which a lexical stimulus was significantly most familiar, for any one referent, was thus, established.

Summary

As stated earlier, the lexical stimulus for each referent was presented in both languages though not simultaneously. The difference in the number of correct responses given to the lexical stimuli in *each* language was statistically analysed for each referent. *Significant* differences in at least *one* age group were indicated for 77 out of the 100 referents used. Thirty six were significantly *English* dominant, 33 *Spanish* dominant, and 8 demonstrated ***shifting*** dominance.

However, statistical significance shown in *one* age group only, can not be considered to indicate an unequivocal pattern from which practical inferences can be made. Table 4.30(ii) below, comprises *51* words which were considered to indicate statistically significant patterns which could be *meaningfully* explained. The rationale for the selection of these words was as follows. When a significant difference was indicated in an isolated age group, except perhaps during the first year in school, it was felt that no meaningful inferences can be drawn. The same argument could be applied when a significant difference was indicated at a number of age codes separated by more than a year's

interval. All significant *shifts* in dominance however, were noted whether these criteria were met or not. The reason for this was that such shifts could be indicative of words becoming more familiar in another language due to *diglossic* factors, or to the timing of an emerging lexicon comprising translational equivalents.

TABLE 4.30(i) REFERENTS FOR WHICH STATISTICALLY SIGNIFICANT LEXICAL FAMILIARITY WAS GREATER IN ONE OF THE LANGUAGES, AGE CODES WHEN DOMINANCE OCCURRED, AND THE RESPECTIVE DOMINANT LANGUAGE

REFERENT	AGE CODES	DOMINANT LANGUAGE
GATE	01-02; 05-16	ENG
BOAT	12; 14	ENG
SNAKE	01-02; 10	ENG
LADDER	04; 06-16	ENG
NECK	01-02	SPAN
BEE	01; 03-12; 14-16	ENG
FEATHER	01-04; 06	SPAN
	09-10	ENG
TORCH	06; 10	ENG
SPANNER	01; 04-08; 10-15	SPAN
ARROW	01; 03; 05	SPAN
CHOPPING	01; 03	SPAN
SHARING	07-10; 12	ENG
HORROR	08	SPAN
FURRY	06; 09-16	ENG
DELIVERING	05-06	SPAN
	09; 12	ENG
EAGLE	04	SPAN
PASTING	09	SPAN
	16	ENG
VEGETABLE	04; 07; 09-10	SPAN
ANKLE	08	SPAN
JUG	11	ENG
DELIGHTED	06; 09	SPAN
TUGGING	05-11	SPAN
TEACHER	04	ENG

Table 4.30(i) (Continued)

REFERENT	AGE CODES	DOMINANT LANGUAGE
DISAGREEMENT	06-10; 13	ENG
PAIR	10	ENG
WRIST	05; 08; 15	SPAN
WAITER	01-08; 12	SPAN
SORTING	04	SPAN
GREETING	03; 05; 07-10	SPAN
ORNAMENT	10-12	SPAN
ENTERTAINER	06; 09-10; 12; 14-16	ENG
PLASTERING	05	SPAN
TUSK	05-06	ENG
LOCKET	05-06	SPAN
WEASEL	09; 16	ENG
ISOLATION	02; 09	SPAN
EMERGING	10-11	SPAN
GROOMING	01; 05-10; 12-15	ENG
APPLAUDING	05-12	SPAN
STADIUM	09; 12	ENG
BEAR	01; 05-06	ENG
YAWNING	05; 08-16	ENG
TIME	10	ENG
SCREEN	04; 07-08; 10	SPAN
KANGAROO	01; 04	ENG
BEEHIVE	01; 05-13; 15-16	ENG
CANDLE	02	SPAN
HATCH	05; 07; 09; 11-16	ENG
ACCIDENT	06	SPAN
NET	09-13; 15-16	ENG
SAFE	02; 06	SPAN
COBWEB	04-05; 07-08; 11-13	SPAN
BROKEN	06	ENG
BEAK	10; 17	SPAN
CLAW	05-07; 09-16	ENG
FEATHERY	09; 16	ENG
WOOLLY	06-09; 11-13	ENG

Table 4.30(i) (Continued)

REFERENT	AGE CODES	DOMINANT LANGUAGE
PADDLING	02-04; 08; 10	SPAN
	15; 17	ENG
DIVING	01; 03; 05-17	ENG
FLASK	09-10; 15	ENG
HAMMOCK	07-08; 10; 12-14	SPAN
SUNDIAL	08	SPAN
SHOWERING	01; 03; 05; 07-08	SPAN
DRIPPING	02; 04-05	SPAN
	15	ENG
FILE	02	ENG
	08-15; 17	SPAN
BOLT	06	ENG
SURPRISE	11	ENG
PRIDE	05-06; 09	ENG
FERN	06; 10-11; 14-16	ENG
IVY	12; 14-16	ENG
SMOKE	01; 03-05	SPAN
	09	ENG
BALCONY	02; 05-08; 11	SPAN
ARCHES	15	ENG
LINK	05-06	SPAN
	15	ENG
HUNTING	05; 07-08; 10	SPAN
SNARLING	02; 07-08; 10	SPAN
BLOOM	01; 03-16	SPAN

Of these, significant dominance in lexical familiarity within the age groups shifted for 8 words; dominance for *Spanish* only, for all the age codes at which it was significant, was indicated for 20 words; the same for *English* only was indicated for 23 words. Forty nine out of the original lexical corpus of 100 items could be discounted regarding their being vulnerable to significant linguistic *'bias'* so that the familiarity in each language was not considered to be significantly different for these items. One could discount items for which a significant familiarity difference appears in non-neighbouring age codes of not more than 12 months interval (e.g. 03; 05, examples of these items being **'ARROW'** and **'BOAT'**), on the basis that this occurrence is more likely to be due to some

irrelevant variable in those age codes. Even if this was done, the *Spanish Dominance* list would only be reduced by 2 to 18; the *English Dominance* list by 1 to 22; the *Shifting Dominance* list would be reduced by 6 to 2. The criterion for disregarding an item from the latter list, even though whilst dominance in one of the languages may span two or more age codes, a shift is indicated in only one age code, bears the same rationale as above.

TABLE 4.30(ii) REFERENTS, RESPECTIVE LANGUAGE DOMINANCE AND SHIFTING DOMINANCE *(N.B. Age Codes involved appear in brackets)*

	REFERENTS INDICATING:	
SPANISH DOMINANCE	**ENGLISH DOMINANCE**	**SHIFTING DOMINANCE**
NECK (01-02)	GATE (01-02; 05-16)	FEATHER
SPANNER (01; 04-08; 10-15)	BOAT (12; 14)	Span - (01-04; 06)
	SNAKE (01-02; 10)	Eng - (09-10)
ARROW (01; 03; 05)	LADDER (04; 06-16)	DELIVERING
		Span - (05-06)
		Eng - (09; 12)
CHOPPING (01; 03)	BEE (01; 03-12; 14-16)	PASTING
		Span - (09)
		Eng - (16)
VEGETABLE (04; 07; 09-10)	SHARING (07-10; 12)	PADDLING
		Span - (02-04; 08; 10)
		Eng - (15; 17)
TUGGING (05-11)	FURRY (06; 09-16)	DRIPPING
		Span - (02; 04-05)
		Eng - (15)
WAITER (01-08; 12)	DISAGREEMENT (06-10; 13)	FILE
		Eng - (02)
		Span - (08-15; 17)
GREETING (03; 05; 07-10)	ENTERTAINER (06; 09-10; 12; 14-16)	SMOKE
		Span - (01; 03-05)
		Eng - (09)
ORNAMENT (10-12)	TUSK (05-06)	LINK
LOCKET (05-06)	GROOMING (01; 05-10; 12-15)	Span - (05-06)
		Eng - (15)
EMERGING (10-11)	BEAR (01; 05-06)	

Table 4.30(ii) (Continued)

REFERENTS INDICATING:		
SPANISH DOMINANCE	**ENGLISH DOMINANCE**	**SHIFTING DOMINANCE**
APPLAUDING (05-12)	YAWNING (05; 08-16)	
SCREEN (04; 07-08; 10)	BEEHIVE (01; 5-13; 15-16)	
	HATCH (05; 07; 09; 11-16)	
	NET (09-13; 15-16)	
COBWEB (04-05; 07-08; 11-13)	CLAW (05-07; 09-16)	
HAMMOCK (07-08; 10; 12-14)	WOOLLY (06-09; 11-13)	
SHOWERING (01; 03; 05; 07-08)	DIVING (01; 03; 05-17)	
BALCONY (02; 05-08; 10)	FLASK (09-10; 15)	
HUNTING (05; 07-08; 10)	PRIDE (05-06; 09)	
SNARLING (02; 07-08; 10)	FERN (06; 10-11; 14-16)	
BLOOM (01; 03-16)	IVY (12; 14-16)	

4.7.2 Equilingual Familiarity

This referred to the *percentage* of correct responses, given in *both* languages (in each age code) for *each* referent. The results of calculations to establish the degree of *equilingual familiarity* also revealed a rather erratic pattern across the age codes. Thus, the percentage of correct responses in *both* languages for any one referent, at any one age code, was not necessarily exceeded in subsequent age codes (Appendix 5.2a-c gives full details). Table 4.30(iii) shows the percentage *bands* (in intervals of 10) attained for *each* translational equivalent and at which age codes (latter appear in the body of the table).

Summary

There would seem to be a *trend* for most referents, not entirely unexpectedly, suggesting that the *higher* percentage of *equilingual familiarity* is achieved at a *higher* age code than the lower percentage. The pattern is however, *not consistent*. It can also be observed (See Tables 4.30(iii) and 4.30(iv), below) that a particular measure of *equilingual familiarity* for several referents may first be observed at an earlier age, then disappear and then emerge again at later ages. So for example, the referent ***drum*** first shows a 91-100% *equilingual familiarity* at Age Code 03 (Age 5-5:5 years) then not again till Age Codes 06 and 07 (Ages 6:6-7:5 years) and then at Age Codes 09 (Age 8-8:5 years) 11 (Age 9-9:5 years) and 16 (Age 11-11:5 years). One can see this more clearly in Table 4.30.3(ii), below which gives an overview of the age codes at which the first three *percentage bands* of *equilingual familiarity* i.e. 91-100%(*), 81-90%(o), 71-80%(†) occurred for each referent.

TABLE 4.30(iii) AGE CODES AT WHICH EACH REFERENT ACHIEVED THE STATED PERCENTAGE CORRECT RESPONSES IN BOTH LANGUAGES

PERCENT INTERVAL	91-100	81-90	71-80	61-70	51-60
REFERENT	AGE CODES				
HAND	1-3; 5-16	4	-	-	-
MONEY	1; 6-16	2-3; 5	4	-	-
GATE	-	13	14	10; 15	11-12 16
BOAT	1; 3; 6-11; 15-16	2; 5; 12; 14;	-	-	4
SNAKE	3; 11-16	6-10	5	1	
DRUM	3; 6-7; 9-11; 13-16	1; 8; 12	5	-	2; 4
LADDER	-	-	-	16	5; 7; 14; 15
PENGUIN	6-16	3; 5	1	2	-
NECK	8-12; 16	6-7; 13-15		5	-
BEE	-	13	6;14; 16	9-11	2; 5; 7; 12; 15
FEATHER	11-16	7-8	6; 10	-	5; 9

Table 4.30(iii) (Continued)

PERCENT INTERVAL	91-100	81-90	71-80	61-70	51-60
REFERENT	AGE CODES				
BRUSHING	9; 11; 13; 16	3; 5; 7; 8; 10; 12; 14; 15	6	-	1
TORCH	9; 11; 13-16	3; 8; 10; 12	7	5-6	1
SPANNER	-	-	14	13; 16	-
ARROW	7; 9-11; 13; 16	12; 14-15	5-6; 8	2	1; 3-4
CHOPPING	14	16	11; 13; 15	12	7; 9-10
SHARING	14-16	11-13		8-10	-
HORROR	13-14; 16	11-12; 15	9	7; 10	1
FURRY	-	-	-	-	-
DELIVERING	-	14-16	13	-	12
LIQUID	14-16	9-13	-	6-7	-
EAGLE	11-16	8-9	6	-	-
PASTING	-	13	12; 14-16	-	10-11
VEGETABLE	12; 14-15	13; 16	8	6; 11	7; 9
ANKLE	11; 13-15	16	9; 12	-	7; 10
JUG	13-14; 16	8-9; 15	6-7; 10-12	3-4	5
DELIGHTED	13; 15	11-12; 14 16	-	9-10	-
TUGGING	13; 15-16	12; 14	11	9	-
TEACHER	-	12-13; 15	9; 14; 16	5-6; 8	7; 10-11
FRUIT	3; 10-15;	9; 16	8	2; 6	4; 7
DISAGREEMENT	14	13	15	16	11-12
ROOT	-	13-14	12; 15-16	9-10	-
PAIR	-	13	12	15-16	14
WRIST	12	-	14-15	11; 13	9-10; 16
WAITER	14	15-16	13	10	11-12
SORTING	-	-	-	13-14;	16 15
GRAIN	-	15	-	14	13; 16
TUBULAR	-	-	-	-	16

Table 4.30(iii) (Continued)

PERCENT INTERVAL	91-100	81-90	71-80	61-70	51-60
REFERENT	AGE CODES				
GREETING	13	16	10-12; 14-15	9	-
ORNAMENT	-	-	15-16	-	-
ENTERTAINER	-	-	16	15	-
PLASTERING	-	16	14	9; 12-13; 15	11
SEED	-	-	14	-	15-16
TRACK	13	14	16	9; 11-12; 15	7
TUSK	-	-	-	13-14	11-12 16
LOCKET	-	-	-	-	13
WEASEL	-	-	-	-	-
ISOLATION	-	-	-	-	14
EMERGING	-	-	-	-	14
GROOMING	-	-	-	-	-
SWAMP	-	-	-	-	15
APPLAUDING	-	15-16	13-14	-	-
STADIUM	-	13	14; 16	15	11
TORTOISE	2; 7-16	6	1	3; 5	4
BEAR	3; 8-9; 11-16	6-7; 10	5	-	2; 4
YAWNING	-	-	-	-	12-13
READING	3; 11; 13-15	5-10; 16	1-2	-	-
TIME	9; 11; 13-15	6-8; 10; 12	5; 16	1; 3	-
SCREEN	-	13	14	15-16	11-12
KANGAROO	9; 11-15	3; 5; 8; 10; 16	6-7	1-2	-
COW	9; 11-14	3; 6-8; 10; 15-16	1; 5	2; 4	-
BEEHIVE	-	-	14	16	13; 15
CANDLE	11-16	5-9	10	3	-

Table 4.30(iii) (Continued)

PERCENT INTERVAL	91-100	81-90	71-80	61-70	51-60
REFERENT			**AGE CODES**		
HATCH	-	-	-	-	13-14
ACCIDENT	8-9; 11-13 15-16	3; 5; 7; 10; 14	6	2; 4	-
NET	-	-	7-8; 11-12; 14	6; 15	5; 9-10; 13; 16
SAFE	-	16	13-15	11	10; 12
COBWEB	14; 16	13; 15	9-11	12; 6	5; 8
BROKEN	11-15	5-7; 9-10 16	2; 8	1; 3	-
ELECTRICIAN	16	9; 12; 14-15	13	8; 10-11	6
DENTIST	14; 16	8-9; 12-13; 15	5-6	7; 10-11	3
BEAK	13-15	11-12	10; 16	8-9	6-7
CLAW	-	-	-	-	16
FOREST	12-16	9; 11	-	6-8; 10	-
VALLEY	-	-	-	16	13-15
FEATHERY	-	-	14	-	-
WOOLLY	-	-	15	14; 16	-
PADDLING	-	-	12	-	14
DIVING	-	-	-	-	-
FLASK	-	-	-	-	-
HAMMOCK	-	-	16	13	12; 15
ANCHOR	14	13; 15-16	6-7; 10-12	9	3; 8
SUNDIAL	14; 16	15	-	9; 13	11-12
SHOWERING	13	9; 14	10-12; 15-16	6	2; 7-8
DRIPPING	10; 13	9; 11-12; 14-16	-	5; 7-8	6
FILE	-	-	-	-	16
BOLT	-	-	-	-	-
SURPRISE	-	-	-	12-16	-

Table 4.30(iii) (Continued)

PERCENT INTERVAL	91-100	81-90	71-80	61-70	51-60
REFERENT			**AGE CODES**		
PRIDE	-	-	-	-	13; 15-16
FERN	-	-	-	-	-
IVY	-	-	-	-	-
SMOKE	-	13-15	16	7-8; 11-12	6
STEAM	-	16	15	14	11-13
BALCONY	14; 16	9-10; 12-13 15	8; 11	6-7	-
ARCHES	-	14; 16	15	13	-
LINK	-	-	-	-	-
XYLOPHONE	14	-	15-16	9; 13	10-11
HUNTING	13-14; 16	-	11-12; 15	9-10	-
SNARLING	-	-	-	16	-
BLOOM	-	-	-	-	-

PERCENT INTERVAL	41-50	31-40	21-30	11-20	1-10
REFERENT			**AGE CODES**		
HAND	-	-	-	-	-
MONEY	-	-	-	-	-
GATE	3; 8-9	2; 6; 7	-	-	-
BOAT	-	-	-	-	-
SNAKE	4	2	-	-	-
DRUM	-	-	-	-	-
LADDER	6; 8; 10; 13	1-4; 9; 11-12	-	-	-
PENGUIN	4	-	-	-	-
NECK	1; 3	2; 4	-	-	-
BEE	3; 8	1	-	-	4
FEATHER	1	4	2-3	-	-
BRUSHING	2	4	-	-	-
TORCH	10	2; 4	-	-	-
SPANNER	12; 15	9; 11	-	2-3; 6; 8	1; 4-5; 7

Table 4.30(iii) (Continued)

PERCENT INTERVAL	41-50	31-40	21-30	11-20	1-10
REFERENT	AGE CODES				
ARROW	-	-	-	-	-
CHOPPING	8	6	2	1; 4-5	3
SHARING	6	5; 7	1; 4	2-4	-
HORROR	6	2-3; 5; 8	1	-	4
FURRY	-	-	13	2; 9; 14	1; 3-8 10-12; 15-16
DELIVERING	11	9	6; 8; 10	1; 3-5; 7	2
LIQUID	5; 8	2-4	1	-	-
EAGLE	5	-	1-4	-	-
PASTING	6; 9	2; 5; 7-8	1; 3	-	4
VEGETABLE	5; 10	-	1; 3	2	4
ANKLE	6; 8	5	4	1-2	3
JUG	-	1-2	-	-	-
DELIGHTED	6-7	5; 8	-	1; 3-4	2
TUGGING	1; 8; 10	4-7	2	3	-
TEACHER	-	2; 4	1; 3	-	-
FRUIT	5	1	-	-	-
DISAGREEMENT	-	-	9	3; 5; 8; 10	1-2; 4; 6-7
ROOT	11	8	6-7	4-5	1-3
PAIR	10	5; 7; 9; 11	4; 8	6	1-3
WRIST	-	-	6-7	4; 8	1-3; 5
WAITER	8-9		6-7	1; 5	2-4
SORTING	9	11-12	6; 10	8	1-5; 7
GRAIN	10-12	-	7; 9	3; 5-6; 8	1-2; 4
TUBULAR	14	13; 15	2; 9	1; 4-7; 10-12	3; 8
GREETING	-	-	6	1; 3; 5; 7-8	2; 4
ORNAMENT	12	-	9; 11; 13	1-2	3-8; 10; 14
ENTERTAINER	-	-	9	1; 3; 7-8; 10-12	2; 4-6; 13-14
PLASTERING	10	2	1; 6-8	3-5	-

Table 4.30(iii) (Continued)

PERCENT

INTERVAL REFERENT	41-50	31-40	21-30	11-20	1-10
	AGE CODES				
SEED	12-13	9	2; 10-11	7	1; 3-6; 8
TRACK	8; 10	3; 5-6	-	2; 4	1
TUSK	15	9	7; 10	6; 8	1-5
LOCKET	-	-	11-12; 14-16	6; 9	1-2; 4-5 7-8; 10
WEASEL	12-15	11	6; 9-10; 16	7-8	1-5
ISOLATION	16	13; 15	12	3; 7; 9 11	1-2; 4-6; 8; 10
EMERGING	-	12; 15	9; 11; 13; 16	5; 8; 10	1-4; 6-7
GROOMING	-	-	11; 13-14; 16	2; 9; 12	1; 3-8; 10
SWAMP	13-14; 16	-	9; 11-12	10	1-8
APPLAUDING	9; 11	10; 12	6	1; 5; 7	2-4; 8
STADIUM	9; 12	10	5-6	1; 7-8	2-4
TORTOISE	-	-	-	-	-
BEAR	1	-	-	-	-
YAWNING	9; 14	3; 11; 15	1; 4; 6-8; 16	2; 5; 10	-
READING	4	-	-	-	-
TIME	2; 4	-	-	-	-
SCREEN	-	-	10	6; 9	1-5; 7-8
KANGAROO	-	-	-	-	-
COW	-	-	-	-	-
BEEHIVE		11	7-10; 12	1; 4	3; 5-6
CANDLE	4	1-2	-	-	-
HATCH	-	11; 16	6; 10; 12; 15	1-2; 4-5; 8-9	3; 7
ACCIDENT	1	-	-	-	-
NET	-	3	1-2; 4	-	-
SAFE	9	7	8	6	1-5
COBWEB	4; 7	1-2	3	-	-
BROKEN	-	-	-	-	-
ELECTRICIAN	3; 5; 7	-	1-2; 4	-	-
DENTIST	-	1; 4	2	-	-

Table 4.30(iii) (Continued)

PERCENT INTERVAL REFERENT	41-50	31-40	21-30	11-20	1-10
	AGE CODES				
BEAK	5	3-4	1	2	-
CLAW	13-14	-	15	6; 12 7-11	1-5;
FOREST	-	1-3	5	4	-
VALLEY	-	11	9-10; 12	4-6	1-3; 7-8
FEATHERY	13; 15	9; 11-12; 16	7; 10	1-2; 5-6 8	3-4
WOOLLY	9; 11; 13	10	7-8; 12	5-6	1-4
PADDLING	10-11; 13	6-7; 9; 15-16	1; 8	2; 5	3-4
DIVING	-	1	2; 11	3; 6-8; 10; 12-13 16	4-5; 9; 15
FLASK	16	12; 14-15	-	6; 9-11; 13	1-5; 7-8
HAMMOCK	9; 14	10	3; 7	6; 8; 11	1-2; 4-5
ANCHOR	1; 4	2; 5	-	-	-
SUNDIAL	10	-	6	1-3; 7-8	4-5
SHOWERING	1	5	3	4	-
DRIPPING	-	1	3	2	4
FILE		13; 15	9-10; 12; 14	1-2; 6; 8; 11	3-5; 7
BOLT	-	-	14; 16	11; 13; 15	1-10; 12
SURPRISE	9-11	-	1; 7-8	3; 5-6;	2; 4
PRIDE	12; 14	-	11	10	1-9
FERN	-	-	13	2; 14; 16	1; 3-12 15
IVY	-	-	13	2; 14; 16	1; 3-12 15
SMOKE	1-2; 10	9	5	3-4	-
STEAM	-	9-10	6; 8	4-5; 7	1-3
BALCONY	3-4	1; 5	2	-	-
ARCHES	12	11	-	4; 8-10	1-3; 5-7

Table 4.30(iii) (Continued)

PERCENT INTERVAL / REFERENT	41-50	31-40	21-30	11-20	1-10
	AGE CODES				
LINK	-	-	-	2-3; 13-14; 16	1; 4-12 15
XYLOPHONE	12	3; 6; 8	2; 5; 7	1; 4	-
HUNTING	7-8	-	1-2; 6	4-5	3
SNARLING	13	14-15	11-12	1; 6; 8-9	2-5; 7; 10
BLOOM	14	13; 16	12; 15	1; 9	2-8 10-11

Summary

91-100% *equilingual familiarity* across most age codes was attained for only *one* referent i.e. ***hand***. This percentage of *equilingual familiarity* started at Age Code 06 (Age 6:6-6:11 years) for several other referents but did not necessarily continue uninterrupted at this level, throughout the rest of the age codes. Several other referents showed 91-100% *equilingual familiarity* from Age Code 11 to 15 (Ages 9-11:5 years) and from 11 to 16 (Ages 9-11:11 years). However, lower percentages of *equilingual familiarity* were attained by most other referents. Table 4.30(iv) below, shows at what age codes referents attained other percentages of *equilingual familiarity*. Table 4.30.3(ii) summarises those referents which attained 91-100% (*), 81-90% (o) and 71-80 (†) *equilingual familiarity*, and at which age codes.

Using the number of referents known in *both* languages in each age code as a measure of whether such familiarity increases with age, did not yield a clear pattern from which unequivocal predictions can be made.

Table 4.30(v), below shows the details of such calculations for items receiving 91 per cent or more correct responses in both languages.

TABLE 4.30(iv) AGE CODES AT WHICH EACH REFERENT ACHIEVED 91-100%(*), 81-90%(o) AND 71-80%(†) CORRECT RESPONSES IN BOTH LANGUAGES

REFERENT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
HAND	*	*	*	o	*	*	*	*	*	*	*	*	*	*	*	*
MONEY	*	o	o	†	o	*	*	*	*	*	*	*	*	*	*	*
GATE													o	†		
BOAT	*	o	*		o	*	*	*	*	*	*		o	o	*	*
SNAKE			*		†	o	o	o	o	o	*	*	*	*	*	*
DRUM	o		*		†	*	*	o	*		*	o	*			*
PENGUIN	†		o		o	*	*	*	*	*	*	*	*	*	*	*
NECK						o	o	*	*	*	*	*	o		o	*
BEE						†							o	†		†
FEATHER						†	o	o		†	*	*	*	*	*	*
BRUSHING			o		o	†	o	o	*	o	*	o	*	o	o	*
TORCH			o				†	o		o		o	*	*	*	*
SPANNER														†		
ARROW					†	†	*	†	*	*	*	o	*	o	o	*
CHOPPING											†		†	*	†	o
SHARING											o		o	*	*	*
HORROR									†		o	o	*	*	o	*
DELIVERING													†	o		o
LIQUID									o	o	o	o	o	*	*	*
EAGLE						†		o	o		*	*	*	*	*	*
PASTING												†	o	†	†	†
VEGETABLE												*	o	*	*	o
ANKLE								†	†		*	†	*	*	*	o
JUG						†	†	o	o	†		†	*	*	o	*
DELIGHTED											o	o	*	o	*	o
TUGGING											†	o	*	o	*	*
TEACHER									†			o	o	†	o	†
FRUIT			*					†	o	*	*	*	*	*	*	o
DISAGREEMENT													o	*	o	
ROOT												†	o	o	†	†
PAIR												†	o			
WRIST												*		†	†	
WAITER													†	*	o	o

Table 4.30(iv) (Continued)

REFERENT	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
GREETING										†	†	†	*	†	†	o
TRACK													*	o		†
APPLAUDING													†	†	o	o
STADIUM													o	†		†
TORTOISE	†	*				o	*	*	*	*	*	*	*	*	*	*
BEAR			*		†	o	o	*	*	o	*	*	*	*	*	*
READING	†	†	*		o	o	o	o	o	o	*		*	*	*	o
TIME					†	o	o	o	*	o	*		*	*	*	†
KANGAROO			o		o	†	†	o	*	o	*	*	*	*	*	o
COW	†		o		†	o	o	o	*	o	*	*	*	*	o	o
CANDLE					o	o	o	o	o	†	*	*	*	*	*	*
ACCIDENT			o		o	†	o	*	*	o	*	*	*	o	*	*
SAFE													†	†	†	o
COBWEB									†	†	†		o	*	o	*
BROKEN		†			o	o	o	†	o	o	*	*	*	*	*	o
ELECTRICIAN									o			o	†	o	o	*
DENTIST					†	†		o	o			o	o	*	o	*
BEAK										†	o	o	*	*	*	†
FOREST									o		o	*	*	*	*	*
FEATHERY														†		
WOOLLY															†	
PADDLING												†				
HAMMOCK																†
ANCHOR						†	†			†	†	†	o	*	o	o
SUNDIAL														*	o	*
SHOWERING									o	†	†	†	*	o	†	†
DRIPPING									o	*	o	o	*	o	o	o
SMOKE													o	o	o	†
STEAM															†	o
BALCONY									o	o	†	o	o	*	o	*
ARCHES														o	†	o
XYLOPHONE														*	†	†
HUNTING											†	†	*	*	†	*

KEY * = 91-100%, o = 81-90%, † = 71-80% *equilingual familiarity*

Summary

As can be seen, the number of referents receiving more than 90% correct responses in *both* languages does increase with age but not in a consistent fashion.

This chapter has presented full details of the results of all the analyses conducted. In the first instance, it has done so in relation to the FIRST LEVEL ANALYSES and in the second instance, it has done the same for the SECOND LEVEL ANALYSES as declared at the beginning of the chapter.

	AGE CODE															
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
N	3	2	7	0	1	5	7	8	15	10	22	18	33	35	26	27

TABLE 4.30(v) NUMBER OF REFERENTS IN EACH AGE CODE RECEIVING MORE THAN 90 PER CENT CORRECT RESPONSES IN BOTH LANGUAGES

These results and their possible practical implication are discussed in greater detail in the next chapter.

CHAPTER 5

DISCUSSION

AND

PRACTICAL IMPLICATIONS

CHAPTER 5 DISCUSSION AND PRACTICAL IMPLICATIONS

5.1 INTRODUCTION

The main aim of this investigation was to study the *receptive lexicon* of *DL Gibraltarian* children in *Primary* Schools.

A variety of lexically-related variables which were investigated at different ages. The major one, however, related to the lexical repertoire/proficiency in L1, L2, and in *Conceptual Vocabulary*. In addition to this, the extent of the subjects' ability to identify correctly a referent's name in *both* languages (i.e. *Bilinguality*) and their *Total Lexical Repertoire* (i.e. *all* words known regardless whether they related to the same referent [*translational equivalents*] or not) was investigated. The lexical *development* in all the parameters mentioned above was also investigated. Two design strategies i.e. *cross-sectional* and *longitudinal*, generated two major data bases. The data from the *cross-sectional* study were used to analyse lexical development across the ages but within the sample. The data from the *longitudinal* study allowed the measuring of the lexical *development* of the same subject, over a number of trials. Relationships across linguistic variables, such as correlations and dominance ratios were also investigated. These analyses were based on Trial 1 data only. All these analyses were *quantitative*.

A second-level investigation included a *qualitative* element. This was achieved by the analysis of each item in terms of their relative *familiarity* in L1 and L2. The number of correct responses in Trial 1 for each referent in L1 and L2 were thus, compared and any differences statistically analysed. This was done for each of the seventeen age codes.

Another area explored in this second level investigation aimed at establishing *tenability* regarding the comparability between DL subjects' performance in Trial 1 and established BPVS *norms* based on *English monoglots*. Reasons for this area of study have already been given in an earlier chapter, and the issues will be discussed further in Section 5.5.1, below.

The results of all these analyses have already been reported in Chapter 4, together with brief summaries after each set of analyses. The aim of the present chapter is to interpret and discuss these results, draw inferences and suggest possible implications. Where appropriate, contrasts with the results of similar published work will be made.

There is, however, one issue that needs to be addressed because of its fundamental significance in current thinking; this is the concept of *lexicon*.

5.2 GENERAL CONSIDERATIONS

5.2.1 Lexicon - A Multidimensional Linguistic Concept

The main variable of this study is *receptive* lexicon. The concept of *lexicon* has many parameters. Hatch (1983) states that a lexical item has a variety of features. These include semantic, phonological, grammatical, prosodic, and syntactic features.

One should add that the nature and development of all these features are related to age and cognition. For example, the well-documented phenomenon of children's use of over and under-extensions is most evident in the early stages of linguistic development. The phonological and grammatical attributes of a word also change with age (See Clark, 1979; Vihman, 1985) but the dependence on these attributes is also very evident in adult speech as studies of (errors in) lexical processing (Heikkinen, 1983) have shown.

The number of parameters that one could study in any investigation on lexicon, particularly 'bilingual' lexicon, presents a formidable challenge to the researcher. The more complex a variable the more difficult it is to achieve construct validity. On the other hand, one could argue that considering only one parameter presents the same problem. However, the inherent complexities of using grammatical, syntactic or semantic criteria for statistical analyses, in this study, particularly when two linguistic codes are involved, were a significant consideration for opting to use the *word* as the basic unit for the analyses. Levinson and Liberman (1981) also found it much easier to use the *word* as the basic unit for their language comprehension model.

Some of the issues with particular pertinence to this study will now be discussed.

For reasons already discussed (See Chapter 3 entitled *Methodology*), it was decided to pre-select the lexical corpus to be used in the investigation rather than undergo exhaustive exercises to study the subjects' naturalistic/spontaneous lexicon. A study of this nature is complex enough with monolingual children since it would necessitate observing and recording their lexicon in a variety of settings, e.g. home, school (class and playground), etc. A similar study of the lexicon in L1 and L2 would be more complex, particularly since one would have to identify the *diglossic* aspects of such a lexicon. Furthermore, such a study would yield a somewhat restricted lexicon and only reveal subjects' active, functional lexicon and not the passive one. The reason for this is that the observed lexicon would be determined by the particular *situation* and/or *context* in which it is being used, at any one moment of time.

Using a pre-selected lexical corpus had certain disadvantages in that it imposed limitations on the extent of generalisations one could make arising from the results. The advantages, from an empirical viewpoint, however, were many. In the first place the lexical corpus was derived from a larger one (i.e. the BPVS's) which had been tested empirically albeit on monolingual English subjects. This lexical corpus had been based primarily on developmental considerations. The lexicon therefore, was appropriate for a wide age range which transcended the one reflected by the subjects in the present study. So, at least from a normative stand point, a not insignificant one in any study of lexicon and lexical development, the choice of such a lexical corpus was the most appropriate.

In terms of grammatical categories, it is difficult to determine whether the lexical corpus used contained nouns, verbs and adjectives in ratios which reflected normal development (See Appendix 6, and Table 5.1, below). Unfortunately, there would seem to be a paucity of published work in this regard. What is available (e.g. one of the most recent being Vihman, 1985) relates to very early language development involving younger subjects than those participating in the current study.

Even if these normative data were available, it is doubtful whether any analyses would be meaningful since the grammatical category of any word may change as language develops. *Word class*, says Clark (1979), is not necessarily a good guide to the categories young children talk about. Comparisons related to grammatical categories, across the ages, may prove not to be valid in an investigation which includes a study of lexical development, such as the current one, especially when the study spans across such a large age range and when two languages are involved. The grammatical category of the same referent, for example, could be different for each language, depending on factors such as when and in which context the particular translational equivalent has been acquired. For example, the word *greeting* could be seen as an *action* word in English and its translational equivalent in Spanish, *saludo*, as a *noun*.

Appendix 6 gives details of this author's analysis of such ratios, across the ages, for the BPVS lexical items used in this study. These ratios were based on the frequency with which a grammatical category appears within the test stimuli for each of the age ranges as indicated in Appendix 6.

A summary of these ratios is given in Table 5.1, below.

	RATIOS BETWEEN GRAMMATICAL CATEGORIES		
AGE RANGE	N/V	N/A	V/A
2:6-3:11	7:1	-	-
4-4:11	14:1	-	-
5-5:11	8.5:1	-	-
6-6:11	3.9:1	9:1	2.3:1
7-7:11	4:1	8:1	2:1
8-8:11	4.2:1	9.5:1	2.2:1
9-9:11	4.1:1	8.2:1	2:1
10-10:11	4.4:1	9.6:1	2.2:1
11-11:11	3.7:1	11:1	3:1

TABLE 5.1 RATIOS BETWEEN GRAMMATICAL CATEGORIES (Noun-Verb (N/V), Noun-Adjectives (N/A) & Verb-Adjectives (V/A)) FOR BPVS ITEMS, ACROSS EACH AGE

As can be seen, there does not seem to be a definable pattern in these ratios, and it is impossible to determine whether the seemingly erratic changes over time in any way reflect normal developmental patterns - one suspects they may not.

Since there does not seem to be any normative data regarding the lexical ratios between each grammatical category at each age, any analysis based on this criterion was not going to make any significant contributions to the aims of this investigation.

The semantic category allotted to the lexical items used in this study was based on the model proposed in the BPVS manual. It was concluded that several categories contained too small a number of lexical items (See Table 5.2a, below) to allow useful statistical analysis and comparisons across semantic fields.

1.	Actions	(?21)
2.	Animals (parts & accessories)	(15)
3.	Building (& parts)	(4)
4.	Clothing (& accessories)	(1)
5.	Descriptive words	(11)
6.	Foods	(?1)
7.	Domestic Fixtures	(1)
8.	Household Utensils	(?3)
9.	Parts of Human Body	(4)
10.	Human Workers & Groups	(5)
11.	Mathematical terms	(1)
12.	Plants & their parts	(5)
13.	Fruits and Vegetables	(3)
14.	School & Office Equipment	(4)
15.	Tools, machinery & apparatus	(?7)
16.	Recreational equipment	(5)
17.	Transportation	(?2)
18.	Weather, geography & outdoor scenes	(?6)

TABLE 5.2a BPVS SEMANTIC CATEGORIES

N.B. The numbers in the brackets represent the number of words used in this study belonging to the semantic category. The ? within the brackets indicates that the totals included some lexical items which could be accommodated under other semantic categories

Other models such as the one used in the McArthur's Longman Lexicon of Contemporary English (1981) (See Table 5.2b, below) and Crystal's PRISM-L (1982) were considered inappropriate for the same reason.

As can be seen below, the Longman's model contains a smaller number of categories.

1. Life & Living Things
2. Body (Function & Welfare)
3. People & Family
4. Buildings, Home, Clothes, Belongings & Personal Care
5. Food, Drinks & Farming
6. Feelings, Emotions, etc.
7. Thought & Communication, Language & Grammar
8. Substances, Materials, Objects & Equipment
9. Arts & Crafts, Science, Technology, Industry & Education
10. Numbers, Measurement, Money & Commerce
11. Entertainment, Sports & Games
12. Space & Time
13. Movements, Location, Travel & Transport
14. General & Abstract Terms

TABLE 5.2b LONGMAN'S SCHEME OF SEMANTIC CATEGORIES

The number of semantic fields suggested by Crystal in his PRISM-L was too great to include here, there being 61 plus 1 category entitled '*Other*'.

Another reason for the inappropriateness of using semantic categories for comparisons lay in the fact that the system suggested in the BPVS manual did not allow for precise categorisation for all lexical items used. For example, it was not clear which category a lexeme such as *money* belonged to, since it could be argued that it is related to the concept of *school* or *office equipment* or even *mathematical terms*. Ambiguities existed with other lexemes e.g. *'time'*, *'horror'*, *'liquid'*, *'disagreement'*, *'isolation'*, *'ladder'*, *'steam'*, *'surprise'*, *'boat'*, *'drum'*.

Even the very detailed Longman's semantic-categorisations was not free of ambiguity.

5.2.2 Comparative Considerations

Several other issues need to be briefly addressed prior to the *Main Discussion*. These relate to the feasibility and validity of *comparing* the results of different studies in the field of 'bilingualism'. Ellis (1994) states that ideally, a *longitudinal* approach is required in the study of L2 vocabulary acquisition though most researchers prefer to conduct cross-sectional studies. Hamers and Blanc (1990) observe that many studies "are longitudinal observations of 1 or 2 children and it is difficult to generalise from so few cases." They also note that researchers do not always focus on the same linguistic aspects and observational methodologies are not always comparable across studies. Cross-sectional responses on the other hand, while neglecting to some extent the developmental aspects of L2 acquisition, enable one to obtain a large body of data from larger samples of learners on specific features of acquisition. The present study has attempted to address similar possible shortcomings by adopting both a *cross-sectional* and *longitudinal* design. The data resulting from both of these have been compared at a number of levels e.g. ages, different linguistic variables, etc. (See Chapter 4.5.4, earlier, and Section 5.4.1 and 5.4.2, below).

Another problem making comparisons difficult is mentioned by Romaine (1995). Most studies of *second language acquisition* (Romaine uses this term to refer to *sequential* 'bilingualism', c.f. *simultaneous* 'bilingualism') have been of adults rather than children. There is much research on *tutored* second language acquisition (See Meara's annotated bibliographies, 1987) but not nearly as much on *untutored* (i.e. without formal instruction) or *naturalistic* dual language development. Whereas most Gibraltarian children who participated in this study were immersed into a mainly English speaking school environment, there was no official policy to *teach* them English *formally*.

One would not expect absolute agreement between the findings of different studies. Many variables such as subjects' age, their attitudes to L1 and L2 learning and use, the amount

of time they have been exposed to L2, the languages involved, and other factors already discussed, can all contribute, singly or cumulatively, to the different results reported. The speed at which language is learned by different children and the strategies used can be influenced by affective factors (Cheng, 1995; Krashen, 1981, 1982 - See Chapter 2.2.16). Other factors are discussed by several authors among them Ellis (1994) who states that "*inter-learner variability* is likely to be responsible for the different results reported in the literature regarding *rate* of development in L1 and L2 language proficiency, developmental *patterns*, etc." Lightbrown (1984) concluded that it was not that clear patterns do not exist but that "there is a need to examine how variables such as level of input and socio-psychological attitudes can result in variant patterns and how these variables interact with universal tendencies."

Ellis (1994) adds that *intra-learner variability* can also be great so that a particular learner could produce utterances reflecting different stages of development. Ellis (1994) thus asks "How then can we speak of a clear developmental pattern?" If variability becomes too great "It makes little sense to talk of a *stage* of development." It is the present author's view that perhaps such variabilities can account for a developmental pattern not being unequivocally indicated over a *short* period of time but that a pattern is more likely to be manifest over longer periods. Furthermore, it is *single case*, or *small* sample studies, which are more likely to be the most vulnerable to subject variability. *Longitudinal* studies of samples greater than a handful of subjects are more likely to be the most reliable and enjoy a greater degree of *external validity* and *generalisability*.

These issues should be kept in mind when evaluating and/or interpreting results of studies such as this.

5.3 GENDER AND SCHOOL DIFFERENCES

Whereas it was felt that the sample size for Trial 1 was large enough (>14% of the Government Primary School population) within most age cells of 12 months age range (See Tables 4A and 4B, in Chapter 4) to be considered representative of the DL primary school population in Gibraltar, the hypothesis that there would not be many significant gender differences was tested. It was predicted however, that there would be a higher incidence of significant school differences.

5.3.1 Gender Differences

The issue of *gender* differences regarding linguistic proficiency and development seems to have lost its momentum in the last decade. Reynell for example, standardised the first version (Reynell, 1969) of her Developmental Language Scales providing separate norms

for males and females. Subsequent versions (Reynell, 1977; Reynell and Huntley, 1985) ignored *gender* differences as they were not considered to be significant.

i) Lexical Proficiency in Cross-sectional Study (6 months age range)

In this study, *gender* differences in lexical *proficiency* were analysed at several levels (See Tables in Chapter 4.5.2). At one level, the performance of children *regardless* of school background was analysed. At another level, *gender* differences *within each school* were analysed. The results of the former indicated significant *Male* dominance in only two *non-neighbouring* age codes which were 2½ - 3 years apart from each other (Ages 4:6-4:11 years and 7-7:5 years). Even then, significance in all linguistic variables (i.e. L1, L2, *Conceptual Vocabulary* and *Bilinguality*) was indicated in only the *higher* age code (i.e. 07 - Age 7-7:5 years). In the *younger* age code, significance was indicated only in *two* linguistic variables (LVs) these being *Spanish* and *Conceptual Vocabulary* (CV).

The results of *within* First-Schools analyses indicated significant *gender* differences in Schools B, C and A at ages 6:6-6:11 years, 7-7:5 years, and 7:6-7:11 years, respectively. Again, the pattern was not reflected in all LVs. Significant *gender* differences were indicated in only *one* of the two Middle Schools. This occurred only at ages 9:6-9:11 years and 11-11:5 years, in the former in English (L2), and in the latter in CV.

A *third* level of analysis was conducted to test the effect of increasing the size of samples. This was done by grouping subjects according to *gender* (disregarding school) and combining two neighbouring age codes spanning 12 months. Significant *gender* differences in lexical *proficiency* were again indicated in only a small number of age groups (See Tables 4.6(i) and (ii) in Chapter 4).

Summary

All these analyses supported the view that there is no *consistent* pattern of *gender* differences in lexical *proficiency*. The results obtained in this study therefore, do not allow for generalisations to be made about *gender* differences in lexical *proficiency*.

ii) Lexical Development in Cross-sectional Study (6 months age interval)

The results of analyses (See Table 4.12(ii) - Chapter 4) indicated that the incidence of significant lexical *development* was exactly the same for *both* genders but rarely at the

same age codes and/or linguistic variable. The pattern of lexical *development* for both genders was very erratic and not juxtaposed. *Males* showed significant lexical *development* in *all* linguistic variables between Age Codes 04/05, 08/09 and 12/13 (i.e. Ages 5-5:11 years, 7:6-8:5 years and 9:6-10:5 years, respectively) and *Females* between different age codes these being 05/06, 11/12 and 13/14 (i.e. Ages 6-6:11 years, 9-9:11 years and 10-10:11 years, respectively).

Summary

These results would seem to suggest that there is a slight statistically significant *gender* difference in the pattern of lexical *development*. However, the pattern is not widespread enough nor is it consistent. One can therefore, not claim that there is an *unequivocal* significant gender difference in lexical *development* between age codes with a 6 months difference. No useful conclusions could therefore, be drawn.

iii) Lexical Dominance in Cross-sectional Study (6 months age range)

The general trend was for *Spanish* to be dominant for *both* genders (though not always significantly so) up to and including Age Code 05 (Age 6-6:5 years). A non-significant dominance in *Spanish* continues for *Females* up to and including Age Code 08 (Age 7:6-7:11 years). Other than at this age code, *Males* demonstrate a dominance in *English* (though not always significant) from Age Code 06 (Age 6:6-6:11 years) onwards.

There was *significant* dominance in *Spanish* in the *early* years involving four age codes i.e. 01-04 See Table 4.17(i) - Chapter 4). However, only *one* of the *two* genders achieved *significant* dominance in each case. *Males* showed significant *Spanish* dominance in *three* of these *four* age codes, and *Females* in *one*. Though the dominance in *English* by *Males* and *Spanish* by *Females*, between ages 6 and 7:5 years, was *not* statistically significant, it could be suggested that there is a possibility of *Males* achieving a small degree of dominance in *English* before *Females*. However, *Spanish* was *significantly* dominant for *both* genders at the next age code i.e. 08 (Age 7:6-7:711 years). It is therefore, more likely that the different results obtained for each gender, between these ages, negate this possibility in favour of a chance factor. Indeed, it was the *Females* who first showed a statistically *significant* dominance in *English*. This occurred at Age Code 09 (Age 8-8:5 years). Males did not acquire a similar dominance till a year later at Age Code 11 (Age 9-9:5 years).

It is interesting to note that when the results of *both* genders are pooled together (See Table 4.16 - Chapter 4) the dominance in *Spanish* at Age Code 07 (Age 7-7:5 years) is

unequivocal. As for the gender analysis, the dominance in *English* for the *combined* gender samples, start at Age Code 09 (Age 8-8:5 years). This was consistently significant from Age Code 11 (Age 9-9:9:5 years) to Age Code 16 (Age 11:6-11:11 years).

Summary

The *significance* pattern of lexical *dominance* was not exactly the same for each gender (i.e. for age codes with 6 months age range - See Table 4.17 (i), in Chapter 4). There is *no* pattern indicating that one gender is consistently dominant in any one language. One therefore, has to conclude that there is no unequivocal pattern of a clear *gender* difference regarding lexical *dominance*.

In the earlier years, up to age 5:11 years, it was mainly *Males* whose *Spanish* dominance was significant. Interestingly there was a period between 6 years and 7:5 years when there was no significant dominance for either gender in any of the two languages.

iv) Lexical Dominance in Cross-sectional Study (12 months age range)

Generally speaking, the *dominance pattern* was similar in all three analyses (as indicated in sections 4.5.5a, 4.5.5b(i) and 4.5.5b(ii), above) in as much as a change of dominant language took place in the *middle* primary school years. There are however, some minor gender differences.

If the results of both sets of analyses (i.e. single age codes and concatenated age codes with a 12 month age range) are studied, it can be concluded that there is some agreement that *Females* may achieve a statistically significant dominance in *English* as early as Age Code 09 (Age 8-8:5 years) and *Males* at Age Code 11 (Age 9-9:5 years). This reiterates the conclusion arrived at earlier on, resulting from similar analyses on samples with *6* months age range.

Summary

It is concluded that significance in *gender* differences regarding lexical *dominance* is best revealed when analyses are conducted for samples comprising a *wider* age range. It has to be pointed out however, that including subjects in a 12 month age range may have somewhat obscured how early *English* became dominant.

Conclusions

The following is a summary of the main conclusions reached following all the analyses conducted to establish possible *gender* differences regarding lexical *proficiency*, *development* and *dominance*:

a) There was *no* consistent pattern of significant *gender* differences in *lexical proficiency.*

b) Despite a *slight* gender difference in the pattern of significant *lexical development*, it was not universal or consistent enough for a generalised conclusion to be made.

c) There would not seem to be a clear pattern of significant *gender* difference regarding *lexical dominance.*

The lack of a clear and widespread significant *gender* difference would seem to be supported by the recent literature. In an analysis of 165 studies, representing the testing of nearly one and a half million subjects, Hyde and Linn (1988) reported a slight *female* superiority in verbal ability. The difference however, was so small that it appears that gender differences in verbal ability no longer exist. A major goal of their study was also to define age trends in the pattern of gender differences. The results of the study indicated that there were "no striking changes in the magnitude of gender differences at different ages" (Hyde and Linn, 1988).

v) Correlations Between Linguistic Variables

There were some variations in the outcome of the analyses for each gender. In the first four age codes (6 months age range), significant *correlations* between LVs seemed to be attained more readily by *Males* (See Table 4.22 - Chapter 4). There would thus, seem to be some *gender* difference in the earlier years regarding the relationship between linguistic variables. The reasons for this are not readily transparent and probably open to speculation.

Whereas there were significant correlations (See Table 4.22 - Chapter 4) between all paired combinations of linguistic variables for *Females* as from Age Code 05 (Age 6-6:5 years), similar significance between *English* and *Spanish* was not evident for *Males* between the ages of 6 years and 6:11 years (Age Codes 05-06). This might suggest that during this age, there is not for *Males* a relationship between their *lexical proficiency* in L1 and L2. This sub-analysis did however, seem to indicate that when genders are analysed separately, and in age codes with a six months age range, *correlation*

significance is indicated less frequently than for similar analyses disregarding gender (and school) differences. Furthermore, this significance does not appear in comparisons between all dyads of linguistic variables until later on. When the age range was widened to 12 months by the concatenation of neighbouring age codes (See Table 4.23 - Chapter 4), there were in fact very few exceptions, and significant correlations between all linguistic variables were indicated in all age groups. The fact that the exceptions were between *English* and *Spanish* in the first three groups (i.e. 01+02, 02+03, 03+04) would confirm the prediction that when an absence of a significant correlation between L1 and L2 occurred, it would be during the earlier ages because children may have just been exposed to English.

It is possible that the greater incidence of significant correlations obtained when gender analyses were conducted for groups with 12 month age range is not due to increased size of samples but rather that it is a function of the wider age range of the sample.

5.3.2 School Differences

The subjects participating in this study attended schools which had different catchment areas. These areas were mostly resided by families representing different socio-economic backgrounds (See Appendix 2.1 for copies of letters from Education Adviser and from the Government Statistician in Gibraltar confirming this assumption).

Wells (1985) and Tizard and Hughes (1984) found a strong relationship with a set of measures relating to family background, parental education and parental literacy. Wells (1985) found evidence that middle-class families are more likely to use language in a way which communicates to the child that words stand for things and are manipulated with an intellectual logic of their own, removed from immediate context. Skehan's (1986) research suggested that aptitude in learning an L2 in school relates to family influences that inculcate in the child the ability to use language in a decontextualised manner.

Families of the subjects participating in this study were thought to differ in their *frequency of use*, and *attitude* to the English language. School B for example served a catchment area containing a larger number of professional parents than in Schools A and C. Greater dominance particularly in English, and superiority in all linguistic variables, was predicted for children in catchment area served by *School B*. Similarly, of the two middle schools, the performance of children attending School E was expected to be *superior* to that of School D. The latter hypothesis was supported in part in that whenever significant superiority was indicated in all/any LVs, it was always School E which led.

The prediction that subjects in School B would perform better than those in the other two First schools (i.e. Schools A and C) was a little more difficult to test since, unfortunately, children from School B were not represented in all age codes i.e. there was no representation in Age Codes 04 (Age 5:6-5:11 years), 07 (Age 7-7:5 years), 08 (Age 7:6-7:11 years). However, there was *no* significant school difference indicated in any LV for the earlier ages 4-5:11 years (Age Code 01-04, inclusive). This suggests that any existing variables distinguishing each catchment area did not affect performance significantly in the first year and a half of formal schooling, and in the first two years, for the comparisons between Schools A and C.

As from age 6 to 7:11 years, significant school differences are indicated in at least *one* linguistic variable (See Table 4.7(i) and (ii) - Chapter 4). These results also partly supported the prediction in that school B was significantly superior to the other two at ages 6-6:5 (except for *Spanish* when it was second best) and 6:6-6:11 in all LVs, though *not* significantly so in Spanish.

Of the two Middle schools, school E obtained the *larger* means at *all* age codes but one (Age Code 11 - Age 9-9:5 years), though the differences were not always significant in all LVs. School E had been identified as serving a catchment area which contained a larger number of children from semi-professional and professional families. The results were therefore, not unexpected

It would seem that generally, it is not until subjects have been attending school for some time that significant differences are in evidence. What is not possible to say categorically is whether the differences are a result of variables associated with the socio-economic status of the catchment area or with school-related factors, such as teaching standards and pedagogical objectives. There is in fact a standard curriculum for all First schools but they inevitably enjoy some variations. Whichever is the exact variable, or combination of variables determining level of performance, it is likely to be related to either socio-economic or school background. The fact that significant differences do not appear in the first one-and-a-half to two years of school life does not necessarily indicate that it is definitely the school variable which determines performance. It is possible that since most children's linguistic dominance in entering school is Spanish, that any socio-economic related variables which may affect linguistic performance only come into play when the child has been attending school after a period of time. For example, parents from a certain socio-economic status might be more inclined to speak English more frequently to their children once they start formal schooling so as to help the children with their studies as reported by Wells (1985), Tizard and Hughes (1984) and Skehan (1986).

The analysis to determine school differences for each gender revealed that significant school differences occurred as early as age 4-4:5 years for *Females* (though not Males) but only in *English*, and at age 6-6:5 years in *all* LVs. Significant school differences were indicated for *Males* at age 6:6-6:11 years in all LVs but Spanish, and for *Females* in *English* only. In later ages significant school differences were indicated for *Females* more often than for *Males* and across more LVs.

These results would suggest that there was perhaps an *interactional effect* of gender and school. This hypothesis was tested (See Section 5.3.3, below).

5.3.3 Interactional Effects

Whereas analyses of only *gender* or *school* differences may not yield any significant results, the possibility of an *interactional* effect of these two variables on lexical *proficiency* was explored. The data were subjected to appropriate statistical analyses. These analyses were possible in only *four* samples when more than two schools participated i.e. at ages 4-4:5 years (Age Code 01), 5-5:6 years (Age Code 03), 6-6:5 years (Age Code 05) and 6:6-6:11 years (Age Code 06); reasons for this have already been stated in Chapter 4. The results indicated that a significant *interactional effect* occurred at only *one* of these i.e. at age 6:6-6:11 years, and then in only *one* linguistic variable i.e. *Conceptual Vocabulary.*

Conclusion

The discussion above would suggest that *school* (or *socio-economic background*) yields a *higher* incidence of significant differences in performance than *gender*. There was however, *no* clear pattern across age codes, or in the linguistic variables affected. There was also virtually *no* interactional school/gender effect in the four samples analysed.

5.4 MAIN DISCUSSION

The major thrust of subsequent statistical analyses disregarded *gender* and *school* so that all subjects of *both* genders and *all* schools were grouped according to age code only. This decision was not only justified by the negligible amount of significant gender difference already reported, and by the inconclusive pattern of significant school difference, but also by the actual size of samples in each Year Group. As shown in Table 4B in Chapter 4.2.2, above, the percentage of the sample size in each Year Group, taken from the total DL school population, was very high and transcended 12% in all Year Groups except for Year Group 1 (4-4:11) in First schools (estimated percentage being 9.5 of all schools and 10.2 of just Government schools) and Year Group 2 (5-5:11) in First schools (estimated percentage 6.5 plus of all schools and 7.1 of Government schools).

These figures provided a strong argument for the decision that disregarding gender and school and thus pooling all children according to age code only, was a legitimate and acceptable strategy. The implication of this was that the subjects participating in Trial 1 of this study were representative of the DL Primary School population in Gibraltar. Nevertheless, sub-analyses were conducted regarding other variables as will be discussed below. In addition, and as already described, the sampling strategy employed was of a random type to minimise the possibility of *biased* sampling. This ensured that it was more likely that the sample was representative of the parent (primary school) population.

A discussion related to the results and conclusions of analyses related to the variables mentioned below, now follows.

a) Lexical Development, *based on Cross-sectional and Longitudinal comparisons* (5.4.1a-c)
b) Cross-sectional v. Longitudinal Design (5.4.2)
c) Lexical Dominance (5.4.3)
d) Correlation between Linguistic Variables (5.4.4)
e) Conceptual Vocabulary (5.4.5)
f) Lexical Proficiency, *including proficiency in L1 and L2* (5.4.6)
g) Bilinguality (5.4.7)
h) Reliability and Validity (5.4.8)

5.4.1 Lexical Development

Without the availability of a vocabulary test standardised on the Gibraltarian DL population, it is very difficult to evaluate lexical development objectively. The English lexical corpus used in this study was based on BPVS picture stimuli. The BPVS was standardised on an English monoglot population in the U.K. and purported to reflect their developmental lexical pattern.

This pattern was however, not necessarily the same as for the English lexical development of Gibraltarian DL children, particularly since most children start developing a Spanish lexicon first and usually do not start developing an English lexicon until entering school at 4 years of age. As *diglossics*, a proportion of the lexicon in each language may relate to different societal domains (Ferguson, 1959; Fishman, 1968a; 1968b) and semantic fields. There is also no empirical evidence to support any notion that the degree of lexico-conceptual difficulty (for English monoglots and as suggested by the BPVS) of the English lexicon, would correlate with that of *translational equivalents* in *Spanish* for Gibraltarian DL children. Neither is there any empirical evidence to suggest that the *word* label for any *one* referent is acquired at the same time in *both* languages. One would not expect this to happen with *sequential* 'bilinguals', particularly in the early years. In fact, neither can it be expected with *simultaneous* 'bilinguals'. Taeschner (1983a) conducted a two year longitudinal study of two *simultaneous* German/Italian 'bilingual' infants (age 1:6 years when the study started). It was concluded that "only a few examples of equivalents appeared at the same time." The children acquired more *new* words than *equivalents*. Taeschner (1983a) acknowledged however, that this claim could only be made about children with the same ages i.e. 1:6-3:6 years such as Giulia and Lisa - one should add, "and about *simultaneous* 'bilinguals'", though the dangers of making generalisations from the results of studies of such small samples have to be considered.

Despite the absence of empirical data, there is also no reason to believe that the Gibraltarian children's Spanish/English lexico-conceptual developmental pattern for referents used differs significantly from that of their English peers. The fact that Gibraltarian children may not have the lexicon in English for a number of items does not mean they may not have it in Spanish either. The existence of lexico-conceptual knowledge would be indicated by whether the name for a picture/drawing was known in at least one of the two languages. In addition, teachers had been consulted regarding the suitability of the referents used (See Chapter 3.1.3, above) and their advice taken before the final selection of picture stimuli was made.

Furthermore, since schools in Gibraltar follow United Kingdom (U.K.) based curricula, it is more likely that Gibraltarian children's lexico-conceptual development closely parallels their peers in the U.K. The pictorial stimuli employed were thus thought *not* to be culturally biased, nor to be outside the children's expected age-appropriate range of experience (as Hamers and Blanc (1990) warn they could be). This pre-supposition was largely supported by an *item analysis* which identified which items received a percentage correct response, equivalent to a *z-score* of ***less*** than -1, the baseline being the basal age suggested for that item in the BPVS manual. A *z-score* of *less* than -1 for responses in *both* languages would suggest that the word was only known by a percentage of the population *below -1 standard deviation*. This would be an indication that the majority of the (*within normal limits*) population was not familiar with the particular word in at least one of the languages.

As will be seen later on (See Section 5.5.2.2, below) none of the 100 items met this criterion.

The task for this experimental sample can, therefore, be considered, with some confidence, to be developmentally-based, at least from a *conceptual* point of view. Familiarity with the referents (i.e. pictures) was thus, within the experience of Gibraltarian children and the *concepts* were likely to have been acquired at, generally speaking, equivalent developmental stages as the English monoglots.

Because there were no 'bilingual' norms, and considering the discussion above, it was decided to measure the *extent* of lexical *development* purely on a *gain* basis. Lexical *development* was measured using *cross-sectional* and *longitudinal* data.

a) Cross-sectional Study

i) Between Age Codes Separated by 6 months

Statistical analyses of data resulting from the *cross-sectional* study were conducted by comparing the means for all subjects between each age code. As reported in Chapter 4.5.3 (See Table 4.10(ii) - Chapter 4) development in ***all*** linguistic variables (LVs) was indicated between each neighbouring age code of six months difference, with some exceptions, (already noted in Chapter 4.5.3). This suggested that there was a developmental *trend*. However, statistically significant *development* in *all* linguistic variables was only attained on 4 out of the 9 comparisons. In only *one* other comparison was significance in lexical *development* indicated in *less* than all four linguistic variables, this being between the Age Codes 13 and 14 (Ages 11-11:5 years and 11:6-11:11 years)

when development was significant in *Conceptual Vocabulary* only. This low incidence of significance would suggest that comparisons between age groups separated by 6 months (or less) may not reveal development in statistically significant degrees though a developmental *trend* is indicated. Hamers and Blanc (1990) state that "a majority of studies agree in the existence of developmental sequences", though Lightbrown (1984) has been quoted earlier regarding his view why this may not be palpable (See 5.2.2, above).

Another phenomenon which could be related to analyses based on a *6 months age* interval, is the fact that there would seem to have been a significant *regression*, in all LVs excepting CV (where a non-significant regression was indicated), at Age Code 04 (Age 5:6-5:11 years) when compared to the previous Age Code 03 (Age 5-5:5 years). A *regression* in *all* linguistic variables at Age Code 10 (Age 8:6-8:11 years) when compared to the previous Age Code 09 (Age 8-8:5 years) was also noted but this was *not* significant (See Table 4.10 (ii) - Chapter 4).

Several variables were considered which might have been responsible for this outcome.

(i) The significance of any influence of different schooling on the younger sample can not be determined statistically because the sample size for each school was too small for appropriate analyses (See Table 4.3 - Chapter 4). However, 8:6-8:11 year old *Males* in one of the two schools participating did not do as well, in *any* LV, as their younger peers (Age 8-8:5 years) from the same school. Despite this, one can not conclude that variables such as standard of class teaching could be held responsible since their *Female* peers aged 8:6-8:11 years, who attended mixed classes, performed *better* in *all* LVs than their *younger* Female peers in the *same* school. In any case, the regression at Age Code 10 (Age 8:6-8:11 years) was not statistically significant and could therefore, have occurred by chance.

(ii) All *cross-sectional* data (i.e. Trial 1) was collected by *one* person, the researcher/author himself. There could therefore, not have been any *inter-researcher* effect.

(iii) The sample size for groups in Age Codes 03 and 04 (Ages 5-5:5 years and 5:5-5:11 years) were similar (N = 11 and 13, respectively) but one known factor differentiated these two samples; the former was drawn from 3 First schools and the latter from two. This however, is unlikely to have affected the results since only two children from the third school were included in Age Code 03 (Age 5-5:5 years).

The difference in sample size for Age Codes 09 and 10 (Ages 8-8:5 years and 8:6-8:11 years) was *larger* (23 and 34, respectively) than for 03 and 04 (Ages 5-5:5 years and 5:6-5:11 years). The different sample sizes between samples in the neighbouring age codes in question were not considered to be responsible for the younger subjects' superior performance over the older subjects as the samples were large enough in all cases for appropriate statistical analyses.

(iv) There were also no known environmental or experiential factors at these ages e.g. anxiety associated with change of class or school) which could adequately explain the outcome between Age Code 03 and 04 (Ages 5-5:5 years and 5:6-5:11 years). The results of the *longitudinal* study indicated very slight *non-significant* development between Age Code 03 (Age 5-5:5 years) subjects' performance in Trial 1 and that of Trial 2, 6-8 months later (See Table 4.13.1(i), in the previous chapter). This was true for *all* LVs with the *negligible* exception of *Spanish*. The results of the *longitudinal* study in this regard, were therefore, not in accord with the results of the *cross-sectional* study. Given that in the former, the same children participated in both trials, subject variables can not be held responsible for the outcome. It is thus, likely that the results of the *longitudinal* study were more reliable.

(v) Though the regression noted in the *cross-sectional* study at Age Code 10 (Age 8:6-8:11 years) was *not* significant, one needed to consider the possible effects resulting from the recent change from Infant to Middle school which might have affected the 8:6-8:11 year olds. This influence was doubtful since it would have been the younger 8-8:5 year olds who were more likely to have been affected and the data show regression at age 8:6-8:11 year olds when one might have expected the children to have been more settled in their new school. Furthermore, the results of the *longitudinal* study indicated a *significant development* in *all* LVs between the performance of Age Code 09 subjects (Age 8-8:5 years) and a subsequent performance (Trial 2) 6-8 months later, when the same subjects were Age Code 10 (Age 8:6-8:11 years).

In view of these *longitudinal* results, it is concluded that the superior performance of the younger subjects in the neighbouring age codes under discussion, was due to irrelevant variables or at best, as Ellis (1994) has suggested (see earlier) to *inter-* or *intra-learner variability.*

Conclusion

Despite the stated general pattern of lexical *development* with age and the fact that in most cases this was indicated in *all* linguistic variables, one can *not* categorically state that the

hypothesis that lexical *development* would occur with age was statistically supported. The lack of universal statistically-significant lexical *development* between *all* neighbouring age codes and/or in *all* linguistic variables may be due to the fact that the task lacked the sensitivity required to reveal such significance. Another reason for this may have been that an age interval of six months was not long enough for *significant* lexical development to take place, as will be discussed next.

ii) Between Age Codes Separated by 12 months

To test the hypothesis that comparisons between samples with an age difference of 12 months (instead of 6 months, as discussed earlier) would be substantially more sensitive, a second series of statistical tests were conducted (See Section 4.5.3a (ii), earlier). These compared performances between alternate age codes with a range of 12 months e.g. 01 v. 03, 02 v. 04, etc.. As was expected, *significant* development was indicated at the great majority of levels, thus confirming the stated hypothesis.

An interesting observation was that in the earlier ages, *significant development* in any linguistic variable was indicated only between Age Codes 01 and 03 (i.e. Ages 4-4:5 and 5-5:5 years) and then only in *Spanish* and *Bilinguality* (See Table 4.11(ii) - Chapter 4). Comparisons *after* Age Codes 03 and 05 (Ages 5-5:5 years and 6-6:5 years) indicated that *significant development* had taken place between *all* age codes in *all* LVs, except between Age Code 06 and 08 (Ages 6:6-6:11 years and 7:6-7:11 years, respectively), Age Codes 09 and 11 (Ages 8-8:5 years and 9-9:5 years, respectively) and Age Codes 14 and 16 (Ages 10:6-10:11 years and 11:6-11:11 years, respectively). Other than subject variables, involving these age codes, it is difficult to provide other plausible explanations since the samples comprised subjects from different schools and genders.

The non-significant development between the top age codes i.e. 14-16 (Ages 10:6-11:11 years), may simply reflect the lower sensitivity of the task in revealing development at the higher ages rather than a lack of development.

An interesting observation can be made after studying the results of analyses of the lexical development between different samples with 12 months age interval (i.e. *cross-sectional* study - See Table 4.11(ii) in Chapter 4) and the development between Trials 1 and 2, in the *longitudinal* study (See Table 4.13.1(ii) in Chapter 4). A comparison shows that lexical *development* was indicated *more* frequently in the *longitudinal* study (based on two trials with a 6-8 months interval between each other) than on comparisons based on these *cross-sectional* data.

Conclusion

The results of analyses conducted to establish if there was lexical *development* over a period of 12 months (See Section 4.5.3a (ii) in Chapter 4) indicated that there was a *higher* incidence of statistical significance than indicated between samples with a 6 months age difference. This result would indicate that in *cross-sectional* studies, lexical *development* is more clearly revealed when longer intervals of time separate the age codes being compared.

There does not seem to be however, a substantially seamless age range over which significant lexical *development* progresses with age. The lack of adequate sensitivity of the task in revealing an unequivocal developmental pattern is thought to be one possible contributing reason for this, another being subject variability within the samples in question. Nevertheless, a *trend* regarding lexical *development* with age predominates.

b) Longitudinal Study

The second strategy for evaluating lexical *development* was based on *longitudinal* data. As discussed earlier, the means for subjects participating in Trial 1 and subsequent trials (i.e. *repeated measures*) were calculated and the interval between trials noted. Comparisons based on these repeated measures were statistically analysed (See Chapter 4.5.3c).

Throughout the discussion about the longitudinal study, the age code mentioned represents the age at the *first* trial, and the relevant interval over which *development* took place is indicated in the sub-section subheading e.g. *between Trials 1 and 2 with 6-8 months interval* (See subsection (i) immediately following).

i) Between Trials 1 and 2 (6-8 months interval)

Lexical *development* between Trials 1 and 2 (repeated measures) was noted for most ages and in *most* linguistic variables. However, *significant* development in *all* linguistic variables was attained in *eight* of the fourteen age codes (See Table 4.13.1(ii) - Chapter 4). As mentioned earlier (See Chapter 4.5.3c(i)) there was *no* significant development in *any* linguistic variable for Age Code 03 (Age 5-5:5 years) subjects. There was *significant* development in only *Bilinguality* for Age Code 08 (Age 7:6-7:11 years) subjects. Other areas of *non-significance* are indicated in Table 4.13.1(i) in Chapter 4, but these are small in number.

Whereas an apparently inherent instability around Age Code 08 (Age 7:6-7:11 years) has already been noted, the possibility of it being caused by an imminent change in school (i.e. from First to Middle), has already been considered to be unlikely (See previous section). There is no unequivocal reason for there not being any statistically significant differences in development between Trials 1 and 2 by Age Code 03 subjects; some possible ones have already been discussed in the previous section. Since the *same* subjects were involved in *both* trials, it is unlikely that subject variability is responsible and it is more feasible to conclude that the reason specifically relates to the nature of the lexical *development* of Gibraltarian DL children.

It is of interest to note that there was statistically significant lexical development between Trials 1 and 2 in ***both*** *English* and *Bilinguality* in *all* age codes (except for Age Code 03 subjects) up to and including Age Code 07 (Age 7-7:5 years). However, significant development in *Spanish* is not indicated in the early ages. It is first observed at Age Code 04 (Age 5:6-5:11 years) and with only *one* exception at Age Code 08 (Age 7:6-7:11 years) continues to be significant in all the subsequent groups.

The significant lexical development in *English* and *Bilinguality* in the early years was not entirely unexpected as Gibraltarian children are exposed to *English* for a large part of the day when they start formal schooling at 4 years of age. Spanish may thus, take a back seat. To use Cummins' (1980) term, the children's *basic interpersonal communication skills* (BICS) are probably adequate enough to deal with social situations and it is the language needed for the *cognitive and academic* educational needs (CALP) i.e. *English*, which is the teaching medium, which takes a measure of priority. Naturally, as their *English* lexicon develops, so does their *Bilinguality*. The fact that their *Conceptual Vocabulary* doe not seem to statistically significantly develop may suggest that the lexicon acquired in *English* largely comprises *translational equivalents* of their existing lexicon in *Spanish*. Taeschner (1983a) recognised this stage as will be seen later in the *Conclusions* after Section 5.4.1c, below.

The results of comparisons between Trials 1 and 2 after Age Code 06 (Age 6:6-6:11 years) indicated *significant* lexical *development* in *all* linguistic variables, with only three exceptions out of the ten age codes statistically analysed (See Table 4.13.1(ii) - Chapter 4). This suggests that after this age, lexical *development* in *both* English and Spanish is taking place. The fact that there is statistically significant lexical *development* in *Conceptual Vocabulary* as well, suggests that the lexicon acquired in each language is diversifying, so that lexical items other than *translational equivalents* are being acquired.

One suspects that this is caused by an interplay between age, greater exposure to English, enriched educational experiences and socio-linguistic factors. An example of the latter could possibly be that children's greater identification with the English language results in a heightened social need to speak more English in the *academic* environment. Spanish use is however, maintained in the *social* environment. A status of *diglossia*, thus develops further.

Interestingly, and as mentioned earlier, lexical *development* with age was in *greater* evidence in the analyses of data resulting from the *longitudinal* study than in those based on *cross-sectional* data. The superior sensitivity of *longitudinal* designs for investigations of lexical *development* will be discussed further (See Section 5.4.2).

ii) Development over more than 8 months interval

The results of analyses conducted between Trials 1 and 3 (repeated measures) with an average interval of 12 months, and between Trials 1 and 4 with intervals of between 17 to 22 months, were more clear cut. Other than in age codes where the size of the sample precluded any meaningful statistical analyses, significant development was indicated at *all* age levels and in *all* linguistic variables. There was a difference of 13 points in *English* and 7 in *Spanish* between Trials 1 and 4 (22 months interval) for subjects who were at Age Code 03 (Age 5-5:5 years) at Trial 1 and at Age Code 07 (Age 7-7:5 years) at Trial 4. Saunders (1982) found that his son Thomas gained just under 10 points in *German* and 7 in *English* between ages 5:5 years and 7:3 years, on a similar task using the PPVT. This development would seem to be remarkably similar in his and the present study. However, Thomas' performance was superior to that shown by peers in the present study. The percentage gains were thus very different.

Significant differences occurred more frequently in comparisons between Trials 1 and 3 than in similar comparisons between Trials 1 and 2. Similarly, generally speaking, *development* was indicated between Trials 1 and 4. Though the development between Trials 1 and 2, was not always significant in all linguistic variables and/or in all age codes, significant progress was much more unequivocal at all levels between Trials 1 and 3, and between Trials 1 and 4.

This unequivocal outcome would support Meara's tacit view (1989) that useful studies on linguistic *development* must allow an interval of "... several months or years ..." Meara (1989) also reports that his laboratory studies have shown that " ... the transition patterns from T2-T3, T3-T4, T4-T5 (T2 meaning first Re-Test following instruction) are fairly stable and any one of these is a better predictor than T1-T2 transition." Meara's

work however, is based on language *acquisition* following *instruction* rather than on language *development* (i.e. *natural* development *without* formal instruction). Furthermore, he proposes optimum intervals of 7 days between tests. English is not taught *formally* as a language in Gibraltarian primary schools but is the predominant medium in teaching. The present investigation did not involve any prescribed, *formal* instruction which would enable the children to *acquire* the lexicon used in the study but depended on natural (*informal*) lexical development (though some might argue that the acquisition is through *quasi-formal* instruction). It was also conducted at inter-trial intervals of months rather than 7 days. Because this study and Meara's were investigating two different processes of *acquisition* the respective designs were different but appropriate to each investigation.

c) Lexical Development as Measured by *Percentage Mean Gain*

So far the *significance* of any development with age has been discussed but no reference has been made to the *extent* of lexical development. There were no normative criteria for the task nor for the subjects participating in this study. Development therefore, could only be determined in terms of a *Percentage Mean Gain* (PMG) measure. This was calculated from the data resulting from Trial 1 and subsequent trials.

It was thus, data resulting from repeated trials, (i.e. *longitudinal* data) after certain intervals of time which were used for these analyses. One advantage of the *longitudinal* analyses was that they were based on a *repeated measures* design and therefore, the same subjects were followed through. Thus, no subject variables were likely to influence the results. Due to logistic reasons, not all children participated in repeated trials at the same intervals. The results of analyses of development between trials had therefore, to be categorised according to a number of different intervals of time (See Tables 4.14.1-4.14.3).

i) Percentage Mean Gain between Trials 1 and 2

There was a PMG between Trials 1 and 2 at *all* age levels in *all* linguistic variables with only one negligible exception in Spanish at Age Code 03 (Age 5-5:5 years). The developmental *trend* in *all* linguistic variables is thus, indisputable. The statistical significance of these gains can be derived from previous statistical analyses (See Tables 4.13.1(i) and 4.14.1, in Chapter 4).

Apart from two negligible exceptions in Age Code 03 and 16 (Ages 5-5:5 years and 11:6-11:11 years, respectively), there was a greater PMG in *Bilinguality*, between Trials 1 and

2 (6-8 months interval) than in any other linguistic variable. With the exception in Age Codes 02 (Age 4:6-4:11 years) and 03 (Age 5-5:5 years), the linguistic variable showing the least PMG between Trials 1 and 2 (6-8 months interval) was *Conceptual Vocabulary.* This would confirm an observation made earlier that relatively speaking, the *greatest* lexical developmental *gain* reflects the acquisition of *translational equivalents* i.e. *Bilinguality,* though one has to consider that the proficiency in this linguistic variable during the early years was very low (See Table 4.13.1(i), in Chapter 4).

ii) Percentage Mean Gain between Trials 1 and 3

The incidence of statistically significant *Percentage Mean Gains* made in all LVs is *higher* between Trials 1 and 3 (inter-trial intervals of between 10 and 13 months) than that seen between Trials 1 and 2 (See Tables 4.13.2. and 4.13.1(i), respectively). As for Trials 1 and 2, the greatest *Percentage Mean Gains* were made in *Bilinguality* and the least in *Conceptual Vocabulary.*

iii) Percentage Mean Gain between Trials 1 and 4

The *gains* made between Trials 1 and 4 (inter-trial intervals ranged between 17 and 22 months) were substantially *larger* than those made between Trials 1 and 3, as expected. As for comparisons between Trials 1 and 2, and Trials 1 and 3, the greatest *Percentage Mean Gain* between Trials 1 and 4 were in *Bilinguality* (See Table 4.14.3 - Chapter 4), and the smallest in *Conceptual Vocabulary.*

Conclusion

The PMG made between Trial 1 and *all* the other trials were unequivocal at *all* ages and for *all* linguistic variables. There was a greater *Percentage Mean Gain* between Trials 1 and 3 than between Trials 1 and 2, in the *great majority* of age codes and linguistic variables, as expected. There were however, *no exceptions* between Trials 1 and 4, gains being indicated for *all* linguistic variables and in *all* age codes.

With minor exceptions, the greatest gain was made in *Bilinguality* and the least in *Conceptual Vocabulary.* This would suggest that the developing lexicon comprises a number of *translational equivalents* rather than just words for new referents. Taeschner (1983a) states that the 'bilingual' child's maximum individual capacity to produce new words must be divided between the two languages. "The child uses a strategy which gives priority to new words at the expense of others. Thus, s/he is able to speak both languages and to express the same number of new objects and events as the monolingual

process continues through the years..." and the list of equivalents becomes longer and longer "without harming the growth of new words."

The pattern which resulted from calculating the *Percentage Mean Gain* between Trial 1 and the other trials, for each age code, did not reveal any *linear* development or any consistent quantitative pattern which might correlate with the length or ratio of intervals between trials. This outcome was not unexpected since the lexical task used in this study did not constitute a standardised *test*, with validated prescribed gradations of increasing difficulty in each linguistic variable and which related to the particular research sample. These results accord with Palmberg (1987) who concluded "we cannot assume vocabulary size to grow in a linear way nor that receptive and productive vocabularies increase in tandem."

Palmberg's study was based on 22 eleven year old fifth form bilingual Finnish/Swedish pupils (11 females and 11 males), learning English as a Foreign Language. After four and a half months of 45 minutes a week study, they had been exposed to 350 lexical items. The subjects also heard English outside school through T.V. and 'pop' music. Each week, the students' progress was measured and they had to produce as many words as possible beginning with a particular letter during a period of one minute.

The results of the study indicated that there was a relatively big difference in size between the native Swedish-language lexicon and the not yet fully developed English language lexicon. There was a steady increase in the overall word-production capability over time. It is not clear whether any words produced in previous weeks were included in the totals. Palmberg acknowledges that "little can be concluded about the size of their productive English vocabulary" because of the well-known difficulties involved in testing learners' productive vocabularies in general. "This can be affected by individual factors e.g. writing speed and learners' recall or association abilities" (Palmberg, 1987). Unlike Palmberg's, the present study was on *receptive*, and not on productive lexicon, and involved *formal* teaching strategies. Comparisons therefore, can at best only be tentative.

Further discussion regarding lexical *development* of 'bilinguals', as measured by *objective*, norm-referenced tests, such as the PPVT, appears in Section 5.5.1, below.

5.4.2 Cross-sectional v. Longitudinal Design

Larsen-Freeman and Long (1991) suggest that there is no reason why the natural linguistic performance data obtained through the longitudinal study could not be supplemented by data elicited by some controlled *obtrusive* verbal task. They argue that if

subjects represent a range of language proficiencies, then it is assumed that their aggregate performance at a single point in time will reflect a developmental picture similar to that obtained by a researcher studying the second language development of a single subject over time. They invoke as evidence the fact that de Villiers and de Villiers' (1973) results of their *cross-sectional* research into the acquisition of certain grammatical morphemes would seem to corroborate Brown's *longitudinal* study (1973) of 3 children learning English as a first language. The present study however, is not based on data from single case or small sample studies as those referred to by Larsen-Freeman and Long (1991). Their premise therefore, does not necessarily hold for the present study. Larsen-Freeman and Long (1991) however, comment in an after note that whereas there is evidence for there being agreement between *cross-sectional* and *longitudinal* studies in first language acquisition, "the picture in second language acquisition is not as clear."

Dato (1970) used a *cross-sectional* and *longitudinal* approach when studying the acquisition of Spanish syntax by English-speaking children living in Madrid using 3 groups of English speakers with varying levels of exposure to Spanish. Dato concluded that there was a lack of generalisability from *cross-sectional* to *longitudinal* studies.

Comparisons regarding the pattern of development between neighbouring age codes (6 months difference) in Trial 1 (*cross-sectional* analysis) and similar analyses between Trial 1 and 2 (*longitudinal* analysis) have already been discussed in Section 5.4.1a and 5.4.1b, above. Significant development was indicated less frequently and at fewer levels (i.e. ages and linguistic variables) in the *cross-sectional* analyses. This would suggest that *longitudinal* studies of the repeated measures design are *more* likely to reveal lexical development than *cross-sectional* studies.

This conclusion would seem to confirm Dato's (1970) assertion, similar ones having been made by authors such as Weil (1978) and Cook (1982) (See Chapter 3.1.4).

5.4.3 Lexical Dominance

The literature regarding *dominance* has already been reviewed in Chapter 2.2.4. The point was made that *dominance* has been operationally defined and measured in different ways, and that in the present study, the focus is on *lexical* dominance. This has been measured in a number of *objective, quantitative* ways. It has also been argued that as the present and other studies have shown, *perfect* balanced 'bilingualism' is invariably impossible to demonstrate and probably does not exist. However, one can define a *degree*, or *percentage*, of 'bilingualism' (or *ambilingualism*) and this should not be ignored as it may have practical implications, as will be seen later.

To reiterate briefly, among the different methods employed for measuring *dominance* has been the presentation of ambiguous stimuli to 'bilingual' subjects (Lambert, Havelka and Gardner, 1959) *dichotic* auditory presentation (Magiste, 1986) of translational equivalents, and *reaction time* to stimuli in the relevant languages (Lambert, 1955).

In addition, Cooper (in Fishman et al, 1971) used tests of *listening comprehension* in Spanish and English. This task was not too dissimilar from the one used in the present study except that Cooper's measuring instrument was not the same as the one used in this study (i.e. BPVS picture stimuli). Cooper (in Fishman et al, 1971) also used measures of verbal fluency and self-ratings of relative usage, in several societal domains. It must be pointed out that only 9 of Cooper's 48 subjects were school children. They were also aged 13-19. The results of his study therefore, are not generally comparable with those of the present one. Another difference between Cooper's and this study is that even though the lexical corpus employed in the latter represented 18 semantic categories, these did not entirely correlate with the domains used by Cooper.

Another strategy used to determine *dominance* is through questionnaires or interviews. As seen in Chapter 2.2.4, authors such as Cornejo (1975), Hernandez-Chavez et al (1978), Dodson (1981; 1985), Baetens-Beardsmore (1982) and Romaine (1995) have criticised this strategy for a number of reasons.

The present study solicited details from subjects regarding the frequency of the language(s) used at home. The language most used at home, one might speculate, could correlate with the language in which subjects demonstrated lexical *dominance* in the present study. The data provided by the subjects about their home language were however, not thought to be reliable as too many respondents gave conflicting responses at each trial. It was thought that, given that trials were conducted at intervals of not more than 6-8 months, it was unlikely that the language most used at home would change radically in such a short space of time.

The linguistic background and language used in Gibraltar has already been discussed in Chapter 2.3. Most Gibraltarian children's dominant language on starting formal schooling, will be *Spanish*, despite the fact that many may have heard, and possibly, spoken English at home. Few will have been using or hearing English to any appreciable level in social situations. It is thus, not until children start formal school that virtually total immersion into the English language occurs. Of course, particularly in the very early years of schooling, the predominant language of the playground is *Spanish*. As children include school-related topics in their conversation with their peers, English is used more frequently but *code-switching* prevails throughout school life.

The expectation that *Spanish* was the dominant language in the early school years was largely supported by the results of statistical analyses.

In the present study, *four* measures of *dominance* were used as discussed in Chapter 4 and the results will now be discussed.

i) Means

One measure of *dominance* (See Chapter 4.5.5) used in this study employed *means* for lexical proficiency (See Table 4.9 in Chapter 4). In this case, *Spanish* (L1) was dominant in all age codes up to and including 08 (Age 7:6-7:11 years) with the exception of Age Code 06 (Age 6:6-6:11 years) when *non-significant* dominance in *English* was indicated (See Table 4.16 in Chapter 4). *Spanish* dominance in all the other age codes before 08 was *significant*, with the exception of Age Code 01 (Age 4-4:5 years). This exception came as a surprise as most Gibraltarian children start First school with *Spanish* as their main language. That the expected significance was not achieved could be due to the lexical items used, i.e. it is possible that the particular lexical corpus was not sensitive enough to the children's *Spanish* lexical repertoire.

Another reason for this exception could have been, as mentioned before in Chapter 2.2.16 and 2.3.5, that the political situation may have provoked an increasing popularity in the use of English at home. This may having gradually caught up and manifested itself round about this time, as reflected in the most recent generation of First school entrants. Subject variables could also have contributed to this non-significance.

Based on a previous unpublished pilot study by Abudarham in 1970, and subsequent studies by other researchers previously cited in Chapter 2.2, a second prediction was made. This was that there would be a period at around age 7-8 years, when lexical dominance would be ambivalent but that soon after, dominance would shift unequivocally from Spanish (L1) in the earlier years, to English (L2). This prediction was mostly supported. Romaine (1995) refers to Ronjat's study (1913) of his son Louis and Leopold's (1939-50) of his daughter Hildegard and states that both these children demonstrated *shifting* dominance over a period of time. She concluded that "the notion of dominance is not a static one."

The trend in this study indicating that *Spanish* (L1) is dominant in the *early ages* and English (L2) just after the age of 8 years, is unambiguous. Indeed, dominance in *English* was indicated from age 8 years onwards, significance being achieved in all but the

sample in Age Code 10 (Age 8:6-8:11 years). It is not possible to attribute this lack of significance at this age, to any identifiable independent variables. By this age, children have been attending Middle school for at least 6 months so that *change of school* is not generally thought to be responsible. The *means* were based on *cross-sectional* data. The possibility therefore, of subject variable rather than developmental factors can not be discarded, given that subjects in this age code did not perform as well as (See Table 4.9 - Chapter 4) in any linguistic variable as younger subjects in the preceding age code. Another possible reason is that over a period of time and around this age, there may be an ambivalence, or hiatus, when dominance is not clearly established. This could be a natural characteristic of the lexical development of *Gibraltarian* DL children.

Summary

The hypothesis that Spanish would be dominant in the earlier years and that English would take over lexical dominance with the growing exposure and expertise in English over the school years, was supported.

ii) Dominance Ratio

*Dominance configuration*s between L1 and L2 have been investigated in a small number of studies. Fantini (1985) states that *dominance configurations* are critical in any study of language interaction. Baetens-Beardsmore (1982) claims that *dominance configurations* are "less easily detected in cases of early childhood bilingualism which has led to apparent *balanced* proficiency." He suggests that in cases of *balanced* bilingualism it might seem a contradiction to attempt to look for dominance. This, he argues however, need not be the case "if the sequence of early learning has been consecutive rather than simultaneous." Furthermore, there is no certainty in the assumption that the language acquired first is likely to be dominant. Moreover, with early bilinguals, "preferred language for a particular domain of activity will also reflect *dominance configurations* that may differ over time" (Baetens-Beardsmore, 1982).

Naturally, no generalisations can be made from any configurations obtained in other DL populations as their 'bilingual' status is bound to be different depending on factors already discussed, particularly in Section 2.3. In this study, *mean dominance ratios* relevant to each dominant language within each age code, were calculated (See Table 4.20.2 - Chapter 4). An interesting observation was that at no time did the mean *dominance ratio* exceed 1.32 for L1/L2. This occurred in Age Code 04 (Age 5:6-5:11 years) for those subjects who were dominant in *Spanish*. This indicated the

developmental relationship between L1 and L2 and demonstrated that one language was not more than a *third* greater in dominance, at any time.

Summary

The trend was that the mean *dominance ratio* ***decreased*** with age, thus showing that the lexicon in each language approached a greater parity with age.

iii) LI/L2 Percentage from Total Lexical Repertoire

Another measure of dominance was calculated by determining what *percentage* of the *Total Lexical Repertoire* (i.e. from *all* words known, including *translational equivalents*) comprised Spanish and English, respectively.

It was observed that, unexpectedly, the percentage distribution between L1 and L2 did not differ substantially. One would have expected a larger difference in the early age codes since it was expected that *Spanish* would be appreciably dominant for most children when they started formal schooling at Age Code 01 (Age 4-4:5 years). In fact, the *lowest* English percentage was indicated at Age Code 04 (Age 5:6-5:11 years), this being 44.1% (therefore, 55.9% in Spanish) and the lowest in *Spanish* was at Age Code 12 (Age 9:6-9:11 years), this being 46.1% (therefore, 53.9% in English).

This suggested that when the lexicon in each language is considered in relation to the subjects' *Total Lexical Repertoire*, there is not an undue degree of dominance of one language over the other, at any age.

The dominance *shift* from Spanish to English at Age Code 09 (Age 8-8:5 years) was noted.

iv) Percentage of Subjects

The subjects within each age code were not always homogeneous in terms of their dominant language. Thus, not all subjects within a particular age code were dominant in the same language, though dominance in *English* was almost unanimous from Age Code 15 (Age 11-11:5 years) onwards.

An interesting outcome of an analysis designed to establish what percentage of children in each age code were dominant in each language (See Table 4.20.1 - Chapter 4) revealed that, with the exception of Age Code 06 (Age 6:6-6:11 years) when there was an *equal*

number of subjects who were dominant in one or the other language, a majority of subjects up to Age Code 08 (Age 7:6-7:11 years) were dominant in *Spanish*. From Age Code 09 (Age 8-8:5 years) on, till Age Code 17 (Age 12:0-12:5 years), there was a clear *greater* percentage of children who were dominant in *English*. These results closely reflect the outcome of the analyses conducted to determine the significance of lexical *dominance*, and age at which there is a dominance shift from Spanish to English, as discussed above.

From Age Code 15 (Ages 11-11:5 years) there were over 85% of subjects who were *English* dominant. These results would indicate that lexically, approximately 70-94% of the *Middle* schools population may be *lexically* dominant in *English*, as measured by this lexical corpus. A similar observation with regards to the *Spanish* dominance of *First* schools children can be made, the figure being between 62% and 92%.

Conclusions

The *main* conclusions from these analyses are:

a) The pattern of Spanish *dominance* in the earlier years, ambiguity in the middle Primary school years, and clear *English* dominance for *both* genders, after age 8, is unequivocal. Fantini (1985) reported that his son Mario was Spanish dominant when he entered school at 5 but by age 10 was a *balanced* 'bilingual' an interesting claim given that he does not define the *degree* of balance. Lambert et al (1959) have argued that *balance* implies a high level of L2 competence, high enough, so that no dominance of one language over the other is measurable with the technique employed. They do not however, define what they mean by *measurable*.

b) The dominance pattern reflected by using *ratios* is generally the same as the one resulting from other measures of dominance already discussed above.

c) The dominance of one language over the other was always *less* than one third greater, and the mean percentage split between the two languages when taken from the mean *Total Lexical Repertoire* never exceeded 56 per cent. This shows the extent to which the lexicon is divided between each language.

d) The *mean percentages* of English and Spanish taken from the *Total Lexical Repertoire*, indicated that a *higher* percentage for *English* was indicated at Age Code 09 (Age 8-8:5 years). This supported a previous conclusion that this is the age at which lexical dominance *shifts* from Spanish to English.

e) *Quantitative* dominance in one language does not necessarily imply that the whole population is dominant in that language. The results indicated that the great majority of the *Middle* schools population may be lexically dominant in *English*, the opposite being true for children in *First* schools.

The *shifting* lexical dominance over the years is indisputable. However, it cannot be said that this dominance is necessarily reflected in the wider sense of *language* proficiency. In the first instance, any claim made can only relate to dominance in ***lexical*** comprehension in one of the languages and even then, only in relation to the particular lexical corpus, research design and languages employed in the study. Doyle et al (1977) stated that dominance in one linguistic parameter such as *vocabulary* does not imply dominance in another e.g. *syntax*. In order to make a generalisation about dominance regarding receptive lexical proficiency, one would have to provide empirical evidence that there was no socio-cultural bias in the list of referents chosen for the study. This issue is discussed in Section 5.5.2 *Item Analyses*, below.

5.4.4 Correlations Between Linguistic Variables

Skehan's (1986) research suggested that aptitude in learning an L2 in school relates to a *general* language processing capacity. He studied 100 of the original sample of 125 school age children who had participated in the Bristol Language Project (Wells, 1985). These children were in secondary schools at the time of Skehan's study. A test of vocabulary given earlier in life correlated consistently with subsequent aptitude in L2 language learning. There appears to be a general language processing capacity that affects language learning ability in first and subsequent languages. Oller (1983) states that studies have shown over and over again that substantial positive correlations exist "... between proficiencies across languages with radically different surface forms". There is also evidence that proficiency in one's native language is a moderately good predictor of attained proficiency in a second language (Cummins, 1979; 1984). Cummins (1980) reports that he has found evidence from 9 studies where the correlations between L1 and L2 CALP ranged from 0.42 to 0.77 with the majority in the range 0.6 to 0.7. The present study investigated *receptive lexicon* and not language structure like Cummins did. However, the correlations between L1 and L2 were generally between 0.384 and 0.849 (See Table 4.21 - Chapter 4) with the exception of subjects aged 4-4:5 years ($r = 0.174$ - See Table 4.21 - Chapter 4). This might have been expected since most of them had only just started schooling and had only just been immersed into an English language speaking environment (See below). Most of the correlation obtained were statistically significant and a correlation of *above* 0.6 was achieved in most age groups.

McLaughlin (1990) affirms his belief that there is an interdependence between L1 and L2 in the cognitive/academic domain because experience with one language gives the learner strategies and metacognitive skills that generalise to subsequent languages. Arnaud (1982) found low but significant correlations between French students' vocabulary size in French (L1) and their vocabulary size in English (L2).

In the present study however, it was conceivable that there would *not* be a significant relationship between the development of Spanish and English; similarly, between any pair of linguistic variables. A theoretical scenario could be that lexical *competence*, at any one age code, in one linguistic variable, would not imply competence in another linguistic variable. The theoretically potential options were as follows:-

(i) Because children who had started formal schooling were likely to be dominant in *Spanish*, one could not necessarily expect significant correlations between English and Spanish in the earlier years. A similar theoretical possibility could be applied for correlations between English and *Bilinguality* or Spanish and *Bilinguality*, since *Bilinguality* is essentially dependent on lexical knowledge in both English and Spanish. However, the same would not apply between English and *Conceptual Vocabulary* (CV), and Spanish and CV, since a high number of correct responses in CV could be achieved by a high number of correct responses in just *one* language.

The results of analyses using the whole group (i.e. ignoring gender and schools - See Table 4.21 in Chapter 4) largely supported the prediction that there would be significant correlations between the linguistic variables (See Section 4.5.6a). (The results of analyses according to *gender* have been discussed in an earlier Section 5.3.1(v), above).

(ii) The second theoretical possibility could be that as the L2 develops with age and, particularly if it becomes dominant at some stage, L1 might lag behind and any significant correlation between L1 and L2 existing in previous years, might disappear.

The results of analyses using whole groups excluded this possibility and the indication was that *Lexical Proficiency* in *both* Spanish and English remained significantly correlated in the rest of the age codes.

Conclusion

Whole group analyses indicated that there were statistically significant, *positive* correlations between *all* linguistic variables for *all* age codes, except at 01 (Age 4-4:5

years) and 03 (Age 5-5:5 years). This indicates that as any one of the four linguistic variables develops, so do the others. Correlations between *Conceptual Vocabulary* and the other linguistic variables could not be assumed before the data were statistically analysed. For example, lexical *development* in *English* would not imply development in *Conceptual Vocabulary* if the lexicon predominantly acquired comprised *translational equivalents* of the existent lexicon in Spanish. If this occurred, it would be reflected in development in *Bilinguality*. Similarly, if the newly acquired lexicon in English was not related to referents already known in Spanish but predominantly to *new* referents, one would expect development primarily in *Conceptual Vocabulary*.

The data also show that Spanish does not stagnate as English becomes dominant.

5.4.5 Conceptual Vocabulary (CV)

The argument for the need to consider a DL subject's CV has already been advanced in Chapter 4.2.4f). The issue was then raised whether lexical *development* comprised predominantly new words for *new* referents, rather than words already known in the other language (i.e. *translational equivalents*). If the latter occurred, the CV would be very similar in size to L1 and L2. In this case, whereas there may be a lexical enrichment, it would not be accompanied by a lexico-conceptual enrichment (in other words, the increased lexicon would not necessarily correlate highly with the number of new *referents* known by name). This in fact has often been a fear of those who have advised against a DL upbringing, the argument being that the potential for lexical development, and the lexical repertoire itself, would have to be shared between two languages. It was therefore, argued that exposure to two languages would be uneconomical and could result in DL subjects not developing proficiency in any of the two languages. Reference to this contention has been made in Chapter 2.2.

The results of the present study have however, partly discredited this claim and have shown that if the CV is taken as a more realistic measure of a DL subject's *true* vocabulary, it is *larger* than the vocabulary in L1 or L2, respectively, and at all ages. This assertion has been reiterated throughout the literature. As early as 1972, Swain recognised this and later on Doyle et al (1977) stated that "when both languages are examined, the total lexis representing the total *Conceptual Vocabulary* of the bilingual child may even be greater than that of the monoglot" (Doyle et al, 1977). Epel and Putter (1995) found this to be so with their Hebrew/English 1:6-2:6 year old children.

Saunders (1982) measured the *Conceptual Vocabulary* (i.e. words known in one or the other language) of his English/German 'bilingual' children, Frank and Thomas, at age

5:5 years (See Appendix 7.1, and 7.2). Frank's CV was at least 19.9% higher than his English lexicon and 13.2% higher than his German lexicon (See Appendix 7.2).

In Thomas' case, the CV was 16.6% higher than English and 9% higher than German. In the present study (See Table 4.9 - Chapter 4), the mean CV for children aged 5-5:5 (N = 11) was also greater than English or even Spanish (i.e. 50.9% and 24.8%, respectively) which was the dominant language at the time. At age 7:3 years, Thomas' lexicon in German and English had increased to 159 and 174 respectively, and his CV to 182. His CV was thus, 14.5% greater than his English lexicon and 4.6% greater than his German lexicon. In the present study, the mean CV at age 7-7:5 (N = 26) was 30% greater than English and 26.5% than Spanish.

The big differentials between Saunders' results and those of the present study may be attributed to several variables such as the differences in the lexical corpus in each study, but is more likely to be caused by the greater likelihood of larger variances in large samples. It may also be that children who are being studied often benefit from receiving more attention and language stimulation, particularly if the researchers are their parents.

The *percentage* differences between the CV and the lexical *proficiency* in each of the languages indicates the potential margin of error which could result if the *Lexical Proficiency* in only one of the two languages is assessed, or in the event of both languages being assessed, if they are considered independently.

Consistently, the results of the present study demonstrate that the most significant aspect of the concept of *Conceptual Vocabulary* was the fact that it was a better indicator of the subjects' true *referential*/receptive lexicon and, as expected, it was substantially greater than any of the other linguistic variables (except the *Total Lexical Repertoire* - See below). It was also interesting to note the extent to which the CV performance was *greater* in relation to *English* and *Spanish*. Already mentioned earlier, is the fact that despite this, CV makes the lowest *Percentage Mean Gain*.

In the present study Table 4.25 in Chapter 4.5.7 shows the ratios of CV/L1 and CV/L2. In both cases, the ratios reduce with age. This suggests that, in *time*, rather than just acquiring more words in one language or the other relating to *new* referents, a greater number of *translational equivalents* are being acquired. One would thus, expect *Bilinguality* to increase with age and indeed it does as discussed in Section 5.4.7, below.

It is interesting to note that in the present study, a 4-6 year old DL child's CV can be one and a half times as great as its L2 lexicon and approximately one and a third times as great as its L1 lexicon (See Table 4.25, in Chapter 4.5.7). Since the earlier of the two

ages usually marks the beginning of formal schooling, and since referrals for suspected speech and language problems are more likely to be made once the child is in the formal education system, these results have very significant practical implications, particularly in the selection of assessment tools and strategies which should be employed with DL children. This issue will be discussed further, later on in this chapter (See Section 5.6, below).

The ratio between *Conceptual Vocabulary* and *Bilinguality* ranged from 2.59 at Age Code 04 (Age 5:6-5:11 years) to 1.28 at Age Code 16 (Age 11:6-11:11 years) having started at 2.51 at Age Code 01 (Age 4-4:5 years). This means that the size of the *Conceptual Vocabulary* could be as much as two and a half times that of the *Bilingual* vocabulary i.e. the number of *translational equivalents. Balanced* 'bilingualism' would be indicated by an equal performance in *Bilinguality* and *Conceptual Vocabulary*, an unlikely occurrence.

Conclusion

In both this study and Saunders' study (1982) *both* CV/L1 and CV/L2 ratios decreased with age. These data also show that lexical *development* substantially comprises *translational equivalents* for an already existing lexicon as opposed to mainly *newly* acquired lexicon for *new* referents.

5.4.6 Lexical Proficiency (*including proficiency in L1 and L2*)

In the present study, *Lexical Proficiency* in *each* language was measured in three ways. The data in Table 4.9 in Chapter 4, show the mean performance for each age group in each linguistic variable. These data represent *means* of the number of correct responses - one might call this the *raw* performance. A second measure of *Lexical Proficiency* in each language was calculated as a percentage of the *Total Lexical Repertoire* (TLR) that is, the number of [all] correct responses given in *both* languages, including *translational equivalents* (See Tables 4.21 - Chapter 4).

Cross-sectional data indicated that the *trend* was that *Lexical Proficiency*, employing the first type of measure, increased with age. From age 4-4:5 to 11:6-11:11, the mean more than doubled (114% increase) for English, and by 77% in Spanish. The greater increase in English was of interest but was seen to be a function of the relationship between the lower English than Spanish means for the younger groups and the higher English than Spanish means for the older groups.

These results may, of course, be a reflection of the particular lexical corpus used in this study rather than a linguistic reality. However, these children spend a large part of their day in a predominantly English-speaking environment, i.e. school. For most of them, their *social* language (L1) (as suggested earlier, this could be what Cummins (1980) refers to as *BICS*) does not need much developing to remain functional in that context. It is not surprising therefore, that their *English* (L2) receptive lexicon develops further because it is the language used in the class and the children's CALP (Cummins, 1980) needs to develop. It therefore, achieves dominance in actual fact, as indicated by the results of this study.

Using a similar methodology to the one employed in the present study, Saunders (1982) used the first 100 items of each of the PPVT Forms A and B. As in the present study, he did not apply the ceiling item strategy required by the PPVT. He reports that at age 5:5 years, Frank was able to respond correctly to 66 items in English, in Form A, and 70 in German (See Appendix 7.1). Correct responses using Form B was somewhat higher i.e. 70 in English and 74 in German.

At the same age, his son Thomas, achieved a superior performance (See Appendix 7.1) in all but in English when Form B was used; however, in this case, his score was only one less than Frank's. Some 22 months later, at age 7:3, Thomas made 80 correct responses in English when Form A was used i.e. 4 more than at age 5:5. He obtained 79 correct responses when Form B was used and this was 10 more than at age 5:5. Similar figures for German were 82 when Form A was used and 92 when Form B was used, showing an increase of 7 and 12, respectively, since 5:5 years of age.

The PPVT and the BPVS are generically the same but standardised on different populations, the former on American English-speaking monoglots and the latter on UK peers. It is difficult to establish to what *extent* factors such as the difference in the tests (i.e. BPVS and PPVT), the different sample sizes and the different backgrounds of the populations studied might have been responsible for the superior results obtained by Saunders' children over the Gibraltarian ones participating in the present study (See Appendix 7.1). He expresses surprise that, given that particularly because of their attendance to Australian schools, his children were exposed to English by a ratio of 3:1 over German, this did not seem to be a significant factor in the "acquisition of oral fluency and grammatical accuracy." A similar argument can be applied to the children's superior German receptive lexicon, as measured by the PPVT. Saunders (1982) acknowledges that the results may be "biased slightly in favour of German because the German language version for Form B seems to be slightly easier than the corresponding English version, despite all efforts to avoid this" during the translation.

The *mean lexical proficiency* for Gibraltarian children aged 5-5:5 years (N = 11) was 51.64 in *Spanish* (their *dominant* language) and 42.7 in *English* (See Table 4.9, in Chapter 4). The *mean lexical proficiency* for Gibraltarian children aged 7-7:5 years (N = 26) was 56.35 for *English* and 57 for *Spanish*. All these measures were considerably *lower* than for Saunders' children.

Comparisons between single case (or small sample) studies such as Saunders' and the present one with larger samples can only be tentative, though it has to be noted that his children were thought to enjoy a high IQ and this might account for their superior performance (See Section 5.5.1 for details of their PPVT scores).

Many of the studies on language aptitude, proficiency and development have considered only one of the DL subject's language, or at best each language separately and independently. The point has already been made that the measure of the CV would provide a better indication of lexical knowledge. But even the CV does not account for a DL subject's *true Lexical Proficiency*. The difference between *Total Lexical Repertoire*, i.e. *total word* count, and CV has already been explained in Section 4.5.8. Abudarham (1987) has argued that a DL subject's *Lexical Proficiency* should also be measured according to the number of words the subject knows in *both* languages i.e. *Total Lexical Repertoire* (TLR), and that this should include (both) duplicate words (Vihman's term, 1985), i.e. *translational equivalents*. The value of using a TLR count is echoed by Grosjean (1985) who states that "The bilingual's communicative competence cannot be evaluated correctly through only one language; it must be studied instead through the bilingual's total language repertoire ..." In both Saunders' (1982) and the present study, the TLR was *greater* than the CV by at least 45.7% (See Table 4.5.2 in Chapter 4 and Appendix 7.2).

In the present study, the third measure of *Lexical Proficiency* was the *Total Lexical Repertoire*. The mean *Total Lexical Repertoire* at age 4-4:5 years was 84.3 (See Table 4.20.2 - Chapter 4) and at age 11:6-11:11 it was 164.4. These figures, as expected, are much *greater* than those for L1 or L2 on their own. They are also greater than measures for CV. Saunders' son (1982) Frank attained a *mean* TLR (English *and* German added) of 140 (in Forms A and B of the PPVT). Thomas at the same age attained a mean TLR of 150. The relatively big differential between the brothers' performance is notable and indicates how two children with almost the same background can perform so differently. Similar differences between performance of children in separate studies should thus, come as less of a surprise, making comparisons, one might argue, theoretically interesting but probably of little practical significance.

Frank's and Thomas' *mean* TLR at 5:5 years seem to be *superior* to the TLR means obtained in the present study which was 93.9 (See Appendix 7.1). At age 7:3 Thomas achieved a *mean* TLR of 166.5 as compared to subjects of a similar age (7-7:5, N = 26) in the present study who achieved a *mean* TLR of 120.

The results of the present study show that, whereas CV only increased by a third from age 4 to 12, the TLR nearly *doubled* over the same period of time. This clearly indicates that whereas these DL subjects are acquiring *names* for new referents, the total *Lexical Proficiency* is being enhanced by a parallel/simultaneous acquisition of *translational equivalents,* during the period of time that these children attended Primary schools. This confirms conclusions reached earlier. The extent of the development of *translational equivalents* is reflected by the increase of *Bilinguality*, as will be seen in the next section.

Taeschner (1983b) found that the amount of (*translational*) *equivalents* acquired by her two subjects (2:4 and 2:10 year old, respectively) was inferior to the words that indicate *new* objects or events. This does not suggest that the children did not also acquire *translational equivalents* (See Taeschner's comments as cited in the *Conclusions* to *Section* 5.4.1c, above). Any implicit differences between Taeschner's (1983b) and the present study can be attributed to the fact that the children in the former were *simultaneous* 'bilinguals' who had been exposed to their L2 earlier than children in the present study. Taeschner's subjects were also younger. Because of these two factors, their lexicon was likely to be very limited so that they were naturally acquiring mainly *new* words. The older children in the present study were more likely to have a broader based lexicon and because they were *sequential* 'bilinguals', were more likely to acquire more *translational equivalents* for their existing lexicon in Spanish, when they were immersed in a predominantly *English* environment. Taeschner (1983b, p.33) observes that it is because of the ability [early on] to acquire more new words than translational equivalents "that the [simultaneous] bilingual child is able to acquire two lexical systems simultaneously."

In contrast with the percentage of CV comprising L1 and L2, the results of similar analyses (in the present study) but in relation to TLR, were perhaps surprising. Far from there being a great difference at any age in the relative L1/L2 percentages, it never exceeded 56 per cent in any of the two languages nor did it dip below 44 per cent, at any age; this was true regardless of which language was dominant. This indicates that Gibraltarian children do not suffer undue attrition in any of their two languages as may happen to other DL speakers (See Seliger and Vago, 1991).

A similar pattern resulted in Saunders' study (1982). At age 5:5 years, Frank's TLR was 280 for both PPVT Forms A and B (See Appendix 7.1). The percentage of English relative to the TLR, was 48.6% and of German 51.4%. Despite Thomas' superior TLR at the same age, his English/German percentages, namely 51.7% and 48.3%, respectively, were not much different to Frank's. In the present study, the mean TLR for 5-5:5 year old children, comprised 55.1% Spanish (L1) and 44.9% English (L2). The results of both these studies are thus, not unduly different. It might be that it is more profitable to study such relationships in comparative studies of this nature than *proficiency* since the tasks are often different and there is likely to be subject variability in similar studies.

At 7:3 years of age, Thomas' TLR comprised 52.3% German and 47.7% English, a surprisingly small change one might say. Similar aged Gibraltarian children's TLR comprised 51.1% Spanish and 48.9% English. The difference in the percentages between the studies are somewhat less in the comparison between the older subjects.

Conclusion

a) Generally speaking TLR increases with age and almost doubles (95% increase) by Age Code 16 (Age 11:6-11:11 years). This suggests that the extent of the increase in lexical development is not realistically reflected by the increase in *Conceptual Vocabulary*. A simultaneous increase in *Bilinguality* (i.e. *translational equivalents*) would account for this.

b) The difference between the lexical repertoire in Spanish and English, when taken as a percentage of the TLR, is unexpectedly not unduly large - at most just under a tenth. It can therefore, not be said that lexical development in one language lags substantially behind the other at any one point. This observation has been made earlier.

Other conclusions regarding the percentage lexicon in each language taken from the *Total Lexical Repertoire* have been discussed in Section 5.4.3 (iii), above.

5.4.7 Bilinguality

The issue about the *degree* of *Bilinguality* that a DL subject can achieve, and whether anyone can be *ambilingual*, or achieve a *balanced bilingualism* has been discussed at length in the literature (See Chapter 2.1.2). Romaine (1995 - p.19) concludes that "the notion of balanced bilingualism is an ideal one, which is largely an artefact of a theoretical perspective which takes the monolingual as its point of reference." Hamers and Blanc

(1990) state that *balanced bilinguality* should not be confused with a very high degree of competence in the two languages - "it is rather a state of equilibrium reached by the levels of competence attained in the two languages as compared to monoglot competence. Equivalent competence should not be equated with the ability to use both languages for all functions and domains." These authors also believe that *dominance,* or *balance,* is not equally distributed for all domains and functions of language and that each individual has his/her own dominance configuration in each domain.

The significance or practical importance of ***degrees*** of 'bilingualism' however, has not always been acknowledged. One can argue that the greater degree of *Bilinguality*, the greater independence a DL speaker will have in *both* languages. Establishing which language is dominant (Burt and Dulay, 1978), and in which domain, and conversely the degree of balance, could well determine decisions such as educational placement and programmes.

Despite the assertions made by some authors regarding the degree of *Bilinguality* a DL speaker can attain, it is not always clear how this has been measured. Almost invariably, claims have been based on studies involving only one, or at best, a small number of linguistic parameters. Abudarham (1970) for example, only studied productive lexicon; Kessler (1971) based her claims on a study of syntactic skills.

In the present study, it is only *receptive lexicon* which has been considered and thus, any claims made can only be based on this limited linguistic parameter. In the first instance, *Bilinguality* was measured by calculating the number of *referents* known in *both* languages (See Table 4.9, in Chapter 4) out of the possible 100 comprising the task. This assessment strategy resulted therefore, in a *referential* measure which was *task related.* A second measure was entirely lexically-based and was expressed as the percentage of the *Total Lexical Repertoire* (TLR) comprising *translational equivalents.* In this case, it was thus the size of the *bilingual lexicon* (See Table 4.26 in Chapter 4) in relation to the subjects' total lexicon which formed the basis of this measuring strategy. This measure was thus *subject related* and based on the number of *words* known rather the number of referents for which words were known. A third index of *'bilinguality'* was obtained by calculating the mean number of *referents* known 'bilingually' and expressing this as a mean percentage of the *Conceptual Vocabulary* (See Table 4.26). This was thus, a *referential*, subject related measure.

Taking the first (i.e. referential, task related) measure, from Age Code 01 (Age 4-4:5 years) to Age Code 16 (Age 11:6-11:11 years), the mean number of responses for *Bilinguality* increased at least threefold (See Table 4.9 - Chapter 4) reaching a maximum

mean *Bilinguality* (quotient) of **72.17** per cent by age 11:5-11:11 years (from 24.05 at Age Code 01). The figure is not unduly different to the 77 per cent claimed by Kessler (1971) albeit in syntactic skills. Given that most subjects in the present study were *sequential bilinguals*, it was not surprising to see that *Bilinguality* is at its lowest in the early years when they are just starting to acquire their L2 i.e. English. Interestingly, in the early age codes, the mean number of correct responses for *Bilinguality* was just over half that in L1 or L2, but by Age Code 16 (Age 11:6-11:11 years), it had increased (as indeed had the L1 and L2 totals) to 85 per cent of the total in *English* and to 93 per cent of the total in *Spanish*. Taeschner (1983b) concluded that one third of her subjects' entire vocabulary was dedicated to *translational equivalents* and the remaining two thirds to new acquisitions. It was within these proportions that her subjects found a way to succeed in simultaneously acquiring two vocabulary systems. These results also showed that whereas translational equivalents were acquired faster, they were *not* in the majority when compared to the number of *new* words acquired.

Taeschner's results can not be realistically compared with those of the present study since she only studied two children. Furthermore, as stated earlier, they were both younger than the youngest in the present study and they were *simultaneous* 'bilinguals'. However, the results of the present study for 4-4:5 year olds were not greatly different. Their *bilinguality* when measured in the same way as Taeschner did, was 39% i.e. just a few percentage points over Taeschner's figure. If the 4-4:5 year old in this study had received as much (or as little) exposure to their second language as Taeschner's two *simultaneous* bilinguals, this could account for the similarity in these ratios.

Hoffman (1991) comments on certain methodological weaknesses of Taeschner's study. She reports that Taeschner recorded her child's responses orthographically and not phonically and might have unintentionally misinterpreted some utterances for particular words. This particular criticism can not be made of the present study since all lexical measures were obtained in response to stimulus words and the children were not required to provide linguistic responses (See Chapter 3). Despite Hoffman's criticism, another study by Vila (1984) of the expressive lexical development of Catalan and Spanish of 3 younger children between 1:2 and 3:2 yielded similar results to Taeschner's study (1983b). He compared these children's language development with that of one Spanish monoglot and two Catalan monoglots and concluded that it was the same for both groups. He also concluded that only about 10-12% of the total forms were *translational equivalents*. If *neutrals* e.g. cognates, in both languages were considered, the total came to 29%, a figure closer to Taeschner's.

Using the *second* (lexical, subject related) measure of *bilinguality* employed in the present study (i.e. the number of *words* known 'bilingually' and expressed as a percentage of *Total Lexical Repertoire* (See Table 4.26 - Chapter 4) the results are somewhat different to those obtained using the *referential*, task related measure. The mean percentage figures were larger (e.g. by as high as 162% at Age Code 04 - age 5:6-5:11 years, and as low as 21.7% at Age Code 14 - age 10:6-10:11 years) than those obtained using the *referential*, task related method. The mean percentage figures obtained in the *referential*, *subject* related measure were also higher than those obtained in the *referential*, *task* related measure, but lower than in the *lexical*, subject related measure. This suggests that the degree of discrepancy between these three ways of measuring, or expressing, *bilinguality* can be great though the discrepancy decreases with age. The operational definition for *Bilinguality* therefore, has research and practical implications.

Lastly, an interesting observation can be made regarding the relationship in the present study between *Bilinguality* (i.e. the *referential,* task related measure) and CV. The difference between *Bilinguality* and CV reflected the subjects' lexicon in either one or the other language. For example, a mean *Bilinguality* of 24.05 (See Table 4.9 - Age Code 01 - Age 4-4:5 years) and the mean CV for that sample was 60.25. This indicates that 24 items were known in *both* languages and that 36, that is the rest making up to 60 (i.e. the CV), were known only in one language or the other. As the *ratio* between *Bilinguality* and *Conceptual Vocabulary* decreases over the years, this indicates that the lexicon for more *new* referents is being acquired in both languages. When the *Conceptual Vocabulary* remains higher than *Bilinguality,* this shows that the lexicon for some referents is known only in one of the two languages and not the other.

Conclusion

The question as to whether *Bilinguality* (at a *receptive lexical* level) should be measured, in terms of number of *referents* known in both languages, or in terms of the total number of *words* known in both languages (whether or not expressed as a percentage of *TLR*) or whether it should be measured in relation to a prescribed task, or in relation to the individual's own proficiency, is an interesting one since it may have assessment, diagnostic and pedagogical implications. The current literature has as yet not seemed to adequately address this issue.

No matter how *bilinguality* is defined or measured, the data also show that the subjects never attain *complete* lexical *ambilinguality*. Depending on how *bilinguality* is defined i.e. a percentage of the *TLR*, or the percentage of *referents* known in *both* languages, one can conclude that these subjects attained between 72 and 87.8 percent *bilinguality*.

5.4.8 Reliability and Validity

According to psychometric theory, *validity* presupposes *reliability* (Oller, 1983). Before a task can be judged valid, it must first be reliable. A task is reliable when it generates similar results on different occasions (Oller, 1983). Statistical analyses were conducted as part of this study to establish task *reliability* and *external validity*. Reliability however, does not ensure validity.

Oller (1983) has asserted that

> "Not only is perfect measurement an impossibility for persons whose knowledge is imperfect and incomplete, but methods of validating tests [or language tasks] are also imperfect. Therefore, some would prefer to forget the whole business of testing and validation and just rely on recipes founded in intuitions and hunches."

Oller (1983) states that both research methods and intuitive approaches are appropriate, however imperfect they might both be. Despite all this, the validity of the task employed in the present study, was investigated.

The possibility of a *rehearsal effect* between successive trials had to be verified since the same task was presented at each trial. Results of analyses indicated that the performance of subjects at a certain age in Trial 1 was not significantly different to peers of the same age in Trial 2 (See Table 4.27 in Chapter 4). This outcome was not entirely surprising. A prediction that the two groups of different subjects of the same age might not perform significantly differently, would not have been unreasonable. However, the subjects in Trial 2 had already completed the task once before about six months earlier. A *practice* or *rehearsal effect* might have therefore, been expected resulting in significantly superior performance by these subjects. Indeed, a superior performance by the groups who had completed the task once before was indicated in most age codes and in most linguistic variables (See Tables 4.27(i) and (ii) in Chapter 4). However, *none* of these were significant except in ages 7 to 7:5 for *all* LVs, in ages 7:6-7:11 for all LVs except *Spanish*, and in ages 12-12:5 for *English* only (See Table 4.27(ii) in Chapter 4).

These results would suggest certain conclusions. Firstly, that despite the fact that subjects in Trial 2 had completed the task approximately six months earlier, a large majority did not benefit significantly from a *rehearsal effect*. This had been predicted when the study was designed since subjects were going to be required to respond to over 200 lexical items and they were not going to be pre-warned that the task would be repeated six months later. Secondly, the children in both groups with equivalent ages, belonged to the same parent population. Thirdly, the task enjoyed *reliability* at most ages.

A post-hoc analysis (See Tables 4.28(i) and (ii), in Chapter 4) showed that, except at two age codes, the performance of the subjects in the cohort completing Trial 1 six months before the second cohort underwent the same trial i.e. C1 and C2, respectively, was not significantly different. This would strengthen the claim that the task had *external validity*.

Construct validity, as has been stated in Chapters 3 and 4, may be indicated if development is indicated with age (Dunn et al, 1982). The results of analyses using *cross-sectional* data indicated that there was a higher incidence of significant lexical development between neighbouring age codes of 12 months interval (See Tables 4.11(i) and (ii) in Chapter 4) than those of 6 months interval (See Tables 4.9, 4.10(i) and 4.10(ii), in Chapter 4). Despite the fact that this development was not significant for L1 and L2 between all ages, a developmental *trend* in *both* sets of analyses was clearly indicated with few exceptions.

If one takes development with age as a criterion of *construct validity,* one can not say with confidence that it was indicated at all age levels in the *cross-sectional* study. However, as Dunn et al (1982) have implied an absence of this development is not necessarily proof of a lack of *construct validity*. It is also possible that *cross-sectional* studies which do not show the development of the same subjects, is less likely to evidence *construct validity* (See Section 4.5.3 c (i), in Chapter 4).

A more unequivocal claim can be made arising from the results of analyses of *longitudinal* data (repeated measures). These indicated that *non-significant* lexical development between Trials 1 and 2 occurred in L1 and L2, over a 6-8 months interval, in all but one case (See Table 4.13.1(i), in Chapter 4) this being *Spanish*, at Age Code 03. *Significant* lexical development in *English* and *Spanish* (L2 and L1, respectively) was indicated in most age codes.

The results of these statistical analyses would also indicate that *longitudinal* studies reveal the task's *construct validity* more readily than *cross-sectional* studies. It would seem that the possible subject variability inherent in *cross-sectional* studies, and the greater subject homogeneity in repeated measures design, could account for the different outcome regarding *construct validity*. In this case, the *construct validity* relevant to performance in Spanish and English was evident at most of the age levels. Lexical development in L1 and L2, over intervals of 12 months or more (See Tables 4.13.2 and 4.13.4) was significant in all samples with more than 4 subjects, again confirming the task's *construct validity*.

5.5 SECOND LEVEL ANALYSES

The data obtained in this study lent itself to analyses of two other variables. As has already been explained in Chapter 4.6, these related to comparisons of performance on 'BPVS' test items between the DL subjects participating in this study and *monoglots* as suggested by the *Normalised Data* contained in the BPVS manual. Such analyses were not undertaken without some qualifications as has already been discussed in Chapter 4.3.1. In addition, the percentage of subjects achieving a BPVS *Standard Score* of 85 or more was calculated for each age code. The percentage not achieving this Standard Score might suggest a potential margin of error in diagnosis when the BPVS is used to measure DL children's receptive lexical proficiency.

The second set of analyses related to the familiarity with which a word was known in *each* language. Familiarity was measured by the number of correct responses each item received in *each* language. An item analysis was thus, conducted and the *percentage* correct responses given in each language, for each referent, was calculated at each age code. This was referred to as the *lexical familiarity*. The percentage of correct responses given in both languages (i.e. known *bilingually*) for *each* referent, at each age code, was also calculated. This enabled a measure of *equilingual familiarity* to be determined for *each* referent, at each age code.

5.5.1 Comparison with BPVS 'Normalised' Data

This study has focused on the receptive lexicon of Gibraltarian DL children. As discussed earlier, the picture stimuli included the first 75 items of the BPVS. The lexical stimulus for each picture was presented in each language. To reduce the amount of guessing by subjects, the presentation alternated between the two languages and no translational equivalents were presented in close order. For these reasons, it was not possible to adhere to the BPVS rules of administration. Furthermore, these rules were also violated inasmuch as no basal or ceiling item criteria were used so that all items were presented to all children regardless of failure at any point in the administration of the task. This violation was not considered to be an unduly serious one since to a large extent, a ceiling strategy is a psychometric expediency. One of the authors of the BPVS (Whetton, 1995) agrees that disregarding the ceiling would not have any significant effect on performance when only English is tested. It is this researcher's view that when two languages are being tested, one has to allow subjects to proceed to the end of a test, as early test items may not be learned in the other language until later on in life, and vice versa. Such a strategy is more likely to reveal the DL children's true potential. The concern that comparisons were made between performance on a task which did not use a

ceiling and norms which might have been based on a ceiling, have also been dispelled by Whetton (1995). He has reported that the ceilings used in the BPVS were established after the norms had been computed.

Despite this, the results of an analysis of performance using the BPVS scoring system could perhaps suggest a *trend* and indicate possible directions for future research. As Genesee (1989) points out, the purpose of this type of examination is not to prove the hypothesis that DL children's lexical development (L1, L2 and CV) is comparable to their monoglot peers', since the available data is not considered to be adequate, but rather to *establish tenability.*

Analyses of the data yielded by this study were largely idiographic. To conclude that DL subjects at a certain age had achieved a total of X, and in a particular linguistic variable, did suggest something meaningful about the subject's performance, and how the lexicon developed with age, etc. However, these analyses were sample specific and did not attempt to answer the question regarding the *normality* of such performance as defined by BPVS derived scores, e.g. age equivalent, standard scores, etc.

Much has been written about the adverse effects of a DL upbringing on language development. With few exceptions in the earlier studies, these claims resulted from comparisons with monoglots. As discussed earlier in Chapter 2.2, almost invariably, the comparisons were based on the DL subjects' performance in their monoglot peers' language. It is therefore, not surprising that when this strategy was employed, DL subjects' proficiency was often found to be inferior to the monoglots' who had to contend with only one language. Oller (1983) states that there remains some question about whether children learning two languages develop their language ability in both languages as rapidly as monolinguals do learning a single language. The issue, however, is whether we can consider a 'bilingual's' development as if s/he were two monolinguals. Authors such as Hamers and Blanc (1990) and Romaine (1995) would reject this. Assessments which make comparisons of DL subjects' L2 with monoglots' language can thus, only be *tentative.*

The argument becomes more poignant when this practice is applied in the assessment of DL children's language proficiency, for the purposes of deciding on educational needs. The results of such inappropriate and unreliable assessment have been well documented in the last two decades (See Abudarham, 1987). It is more useful and valid to consider a DL subject's lexical development as a phenomenon which is in many ways unlike monolingual development. This is because development in L1 and in L2, and their relationship, as reflected by development of the *Conceptual Vocabulary* and *Bilinguality*, should be taken into account, and language tests currently available do not.

In an attempt to address some of these issues then, and to illustrate the *inappropriateness* of comparing DL subjects' L2 development with monoglots', Trial 1 data in this study were analysed. The totals for correct responses (disregarding ceilings) for BPVS *test* items only were calculated. These were then transformed into *age equivalents* and *standard scores* following consultation with the tables in the BPVS manual. This was done for performance in *English*, *Spanish* and *Conceptual Vocabulary* - it was not considered appropriate or useful to conduct a similar exercise for performance in *Bilinguality* as this was not relevant to monoglots and was therefore, irrelevant to the objectives of this exercise.

The results (See Tables 4.29.1 and 4.29.2, in Chapter 4) indicated that whereas lexical *development* (in all linguistic variables under consideration) as measured by the use of only BPVS *test* items, increased with age, these subjects' performance did not compare favourably with English monoglot peers' *norms*. The use of BPVS *norms* relating to English *monoglot* children, to assess Gibraltarian children's lexical *proficiency* or *development* is therefore, not valid. This outcome was entirely expected, particularly when these children's performance in English was compared with that of their English monoglot peers. The same expectation applied when the performance of Gibraltarian children's *first* language i.e. Spanish, was compared with English monoglots' performance in English. Though generally *raw scores* increased in all linguistic variables, *Standard Scores* diminished with age. Interestingly, up to the age of 7:11, the Gibraltarian children's *Standard Scores* in *Spanish* were more favourable when compared to the BPVS norms than they were in *English*. This trend was reversed from age 8 onwards as lexical dominance shifted from Spanish to *English*.

It has already been argued that a more valid measure of 'bilingual' subjects' lexical development is their CV. There was a theoretical possibility that since *conceptual vocabulary* was greater than L1 or L2 and reflected the number of referents known in either language, performance in this linguistic variable would be within, or at least more comparable, to the BPVS *norms*. Both languages could be considered as a unitary system, a paradigm more akin to the monolingualism of subjects used for the standardisation of the BPVS.

To some extent, the results of analyses do support this hypothesis. The figures in Table 4.29.3 in Chapter 4, clearly show the difference made by considering CV as opposed to *only* English, or Spanish, and the margin of error that could exist in determining the number of subjects whose *word power* (CV) is within *'normal' limits*. Furthermore, the incidence of mean *Standard Scores* which were *within* BPVS *'normal' limits* (i.e. 85 or more) was greater for performance in *Conceptual Vocabulary* than in English or Spanish (See Table 4.29.3, in Chapter 4).

Moreover, such mean *Standard Scores* were achieved for *Conceptual Vocabulary* at *higher* age codes than for English or Spanish (See Table 4.29.2 - Chapter 4). Thus, if CV was considered, the performance of children up to the age of eight and a half (with the exception of Age Code 08 - age 7:6-7:11 years) would lie within *'normal' limits*. This might suggest that the use of CV as a measure of lexical *proficiency* may result in less children being *misdiagnosed* by the use of tests designed for and standardised on monoglots. It would also suggest that older children would be less vulnerable to misdiagnosis. However, there would be no guarantee that the use of such tests would provide a reliable and accurate measure of DL children's *true* receptive lexical proficiency.

Interestingly, it was in the youngest age group that there was a greater percentage of children achieving *Standard Scores* above 85 (i.e. within BPVS *normal* limits) in *all* linguistic variables (i.e. L1, L2 and CV - See Table 4.29.3 - Chapter 4). Thus, no matter which linguistic variable had been used to assess receptive vocabulary, these children would have performed *within 'normal'* (BPVS) *limits*. Surprisingly, at this age (4-4:5) eighty per cent of subjects performed *within* such *limits* in English whilst the percentage for Spanish was 90 per cent. However, when 4-5:5 year old subjects' CV was compared to BPVS '*norms*', 100 per cent were *within 'normal' limits*. Further details however, reveal a more ominous picture.

The analysis of the percentage of DL children obtaining BPVS *within 'normal' limits* (WNL) scores (i.e. *Standard Score* of 85 or more) suggested that if DL children's receptive lexical proficiency was measured by using the BPVS, the following margins of error in *diagnosis* could occur.

Over 19% of children did not achieve a WNL score in English receptive lexical proficiency at any age (See Table 4.29.3). From age 5-5:5 years onwards, over 50% did not achieve WNL scores in English suggesting that they had an L2 problem. In Spanish, well over 50% would have similarly been *misdiagnosed* as having an L1 problem. Even when CV was taken as a better measure of receptive lexical proficiency, over 22% would not have achieved a WNL score from age 5:6-5:11 years onwards. Generally speaking, the percentage of children *'failing'* increased with age.

One can only guess at the implications of such misdiagnoses for the educational/remedial services, the possible effect on these children's educational development, and the potential emotional trauma which parents/carers and children alike could be exposed to.

Several studies have been reported in the literature regarding the measurement of the lexical development of 'bilingual' children, by the use of tests standardised on *monoglots*. Carrow (1972b) found that linguistically, 'bilingual' children were very heterogeneous. Some scored better in one language than in the other. Others were equal in both. A greater proportion of children scored higher in English than in Spanish and older children scored higher on the linguistic measures under consideration (e.g. receptive lexicon, morphology, etc.) in both languages. This was the case even though Spanish was not used as a medium of instruction in educational programmes (Carrow, 1972b) for these children. It must be pointed out that Carrow's study (1972b) went beyond studying just lexical proficiency, as mentioned above.

Carrow's *cross-sectional* comparison of *English* proficiency between monolingual and Spanish-English 'bilingual' children aged 3:10-6:9, showed a positive trend for *both* languages. 'Bilingual' children tended to score lower than monolingual children in English measures during ages 3:10 - 5:9. The results of the present study would concur with Carrow's findings. Carrow (1972b) also found that 'bilinguals' and monolinguals in the final age comparison group (i.e. age 6:9 years), did not differ significantly on these same English measures. The combined results indicated that at the receptive level, her Spanish-English 'bilingual' subjects were progressing in both Spanish and English, and were heterogeneous as a group, although most favoured one language (typically English) over another. However, they *lagged* behind monolingual children in their acquisition of English at an early age (i.e. 4-5 years) but eventually *caught up* at a later age (i.e. 6-7 years). A similar pattern resulted from the present study when, as Carrow did, *Raw Scores* were used as a criterion for lexical proficiency/development. However, raw scores are not a good measure of development as they are usually not related to the age factor, task gradations, etc.. *Standard Scores* for *all* linguistic variables i.e. L1, L2 and CV, *decreased* with age. However, *raw scores* in *all* LVs did increase with age, as did *Age Equivalents.*

Doyle et al (1977) compared the lexical development over two years of 13 Canadian French/English 'bilinguals' and 13 Canadian *monoglots*, aged between 17-42 months (mean age 2 1/2 years). They used the Peabody Picture Vocabulary Test (PPVT) administering one part in French and the other in English. They found that the scores in their subjects' dominant language were significantly lower than that of the monolinguals. However, they made no attempt at using the subjects' *Conceptual Vocabulary* as a measure and as Swain (1972) argues, when both languages are examined separately, the 'bilingual' speaker's total CV may exceed that of the monoglot. Furthermore, since as shown by the results of the present study, a dominance shift may occur when children are approximately six years *older* than those studied by Carrow (1972b) and Doyle et al

(1977) the question remains whether the results might have been different had these authors studied *older* children. Though one can not generalise, the results of the present study might suggest the unlikelihood of this happening since there is a clear *downward* trend with age in receptive vocabulary as measured by BPVS *Standard Scores*, in *both* English and Spanish. This would indicate that Gibraltarian children's receptive vocabulary, almost certainly in at least English, would be regarded as lagging behind their English monoglot peers', but only as reflected by the BPVS *norms*.

Doyle et al (1977) also studied the receptive lexicon of 22 older French/English (Montreal) *balanced* 'bilinguals' and an equal number of monoglots (mean age 51 months). The results indicated that *they* also showed a relative lag in the development of English receptive vocabulary (as measured by the PPVT) when compared to monoglot peers. Doyle et al (1977) conclude that contrary to Cummins' (1979) claim, even *balanced* 'bilinguals' had "somewhat lower receptive vocabulary scores." However, other measures such as verbal fluency in response to pictures in the Reynell Developmental Language Scales (RDLS - 1969 edition) showed a superiority of bilinguals over monoglots.

Doyle et al (1977) defend the validity of measures of language development in particular as a result of using the PPVT to assess *French* receptive vocabulary. They argue that "the non-equivalence of French and English forms could not have biased our results since bilinguals were matched with monolinguals in dominant language; however it is true that the French PPVT was relatively unstandardised and little researched." Doyle et al (1977) did not attempt to measure their subjects' *Conceptual Vocabulary*.

Saunders (1982) did measure *Conceptual Vocabulary* and provided *percentiles* for Frank's and Thomas' *raw scores* in *English* (Saunders, 1982:164). He calculated these by using PPVT criteria and *norms*. Frank's *raw score* of 56 on Form A put him in the 75th *percentile*. His *raw score* of 60 on Form B, in the 91st *percentile*. Thomas' *raw score* of 60 in Form A put him in the 93rd *percentile* and the *raw score* of 63 on Form B, in the 95th *percentile*. At age 7:3 years, Thomas' score of 78 on Form A ranked him in the 98th *percentile* and his score of 76 on Form B ranked him in the 97th *percentile*.

On the strength of these results, Saunders claims that both children's English receptive vocabulary compares very favourably with their monolingual peers in America. These results would seem to be more favourable than the ones reported above for the present study. Possible reasons for this have already been given in Section 5.4.6, above.

In a similar study in 1985, Fantini's son Mario ranked in the 29th *percentile* at age 4:9, according to PPVT norms for monolingual English speakers. This was much lower than Saunders' slightly older children, perhaps accountable by the fact that Mario had been

exposed to Spanish, English and Italian (the latter less frequently than the others) and having recently arrived to the United States from Latin America, had not started speaking English till 2 years 3 months earlier. He had also been looked after by a Spanish monolingual nanny, and his family seemed to have moved between countries quite frequently. This, rather than a rehearsal effect, might explain why when tested in Spanish (his *dominant* language) a couple of days later, his score doubled. Mario's performance in *subsequent* formal testing in English at school, compared favourably with his monolingual peers. Fantini does not record whether he measured Mario's *Conceptual Vocabulary* and whether, if so, he compared it with PPVT *norms*. This could have made a material difference to the child's percentile rank.

Whether the use of a ceiling and executing the task according to BPVS rules would have enhanced or reduced performance levels in the present study, or would have provided a more accurate indicator of the subjects' CV, is open to speculation. One could argue that subjects were given a greater chance to achieve a high performance because they were not stopped at a ceiling point. On the other hand, the task was much longer and more complex and involved having to process two linguistic codes. These factors could have had an adverse effect on performance due to fatigue, decreasing motivation, etc. though this was not generally apparent during any of the trials conducted by this author.

If these results however, suggest a trend, it is that the CV is a more *realistic*, and probably a more reliable indicator of a DL subject's *true* vocabulary in terms of *receptive lexicon*. This said, it is also arguable at what ages it is appropriate or valid to consider CV performances, particularly since the ratio between CV and any one of the two languages decreases and is not predictable.

The sampling strategy employed in the present study, the sample size and the high percentage it formed from the total *primary school* population would suggest that the sample was likely to reflect the parent school population. No participant had a known learning disability since they were attending mainstream schools, and teachers had been asked to exclude such children from any sample. The results can therefore, not be attributed to factors such as *learning disability*. The practical implications of these results are discussed later on.

The possibility of *culture bias* in the referents used is addressed later on (See Section 5.5.2.2, below).

Conclusion

It is a psychometric truism that tests are generally only reliable or valid for subjects belonging to the population on which the test was standardised. However, general practice does not always adhere faithfully to this rule. Given the similarities in educational background between Gibraltarian and English children, one had to consider the possibility that the BPVS was an acceptable tool for testing auditory comprehension of vocabulary. The results of analyses discussed above indicate that even if the *Conceptual Vocabulary* was taken as the *benchmark* for measuring *receptive Lexical Proficiency*, the BPVS is not a reliable nor valid tool for '*norm*' based *testing* Gibraltarian children's *receptive Lexical Proficiency.*

5.5.2 ITEM ANALYSES

5.5.2.1 Lexical Familiarity

The ages at which an item received more responses in one language or the other are shown in Table 4.30(i), in Chapter 4. The column showing the *Dominant Language* in this table indicates that an item was statistically more familiar in that language at the age codes shown.

A close inspection indicates that the difference in correct responses given to Spanish and English stimulus words was significantly large, in at least one age group, in 77 lexical items (See Tables 4.30(ii) - Chapter 4). This however, did not occur at all age codes. Of these, 23 showed significant dominance in only *English* in at least two age codes (with age range no more than 12 months), 20 showed significant dominance in only *Spanish* in at least two age codes (age range not more than 12 months), and 8 indicated *shifting dominance* over the years. This could therefore, suggest that there was a linguistic bias for some referents inasmuch as many referents were more likely to be known in one language or the other. This is to be expected in *sequential* 'bilinguals' since, unlike *simultaneous* 'bilinguals', they are not exposed to L2 as early. One would therefore, expect a *linguistic* bias in *sequential* 'bilinguals', such as the subjects participating in this study, in the earlier years, though as has been pointed out by Taeschner (1983a) the majority of equivalents do not appear at the same time even in *simultaneous* 'bilinguals'. There was almost an equal number of referents showing a linguistic bias in each language. It could be argued therefore, that the bias was equally distributed between the languages.

Interestingly however, a significant dominance for a lexical item sometimes first appeared in the older age groups. This outcome could be more a reflection of the *late* acquisition of such lexical items for most children. Alternatively, the lexical item may have generally not been acquired in either language until a later age. There was indeed evidence of late exposure to several referents in many cases. This may have been as a result of the *referent* itself not entering the subjects' range of experience until later on in life. There was therefore, no need or opportunity for the lexicon for those referents to be acquired. An example of such a referent could be **IVY**. This grows commonly in Gibraltar but the younger child would refer to it by another name e.g. *plant*. Other examples of this can be observed on close inspection of Appendix 5.1a-d which provides details of the number of correct responses for each item, in each language and at each age code.

Generally speaking, the familiarity pattern across the ages was quite *erratic*, thus making it difficult to establish in which language the word for a particular item was learned first. The possible reasons which might have determined this erratic pattern are outlined below.

The data were also inspected to establish the possible existence of any meaningful patterns in these differences. The criteria for such meaningfulness were determined by certain expectations based on the author's own DL experience as a native Gibraltarian.

The following were considered.

a) Some words would be known more readily in *Spanish* at certain ages though not necessarily in the earlier ages, depending on when they were introduced in Spanish, and depending on whether they were introduced in Spanish before English.

b) Some words would be more readily known in *English* at certain ages though not necessarily at the later ages, the reasons being similar to those stated in a) above.

c) A third possibility could present indicating a *shifting dominance*, so that such dominance would be indicated in one language in earlier years and would then be transferred to the other language in later years. By no means would the pattern be Spanish dominance first and then English because DL children might first acquire a word in English and its equivalent in Spanish, later (See discussion of Villata's study 1985, below).

d) One other criterion has already been mentioned in Chapter 4.7.1 this being that when a significant difference is indicated in an isolated age group, except perhaps during the first year in school, no meaningful inferences could be drawn. The same argument applied when a significant difference was indicated at a number of age codes with more than a year's interval.

Employing criteria suggested by these considerations, 51 words were thought to indicate statistically significant patterns which could be meaningfully explained (See Table 4.30(ii), in Chapter 4).

There does not seem to be many studies published recently which have involved item analyses of this nature. A close inspection of data from Villata's study (1985) provides an item analysis though the significance of the results was not tested as with the present study. His sample of 480 subjects (equally divided by gender) comprised 120 Italian/English/French trilinguals (Italian L1) in each of four age groups (with 12 months age range) between 9 and 12 years of age. At a number of sessions spread over a period of 4 months, subjects were asked to write down as many words as they could, in a 10

minute period of time. Each 10 minute session was devoted to each of 10 different semantic fields (called out by the researcher at the beginning of each session) which were thought to reflect the subjects' "conceptual world" (e.g. parts of the human body, furniture, the city, etc.). Subjects were not required to respond to a particular semantic field in more than one language in the *same* session.

As with the present study, Villata (1985) found that the number and percentage of subjects providing names for any one referent differed in each language. For example 400 subjects (84% of respondents) listed *leg* in French, 416 (87% of respondents) in English and 406 (85% of respondents) in Italian. The percentage responses for this part of the body was one of the most similar for each language. However, other parts of the body received a greater variation of responses in each language. For example, *tongue* was listed in French by 28% of respondents, 52% in English and 44% in Italian. In a sense this could be construed as an index of *productive* familiarity (c.f. with the present study which reports on *receptive* familiarity).

The main point of agreement between Villata's study and the present one is that each referent enjoys different familiarity in each language. Among several of the possible reasons for this are the fact that a particular language was used more frequently in most domains (Fishman et al, 1971; Saunders, 1982; Romaine, 1995), *translational equivalents* might not have been acquired at the same time (Taeschner, 1983a), or because the language used for many referents was *domain related.* It must be pointed out however, that unlike the subjects in the present study, Villata's subjects were trilingual and were required to respond in three languages to each semantic field, albeit at different sessions to avoid the contemporaneous production of translational equivalents. The items in the present study were not presented to the subjects under discrete semantic categories, though 18 semantic categories were represented in the lexical corpus. Some referents in Villata's study enjoyed equilingual familiarity in 2 of the 3 languages. For example, *mouth* was mentioned by 78% of respondents in both English and French, and *nose* by 84% of respondents in both Italian and English.

Villata's study was unlikely to have tapped the true extent of familiarity for each referent in each language because each task was limited by time and because it did not reveal subjects' *receptive* lexicon. Tasks requiring subjects to *produce* words are not as reliable indicators of *Lexical Proficiency* as *receptive* tasks; this issue has been discussed earlier. One of the problems noted in Villata's data was that, in requiring children to *produce* words in one particular language, subjects often included words from another language. For example, some gave *knee*, *mano* (*hand* in Spanish), *cuore* (*heart* in Italian) in the French list; *lung*, *liver*, *nose*, *bouche* (*mouth* in French) in the Italian list. It is possible

that these might have been *loan words* adopted by the subjects. Interestingly, this hardly happened in the English list, indicating perhaps a type of dominance in English.

5.5.2.2 Cultural Bias

The next issue to be addressed is the existence or degree of *cultural bias* which may have been present in the referents used. This would, to a degree, be indicated if a number of referents received fewer correct responses, the language being optional, than would be expected. Such expectation could be determined to some extent by inspecting the basal age level suggested by the BPVS for an item. So, for example, if fewer correct responses for a particular item were given in a particular age group than one would expect, after consultation with the suggested BPVS basal ages for that item (See Appendix 8) this might indicate a cultural bias; the percentage figure used should be the highest one obtained in the two languages.

The critical percentage correct responses below which a cultural bias might be suggested, should be the one indicated by a **'z'** score of below **-1** i.e. below *'normal'* limits in a normal distribution. This critical value would thus, be equivalent to 15.87%. Using this criterion, *no* item in the present study could be said to suffer from cultural bias.

Whereas Appendix 8 only lists the basal ages given by the BPVS for test/stimulus items, non-BPVS stimulus items (which nevertheless appear in BPVS plates) were assigned to basal ages corresponding to BPVS stimulus items appearing in the same plate.

5.5.2.3 Equilingual Familiarity

Whereas some referents might enjoy *full* equilingual familiarity as reflected by 100% correct responses in *each* language, most will have different *degrees* of *equilingual familiarity*. The degree often changes with variables such as time and age. The data in Table 4.30(iii) (Chapter 4) provided an overview of the age codes at which different *percentage bands* of *equilingual familiarity* occurred for *each* referent. In Chapter 4.7.2 it was observed that there would seem to be a *trend*, albeit not consistent, for the higher percentage of *equilingual familiarity* for most referents to be achieved at a higher age code than the lower. The pattern was however, generally *inconsistent* and a particular measure of *equilingual familiarity* for several referents may first be observed at an earlier age, then disappear and then emerge again at later ages. The example was given of the referent ***drum*** which first showed a 91-100% *equilingual familiarity* at Age Code 03 (Age 5-5:5 years) then not again till Age Codes 06 and 07 (Ages 6:6-7:5 years) and then at Age Codes 09 (Age 8-8:5 years), 11 (Age 9-9:5 years) and 16 (Age 11-11:5 years).

One could expect that once a referent attains a certain measure of *equilingual familiarity*, it should continue throughout the age codes or even increase as subjects get older and acquire *translational equivalents* for more referents. This was not however, in evidence all the time. Several factors were considered in an attempt to explain this occurrence. One possible explanation was that if sample sizes were very small then the number of subjects *not* providing correct responses in both languages would reduce the percentage by a greater value than if the same number did not respond in large samples. But there is no evidence from the data that the age codes with smaller samples (say, less than 20) i.e. 02 (N = 13), 03 (N = 11), 04 (N = 13) and 11 (N = 18), are implicated any more than other age codes. Any possible effects of differences in sample sizes has to some extent been accounted for by allowing intervals of 10 per cent between each *equilingual familiarity* percentage range i.e. 91-100%, etc. If one thus, calculates the percentage of one subject out of the smallest sample i.e. at Age Code 03 (N = 11), not having provided a correct response for one referent in both languages, this would result in 90.9% *equilingual familiarity*. If one calculates the same for the largest sample as Age Code 06 (N = 39) this would result in 97.4% *equilingual familiarity*. The margin of difference is thus, less than 7 per cent. Of course, there will be times when this margin will result in *equilingual familiarity* in a neighbouring band. However, depending on the use one might wish to make of these data such as for the selection of a lexical corpus with high *equilingual familiarity* for a test of vocabulary, this can be compensated for somewhat, by widening the band range, say from 91-100% to 81-100%, provided of course that this is valid.

The results of the analyses conducted to establish the degree of *equilingual familiarity* (i.e. as measured by the *percentage* correct responses each referent received in both languages) might be considered somewhat surprising if only because of the inconsistent resultant pattern across the ages. It was predicted that this percentage would generally increase with age. This did happen for a few referents but for many it did not. For some referents there was either an erratic percentage increase with age, or a *see-sawing* pattern which shifted from large to small percentages up and down the age range (See Appendix 5.2a-c and Table 4.30(iii) in Chapter 4). This outcome might suggest that these words are vulnerable to the influence of certain variables, such as socio-economic status, type of schooling and curriculum, etc. It was not within the scope of this work to validate this hypothesis and identify which of a number of variables, or combination of variables, might be responsible for this outcome.

However, it is more likely that the erratic pattern is caused by subjects' lexicon for some referents developing in one language alone, and thus, the *equilingual familiarity* disappears. On occasions, the acquisition of *translational equivalents* could have been

acquired at a subsequent age, rather than there being any lexical *attrition* in one language (Seliger and Vago, 1991). This later acquisition of translational equivalents could result in an increase in percentage *equilingual familiarity*. The possibility of *attrition* can not be entirely dismissed, however. Saunders (1982) found that some words known by his children in the first test had become "little heard and as a result no longer recognised." When comparing the results of the two tests, he observed that 32.5% of English items and 50% of German ones missed by Thomas at age 7:3 years were known to him at age 5:5 years. Whilst this may be partly due to the differences in the amount of *guessing* on the more difficult items at each testing, Saunders (1982) shows that he is aware of this possibility. He offers evidence for Thomas having shown knowledge and use of some of these *disappeared* items, in his conversation 22 months earlier. This could indicate that there is a possibility that through disuse and lack of reinforcement, the vocabulary for some items can be lost, though it may perhaps be recovered if and when needed at a later stage. This phenomenon also occurs in monolinguals and is therefore, not peculiar to 'bilinguals'.

Another possible explanation for an erratic pattern in *equilingual familiarity* is suggested by Taylor and de Lacey (1972). They found that the order of difficulty of some items in the Peabody Picture Vocabulary Test (Dunn, 1965 version) did not progress regularly at some points in the sequence for their 60 Australian monolingual 6-10 year old children. A similar reason could account for the erratic pattern with the Gibraltarian children in this study, particularly since the order of *lexical* difficulty between the two languages and therefore, the familiarity, could be different.

This author was not unaware of one other possible (and with some items, probable) variable. As described in Chapter 3, the *translational equivalents* for each item were determined by the author's and teachers' intimate and native knowledge of *Yanito* Spanish and of the local English. There were some translational equivalents which were thought to be hardly used, or for that matter generally known, by the DL Gibraltarian population at large. It was possible therefore, that the relevant referents might enjoy low levels of, or no, equilingual familiarity.

Similarly, there were other items for which only one lexeme was available to the speaker, regardless of whether the speaker was having a conversation in English or Spanish (i.e. *lexical borrowing*). The Cuyas Spanish-English dictionary (Cuyas and Cuyas 1960) was consulted for the translational equivalents for these items. Anyone familiar with the English/Spanish spoken in Gibraltar will be able to inspect Appendix 5.2a-c and identify some of these items by the low percentage of 'bilingual' responses they received. The practical implications of this is discussed below in Section 5.6.2.

This fact may also have been partly if not wholly responsible for the lack of steady linear progression with age in the number of items enjoying equilingual familiarity as shown in Table 4.30(iv) - Chapter 4 - and for the fact that several items only enjoyed this familiarity at isolated age codes.

Conclusion

The results of the item analyses did not allow for unequivocal conclusions but certain trends were identified. The first one was the fact that most items were significantly more familiar in one language at certain ages. There was a minority whose familiarity shifted from one language to the other. The second trend was that the *equilingual familiarity* of most items did not necessarily increase with age. The third trend was that the number of items receiving 91 per cent or more correct responses in *both* languages generally increased with age but this was not clearly apparent until the *Middle* school years. Having considered other possibilities, this outcome is probably mainly a function of a *normal* lexical developmental pattern in DL (Gibraltarian) children.

An analysis to establish the existence of *cultural bias* for each referent, failed to reveal any.

This section aimed at discussing the main results of the investigation and compared them to the published literature on similar research. Possible explanations have been offered for the outcome at all the major analytic levels explored. The practical implications suggested by the results are discussed in the next section, followed by Chapter 6 which will include a summary of the main conclusions of this study and suggest possible areas for future research.

5.6 PRACTICAL IMPLICATIONS

5.6.1 Introduction

The results of this study have clear practical implications in the educational and remedial fields. It is perhaps in the area of assessment and identification of communication problems that the issues are most directly related. Mowder (1980) states that educationalists have to determine whether or not children are "handicapped" and also plan individual children's educational programmes based on each child's skills, strengths and weaknesses. She further states that not much will be achieved without very strict mandatory requirements and resources to satisfy them, however. It is generally felt that no one single instrument should be used as the sole determinant for educational placement and even if both languages are tested, testing must be conducted in the subject's native language or primary mode of communication.

The practical implications discussed below should not only be considered by relevant professionals working with Dual Language children but also in the undergraduate training of the relevant professions, particularly teachers of English as a Second Language and speech and language therapists.

The following discussion addresses some of the issues regarding the assessment, identification and remediation of communication problems in DL subjects. The result of the present study suggests several measures which merit consideration in this field. One remains mindful of Romaine's (1995) assertion that "bilingualism is a resource to be cultivated rather than a problem to be overcome." It is in this spirit that this section has been written.

The discussion that follows relates to assessment or testing. It should be borne in mind that the main focus of the present study was based on a *descriptive* and *not* an *experimental* framework. Eliciting responses from the subjects thus, resulted in data which reflected whether the subjects' possessed the pre-selected lexicon in each language, etc. The task was *criterion* referenced and not *norm* referenced. The analyses conducted employed a common data base and any comparisons made were in relation to this data base and not one generated by any other study.

5.6.2 Assessment and Identification

Several authors have stated that developmental delays, including speech and language delays, during the pre-school years are predictive of academic difficulties in later school years (See Westby, 1995). Westby (1995) also states that "lexical knowledge has been

shown to be quite predictive of a child's general language skills." The question of *how* one should assess the linguistic proficiency of *monoglot* subjects, how one decides on whether a communication problem exists, and how to determine the exact nature (*differential description* or *diagnosis*) of such problems, has been discussed in the literature for quite some time. There is however, comparatively little literature on these issues regarding '*bilinguals*'.

One of the major arguments has revolved around whether proficiency in only *one* of the languages should be assessed (usually the *host* language which is almost invariably the 'bilingual's' *second* language) or whether *both* languages should be considered. Other important but perhaps more recent and current issues relate to the assessment *strategies* one should use, and how to interpret results of assessments in order to identify the existence and nature of a communication problem.

Langdon (1983) argues that the purpose of testing 'bilinguals' is to determine their proficiency in L1 and compare it with performance in L2, when appropriate. This procedure helps to determine if lack of proficiency in L2 is due to a general language *disability* or is a reflection of a second language-acquisition process. In other words, is the subject suffering a linguistic *difference* or linguistic *deficit,* or as other authors (e.g. Abudarham, 1987) have put it, whether a DL speakers has a ***specific*** language-learning problem or a ***second*** language-learning problem. The former is more appropriately remediated by speech and language therapy and the latter by a teacher of English as a second language.

Langdon (1983) recommends that 'bilinguals' should be tested in L1 initially and then in L2. Testing in L2 should occur after a few days. When commercial materials are unavailable, she suggests that translations or adaptations of existing instruments in English may be used. Her rationale is that although normative data may not be possible, information on subjects' specific strengths and weaknesses in their native language can be obtained.

Olmedo (1981) argues that scores on standard English proficiency tests may reflect the extent of 'bilingual' subjects' linguistic *acculturation*, but these scores should not be interpreted as necessarily accurate assessments of language *development.* One might add that the question of linguistic *acculturation* however, is not likely to be a problem in culturally homogeneous communities e.g. in Gibraltar, Wales, Switzerland, Holland, etc.

These authors seem to advocate language specific approaches to assessment and do not attempt to consider the interdependence and relationship of 'bilingual' subjects' two languages such as for example, their *Conceptual Vocabulary.* Romaine (1989; 1995)

supports the view that it is more revealing to look at DL subjects' *Conceptual Vocabulary* across the two languages. The possibility of a DL child's *total vocabulary* exceeding that of a monoglot peer's has been suggested by Swain (1972) and had been demonstrated by others such as Saunders (1982) and Fantini (1985). This *total vocabulary* (or *Total Lexical Repertoire*) is not the same as the *Conceptual Vocabulary* that Swain proposed. As has been stated earlier, in the former, all the *words* known are counted whilst in the latter, only the number of *concepts* or *referents* for which a DL child knows the word are counted. Thus, translational equivalents only count as one.

Most authors will recommend that *both* languages are assessed. Burt and Dulay (1978) recommend that linguistic proficiency should be evaluated for *both* languages, and that proficiency in each language should be compared in order to determine *dominance*. They suggest that if proficiency levels in both languages are below what is normal for monolingual development in either language, the child should be further diagnosed. The problem of course arises when there are no tests standardised on a particular population, or when no norms are available. Abudarham (1987) has argued that it is not valid to use *norms* derived from a particular population for a different one, even if they speak the same language. Children's development in, for example, Turkish in Turkey may be quite different to that of Turkish 'bilinguals' in another country, not least because the latter, unlike the former, are exposed to a second language. Mowder (1980) supports the view that one language score alone is undoubtedly an underestimate of a 'bilingual' child's repertoire.

Even though in the present study significant correlations existed between performance in English and Spanish, the *Lexical Proficiency* in L1 was greater in the younger age codes, and superior in L2 in the later age codes. Furthermore, the development between each age code did not occur in predictable ratios. Assessing both languages provides the opportunity for calculating the subjects' *Conceptual Vocabulary*, *Total Lexical Repertoire* and their *Bilinguality*. One must consider however, that *bilingualism* is not the sum of two languages (Hamers and Blanc, 1990). Westby (1995) suggests that the functions served by each language in the child's environment has to be carefully determined, as have the contexts in which each language occurs. These factors will affect the vocabulary used. Romaine (1995) says that "it does not make much sense to assess bilinguals as if they were two monolinguals" since it is unlikely that a 'bilingual' will have the same experiences in both languages. This fact also makes comparisons between some studies invalid. This may be true even when the same combinations of languages are involved because different 'bilingual' subjects will also have different societal and cultural experiences which may influence their lexical proficiency and development in different ways.

Despite intensive advocacy for the need to assess *both* languages, exclusively and inclusively, there is little evidence that the teaching, educational psychology and speech and language therapy professions are applying the principles.

The next important issue that needs to be addressed is the validity of the practice of translating tests. Tests standardised on monoglot English-speaking children are still being translated. Romaine (1995) says that tests used for monolinguals are sometimes translated into a minority language "with no provision made for the fact that the norms for the use of the language in its new environment may be very different, or that children may have acquired a non-standard variety of the language."

Among tests which have been translated from the original version in English are the *Sentence Comprehension Test* (Wheldall et al, 1987) which has been translated into Punjabi; the *Reynell Developmental Language Scale*s (Reynell, 1977 version) which has been translated into Welsh, Danish, German, Norwegian, Dutch, Chilean (Spanish), Portuguese and Japanese, and the *Peabody Picture Vocabulary Test* (PPVT) (Dunn and Dunn, 1981) which has been translated into Spanish (Chavez, 1982).

Very often, translated tests aim to assess proficiency in *each* language *independently*. In such cases, DL subjects' performance is not credited with knowledge in *either* of the two languages or with responses which, despite code switching, should be considered as an indication of the subjects' lexical knowledge. So for example, at the time of testing for knowledge in L2, correct responses albeit in L1, may not be accepted, and vice versa. Equally so, in receptive tests, DL subjects may not always be offered the stimulus item in *both* languages. There is no denying that DL subjects do switch codes, sometimes within a phrase (Poplack, 1980; Romaine, 1995). Provided their interlocutors share the same DL system, strategies such as lexical borrowing and code switching are legitimate and make for a viable and effective communication system. It is readily acknowledged however, that DL subjects who use these strategies alone would find it difficult to communicate with monoglots. This becomes more crucial when the DL child is immersed in a monolingual school environment, though most children seem to survive any initial communication difficulties.

Translations are almost invariably, notoriously unreliable particularly when the complexities introduced by different grammatical and syntactic rules alter the linguistic demands for the subject. Olmedo (1981) says that interpretation of scores is difficult even after translation, because the test content could remain culture-bound. Another criticism of translations is that in some 'bilingual' communities there may be regional and

subgroup linguistic differences (Mowder, 1980). Monolingual translations are also often inappropriate since a 'bilingual' subject's communication system may comprise a combination of *two* languages or dialects. This could be one of the reasons why one should use the same referents to test each language so that one can conclude if the 'bilingual' subject has a word label, albeit in only one language, for a particular referent. Such a strategy would allow a more realistic indicator of a subject's *total lexico-referential repertoire.*

In the field of speech and language therapy, translations of tests are still common place. Ball and Munro (1981) explain that many speech and language therapists are forced to make their own translations of English tests, despite the fact that they admit that it is not an ideal practice. They state that the results of procedures used to assess the *English* proficiency of English/Welsh speakers do not give a full account of their overall linguistic ability, particularly if the dominant language is English. The same of course applies to other 'bilinguals'.

The construction of *new* tests specially for 'bilingual' subjects can however, bring its own problems. Ball and Munro (1981) constructed the *Welsh Phonological Assessment Procedure*. They observed that both the system and structure of Welsh phonology, and its phonotactic features, differ from that of English. Even in this test they had to take regional accental variations for the same words into account. For example, some sounds such as /z/ are omitted in most Welsh dialects and only used in the South Welsh dialect. They also took into account phonemes used in loan words from English which also contained phonemes not found in the Welsh phonology.

Burt and Dulay (1978) warn about the dangers of employing *translational equivalents* to determine dominance of syntax. Clearly, any differences between languages are more acute at a syntactic level and translations are more likely to yield semantic, grammatical and syntactic inaccuracies. Even at its simplest linguistic level i.e. the *lexical* level, problems of translation soon become palpable. Chavez (1982) took the precaution of translating the PPVT into his subjects' *local* Spanish. The 37 Spanish/English speaking children performed significantly better on the English (original) version than on the Spanish (their L1) version. He concluded that the local Spanish version of the PPVT was an inappropriate *assessment* instrument for use with 'bilingual' children. This did not seem to be the case in the present study. When calculated according to BPVS '*norms*', a greater percentage of subjects achieved a BPVS *within normal limits* proficiency in *Spanish* than in *English* in all but one age code (See Table 4.29.3) from 01 (Age 4-4:5 years) to 07 (Age 7-7:5 years). It was only in two age codes i.e. 09 (Age 8-8:5 years)

and 10 (Age 8:6-8:11 years) that a greater percentage achieved such a proficiency in *English.*

Chavez's (1982) conclusion seemed to ignore another possibility this being that the PPVT items perhaps had different familiarity in each language and that this familiarity often depended on age, socio-cultural background, etc. Burt and Dulay (1978) argued that vocabulary tests are most appropriate for testing groups who had had homogeneous experiences. However, vocabulary used in one language may differ from locale to locale. For a heterogeneous population, the use of vocabulary as an indicator of language development penalises some children from not having been exposed to the "right vocabulary." *Sequential* 'bilinguals' particularly may learn a lexicon in L1 at an early age and may learn the translational equivalents in L2 later on, or not at all; the opposite may be true and some of the lexicon may be acquired in L2 first and then in L1. The results of the item analysis in this study support this argument. Burt and Dulay (1978) stated that vocabulary tests were more appropriate for testing DL subjects with homogeneous experiences.

These facts need to be seriously considered particularly when employing translated tests which use ceiling items. Abudarham (1987, Chapter 6) has demonstrated that when employing such tests, unless stimuli or responses are allowed in either language, the DL subject could be severely penalised and true linguistic potential fail to be tapped. If during such tests, each language is tested independently, and if the test is stopped after a number of errors have been made within a number of consecutive responses (6 in 8, in the BPVS) it could be that the ceiling is reached prematurely. Had the subject been given an opportunity to respond in the other language when the response in the first one was incorrect, the ceiling might have been reached later on and the performance enhanced. Table 5.3 below demonstrates a fictional example, though theoretically feasible, of the possibilities, by using data from this study (See Appendix 5.1).

LEXICAL ITEM	RESPONSES TO STIMULI IN: ENGLISH	SPANISH
HAND	*	*
NECK	NR	*
BEE	*	NR
FEATHER	NR	*
DIVING	*	NR
ARROW	NR	*
CHOPPING	NR	*
LIQUID	NR	*
TUGGING	NR	*
SHARING	NR	NR
GATE	*	NR
SNAKE	*	NR
BOAT	*	*
BEAK	NR	NR
KANGAROO	*	*
FILE	NR	NR
BEAR	*	NR

CV count	14(+)
ENGLISH	3
SPANISH	9
TLR	17

KEY NR = Incorrect OR NO Response; * = Correct Response

CV = Conceptual Vocabulary; TLR = Total Lexical Repertoire

TABLE 5.3 ILLUSTRATION OF POSSIBLE SHORTCOMINGS OF THE USE OF CEILINGS IN DL TESTING OF RECEPTIVE LEXICON

The lexical items chosen for this example reflected the relative number of correct responses in each language and based on this, the possible response pattern for a 4 year old (See Appendix 5.1a). Arriving at a ceiling item using the BPVS criteria, this subject would have obtained raw scores of 3 in English and 9 in Spanish. And yet, the example shows that there were several items known in English after the ceiling item in English (*tugging*, in this example) had been reached. Furthermore, if these are counted, the English and Spanish scores (8 and 9, respectively) are not too dissimilar. Nevertheless, according to BPVS-type *norms*, these scores could have indicated an inferior performance *both* in English (equivalent to a BPVS *standard score* of 46) and Spanish (equivalent to a BPVS *standard score* of 63). However, using the *notion/measure* of *Conceptual Vocabulary*, the raw score would have been (at least) 14 and an equivalent

BPVS *standard score* would have been (at least) 72. If a ceiling approach needs to be used when testing 'bilingual' subjects, it should be on the basis of the *Conceptual Vocabulary*. In other words, an *error* for any *one* item would be defined as 'incorrect responses in *both* languages'. In the example above, if this criterion for the ceiling item is employed, this subject would have not reached that ceiling yet and, if allowed to progress until s/he did, might well have obtained a raw score which was *within BPVS 'normal' limits.*

It is suggested that diagnoses regarding language competence (in this case *receptive lexical proficiency*) or language problems, based on an assessment strategy which employs ceiling items for *each* language *independently* are invalid. The sample used in this study was considered to be normally distributed. The results of the present study would seem to indicate that though taking the *Conceptual Vocabulary* approach favoured the younger subjects, the same was not true for subjects above the age of eight and a half even though a ceiling strategy was not employed at all. This would suggest that the use of a ceiling strategy in tests for DL subjects, even if the *Conceptual Vocabulary* is the criterion, is a dangerous practice and should not be used.

Only subjects aged *up to* Age Code 02 (Ages 4-4:11 years) obtained a mean *standard score* for English which was *within BPVS 'normal' limits*. Similarly, only subjects up to the age of 5:5 obtained a mean *standard score* which was *within BPVS 'normal' limits*. If however, the percentage of subjects obtaining a *within 'normal' limits* BPVS standard score, a different perspective with potentially dire practical implications is obtained.

In a '*normally*' distributed population, one would expect that 85% of subjects would perform '*within normal limits*' (i.e. standard deviation of -1 or better). This was not the case for most ages in this study (See Table 4.29.3 in Chapter 4). In fact, this percentage was not obtained at all for English; for Spanish, it was only obtained at age 4-4:5 years. Even in the case of *Conceptual Vocabulary*, such a percentage was only obtained by children up to and including age 5:5 years. The potential margin for error in differential diagnosis, when the BPVS is used to assess the receptive lexical proficiency of (Gibraltarian) DL children, is suggested by the difference between the percentage of children expected to perform within normal limits (i.e. 85%) and the actual percentage. So for example, at age 5-5:5 years (See Table 4.29.3), there is a potential risk of misdiagnosing no less than 58% of DL Gibraltarian children when their receptive lexical proficiency in English is assessed using the BPVS.

If the BPVS had been used to test each subject's language independently, and the *standard score* used as an indication of the existence of a communication problem, most of these children would have been candidates for 'remedial' education (e.g. second

language programmes or speech and language therapy). It is suspected that even the *standard scores* which were *within normal limits* in the present study, were not a reliable reflection of the subjects' true lexical proficiency and that they were in fact *underestimates*.

The *main* reason for all this is likely to be that *norms* based on *monoglot* subjects were used for comparisons. If this were the case, it suggests additional evidence that such *norms* should never be used (as is often the case currently) especially for the diagnosis of communication problems in DL subjects. Indeed, there has been a view for quite some time that *norm referenced* testing of DL subjects is not valid. Burt and Dulay (1978) have stated that in order to fairly and accurately assess a 'bilingual' child's lexical progress, *criterion-referenced* instruments developed for particular groups of children would be the most appropriate tool. "An interpretative framework of language tests for 'bilingual' children cannot follow the norm-referenced approach ...." unless length and type of language exposure to the *Target Language* can be incorporated into the norms. The results of their study indicated that "In most of the *normal* (i.e. as opposed to *non-normal* development) categories of bilingual development, proficiency in one language is at least one level lower [as measured by the Bilingual Syntax Measure (B.S.M.)] than the other, *balanced* 'bilinguals' being the only exception."

Mowder (1980) however, advocates regional norms arguing that these are necessary as are *criterion*-referenced (i.e. *non-normative*) measures. However, consensus for such criteria is difficult to obtain though perhaps less so in culturally homogeneous 'bilingual' populations such as those found in some parts of Wales and Gibraltar. Mowder (1980) acknowledges though that such measures are useless for classification. Westby (1995) argues that 'norm'-based assessments are not sufficient to determine the appropriate educational placement or to write appropriate intervention plans. Developmental 'norms' may also vary according to the culture. Westby (1995) states that in the United States children are expected to start talking between the ages of 18 and 24 months. However, in many Native American (Indian) cultures a language deficit would not be noticed till age 4 when the children are expected to talk to their peers. Even then, only the more severe delays may be noticed.

Some authors (e.g. Swain, 1972; Saunders, 1982; Abudarham, 1987; Romaine, 1995) have considered the possibility that the lexical development *potential* of a subject could best be indicated by the *total* number of words s/he knows, regardless whether they are duplicates or not. Thus, calculating the subject's *Total Lexical Repertoire* could contribute to a diagnosis and ultimately, to a prognosis, since it could be an indicator of the subject's l*anguage-learning potential* (Abudarham, 1980a, 1980b), or ability to

acquire a larger lexicon. In the illustration above (See Table 5.3), for example, the subject's TLR totalled 17 and this was thus higher than the *Conceptual Vocabulary*.

There is another problem inherent in assessing lexicon in both languages whether the CV is taken into account or not, but particularly if ceilings are used. Romaine (1995) suggests that "In situations of intense language contact, it is possible for a third system to emerge which shows properties not found in either of the input languages. Thus, through the merger or convergence of two systems, a new one can be created." The present author finds sympathy with this view. It follows that a 'bilingual' who mixes both languages is best regarded as speaking, or using, three language/codal systems. It is this that has to be assessed, thus supporting the argument that when assessing *Lexical Proficiency*, not only does one need to assess it in L1 and L2, but also the subject's *Conceptual Vocabulary*.

Another factor needs to be considered when using tests which have been developmentally graded in *one* language. As was demonstrated in the example above, the ceiling for each language was quite different. Reference to the fact that the name for a particular referent may be learned in one language early on perhaps, and its equivalent in the other much later on has already been made. Many language tests, particularly those employing ceilings, follow a developmental pattern so that the easiest items, from a developmental cognitive/linguistic point of view, appear first. As the test progresses, the complexity of the items increases. The selection of items for a DL lexical test has to be considered very carefully because it is possible that items belonging to an earlier stage in one language may not have been acquired till a much later stage in the other. A DL test containing such items will discriminate against one of the languages and a DL subject's performance in the latter language may appear depressed because of this developmental-linguistic bias.

One way of obviating this problem is to select items whose lexical equivalents in both languages present the same level of difficulty. Such level of difficulty can be determined by several methods. These will be discussed briefly in Chapter 6.3.2.

Another criterion for the selection of assessment lexical items relates to socio-linguistic bias; in other words, when the lexeme for an item is more likely to be known in one language only, or is more readily familiar or accessible in one language. This is more likely to happen to *diglossics* and could be due to the fact that the societal use of a lexeme may occur in one language only, and rarely, if at all, in the other. The client is thus, deprived of the option of responding correctly, albeit in the language not being examined. The fact that in this study nearly half the items out of a lexical corpus of 100 were vulnerable to *linguistic* bias, as indicated by the statistically significant dominance in one language, underlines the importance, when *tests* are designed, for selecting a lexical

corpus for assessment purposes very carefully. If the principal is accepted that in order to assess DL subjects' *true* lexical repertoire, an opportunity must be given to them to respond in either language, there would be little point in using a list of *test* items, the lexicon for which is likely to be known in only one of the languages. This caution must be applied at all age levels since this study has clearly demonstrated that the lexical familiarity of different lexemes can shift from one language to another at different ages.

The observations already made in Chapter 4.7.2 and Section 5.5.2.3 above, regarding *equilingual familiarity*, can be elaborated and applied to the argument about criteria which should be considered when selecting a lexical corpus for assessment purposes. Much will of course, depend on the use one might wish to make of data related to *equilingual familiarity* (See Tables 4.30(iii) and (iv), in Chapter 4), and the percentage responses desired for such purposes, (e.g. selecting a lexical corpus to use as a test of receptive vocabulary for DL [Gibraltarian] children) certain additional observations could be pertinent.

If, for example, it was decided to select only such referents with 91-100% 'equilingual familiarity', perhaps to reduce any linguistic bias, the data in the present study might indicate that items such as *hand* satisfies this criterion at almost all ages from 4 to 11:11 years of age. Others such as *money* and *feather* satisfy the criterion for a narrower age range (i.e. 6-11:11 years and 9-11:11 years, respectively), but the range covers several years. It may not be considered appropriate, valid or practical to select referents where 'equilingual familiarity' is not manifest over more than two consecutive age codes i.e. 12 months. If the *equilingual familiarity* criterion for selection of a lexical corpus is widened so that referents manifesting a lower percentage are selected, a greater number become eligible. For example, whereas there were 17 referents with 91-100% *equilingual familiarity*, this number more than doubled to 39 with 81-100% 'equilingual familiarity', and more than trebled to 54 with 71-100%.

Data such as generated in the present study, could also help in selecting referents with increasing degrees of *difficulty* in *equilingual familiarity* or which are clearly on a *developmental continuum*. Though not unequivocally consistent, there was a trend showing that the percentage equilingual familiarity for most referents was, generally speaking, highest in the older age groups.

Failure to choose items which are free of *linguistic* bias would result in a lexical assessment instrument which would at best provide an indication of a DL subject's lexical repertoire in each language independently. The inadequacy of this outcome has previously been discussed by this author (Abudarham, 1987 - Chapter 6).

The design for any DL lexical test instrument has to be very carefully thought out and the issues discussed above taken into consideration well before any attempt is made to compute *normalised* scores. But once this is done, scoring criteria have to be employed which will provide valid and reliable assessment results which will correctly indicate subjects' level of [receptive] *Lexical Proficiency.*

In the 1950s and 1960s, there seemed to be a greater importance attached to the study and assessment of *expressive* language skills. The importance of assessing children's *receptive* language has been stressed by De Vito (1970) and many others since. It is more difficult to assess *expressive* language as subjects find it more difficult to recall words expressively i.e. *encode*, than *decode*. Romaine (1995) states that word-*naming* is a weak predictor of 'bilingual' proficiency.

However, one must pay due regard to some of the comparative difficulties even in *receptive* language tasks when 'bilingual' subjects are involved. Commenting on problems of 'bilingual' tasks, Hamers and Blanc (1990, p.18) say that these are often not equal in the two languages, either because of the frequency distribution of the *translational equivalents* or because the decoding process seems to be different in each language. Oakland et al (1977) stated that 'bilingual' individuals can also differ widely in terms of their receptive and expressive language *dominance* because of their varying experiences. Meara (1984) has demonstrated that while in English the beginning of a word is the most important cue for decoding, in Spanish it is the middle syllable. This would suggest that there may not be parity of difficulty, or ease, in the decoding between different languages, though the task might be simpler when languages are similar e.g. Italian and Spanish.

Another consideration when assessing the speech and language of a DL subject must be the language medium one should use during the assessment procedure. This is particularly important when assessing *expressive* skills. If subjects are given instructions in a language they do not understand, their poor performance on such tests could be due to the fact that they could not understand what was required of them and not necessarily to poor expressive skills . The results of the present study has shown that dominance shifts after the age of eight. This might suggest that assessments should be conducted in L1 for young children and L2 for older ones. These proposed ages would have to be modified when assessing DL children with specific learning or language-learning difficulties and depending on the amount of L2 exposure even older subjects might have received. Bozinou-Doukas (1983) proposes that language assessment sessions with DL children should be conducted in *both* their languages and the child's dominant language should be used whenever possible.

Having discussed some assessment issues, one now has to turn to the process of identifying the presence and nature of a communication problem. This is the object of most appraisal procedures. Nelson-Burgess and Meyerson (1975) suggest that "early determination of problems and priorities can be made ..." so that children "can be included in the (speech therapy) case load" and be provided with "language stimulation and training to bridge ... [any] developmental gap." Romaine (1995) agrees with other authors (e.g. Cummins, 1984) that unless children's possible communication problems are diagnosed early, their right to special education may be discriminated against. In the United Kingdom, the need for early assessment and intervention was again highlighted in the Warnock report (1978) sixteen years ago and remains a very important educational principal. Warnock recommended that when a child whose first language is not English is assessed, at least one of the professionals assessing must understand and speak the child's language. It is strange that having made this important recommendation, the needs and rights of minority children are not mentioned in the report.

Another important issue in the assessment/diagnostic procedure has been discussed in this author's earlier works (Abudarham, 1987) this being the differential diagnosis between a specific (first) language-learning or second language-learning problem. Nelson-Burgess and Meyerson (1975) refer to the need for the speech and hearing clinician to be able to determine "a language difference or a language delay." The decision could influence the DL child's pedagogical language priorities.

A scenario which often presents itself in speech and language therapy clinics is the child who has only recently been exposed to L2. This is not often recognised even though it has diagnostic implications. Grosjean (1985) states that we must ensure that we "differentiate between the person ... who is in the process of becoming bilingual and the one who has reached a (more or less) stable level of bilingualism." Data from studies such as the present one can indicate whether subjects have achieved this stage.

A number of views can be found in the literature regarding *diagnostic criteria* for communication problems in DL subjects. The way in which CV, *Bilinguality*, lexical dominance etc., develop and their relationship between each other in the earlier years of a DL lexical development, and how patterns change in later years has also assessment and diagnostic implications which are age-related. Bozinou-Doukas (1983) stated that a learning disability may be suspected if consistent patterns of deficiencies affecting language-learning may not only be linguistic but also cognitive. Among these are problems concerning auditory-sequential-spatial and visual-spatial skills. Burt and Dulay (1978) recommend that "only if proficiency is low in both languages ... should a child be referred for further diagnosis". Bozinou-Doukas (1983) agrees that when deficiencies affect both languages, there may be a specific language-learning problem. However, he

warns that a DL child's low score on test items such as grammatical rules and other linguistic parameters "is not necessarily an indicator of language disability" because such *errors* can be due to *interference* or *transfer*. Burt and Dulay (1978) state that an inability to speak English proficiently does not necessarily imply a communicative disorder. *Normal* 'bilingual' children are often misclassified as "mentally retarded" or language handicapped when this criterion is employed indiscriminately.

The principle that a language disorder is indicated if scores in *both* languages are depressed, has been expounded by Nelson-Burgess and Meyerson (1975), and Abudarham (1987). A *second language-learning* problem may be indicated by an inferior performance in one language, usually L2, but a superior performance in the other, usually the first. Langdon (1983) reports on a personal communication with Minerva Galvan who suggests five possible types of main profiles. The first type described the DL child whose L2 is stronger than L1, where L2 seems within the norm and there may be some L1 influence. The second type presents with an L2 stronger than L1, but some L2 problems are reported. Another type presents with L1 stronger and seemingly within the norm, but L2 problems are noted. The fourth possibility is characterised by communication problems in both languages, proficiency in both being below the norm. The fifth presentation may manifest itself in both languages being weak though L1 is stronger than the other.

No mention is made in this diagnostic model as to whether *Conceptual Vocabulary* was considered. One other concern is that the DL subject's *Total Lexical Repertoire* is sometimes not considered. The results of the present study show how the TLR is larger than any other linguistic variable including CV. Abudarham (1980a; 1982; 1987) has already argued that the TLR is a measure of a DL subject's capacity to learn words and therefore, could be an indication of *language-learning potential*. The TLR can in fact develop in a way not entirely related to the way CV develops. A high CV does not necessarily imply a high TLR count. In fact, a low CV may be accompanied by a high TLR. This would suggest that the lexicon in each language could be developing, at certain ages, with many *translational equivalents* being acquired, rather than *new* lexemes for *new* referents, as demonstrated earlier. This would not be untypical of sequential 'bilinguals'.

The formulation of a differential diagnosis is thus, a very complex and multi-factorial task. A diagnosis can not be made on the basis of an assessment of one or two linguistic skills (Oller, 1983). This is true for monoglots - how much more for DL subjects! However, perhaps the least vulnerable linguistic parameter in terms of construct, internal and external validity is likely to be the least complex one i.e. *lexicon*. Burt and Dulay (1978) assert that, the growth of a child's *vocabulary* is indeed a necessary part of

linguistic development and consequently, an important part of a language curriculum. Johnson, Toms-Bronowski and Pittelman (1982) stated that "Word knowledge has always been identified as a significant component of comprehension." Research into reading comprehension and in verbal intelligence found that vocabulary knowledge played a significant role in both areas. In the remedial professions, such as speech and language therapy, assessment of vocabulary might be the only realistic option since many children may have not started to develop language structure. Furthermore, the child only recently exposed to a second language may only be functioning at a *one-word* level in the second language, or may have difficulty with vocabulary. Some children, as has already been discussed, may be using *formulaic expressions* in L2 without much understanding of the vocabulary they are using or indeed linguistic structures (See also Section 5.6.3, below). They may thus give the impression that they have good language and communication skills. One therefore, needs to assess their lexical proficiency in both L1 and L2 and consider those issues already raised earlier.

There would seem to be a consensus for the need of reliable assessment tools and the importance of arriving at the correct *differential description*. Quite which is the best way to resolve these issues however, does not seem to enjoy the same consensus. The respective problems still permeate within the teaching, remedial and speech and language therapy professions all over the world, the U.K. being no exception.

5.6.3 Pedagogical and Remedial Implications

Criticism of the practical value of studies of vocabulary beyond the early language stage (i.e. age 2:6), is in this author's view unfounded. It is true that the study of other linguistic parameters such as semantics and syntax may in certain situations be more appropriate after this age, particularly in monoglots. However, given that the DL subject does not always acquire the equivalent lexicon, i.e. *translational equivalents*, in both languages and that, as has been seen from this study, the lexical development is not entirely parallel, the study of lexical development in DL children may in fact be more pertinent than in monoglots.

For sequential 'bilinguals', the practical implications of such a study are more significant, particularly if the individual is exposed to L2 after the age of seven or so. At this age, monoglots' linguistic development has reached virtual grammatical maturity but lexical development continues for a very long time and well into adulthood. The individual, on being exposed to a second language, starts by building up a lexicon. Asher's work (1966, 1969) in particular, clearly demonstrates the importance of starting off developing a lexicon. His approach makes use of a "Total Physical Response" in teaching second language, whereby the learner is not expected to, or required to, say anything when the

teacher introduces a new word. The focus is initially on facilitating *comprehension* of the new word first. The involvement of a prescribed action i.e. a *total physical response*, by the learner has been shown by Asher to enhance the acquisition of an L2 lexicon.

Many L2 learners will soon seem to have acquired phrases and sentences but these are often *formulaic expressions* (Fillmore, 1976) which they use without really knowing the meaning of every word used in the expression. This is a social strategy which enables emerging DL subjects to communicate with corresponding monoglots in social situations, very early on after being exposed to the second language. Despite this *phenomenon*, the development of the L2 lexicon is of paramount importance and no matter how competent the DL speaker is in the use of L2 grammatical rules, unless the vocabulary has been acquired, communication can be very seriously hampered.

The way that the lexicon in each language has been shown to develop in this study, the relative timing of such development in L1 and L2, the ages at which L1 and L2 dominance were manifested, and the results of the item analyses, can provide valuable criteria for L2 programmes. Burt and Dulay (1978) have stated that assessing language dominance is important for 'bilingual' programme planning and streaming. As stated earlier however, Doyle et al (1977) found that dominance in one linguistic parameter e.g. vocabulary, does not imply dominance in another, such as, for example *syntax*. They recommend that language *dominance* information is "crucial to the placement of children in appropriate classes and to the determination of further testing needs." Whereas one can accept this assertion, it is important to know the *normal* dominance pattern or configuration across the ages, as these differ across 'bilingual' groups. Dominance shifts with age as do the type and extent of exposure to a second language.

The language spoken at home may result in this language being dominant in social domains. Doyle et al (1977) say that one needs to know "home language usage patterns", as this may reveal possible reasons for low proficiency. It would also be necessary to determine both normal and abnormal levels of language development though *norms* are not always available for all languages, or even for the same language for different communities.

As in the present study, *item analyses* can indicate the language in which the lexeme for a referent was first established. Karbon (1984) found that children did exploit their unique experiences as a means of developing their L2 vocabulary. He therefore, suggested that vocabulary instruction could be more effective if teachers encouraged students to relate new words to those already known, thus using the latter as a bridge to acquire the equivalent lexicon in the other language. The role of vocabulary acquisition in classroom programmes is a subject which constantly appears in the literature (most recently Allen et

al, 1990; Lightbrown, 1990; Stern, 1990; Hamers and Blanc, 1990) and for obvious reasons. Of particular relevance and urgency is the teaching of vocabulary to DL children in the field of special education (Omark and Erickson, 1983; Cummins, 1984; Baca and Cervantes, 1984).

Very often, there are socio-cultural criteria which determine why the word for a referent is learned in one language first and in the other, perhaps years later. In the present study, it has been largely the '*educational culture*' which has been responsible for this. L2 programmes therefore, should be designed after the student's socio-cultural background has been studied.

An area in which vocabulary development assumes significant practical and pedagogical importance is in the development of reading skills. Naturally, as Johnson et al (1982) state, vocabulary knowledge plays a significant role in reading comprehension and in verbal intelligence. The literature in this regard is very rich (e.g. Beck et al, 1987; Graves, 1987; Hamers and Blanc, 1990).

It has only been possible in this section to underline some of the major practical implications of this study. It is suggested that educational programmes for DL subjects can not ignore the outcome of investigations such as this. However, it is by no means suggested that studies in DL *lexicon* are the only relevant ones in the educational context, and though fundamental, only scratch the surface of the studies needed in the field of socio- and psycho-linguistics. As will be discussed in Chapter 6.4, more research is needed and the 'linguistic net' must be cast wider. Furthermore, the complementary roles of research and researchers and instruction and practitioners in first and second language education (Blachowicz, 1985; Handscombe, 1990) must be further developed.

CHAPTER 6

SUMMARY OF MAIN CONCLUSIONS

AND

FUTURE TRENDS

CHAPTER 6 SUMMARY OF MAIN CONCLUSIONS AND FUTURE TRENDS

6.1 INTRODUCTION

The main aim of this investigation was to study the *Receptive Lexicon* of *Dual Language* (DL) *Gibraltarian* children in *Primary Schools*.

The languages involved were *Spanish* (L1) and *English* (L2). In addition, two other linguistic variables were studied, these being *Conceptual Vocabulary* and *Bilinguality*.

There were several lexical parameters which were considered, as follows. The *lexical development* in each linguistic variable was investigated using both *cross-sectional* and *longitudinal* data. *Cross-linguistic* phenomena were also studied. These were the receptive *lexical dominance* of one linguistic variable over the other, *correlations* between linguistic variables, and the *relative lexical proficiency* in each linguistic variable.

There were two *subordinate* aims. The first was to compare the performance in English, Spanish and Conceptual Vocabulary of DL subjects participating in Trial 1, with *'normalised' scores* for *monoglots*, as published in the British Picture Vocabulary Scales manual. The second subordinate aim was to conduct a series of *Item Analyses*. These provided data regarding the *lexical familiarity* of translational equivalents (i.e. in Spanish and English) for each referent used in the investigation. These analyses also provided data regarding the percentage correct responses which were correctly given for each referent in *both* languages - this was referred to as *equilingual familiarity*.

The thrust of all these analyses involved data from the whole cohort of subjects, regardless of gender or school attended, for each age code. The existence and significance of gender and school differences were however, statistically tested at different levels.

6.2 MAIN CONCLUSIONS

6.2.1 Gender and School Differences

a) Lexical Proficiency

Analyses were conducted to establish if there were significant differences in the *lexical proficiency* between genders and schools.

(i) In only *two* variables at Age Code 12 (Age 4:6-4:11 years) and in *all* variables at Age Code 07 (Age 7-7:5 years) was there any significant Male dominance in lexical proficiency.

(ii) There was a scattering of half a dozen cases of significant *gender* differences in lexical proficiency *within* schools. With one exception, these favoured Males.

(iii) Even when neighbouring samples were concatenated to comprise samples with a 12 months age range (and an increased sample size), there were only *four* cases of significant *gender* difference in lexical proficiency, scattered across the ages, again favouring Males.

(iv) A *gender* analysis across schools again failed to yield a clear pattern of significantly different lexical proficiency though in most cases of significant differences, it was Females across schools who showed the greatest variability.

(v) The incidence of significant differences in lexical proficiency *between* schools (*disregarding* gender) was considerably higher than for *gender* differences. However, there was not a distinct pattern of such differences. *First* School B was generally superior to C and then A and *Middle* School E was always superior to school D.

The results of an *Interactional* analysis (i.e. between schools and gender) indicated a significant difference at only *one* age code (06 - Age 6:6-6:11 years) and then in only *one* linguistic variable, i.e. Conceptual Vocabulary.

Conclusion

Considering the above, it was concluded that the results of these analyses indicated that there was no consistent pattern of gender differences in lexical proficiency. There was at best a negligible significant gender difference in lexical proficiency. A more conspicuous significant school difference in lexical proficiency failed to reveal a consistent pattern, particularly regarding the linguistic variable(s) where such significance was indicated. In

addition, analyses of *Interactional Effects* between *gender* and *schools*, failed to demonstrate any significant influence on lexical proficiency.

b) Lexical Development

Whereas lexical development with age was indicated in the great majority of comparisons involving neighbouring age codes with 6 months intervals, significance was established only in a minority and not always in all LVs. In the small number of cases when this significance was indicated, it did not occur at the same time for both genders.

Conclusion

The pattern of significant lexical development for each gender was not widespread nor consistent enough. It was therefore, concluded that there is generally no unequivocal gender difference in the pattern of lexical development.

c) Lexical Dominance

Whereas there are some *minor* differences in the incidence of *significant* dominance in any one language between the genders, and the age at which dominance *shift* takes place, the trend would indicate that there are no substantial gender differences regarding the pattern of lexical dominance.

Results of analyses using data from samples with 6 months age range were similar to those with 12 months age range. Both suggested that Females lexical dominance may shift significantly to English from 8 and Males from age 9.

d) Correlations Between Linguistic Variables

The predominant pattern suggests that there are positive correlations in the lexical proficiency between the great majority of LV dyads for *both* genders. These correlations are almost universally significant for *both* genders from Age Code 05 (Age 6-6:5 years) onwards. Up to this age code, the *incidence* of significant correlations in *Males* is more than double that in Females. Though one might conclude that in this respect, there is a gender difference in these early age codes, the pattern is however, not consistent.

A clearer pattern resulted from similar analyses on the data of concatenated groups with a 12 months age range. This pattern showed significant correlations between *all* but 3 negligible comparisons between dyads of linguistic variables. This indicated that when the age range was widened, there was practically no gender difference in the incidence of significance of correlations between LV dyads.

6.2.2 Whole Group Analyses

a) Lexical Development

(i) Analyses of *whole* group *cross-sectional* results indicated a *trend* of lexical development between age codes of 6 months differences. However, whereas lexical development with age was indicated in the great majority of comparisons involving neighbouring age codes with 6 months intervals, significance was established only in a minority and not always in all LVs.

(ii) Though there were several examples of significant lexical development between neighbouring age codes with 6 months difference, there was no unequivocal pattern.

(iii) The results of analyses of the same data between alternate age codes separated by 12 months, yielded almost twice as many cases of significant development.

(iv) The incidence of significant lexical development over a 6-8 months interval in the *longitudinal study* was nearly 3 times higher than that found in the analyses of *cross-sectional* data (comprising age difference of 6 months between groups). The majority of comparisons in the longitudinal analyses indicated a significant lexical development between Trials 1 and 2. There was significant lexical development in all linguistic variables (with one exception) between Trials 1 and 3 (though at 4 age codes, the samples were too small for meaningful statistical analyses). All analyses conducted between Trials 1 and 4 indicated significant lexical development.

(v) Percentage mean gains between the first trial (T1) and subsequent ones (T2, T3, T4) indicated that there was development in the great majority of linguistic variables but it was not *linear*.

Conclusion

It would seem that lexical development in *cross-sectional* studies is not revealed clearly when analyses are based on samples with an age difference of 6 months between them. Lexical development in such studies was more readily manifested when samples with a 12 months age difference were compared. It is possible that this is a function of an actual lower rate of lexical development which takes place naturally over a period of 6 months. It could also be a function of the insensitivity of the instrument to detect any significant lexical development over such a short period of time.

The results of longitudinal analyses between Trials 1 and 2 revealed a clearer pattern of lexical development than those of equivalent *cross-sectional* analyses between

neighbouring age codes (of 6 months interval) within Trial 1. This confirmed the value of longitudinal studies claimed in the recent literature. The lexical development continued in all linguistic variables, between a trial and subsequent ones though the development did not follow a linear pattern.

b) Lexical Dominance

(i) When lexical dominance was determined by comparing the *mean* lexical proficiency, significance for Spanish dominance was indicated in Age Codes 02-08 (Ages 4:6-7:11 years) inclusive with only one exception of non-significant English dominance at Age Code 06 (Age 6:6-6:11 years).

(ii) Significant dominance to English shifted at Age Code 09 (Age 8-8:5 years) and continued throughout with only one exception at Age Code 10 (8:6-8:11 years).

(iii) A similar pattern of dominance in Spanish and a shift to English occurred when dominance was measured according to whether a majority of subjects showed dominance in one of the languages.

(iv) The *dominance ratio* between Spanish and English was never higher than 1.31 and decreases with age showing that an approximation of the strength of each language, when considered independently, develops with age.

(v) Conclusions about the dominance of CV over L1 and L2 are summarised in d) below. Similarly, conclusions regarding L1/L2 dominance measured as a percentage of TLR, are summarised in e) below.

Conclusion

In the early ages, during the First School years, Spanish is generally dominant. Coinciding with the beginning of the Middle School years, there is an unambiguous dominance shift towards English which remains throughout subsequent years. This conclusion was confirmed by the results of analyses based on two different operational definitions of *lexical dominance* (See (i)-(ii) and (iii), above).

c) Correlations between Linguistic Variables

Significant correlations in performance were established between each dyad of linguistic variables, at most age codes, with negligible exceptions. Correlations between L1 and L2 ranged from 0.384 to 0.849 and significant correlations in excess of 0.6 were achieved in most age groups. The significant correlations with CV and Bilinguality suggested that both translational equivalents, and words for new referents were being acquired.

Conclusion

These results would suggest that, as expected given the 'bilingual'/diglossic status of the subjects, no language attrition took place.

d) Conceptual Vocabulary

(i) Conceptual Vocabulary was *significantly superior* to English, Spanish and Bilinguality, at *all* age codes.

(ii) The *ratio* however, between Conceptual Vocabulary and the other three linguistic variables, decreased with age. This reflected an increase in the acquisition of *translational equivalents* with age. However, the fact that CV continued developing indicated that new lexemes for new referents were also being acquired.

(iii) Up to Age Code 08 (Age 7:6-7:11 years) the CV/E ratios were larger than the CV/S ratios for each equivalent age code. The pattern was reversed, however, as from Age Code 09 (Age 8-8:5 years). This reflected the increased lexical development in English.

(iv) Between Age Codes 01 (Age 4-4:5 years) and 16 (Age 11:6-11:11 years), i.e. over a period of 8 years, the mean CV increased by 53%.

(v) The data indicated that the *Conceptual Vocabulary* of children between ages 4 and 6 could be 60% greater than their lexicon in English, and nearly 40% greater than their Spanish lexicon.

Conclusion

Conceptual Vocabulary was always greater than English or Spanish. This suggested that DL children's true lexical repertoire was much greater than indicated by their lexical knowledge in either of their languages. It also indicated that the process of acquiring the lexicon for new referents continued. However, the reducing ratio between CV and the other LVs also indicated an increase in the acquisition of *translational equivalents* with age.

e) Total Lexical Proficiency

Subjects' *Lexical Proficiency* as reflected by their *Total Lexical Repertoire* (i.e. the ***total*** number of words known, ***both*** *translational equivalents* being included in the count) increased with age; it nearly *doubled* over a period of 8 years. This was regarded as

being the truest indicator of a DL subject's *lexical proficiency* and could arguably be an indicator of a DL child's *language learning potential.*

When calculated from the TLR, the mean percentage of words known in any one of the two languages never exceeded 56% of the *Total Lexical Repertoire.* This showed that the *TLR* was almost equally divided between the two languages, at all times. However, Spanish had the greater mean percentage TLR up to and including age 7:11 years after which English became superior. Thus, a dominance shift at age 8 years was again noted.

f) Bilinguality

When measured as the number of referents for which correct 'bilingual' responses were given in the whole task (i.e. *referential, task* related measure), the *Bilinguality* performance increased threefold from Age Code 01 (Age 4-4:5 years) to 16 (Age 11:6-12 years) when the total attained was just over 72 percent. Furthermore, the number of ***items*** known bilingually increased twofold by Age Code 17 (Age 12-12:5 years) when just over 81% were known in both languages. This confirmed claims in the literature that *no* DL speaker is likely to be 100% 'bilingual' or *'ambilingual'.*

When *'bilinguality'* was calculated *lexically* (i.e. the mean percentage of the individual's TLR comprising the 'bilingual' lexicon) rather than *referentially*, over half of the TLR comprised *translational equivalents* at age 4-4:5 years. By the time age 11:6-11:11 years was reached, this figure had increased to 87.8%. The 'bilingual' lexicon thus increased by one and a half times over a period of 8 years.

The third measure (i.e. *referential, subject* related) showed that the mean *'bilinguality'*, when taken as a percentage of the *Conceptual Vocabulary,* increased nearly twofold between ages 4-4:5 years (39.9%) and 11:6-11:11 (78.2%).

g) Reliability and Validity

Reliability and *validity* was measured at different levels. The latter included *external* and *construct validity.* Statistical analyses indicated that any *rehearsal* or *practice effect* was likely to be negligible. This would suggest that the task enjoyed *reliability.*

Analyses of results between two *cohorts* participating in Trial 1 at different times, also indicated that the task enjoyed *external validity.*

The fact that there was a trend indicating lexical development with age, was taken as an indication of the existence of *construct validity.*

6.2.3 Second Level Analyses

a) Comparisons with BPVS 'Normalised' Scores for English Monoglots

The trend indicated following comparisons with BPVS *'normalised'* scores for English *monoglots* was that, if the Conceptual Vocabulary was taken as DL subjects' measure of lexical proficiency, the mean standard scores for this was within BPVS *'normal limits'* for all age codes up to and including 09 (Age 8-8:5 years), with the exception of Age Code 08 (Age 7:6-7:11 years) whose mean standard score was just over four points below 85, the latter indicating a **'z'** score of -1.

If only the standard score in English or Spanish is taken as the criterion for lexical proficiency, DL subjects' performance, will be perceived as inferior to that of monoglots' (according to BPVS *'norms'*) as early as Age Code 04 (Age 5:6-5:11 years) in both languages and in English 6 months earlier. This practice could therefore, lead to incorrect diagnoses of communication problems and subsequently, inappropriate responses to the DL subjects' educational needs. However, even if the CV was taken as a criterion, many children above the age of 8 1/2 years of age could also become victims of this misdiagnosis.

An analysis of the percentage of DL children obtaining BPVS *within 'normal' limits* (WNL) scores (i.e. *standard Score* of 85 or more) was conducted. It suggested that if DL children's receptive lexical proficiency was measured by using the BPVS, the margins of error in *diagnosing* L1 and L2 or specific language learning problems (defined by a low *Conceptual Vocabulary* - See earlier chapter) would be unacceptably high.

b) Item Analyses

(i) Lexical Familiarity

Item Analyses indicated that 77 of the 100 items received a significantly different number of correct responses in each language, in at least one age code. The familiarity pattern in each language was generally erratic. It was suggested that there may have been predominantly sociolinguistic reasons for this and that the educational system in Gibraltar could also have contributed. Both these factors could have determined when the word for an item would be acquired in one language or the other. Other published research (See Chapter 5) has reported that there may not be a consistent pattern of acquisition of vocabulary for new referents or of translational equivalents.

An interesting finding was that the dominant lexical familiarity for eight items shifted from one language to the other, in all cases but one from Spanish to English. This familiarity dominance shift occurred after a certain age and never reverted to the previously dominant language after this. Other published research (See Chapter 5) has suggested that the familiarity for certain words may decrease because of reduced or lack of usage of these words.

(ii) Equilingual Familiarity

Regarding *equilingual familiarity* i.e. the percentage of responses known in both languages for any one item, an erratic pattern was again indicated, so that the '*equilingual familiarity*' did not increase with age for all items. There was however, a trend indicating an increase with age in the number of items receiving over 90% correct responses in both languages.

(iii) Cultural Bias

Following appropriate analyses, it was concluded that none of the referents used in this study suffered from cultural bias.

Finally, the results of this study and the conclusions reached have very definite practical implications for professionals in the educational and remedial fields which have already been discussed in Chapter 5.6.

6.3 THE WAY FORWARD - FUTURE TRENDS

6.3.1 Introduction

There is much that one can learn from the outcome of this study both from its unequivocal results and from the questions that remain unanswered. The proposals for future research which will now be briefly discussed result from both of these and from indications suggested by the study's outcome regarding possible refinements which should be considered in future research.

6.3.2 Research Design Considerations

The sample sizes employed in this study are not unprecedented but are also not common in studies of this nature. Less common, however, are studies employing samples comprising such a large percentage of the parent population. Whereas research employing large samples do have their advantages, e.g. they allow for more confident generalisations to be made, they also have disadvantages which are both logistic and empirical. Smaller samples allow for attending to more detail and for more rigorous control of the experimental design. For example, in this study, the large sample was one of the reasons for necessitating research assistants (RAs). These assistants had been trained in the conduct of the data collection and were instructed to adhere closely to a script and other important procedures. Whilst there is no reason to believe that assistants had deviated from the prescribed procedures, it is not clear to what extent the use of such assistants affected the reliability or validity of the study and its results but the threat of such an effect is a consideration. It must be said however, that many RAs made useful contributions not least by the insights they offered but also by the mere fact that they were familiar with and to the children.

Depending on RAs, added to the fact that the author was not able to be in Gibraltar when all trials were due to take place, was largely responsible for one minor disadvantage. This was that the prescribed 6 months intervals between trials was not always adhered to by the RAs. It must be said, however, that allowances and qualifications have been made for this (See Chapter 4). Furthermore, analyses of the data have shown that intervals of not more than 6 months between trials may not be enough for significant changes in lexical proficiency to be detectable. The initial concern therefore, that the pre-scribed six months intervals between trials were not always adhered to, may not have been justified.

Generally speaking, however, many of the potential disadvantages had been considered during the development of the design of this study. This author's view is that the

achievement of the objectives of this particular study was facilitated by its design, despite some of these qualifications.

It would be up to future researchers to consider these critically. One consideration offered by this author is that future research uses smaller samples though the results of this study could provide useful guidance. By studying smaller samples, a researcher may find it easier to devote time to seeing each subject individually rather than in groups. In the present study, only the younger subjects were seen individually. This would help to enhance the reliability of the subject's performance as the exercise would be more rigorously controlled.

It would seem from the results of this study that it was perhaps not essential or desirable to repeat trials after approximately six months and that intervals of 12 months were more appropriate.

Future research should consider a modification to the strategy employed to select the experimental lexical corpus. This issue has already been argued earlier. There are several options and the following issues might be considered. The distinction between the language (and lexical) proficiency required for *basic interpersonal communication* i.e. BICS (Cummins, 1980) and the one required for *cognitive-academic* purposes i.e. CALP (Cummins, 1980) has already been referred to in Chapter 2.2. This distinction is more crucial for DL speakers particularly if they are also diglossics since a proportion of the total lexicon will appear at only one level and not the other. This study has shown evidence of this in that when subjects were more familiar with English lexemes and not so much with the Spanish equivalents, these related more to the school environment or work, i.e. CALP. The opposite was sometimes true because the lexicon related more to DL subjects' BICS. In selecting lexical items relating to subjects' BICS, the lexicon used in several domains should be observed and subsequently incorporated in the experimental lexical corpus. Kellerman's (1976) *lateralisation* strategy (See Chapter 3) could thus, be employed.

One final observation on this issue is that though not easy to achieve, the lexical corpus should be developmentally rational and should also consider variations resulting from socio-economic and socio-cultural factors. Formulating a lexical corpus based on these considerations is in itself likely to be a complex and mammoth task requiring large resources, particularly since two languages are involved. Though the strategies just proposed are ideal, there are others which might be more expedient and possibly just as valid.

Abudarham (1976) employed a method for selecting a DL lexical corpus which would generally satisfy these requirements. It was an application of a strategy used by Carroll and White (1973) with monoglot speakers. Their study required adult subjects to estimate at what age they thought they had acquired each of a long list of 220 words. The results correlated significantly with published word frequency counts such as those of Thorndike and Lorge's (1944). Another method for determining such levels of difficulty was employed by Noble (1953) who used the concept of word familiarity. Adult subjects were required to state, on a 5 point scale, how familiar each of a long list of words was to them.

The results of this study (Abudarham, 1976) concluded that certain words which he referred to as *alpha* words, shared the same estimated age of acquisition and familiarity in both languages. He thus, suggested that these words were probably the most appropriate for inclusion in a test of receptive lexicon as they did not seem to have any language bias. Abudarham (1976) also concluded that the results of the study indicated that a lexicon can be produced which is free from biases imposed by the independent variables e.g. gender, age, educational background. Other biases can also be neutralised using the same research strategy.

One area of future research could aim at confirming in a more pragmatic fashion whether there are significant correlations between estimated age of acquisition and/or word familiarity for such words and how early these are actually acquired by DL children. If such correlations existed, the less expensive and laborious study involving young subjects can be replaced by a much more expeditiously but equally reliable word familiarity, or age of acquisition one with adults, or even adolescents.

6.4 PASTURES NEW AND NOT SO NEW

The following are suggestions for future research with particular reference to DL subjects. Some of the proposals relate to work already done with monoglots and others suggest fresh areas, or extending on areas which have only recently been employed. As has been suggested earlier, there is a need for longitudinal studies since cross-sectional studies seem to prevail. Only the latter can provide indications of reliable developmental progressions (Meara, 1982; Abudarham, 1987; Hoffman, 1991; Ellis, 1994; Romaine, 1995).

6.4.1 Semantics, Pragmatics and Interlanguage

A greater focus on other linguistic parameters may be particularly useful in the case of DL speakers. Studies in areas such as semantics and pragmatics might provide a rich source for the appropriate remedial and pedagogical professions. The problems in developing an appropriate research design can not be minimised particularly in the field of Dual Language. Another problem lies in the lack of consensus about, and inadequacy of, current semantic and pragmatic theoretical models, the latter in particular, as reflected by the paucity of assessment material, Crystal's Profile in Semantics i.e. PRISM (Crystal, 1982) and Dewart and Summers' Pragmatics Profile (1995) being two notable exceptions. Two models related to pragmatics and semantics developed with the DL child in mind are offered by Omark and Erickson (1983:103).

Ellis' comments (1994) regarding research into pragmatics have already been reported (See Chapter 2.2.10). There is a clear need to conduct *longitudinal* studies on the acquisition of pragmatic skills in 'bilingual' subjects, so that the developmental process can be explored. Socio-cultural backgrounds and mores might determine such acquisition. Cheng (1995) states that non-verbal cues such as eye contact and body language are embedded in socio-cultural contexts. For example, cultures such as those of some Asian (South) communities vary the amount of information explicitly transmitted through verbal channels as opposed to information transmitted contextually through physical cues present, and the person's body and facial language. Cheng (1995) gives an example of this and says that Asian parents in general have trained their children to be quiet and obedient. They may thus, be receiving conflicting messages at home and at school. Bishop (1988) reports that 'bilingual' Vietnamese children were using English along with home culture discourse rules, simultaneously engaging two different codes, one linguistic and one pragmatic. Parallel cross-cultural studies are therefore, needed.

In addition to this, both the independent and dependent variables that need to be considered when studying semantic and pragmatic skills are multifarious and often complex. These range from being able to formulate credible operational definitions to arriving at a reliable, valid and useful measure for evaluating them. In addition, semantics is also a complex variable because it does not only relate to lexicon (See Crystal's PRISM-L - Crystal 1982) but also to grammar (PRISM-G - Crystal, 1982). The contribution of other linguistic parameters such as prosody, which contribute to semantics, has not escaped this author and neither has their interplay and cumulative outcome.

The field of interlanguage seemed to have remained somewhat dormant for a few years after Selinker (1972) wrote about it. In recent years however, this subject has attracted serious attention (Bialystok and Sharwood-Smith, 1985; Tarone, 1988; Sharwood-Smith, 1991). The usefulness of studying DL lexicon within the context of interlanguage theory remains to be established. Some research has been conducted in this field (e.g. Walters, 1979; Carrell and Konneker, 1981; Olshtain and Blum-Kulka, 1985; Ellis, 1994) as reported in Chapter 2.2.10.

6.4.2 Acquisition Strategies

The acquisition contexts and strategies for the lexicon in each language has been discussed for many decades now (See Chapter 2.2). One area of work in this field that is enjoying currency is that of *Fast Mapping* (Dollaghan, 1985; 1987; Rice, Buhr and Nemeth, 1990). The term is applied to the hypothesised process enabling children to rapidly create lexical representations of unfamiliar words encountered. Westby (1995) states that whereas this research has shown that *monoglot* children identified as specifically language impaired, experience more difficulty on a number of *fast mapping* tasks, similar research has not been conducted on 'bilingual' children. She suggests that it is possible that *fast mapping* tasks could be employed to assess the language learning potential of 'bilingual' pre-school children.

Though the hypothesis is still being tested on monoglots, there does not seem to be similar published work on DL subjects. Such studies could be very productive and help to explain issues such as how DL subjects acquire new words and subsequently lexical equivalents in the other language. For example, is there any evidence that acquisition of a new word is *fast mapped* i.e. the connection between a new word and the referent is inferred. Furthermore, when DL subjects first encounter a translational equivalent for the first time, do they employ the same strategy as monoglots might, and if so do they make connections with the referent and/or the translational equivalent that they do know, as well?

Another phenomenon which may need further research is the varying rates at which (each) language is acquired and its relationship with different developmental phases/stages. Goldfield and Reznick (1990) studied the language development in the second year of 24 normally developing monolingual middle class English speaking children. The data came from diaries kept by mothers in addition to vocabulary check lists completed at two monthly laboratory visits. Eighteen subjects completed the trials and 75 or more words were documented. Seventy two per cent of the subjects evidenced a period of rapid word-learning or as sometimes referred to vocabulary *spurt* or *naming explosion*.

The possibility that this may also happen in young 'bilingual' speakers may provide some answers to such questions which could in turn suggest assessment and pedagogical strategies.

Another area for future research is the role played by *metalinguistic awareness* in second language learning. Examples of recent work in this field are those published by (Thomas, 1988; Bialystok, 1991b; Malakoff and Hakuta, 1991), others having been cited in Chapter 2.2.

6.4.3 Diagnostic Issues

Being in the field of speech and language pathology and therapeutics, this author declares some professional bias in his attempt to study the practical implications of this study and in suggesting a practical orientation for future studies.

Diagnoses of specific language-learning problems are not easy to arrive at even with monoglots. There is an absence of enough valid and reliable objective assessments for 'bilinguals' with different cultural and linguistic backgrounds. However, despite admonitions from authors such as Romaine (1995) and Westby (1995) - See Chapter 5.6.2 - the identification of communication problems can also be aided by a knowledge of developmental 'norms', provided cultural variations are considered. There would seem to be a paucity of data on norms for non-English language development both in children living in their mother land and in host countries. Westby (1995) reports that there is limited information on the language development of children for many languages in the world. She adds that most of the information that *is* available is limited to vocabulary or syntactic development. Regarding the language development of pre-school children in particular, she states, "Only anecdotal data are available from children who are developing two languages simultaneously or sequentially." One has to consider however, that 'norms' for children developing language in their country of origin are not

necessarily the same as for peers developing the same language outside the 'mother' land. There are socio-cultural, affective, and linguistic reasons for these, particularly since the former *usually* only need to concentrate on one language or at worst a number of dialects belonging to the same language. There are of course countries which are bi- or multilingual but the societal and linguistic demands are different to those of other countries.

Westby (1995) also draws the pre-requisite distinctions regarding assessment and intervention issues between Pre-school and School age children. Assessment strategies should differ in terms of focus and format, the language(s) used and how they are used (diglossic variables) and the differing nature and goals of intervention. For example, the focus of assessment for pre-schoolers should be on culture/nurture i.e. how the child functions within the home culture and the nature of the child's interactions with others in the environment. For school age children the focus should be on the individual's skills in relation to the curriculum. The pre-school child is more likely to be developing communication skills in only one language and if so this should be the major focus of attention. It is their *basic interpersonal communication skills* (BICS) that need to be assessed. She does not however, seem to consider that *simultaneous bilinguals* are exposed to two languages simultaneously and does not discuss whether BICS should then be assessed in one of the two languages, or both independently, or whether the communicative competence resulting from the interchangeable and cumulative use of both languages should be considered in any assessment of BICS. Westby (1995) states that the child in mainstream school requires L2 to benefit from schooling and so the focus of assessment should be on their *cognitive and academic language proficiency* (CALP). This does not mean that their communication skills in only *one* language need to be assessed. A differential diagnosis can not be arrived at unless communication skills in *both* languages are assessed.

There is clearly much work still to be done on developing different but reliable assessment strategies which meet the differing needs of pre- and mainstream school children.

The present study strongly suggests that there is a need for research into the interaction and relationship between the two languages and to what extent and how each independently and *cumulatively* contributes to, or compromises, the individual's communicative competence in different societal domains. It is often this information which is necessary to arrive at a differential description of the existence of any communication problem and its nature. This information, as has already been discussed, may have management implications.

There would seem to be a great need by practitioners for the development of reliable and valid assessment, diagnostic and pedagogical procedures which may be based on, or extend from, conclusions similar to those arrived at in this study. The reasons for this are discussed or implied in Chapter 5.6 of this thesis. However, before one can develop such instruments, more research is needed on aspects which may impinge on their design and use. An example of this is in the nature of the task used during assessment. It is not just the avoidance of culture-bound material that needs to be considered but also other restrictions which a culture might put on the presentation of assessments. Heath (1983), Gutierrez-Clellen and Iglesias (1987) and Quinn (1992) have illustrated how in some culture picture naming is not a common activity. Cultural mores may dictate that children should not initiate communication with adults. Expectations of children's academic skills and behaviour patterns might differ across cultures (Hess et al, 1980; Tobin, Wu and Davidson, 1989). One can therefore, not make assumptions that children who have attended pre-school programmes in another country will have the skills of their peers in the host country. Much cross-cultural research is thus, still needed to study these variations and their implications on the diagnostic and remedial process.

Mercer and Lewis(1976) advocated a system of multicultural pluralistic assessment (SOMPA). However, to date many authors have acknowledged that there is no easy solution to the problem of assessing bilingual handicapped children. Mowder (1980) has argued that pluralistic assessment techniques integrate socio-cultural factors in the evaluation of intelligence aptitude scores which provide estimates of learning potential and distinguishes "between retarded individuals and those with impaired abilities due to socio-cultural factors." Much research is still needed in this field.

6.4.4 Replication Studies

To some extent, the present study was replicated, albeit *post hoc,* and the results indicated that there was generally speaking *external validity.* This would enable the generalisation of the results of the present study to the primary school parent population. However, one could not generalise the result of this study to other DL populations.

It would therefore, be necessary to replicate this study using other DL populations. This would offer comparative and contrastive data which might suggest universal patterns of DL lexical acquisition and also identify factors responsible for variations. However, any expectations that any substantial agreement in outcome will be obtained between studies involving other languages or cultures may be unrealistic. This could even apply to other Spanish-English speaking communities. Evard and Sabers (1979) found that Spanish syntax does not change significantly from one cultural group to another but vocabulary

does differ greatly *within* the same group and among the *various* Spanish speaking cultures.

Mowder (1980) agrees and states that "Not only are the varieties of bilingualism awesome - but it must be recognised that subdivisions exist even within bilingual groups" so that not all Spanish-English speaking people, for example, use the same dialect, language context or language characteristics.

6.5 CONCLUSION

It does not require a fertile imagination to propose further areas for future research. Those which have been suggested reflect work which has already been started but from which the need for further developments are indicated. Some areas such as 'Fast Mapping' regarding DL lexical acquisition do not seem to have been addressed in the 'bilingual' literature as yet. Other suggestions have been made specifically because of their potential practical value.

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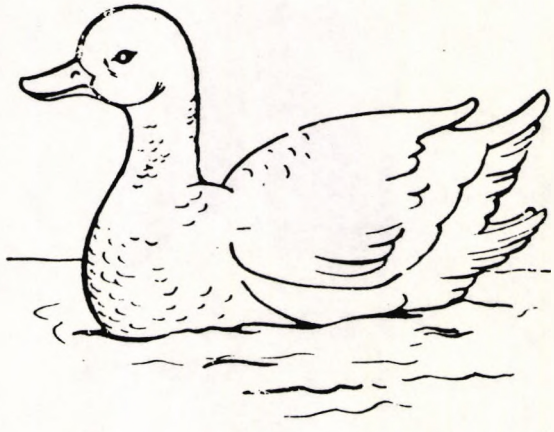
APPENDICES

APPENDIX 1.1a SAMPLE OF BPVS PICTURE PLATE

1



2

3

4

APPENDIX 1.1b BRITISH PICTURE VOCABULARY SCALES ITEMS USED IN THE STUDY

ITEM	ITEM	ITEM
1. HAND (S1)	26. DELIGHTED (E40)	51. STADIUM (S75)
2. MONEY (E2)	27. TUGGING (E41)	52. TORTOISE (E151)
3. GATE (E5)	28. TEACHER (S43)	53. READING (E154)
4. BOAT (S6)	29. FRUIT (E44)	54. TIME (E155)
5. SNAKE (S7)	30. DISAGREEMENT (S46)	55. COW (E158)
6. DRUM (E8)	31. ROOT (E47)	56. CANDLE (E160)
7. LADDER (S10)	32. PAIR (S48)	57. ACCIDENT (E162)
8. PENGUIN (E11)	33. WRIST (S49)	58. NET (S163)
9. NECK (S13)	34. WAITER (E50)	59. BROKEN (S166)
10. BEE (S15)	35. SORTING (E53)	60. DENTIST (E168)
11. FEATHER (E17)	36. GRAIN (S54)	61. CLAW (E170)
12. BRUSHING (E18)	37. TUBULAR (S55)	62. FOREST (S171)
13. TORCH (S20)	38. GREETING (E56)	63. WOOLLY (E174)
14. SPANNER (E21)	39. ORNAMENT (E58)	64. DIVING (S176)
15. ARROW (S23)	40. ENTERTAINER (S59)	65. FLASK (S177)
16. CHOPPING (E24)	41. PLASTERING (S61)	66. ANCHOR (E178)
17. SHARING (E25)	42. SEED (S63)	67. DRIPPING (E182)
18. HORROR (E28)	43. TUSK (E65)	68. BOLT (E184)
19. FURRY (S29)	44. LOCKET (E66)	69. SURPRISE (S185)
20. DELIVERING (S30)	45. WEASEL (S68)	70. FERN (S187)
21. LIQUID (E31)	46. ISOLATION (E69)	71. STEAM (E190)
22. EAGLE (S33)	47. EMERGING (S71)	72. BALCONY (S191)
23. PASTING (E34)	48. GROOMING (E72)	73. LINK (E193)
24. VEGETABLE (S36)	49. SWAMP (E73)	74. SNARLING (S196)
25. ANKLE (S38)	50. APPLAUDING (E74)	75. BLOOM (S198)

KEY S = SPANISH; E = ENGLISH; THE NUMBER IN THE BRACKET REFERS TO THE ORDER OF THE STIMULUS, GIVEN IN THE LANGUAGE INDICATED BY THE INITIAL TO ITS LEFT e.g. HAND (S1) was given in Spanish first and was the first lexical stimulus given.

APPENDIX 1.2 PICTURE STIMULI, THEIR ORDER OF PRESENTATION, TRANSLATIONAL EQUIVALENTS, AND GRAMMATICAL CATEGORY OF RELEVANT LEXEME

PLATE NUMBER (BPVS)		REFERENT & ORDER ENGLISH		REFERENT & ORDER SPANISH	GRAMMATICAL CATEGORY
1		1	HAND	100 MANO	NOUN
2		2	MONEY	101 DINERO	NOUN
3	**	102	TRAIT	3 PETRA	NONSENSE
4	**	4	STANT	103 SALCA	NONSENSE
5		5	GATE	104 RASTRILLO	NOUN
6		105	BOAT	6 BOTE	NOUN
7		106	SNAKE	7 SERPIENTE	NOUN
8		8	DRUM	107 TAMBOR	NOUN
9	***	108	SLURP	9 METON	NONSENSE
10		109	LADDER	10 ESCALERAS	NOUN
11		11	PENGUIN	110 PINGUINO	NOUN
12	**	12	LARTS	111 SELESIO	NONSENSE
13		76	NECK	13 PESCUEZO	NOUN
14	*	14	TRACTOR	77 TRACTOR	NOUN
15		78	BEE	15 ABEJA	NOUN
16	+	79	GATE	16 RASTRILLO	NOUN
17		17	FEATHER	80 PLUMA	NOUN
18		18	BRUSHING	81 CEPILLANDO	VERB
19	+	19	BAROMETER	82 BAROMETRO	NOUN
20		83	TORCH	20 ANTORCHA	NOUN
21		21	SPANNER	84 HERRAMIENTA	NOUN
22	*	85	TWISTED	22 TORCIDO	ADJECTIVE
23		86	ARROW	23 FLECHA	NOUN
24		24	CHOPPING	87 CORTANDO	VERB
25		25	SHARING	124 COMPARTIENDO	VERB
26	**	125	CLASO	26 ALTOR	NONSENSE
27	**	27	SPRET	126 PERON	NONSENSE
28		28	HORROR	127 HORROR	NOUN

Appendix 1.2 (Continued)

PLATE NUMBER (BPVS)		REFERENT & ORDER ENGLISH		REFERENT & ORDER SPANISH	GRAMMATICAL CATEGORY
29	128	FURRY	29	SARROSO	ADJECTIVE
30	129	DELIVERING	30	REPARTIENDO	VERB
31	31	LIQUID	130	LIQUIDO	NOUN
32	** 131	MIRTLE	32	SPLETO	NONSENSE
33	132	EAGLE	33	AGUILA	NOUN
34	34	PASTING	133	EMPASTANDO	VERB
35	** 35	CORNY	134	CANSOSO	NONSENSE
36	135	VEGETABLE	36	VERDURA	NOUN
37	* 37	SWIMMING	88	NADANDO	VERB
38	89	ANKLE	38	TOBILLO	NOUN
39	90	JUG	39	JARRO	NOUN
40	40	DELIGHTED	91	ENCANTADO	ADJECTIVE
41	41	TUGGING	92	TIRANDO	VERB
42	* 42	BOULDER	93	PIEDRA	NOUN
43	94	TEACHER	43	MAESTRA	NOUN
44	44	FRUIT	95	FRUTA	NOUN
45	* 96	WATERING	45	REGANDO	VERB
46	97	DISAGREEMENT	46	DESACUERDO	NOUN
47	47	ROOT	98	RAIZ	NOUN
48	99	PAIR	48	PAR	NOUN
49	136	WRIST	49	MUNECA	NOUN
50	50	WAITER	137	CAMARERO	NOUN
51	*** 51	STITT	138	ESTOL	NONSENSE
52	** 139	DRACK	52	PARETO	NONSENSE
53	53	SORTING	140	COLOCANDO	VERB
54	141	GRAIN	54	GRANO	NOUN
55	142	TUBULAR	55	TUBULAR	ADJECTIVE
56	56	GREETING	143	SALUDO	NOUN
57	** 57	TARN	144	HASON	NONSENSE
58	58	ORNAMENT	145	ADORNO	NOUN

Appendix 1.2 (Continued)

PLATE NUMBER (BPVS)		REFERENT & ORDER ENGLISH		REFERENT & ORDER SPANISH		GRAMMATICAL CATEGORY
59		146 ENTERTAINER	59	FESTEJADOR		NOUN
60	**	147 CHINT	60	PANSO		NONSENSE
61		112 PLASTERING	61	EMPLASTANDO		VERB
62	**	113 CARK	* 62	PORTAL		NONSENSE
63		114 SEED	63	SEMILLA		NOUN
64		64 TRACK	115	VIA		NOUN
65		65 TUSK	116	COLMILLO		NOUN
66		66 LOCKET	117	BROCHE		NOUN
67	*	67 WHINING	118	GEMIENDO		VERB
68		119 WEASEL	68	COMADREJA		NOUN
69		69 ISOLATION	120	AISLAMIENTO		NOUN
70	*	121 SCORPION	70	ESCORPION		NOUN
71		122 EMERGING	71	EMERGIENDO		VERB
72		72 GROOMING	123	ARREGLANDO		VERB
73		73 SWAMP	148	PANTANO		NOUN
74		74 APPLAUDING	149	APLAUDIENDO		VERB
75		150 STADIUM	75	ESTADIO		NOUN
3		151 TORTOISE	224	TORTUGA		NOUN
3		223 BEAR	152	OSO		NOUN
4		225 YAWNING	153	BOSTESANDO		VERB
4		154 READING	226	LEYENDO		VERB
9		227 TIME	155	HORA		NOUN
9		156 SCREEN	228	PANTALLA		NOUN
12		230 KANGAROO	157	CANGURO		NOUN
12		158 COW	229	VACA		NOUN
14	*	159 BANK	231	BANCO		NOUN
14		232 CANDLE	160	VELA		NOUN
16		161 HATCH	234	INCUBAR		VERB
16		162 ACCIDENT	233	ACCIDENTE		NOUN
19		235 NET	163	RED		NOUN

Appendix 1.2 (Continued)

PLATE NUMBER (BPVS)	REFERENT & ORDER ENGLISH		REFERENT & ORDER SPANISH		GRAMMATICAL CATEGORY
19	164	SAFE	236	CAJA DE HIERRO	NOUN
22	238	COBWEB	165	TELARANA	NOUN
22	237	BROKEN	166	ROTA	ADJECTIVE
26	167	ELECTRICIAN	239	ELECTRICISTA	NOUN
26	168	DENTIST	240	DENTISTA	NOUN
27	242	BEAK	169	PICO	NOUN
27	170	CLAW	241	TALON	NOUN
32	243	FOREST	171	BOSQUE	NOUN
32	244	VALLEY	172	VALLE	NOUN
35	246	FEATHERY	173	PLUMOSO	ADJECTIVE
35	174	WOOLLY	245	LANOSO	ADJECTIVE
37	175	PADDLING	200	REMANDO	VERB
37	199	DIVING	176	ZAMBULLANDO	VERB
39	202	FLASK	177	FRASCO	NOUN
39	178	HAMMOCK	201	HAMACA	NOUN
42	179	ANCHOR	203	ANCLA	NOUN
42	180	SUNDIAL	204	RELOJ DE SOL	NOUN
45	206	SHOWERING	181	DUCHANDO	VERB
45	182	DRIPPING	205	GOTEANDO	VERB
51	183	FILE	208	LIMA	NOUN
51	184	BOLT	207	PERNO	NOUN
52	210	SURPRISE	185	SORPRESA	NOUN
52	209	PRIDE	186	ORGULLO	NOUN
57	211	FERN	187	HELECHO	NOUN
57	212	IVY	188	HIEDRA	NOUN
60	214	SMOKE	189	HUMO	NOUN
60	190	STEAM	213	VAPOR	NOUN
62	216	BALCONY	191	BALCON	NOUN
62	192	ARCHES	215	ARCOS	NOUN
64	193	LINK	217	ANILLO	NOUN

Appendix 1.2 (Continued)

PLATE NUMBER (BPVS)	REFERENT & ORDER ENGLISH		SPANISH		GRAMMATICAL CATEGORY
64	194	XYLOPHONE	218	XYLOFONO	NOUN
67	219	HUNTING	195	CAZANDO	VERB
67	220	SNARLING	196	GRUNIENDO	VERB
70	222	BEEHIVE	197	COLMENA	NOUN
70	221	BLOOM	198	FLORACION	NOUN

** NONSENSE WORDS USED AS DECOYS IN PILOT STUDY BUT OMITTED FROM ANALYSES

*** NONSENSE WORDS USED AS DECOYS IN MAIN STUDY BUT OMITTED FROM ANALYSES

* WORDS DROPPED AFTER PILOT STUDY AND NOT USED IN MAIN STUDY ANALYSES

+ WORDS NOT USED IN FINAL ANALYSES

APPENDIX 2.1 LETTERS FROM EDUCATION OFFICER & GOVERNMENT STATISTICIAN IN GIBRALTAR REGARDING LIKELY SOCIO-ECONOMIC STATUS OF SAMPLE

Government of Gibraltar
Department of Education
40 Town Range
Gibraltar

☎ (350) 78638/75987

General Education Adviser: L Lester BSc(Hons), MA(Ed),M Inst P, CPhys.

S Abudarham, FCSLT, M.Sc.,
MCSLT, Dip CST, LCST.
School of Speech Therapy
University of Central England
in Birmingham,
Franchise Street, Birmingham B42 2SU

Your reference:
Our reference:
Date: 1 September 1992

Dear Sam

It was good to see you again. I was pleased to learn that your hard work for your PhD is "nearly" over.

2. Regarading the issue you raised, I confirm that the three First Schools and two Middle Schools which participated in your study, and from which you took your samples, represent a socio-economic cross-section of the Primary Schools and indeed of the general population in Gibraltar.

3. I look forward to receiving an abstraact of your final dissertation.

Best wishes

L Lester
General Education Adviser

LL/SG

STATISTICS OFFICE
NO. 6 CONVENT PLACE
GIBRALTAR

Mr. S. Abudarham, FCSLT, MSc, LCST,
DipCST, (Reg.)MCSLT
199 Pershore Road,
Birmingham B5 7PF
England.

Your referehce:
Our reference: EPS 39B
Date: 1 July 1993

GC

Dear Mr. Abudarham,

SOCIO-ECONOMIC STATUS

Further to your letter dated 4.6.93 and to our telephone conversation, I am afraid that there are no data on socio-economic status in either the 1981 or 1991 Census.

I can confirm that the schools selected by you are spread out across the city drawing from different catchment areas. It probably is a valid assumption that children in these schools fairly represent a cross-section of socio-economic status.

Also enclosed are copies of the 1981 and 1991 Censuses for your information.

Yours faithfully,

J.L. Pinero, BSc Econ (Hons), D.I.S., AITSA
Government Statistician

APPENDIX 2.2 NUMBER OF MALE AND FEMALE SUBJECTS WHO COMPLETED TRIAL ONE IN EACH SCHOOL, ACCORDING TO AGE.

AGE		FIRST SCHOOLS				AGE	MIDDLE SCHOOLS		
CODES	SEX	A	B	C	TOTALS	CODES	D	E	TOTALS
01	M	7	1	1	9	09	4	7	11
(4-4:5)	F	5	1	5	11	(8-8:5)	4	8	12
		12	2	6	20		8	15	23
02	M	2	3	1	6	10	4	10	14
(4:6-	F	4	3	-	7	(8:6-	9	11	20
4:11)		6	6	1	13	8:11)	13	21	34
03	M	4	1	1	6	11	9	8	17
(5-5:5)	F	2	1	2	5	(9-9:5)	7	6	13
		6	2	3	11		16	14	30
04	M	6	-	2	8	12	7	4	11
(5:6-	F	3	-	2	5	(9:6-	9	6	15
5:11)		9	0	4	13	9:11)	16	10	26
05	M	4	4	4	12	13	3	6	9
(6-6:5)	F	9	4	4	17	(10-	3	11	14
		13	8	8	29	10:5)	6	17	23
06	M	5	10	6	21	14	8	2	10
(6:6-	F	5	7	6	18	(10:6	3	8	11
6:11)		10	17	12	39	10:11)	11	10	21
07	M	6	-	7	13	15	5	5	10
(7-7:5)	F	5	-	8	13	(11-	8	13	21
		11	0	15	26	11:5)	13	18	31

Appendix 2.2 (Continued)

AGE CODES	SEX	FIRST SCHOOLS A	B	C	TOTALS	AGE CODES	MIDDLE SCHOOLS D	E	TOTALS
08	M	5	-	11	16	16	6	4	10
(7:6-	F	6	-	9	15	(11:6	5	3	8
7:11)		11	0	21	31	11:11)	11	7	18
						17	1	1	2
						(12-	2	-	2
						12:5)	3	1	4

GENDER	FIRST SCHOOLS A	B	C	SUB-TOTALS	MIDDLE SCHOOLS D	E	SUB-TOTALS	GRAND TOTALS
MALE	39	19	33	91	47	47	94	185
FEMALE	39	16	36	91	50	66	116	207
TOTALS	78	35	69	182	97	113	210	392

KEY M = MALE; F = FEMALE

APPENDIX 2.3 TRIAL ONE SAMPLE SIZE WITHIN EACH DECLARED HOME LANGUAGE-USE ACCORDING TO EACH AGE CODE.

AGE CODE	SEX	HOME LANGUAGE S	R	A	K	TOTALS	AGE CODE	HOME LANGUAGE S	R	A	K	TOTALS
01	M	2	2	3	2	9	10	4	7	2	1	14
(4-	F	3	4	2	2	11	(8:6-	3	6	8	3	20
4:5)		5	6	5	4	20	8:11)	7	13	10	4	34
02	M	0	2	4	0	6	11	3	7	4	3	17
(4:6-	F	1	4	2	0	7	(9-	3	3	3	4	13
4:11)		1	6	6	0	13	9:5)	6	10	7	7	30
03	M	1	3	1	1	6	12	1	9	1	0	11
(5-	F	2	1	1	1	5	(9:6-	1	10	3	1	15
5:5)		3	4	2	2	11	9:11)	2	19	4	1	26
04	M	3	5	0	0	8	13	1	4	1	3	9
(5:6-	F	0	3	2	0	5	(10-	0	8	2	4	14
5:11)		3	8	2	0	13	10:5)	1	12	3	7	23
05	M	0	8	3	1	12	14	1	5	3	1	10
(6-	F	3	9	3	2	17	(10:6-	1	6	3	1	11
6:5)		3	17	6	3	29	10:11)	2	11	6	2	21
06	M	4	5	7	5	21	15	1	5	3	1	10
(6:6-	F	2	7	6	3	18	(11-	4	10	5	2	21
6:11)		6	12	13	8	39	11:5)	5	15	8	3	31
07	M	0	9	2	2	13	16	1	4	4	1	10
(7-	F	4	7	0	2	13	(11:6-	0	5	2	1	8
7:5)		4	16	2	4	26	11:11)	1	9	6	2	18

Appendix 2.3 (Continued)

AGE CODE	SEX	HOME LANGUAGE S	R	A	K	TOTALS	AGE CODE	HOME LANGUAGE S	R	A	K	TOTALS
08	M	2	11	3	-	16	17	0	1	1	0	2
(7:6-	F	1	12	0	2	15	(12-	0	1	1	0	2
7:11)		3	23	3	2	31	12:5)	0	2	2	0	4
09	M	1	5	4	1	11						
(8-	F	0	5	6	1	12						
8:5)		1	10	10	2	23						

GENDER	FIRST SCHOOLS HOME LANGUAGE S	R	A	K	SUB-TOTAL	MIDDLE SCHOOLS HOME LANGUAGE S	R	A	K	SUB-TOTAL	GRAND TOTALS
MALES	12	45	23	11	91	13	47	23	11	94	185
FEMALES	16	47	16	12	91	12	54	33	17	116	207
SUB-TOTAL	28	92	39	23	182	25	101	56	28	210	392

KEY HOME LANGUAGE - S = SPANISH ONLY; R = SPANISH MORE THAN ENGLISH
A = SPANISH AND ENGLISH; K = MAINLY ENGLISH EQUALLY SO

APPENDIX 3 INFORMATION AND ANSWER SHEET

BILINGUAL PROJECT - GIBRALTAR - 198·

INFORMATION & ANSWER SHEET TRIAL: 1st ☐ 2nd ☐ 3rd ☐

NAME: .... DATE:.../.../8

SCHOOL ..... DATE OF BIRTH: .../.../..

SEX: Male ☐ Female: ☐ Age:... yrs ... mths

LANGUAGES SPOKEN AT HOME: ENGLISH ONLY ☐ SPANISH ☐

ENGLISH MAINLY & SOME SPANISH ☐ SPANISH & SOME ENGLISH ☐ ENGLISH & SPANISH EQUALLY SO. ☐

ANSWER SHEET

EXAMPLES					DON'T KNOW
A	1	2	3	4	5
B	1	2	3	4	5
C	1	2	3	4	5
D	1	2	3	4	5
E	1	2	3	4	5
F	1	2	3	4	5

QUESTION						QUESTION					
1)	1	2	3	4	5	16)	1	2	3	4	5
2)	1	2	3	4	5	17)	1	2	3	4	5
3)	1	2	3	4	5	18)	1	2	3	4	5
4)	1	2	3	4	5	19)	1	2	3	4	5
5)	1	2	3	4	5	20)	1	2	3	4	5
6)	1	2	3	4	5	21)	1	2	3	4	5
7)	1	2	3	4	5	22)	1	2	3	4	5
8)	1	2	3	4	5	23)	1	2	3	4	5
9)	1	2	3	4	5	24)	1	2	3	4	5
10)	1	2	3	4	5	25)	1	2	3	4	5
11)	1	2	3	4	5	26)	1	2	3	4	5
12)	1	2	3	4	5	27)	1	2	3	4	5
13)	1	2	3	4	5	28)	1	2	3	4	5
14)	1	2	3	4	5	29)	1	2	3	4	5
15)	1	2	3	4	5	30)	1	2	3	4	5

QUESTION					
31)	1	2	3	4	5
32)	1	2	3	4	5
33)	1	2	3	4	5
34)	1	2	3	4	5
35)	1	2	3	4	5
36)	1	2	3	4	5
37)	1	2	3	4	5
38)	1	2	3	4	5
39)	1	2	3	4	5
40)	1	2	3	4	5
41)	1	2	3	4	5
42)	1	2	3	4	5
43)	1	2	3	4	5
44)	1	2	3	4	5
45)	1	2	3	4	5
46)	1	2	3	4	5
47)	1	2	3	4	5
48)	1	2	3	4	5
49)	1	2	3	4	5
50)	1	2	3	4	5
51)	1	2	3	4	5
52)	1	2	3	4	5
53)	1	2	3	4	5
54)	1	2	3	4	5
55)	1	2	3	4	5
56)	1	2	3	4	5
57)	1	2	3	4	5
58)	1	2	3	4	5
59)	1	2	3	4	5
60)	1	2	3	4	5
61)	1	2	3	4	5
62)	1	2	3	4	5
63)	1	2	3	4	5
64)	1	2	3	4	5
65)	1	2	3	4	5
66)	1	2	3	4	5
67)	1	2	3	4	5
68)	1	2	3	4	5
69)	1	2	3	4	5
70)	1	2	3	4	5

QUESTION					
71)	1	2	3	4	5
72)	1	2	3	4	5
73)	1	2	3	4	5
74)	1	2	3	4	5
75)	1	2	3	4	5
76)	1	2	3	4	5
77)	1	2	3	4	5
78)	1	2	3	4	5
79)	1	2	3	4	5
80)	1	2	3	4	5
81)	1	2	3	4	5
82)	1	2	3	4	5
83)	1	2	3	4	5
84)	1	2	3	4	5
85)	1	2	3	4	5
86)	1	2	3	4	5
87)	1	2	3	4	5
88)	1	2	3	4	5
89)	1	2	3	4	5
90)	1	2	3	4	5
91)	1	2	3	4	5
92)	1	2	3	4	5
93)	1	2	3	4	5
94)	1	2	3	4	5
95)	1	2	3	4	5
96)	1	2	3	4	5
97)	1	2	3	4	5
98)	1	2	3	4	5
99)	1	2	3	4	5
100)	1	2	3	4	5
101)	1	2	3	4	5
102)	1	2	3	4	5
103)	1	2	3	4	5
104)	1	2	3	4	5
105)	1	2	3	4	5
106)	1	2	3	4	5
107)	1	2	3	4	5
108)	1	2	3	4	5
109)	1	2	3	4	5
110)	1	2	3	4	5

QUESTION					
111)	1	2	3	4	5
112)	1	2	3	4	5
113)	1	2	3	4	5
114)	1	2	3	4	5
115)	1	2	3	4	5
116)	1	2	3	4	5
117)	1	2	3	4	5
118)	1	2	3	4	5
119)	1	2	3	4	5
120)	1	2	3	4	5
121)	1	2	3	4	5
122)	1	2	3	4	5
123)	1	2	3	4	5
124)	1	2	3	4	5
125)	1	2	3	4	5
126)	1	2	3	4	5
127)	1	2	3	4	5
128)	1	2	3	4	5
129)	1	2	3	4	5
130)	1	2	3	4	5
131)	1	2	3	4	5
132)	1	2	3	4	5
133)	1	2	3	4	5
134)	1	2	3	4	5
135)	1	2	3	4	5
136)	1	2	3	4	5
137)	1	2	3	4	5
138)	1	2	3	4	5
139)	1	2	3	4	5
140)	1	2	3	4	5
141)	1	2	3	4	5
142)	1	2	3	4	5
143)	1	2	3	4	5
144)	1	2	3	4	5
145)	1	2	3	4	5
146)	1	2	3	4	5
147)	1	2	3	4	5
148)	1	2	3	4	5
149)	1	2	3	4	5
150)	1	2	3	4	5

QUESTION					
151)	1	2	3	4	5
152)	1	2	3	4	5
153)	1	2	3	4	5
154)	1	2	3	4	5
155)	1	2	3	4	5
156)	1	2	3	4	5
157)	1	2	3	4	5
158)	1	2	3	4	5
159)	1	2	3	4	5
160)	1	2	3	4	5
161)	1	2	3	4	5
162)	1	2	3	4	5
163)	1	2	3	4	5
164)	1	2	3	4	5
165)	1	2	3	4	5
166)	1	2	3	4	5
167)	1	2	3	4	5
168)	1	2	3	4	5
169)	1	2	3	4	5
170)	1	2	3	4	5
171)	1	2	3	4	5
172)	1	2	3	4	5
173)	1	2	3	4	5
174)	1	2	3	4	5
175)	1	2	3	4	5
176)	1	2	3	4	5
177)	1	2	3	4	5
178)	1	2	3	4	5
179)	1	2	3	4	5
180)	1	2	3	4	5
181)	1	2	3	4	5
182)	1	2	3	4	5
183)	1	2	3	4	5
184)	1	2	3	4	5
185)	1	2	3	4	5
186)	1	2	3	4	5
187)	1	2	3	4	5
188)	1	2	3	4	5
189)	1	2	3	4	5
190)	1	2	3	4	5

QUESTION					
191)	1	2	3	4	5
192)	1	2	3	4	5
193)	1	2	3	4	5
194)	1	2	3	4	5
195)	1	2	3	4	5
196)	1	2	3	4	5
197)	1	2	3	4	5
198)	1	2	3	4	5
199)	1	2	3	4	5
200)	1	2	3	4	5
201)	1	2	3	4	5
202)	1	2	3	4	5
203)	1	2	3	4	5
204)	1	2	3	4	5
205)	1	2	3	4	5
206)	1	2	3	4	5
207)	1	2	3	4	5
208)	1	2	3	4	5
209)	1	2	3	4	5
210)	1	2	3	4	5
211)	1	2	3	4	5
212)	1	2	3	4	5
213)	1	2	3	4	5
214)	1	2	3	4	5
215)	1	2	3	4	5
216)	1	2	3	4	5
217)	1	2	3	4	5
218)	1	2	3	4	5

QUESTION					
219)	1	2	3	4	5
220)	1	2	3	4	5
221)	1	2	3	4	5
222)	1	2	3	4	5
223)	1	2	3	4	5
224)	1	2	3	4	5
225)	1	2	3	4	5
226)	1	2	3	4	5
227)	1	2	3	4	5
228)	1	2	3	4	5
229)	1	2	3	4	5
230)	1	2	3	4	5
231)	1	2	3	4	5
232)	1	2	3	4	5
233)	1	2	3	4	5
234)	1	2	3	4	5
235)	1	2	3	4	5
236)	1	2	3	4	5
237)	1	2	3	4	5
238)	1	2	3	4	5
239)	1	2	3	4	5
240)	1	2	3	4	5
241)	1	2	3	4	5
242)	1	2	3	4	5
243)	1	2	3	4	5
244)	1	2	3	4	5
245)	1	2	3	4	5
246)	1	2	3	4	5

SCORES

ENGLISH TARGET WORDS =
SPANISH TARGET WORDS =
ITEMS IN BOTH L1 & L2 =
ENGLISH DECOY WORDS =
SPANISH DECOY WORDS =
DECOYS RESPONSES =
DECOYS IDENTIFIED =
BPVT SCORES: RAW =
STANDARD =

APPENDIX 4 INSTRUCTIONS GIVEN TO RESEARCH ASSISTANTS (RAs)

1. Introduce the project in a way that will motivate the children e.g. you could say "we are now going to play a word game/ have a word competition, etc." (See below).

2. It is important that you adhere to the instructions given below.

3. Ascertain whether each child can recognise numbers and can match numbers as he/she will be required to tick a box containing a number corresponding to the number of the picture named.

4. It is likely that children under the age of five and a half, or even six will not be able to do this reliably for the purposes of this study. *These children must be seen individually.* Those children who can reliably respond in the required manner, can be seen in groups.

5. As far as possible, ensure that no copying can or does occur. You may wish to warn the children of some appropriate 'penalty' for doing so. Similarly, a 'reward' can be promised for co-operative behaviour.

6. Please ensure that all children seen in a group have an *Answer Sheet* and that they have completed the *Information Section* on this sheet. It would be helpful if the answers given in this section were verified from official records. It may, however, be easier for the RA to do this for some parts of this section rather than asking the children to do it. This would probably have to be the case for the children seen individually.

7. Always precede *each* session by giving an example of what has to be done until you are convinced that *every* child understands what is required. If one particular child persists in not understanding the requirements, he/she should be allowed to participate though a comment should be made at the top of the Answer Sheet indicating as much.

8. Please indicate on the Information and Answer Sheet which Trial (i.e. *child's* trial) to which the responses relate.

AIM

The aim of the project is to obtain data from Gibraltarian children with regards to their receptive vocabulary in Spanish and English, and the extent of their 'bilingual' (Dual Language i.e. DL) and 'Conceptual' vocabulary.

SUBJECTS

Gibraltarian DL children, in Primary School, aged between 4 and 11 years.

Children must be exposed to either:

Spanish at home and English at school OR
Spanish and English at home OR
predominantly English at home but speak Spanish outside e.g. with friends

METHOD

1. *All* children must be exposed to *ALL* the questions, regardless whether the child is thought to know the correct response or not.

2. Introduce the task in a way which will motivate the children. It is also important to maintain this motivation throughout by the use of appropriate reward strategies.

3. Data for any group or individual should be collected within a fortnight. If this has not been possible, please record the fact on accompanying note stating date when started and completed, reason for not completing within a fortnight, name of school, name of RA, and age (range) of individual (or group). These data *may* be used in the final analysis depending on other circumstances and variables. *There is no reason why data can not be collected over several sessions within the fortnight* particularly if the individual's/group's motivation is seen to be waning.

4. Ensure that *ALL* children can here and see the respective stimuli properly.

5. The stimuli should be presented in the order given in the accompanying Word List. The OHP transparencies provided should be checked before the start of the task to ensure that they are in the correct order.

6. Whereas there are no major objections to forming groups of mixed ages, it is recommended that groups comprise of children in the following age groups:

6-7 years; 7-8 years; 8-9 years; 9-10 years; 10-11 years.

In any event, it is preferable that the age range of any one group does not span more than 12 months.

INSTRUCTIONS TO SUBJECTS (To be read out in Spanish and English)

Span. 1 "Vamos a jugar un juego/tener un concurso para ver cuantas palabras sabeis en inglés y español."

Eng. 1 "We are going to play a game/have a competition to see how many words you know in English and Spanish."

Span. 2 "Arriba de la primera página que teneis, debeis escribir vuestro primer nombre, donde pone **NAME**."

Eng. 2 "At the top of the first page you have been given, you should write your first name, where it says **NAME**."

Span. 3 "Ya habeis hecho esto? Quién no lo ha hecho? Todos enséñeme - levanteis la página para que yo vea. Bién."

Eng. 3 "Have you all done this now? Who has not? Everybody, show me - raise your answer sheets so I can see when I come round. Good."

Span. 4 "Ahora teneis que escribir la fecha de hoy, donde pone **DATE** arriba de la página en la esquina a la derecha. La fecha hoy es ..." *RA to raise the Answer Sheet and point at the top right hand corner. RA to state the date.

Eng. 4 "Now write in today's date where it says **DATE** on the right hand corner of the page. The date today is ..." RA to do as * in 4 above.

Proceed in the same way to elicit the rest of the information, as indicated.

Eng. 5 "Now, that's good. You are all doing very well. You will now see four pictures, on the screen. Notice each picture has a number underneath." (RA points at

each number and continues) "1, 2, 3, and 4. Now look at your answer sheet. You will see that it has five boxes in each row and each of these boxes has a number in it." (RA demonstrates). "Now. You will be shown many of these pictures and I shall be saying a word. When you hear the word, try and find out if the picture of the word appears in one of the four on the screen. If so, find out what number appears under that picture. For example ..." (Project example A) ... if you hear the word **DOG**, what picture number is that." (Wait for answer from children). Good. Now, look at your answer sheet. Find the box in Row A which contains that number and put a cross or tick in it."

(RAs - Check that all children have done this correctly - if you are not satisfied that children haveunderstood what to do, continue with examples B (MAN), C (BEBIENDO) and D (SLEEP).

"Sometimes, to catch you out, you may hear a word you do not know or for which there is no picture on the page/screen. If this happens, put a cross in the box which contains a '5'."

(RAs - Turn to Example E and continue....)

"Let us try this to see if you have all understood. Ready? Look at these pictures and listen carefully to the next word... (Pause) 'ARTIFICIAL'. Is there a picture of this word on the page/screen? If not, put a cross in box '5' on line 'E'."

(RAs - Allow time and check response).

"Let us try another word." (RAs - Show next plate, example 'F').

"SIERRA" (RAs - Allow time for response).

"Now, if you can find the right picture, put a cross in the box with the same number as appears under the picture, in Row 'F'. If not, put a cross in box '5'."

(RAs - Give one more example from <u>same</u> plate).

"CATULA."

Span. 5 "Muy bién. Ahora vais a ver una página con cuatro dibujos (pictures) en cada una. Si mirais bién, vereis que vada dibujo tiene un numero debajo ... uno ... dos ... tres ... y ....cuatro. Ahora, mirad en la página que teneis delante. Vereis que hay siete cajitas

en cada linea. Dentro de cada cajita hay un numero. Pronto vais a ver muchas páginas con cuatro dibujos en cada una. También vais a oir una palbra que yo voy a decir. Cuando escuchen ustedes la palabra, teneis que buscar si hay un dibujo de esa palabra en la página. Si hay un dibujo de esa palabra, teneis que tomar nota de el número debajo de ese dibujo. Por ejemplo, (Example A) si escuchais la palabra DOG/PERRO, que numero esta escrito debajo de ese dibujo? (Wait for an answer). Ahora teneis que mirar en las cajitas en la linea 'A', y buscar la caja con ese número dentro. Poned una cruz dentro de esa caja. (Having checked if all children have done this correctly, continue with example B (MAN), C (BEBIENDO) and D (SLEEP), if necessary). Algunas veces, para ver si vos puedo coger, voy a decir una palabra que no conoceis o que no tiene un dibujo en esa página. Cuando escuschei esa palabra, teneis que poner una cruz en la cajita que contiene el número '5'."

(RAs - Turn to example E and continue)...

"Vamos a tratar esto para ver si comprendeis. Estais listos? Mirad estos dibujos y escucheis la palabra. (Pause). 'ARTIFICIAL' (Use English pronunciation). Hay un dibujo en esta página de esta palabra? Si no hay, poned una cruz en una de las cajas en la linea que contiene el número cinco. (RAs - Allow time and check responses). Ahora vamos a tratar otra palabra. (RAs - Use plate with example F and say the word...)

"SIERRA" (... and allow time for response).

"Si encontrais el dibujo de esta palabra, marcad con una cruz, una de las cajitas en la linea F, que contiene el mismo número; si no encontrais un dibujo de esta palabra, teneis que poner una cruz dentro de la caja que contiene el número '5'."

(RAs - Give one more example from the same plate and say ...)

"CATULA."

(RAs - when satisfied that every child understands what is required, continue as follows).

Eng. 6 "Now we are ready to start but before we do, are there any questions?"

Span. 6 "Ahora podemos empezar, pero antes, quién quiere hacer una pregunta?"

(RAs - Respond to any relevant questions).

Eng. 7 "OK. Each time you hear a new word, you will hear the number of the question. Make sure you put your cross in one of the boxes in the row which has that number. You will hear the same word three times so do not worry if you miss the first time."

Span. 7 "Bién. Antes de cada palabra, vais a escuchar el número de esa pregunta. Teneis que asegurarseis de poner una cruz en una de las cajitas en la linea que tiene el número de esa pregunta. Vais a escuchar la misma palabra tres veces conque no apurarseis si no escuchais la palabra la primera vez."

RAs - proceed with the main Task.

APPENDIX 5.1a ITEM ANALYSES - PERCENTAGE OF CORRECT RESPONSES IN ENGLISH AND IN SPANISH FOR EACH ITEM, ACCORDING TO AGE CODE

AGE CODE		01		02		03		04	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
	REFERENT								
1	HAND	100	100	92.3	100	100	100	92.3	92.3
2	MONEY	95	95	92.3	92.3	90.9	90.9	76.9	84.6
3	GATE	80	25	84.6	30.8	81.8	45.5	84.6	61.5
4	BOAT	100	100	100	84.6	100	100	84.6	61.5
5	SNAKE	100	60	76.2	83.5	100	90.9	76.9	61.5
6	DRUM	90	95	61.5	84.6	90.9	100	69.2	84.6
7	LADDER	50	70	69.2	38.5	63.6	54.5	76.9	38.5
8	PENGUIN	80	80	76.9	84.6	81.8	100	61.5	76.9
9	NECK	45	90	38.5	76.9	45.5	90.9	46.2	61.5
10	BEE	85	35	76.9	61.5	90.9	45.5	84.6	23.1
11	FEATHER	50	85	23.1	84.6	27.3	90.9	46.2	84.6
12	BRUSHING	65	70	46.2	69.2	81.8	81.8	61.5	69.2
13	TORCH	65	65	69.2	61.5	81.8	90.9	61.5	38.5
14	SPANNER	5	45	23.1	53.9	36.4	36.4	0	53.9
15	ARROW	60	90	69.2	84.6	54.5	100	69.2	76.9
16	CHOPPING	20	55	38.5	46.2	9.1	81.8	30.8	53.9
17	SHARING	55	25	38.5	30.8	27.3	54.6	38.5	30.8
18	HORROR	35	40	53.9	46.2	45.5	63.6	7.7	30.8
19	FURRY	30	15	23.1	23.1	18.2	36.4	15.4	7.7
20	DELIVERING	30	40	15.4	38.5	18.2	36.4	30.8	23.1
21	LIQUID	30	50	53.9	53.9	36.4	63.6	53.9	61.5
22	EAGLE	40	50	38.5	53.9	36.4	63.6	30.8	69.2
23	PASTING	35	35	46.2	53.9	36.4	54.6	8.3	38.5
24	VEGETABLE	45	55	30.8	30.8	45.5	72.7	0	46.2
25	ANKLE	35	40	30.8	23.1	27.3	45.5	30.8	61.5
26	JUG	60	60	61.5	53.9	63.6	72.7	84.6	69.2
27	DELIGHTED	30	40	7.7	30.8	27.3	45.5	15.4	38.5

* Sample sizes at each age code for each referent may vary because the responses from all subjects responding to any one referent were included in these analyses, whether they completed the *whole* task or not.

Appendix 5.1a (Continued)

AGE CODE		01		02		03		04	
LANGUAGE	REFERENT	ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
28	TUGGING	45	75	38.5	61.5	27.3	63.6	30.8	46.2
29	TEACHER	40	60	46.2	61.5	36.4	27.3	76.9	38.5
30	FRUIT	40	55	69.2	69.2	100	90.9	53.9	69.2
31	DISAGREEMENT	10	10	38.5	23.1	45.5	27.3	7.7	15.4
32	ROOT	15	10	7.7	38.5	27.3	27.3	15.4	30.8
33	PAIR	15	20	7.7	23.1	27.3	27.3	30.8	23.1
34	WRIST	10	5	15.4	7.7	36.4	18.2	30.8	30.8
35	WAITER	20	60	7.7	69.2	9.1	72.7	15.4	84.6
36	SORTING	30	20	30.8	38.5	27.3	18.2	0	38.5
37	GRAIN	15	20	23.1	30.8	27.3	36.4	7.7	23.1
38	TUBULAR	30	30	30.8	23.1	9.1	27.3	23.1	23.1
39	GREETING	20	25	7.7	23.1	18.2	81.8	15.4	38.5
40	ORNAMENT	30	20	15.4	46.2	9.1	27.3	0	23.1
41	ENTERTAINER	25	25	46.2	15.4	27.3	45.5	15.4	15.4
42	PLASTERING	30	40	46.2	53.9	27.3	54.6	15.4	38.5
43	SEED	10	15	23.1	30.8	9.1	18.2	15.4	7.7
44	TRACK	10	30	30.8	38.5	45.5	54.6	30.8	46.2
45	TUSK	20	15	15.4	23.1	18.2	18.2	7.7	15.4
46	LOCKET	15	10	7.7	38.5	9.1	45.5	7.7	38.5
47	WEASEL	10	10	23.1	15.4	18.2	9.1	15.4	7.7
48	ISOLATION	15	5	0	30.8	27.3	27.3	30.8	23.1
49	EMERGING	20	10	7.7	7.7	9.1	18.2	15.4	7.7
50	GROOMING	5	45	23.1	46.2	18.2	45.5	7.7	15.4
51	SWAMP	10	10	23.1	15.4	18.2	18.2	7.7	7.7
52	APPLAUDING	15	30	15.4	23.1	18.2	45.5	15.4	38.5
53	STADIUM	35	25	30.8	23.1	27.3	0	23.1	15.4
54	TORTOISE	75	95	92.3	100	72.7	90.9	69.2	76.9
55	BEAR	85	50	76.9	76.9	90.9	100	69.2	69.2
56	YAWNING	40	45	30.8	23.1	54.6	62.6	46.2	38.5
57	READING	80	85	92.3	84.6	100	100	69.2	61.5
58	TIME	70	80	53.9	69.2	72.7	63.6	76.9	53.9

Appendix 5.1a (Continued)

AGE CODE		01		02		03		04	
LANGUAGE	REFERENT	ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
59	SCREEN	15	20	15.4	38.5	0	18.2	7.7	53.9
60	KANGAROO	95	60	76.9	76.9	90.9	81.8	100	46.2
61	COW	85	85	84.6	69.2	90.9	90.9	69.2	76.9
62	BEEHIVE	65	15	61.5	38.5	45.5	27.3	30.8	23.1
63	CANDLE	55	75	38.5	84.6	72.7	90.9	46.2	76.9
64	HATCH	25	35	23.1	15.4	9.1	36.4	15.4	30.8
65	ACCIDENT	50	70	76.9	69.2	81.8	90.9	76.9	92.3
66	NET	60	45	30.8	53.9	45.5	54.6	53.9	53.9
67	SAFE	10	35	15.4	61.5	9.1	45.5	7.7	38.5
68	COBWEB	45	75	46.2	53.9	36.4	72.7	46.2	84.6
69	BROKEN	70	85	84.6	84.6	81.8	63.6	84.6	53.9
70	ELECTRICIAN	35	35	30.8	46.2	72.7	45.5	30.8	23.1
71	DENTIST	45	55	30.8	38.5	63.6	63.6	38.5	61.5
72	BEAK	60	45	38.5	46.2	45.5	63.6	38.6	61.5
73	CLAW	40	20	23.1	7.7	36.4	18.2	30.8	15.4
74	FOREST	40	50	30.8	46.2	45.5	72.7	30.8	38.5
75	VALLEY	15	15	15.4	30.8	18.2	27.3	23.1	23.1
76	FEATHERY	35	25	46.2	23.1	27.3	18.2	30.8	7.7
77	WOOLLY	25	5	15.4	7.7	18.2	9.1	0	0
78	PADDLING	40	55	30.8	69.2	9.1	54.6	7.7	53.9
79	DIVING	75	40	53.9	30.8	81.8	27.3	46.2	15.4
80	FLASK	0	10	23.1	15.4	27.3	9.1	15.4	23.1
81	HAMMOCK	10	35	23.1	23.1	45.5	45.5	15.4	30.9
82	ANCHOR	55	60	69.2	38.5	54.6	90.9	53.9	53.9
83	SUNDIAL	25	25	38.5	46.2	36.4	36.4	7.7	23.1
84	SHOWERING	40	80	61.5	92.3	27.3	100	15.4	84.6
85	DRIPPING	50	65	23.1	61.5	36.4	63.6	23.1	61.5
86	FILE	50	25	53.9	15.4	36.4	36.4	23.1	23.1
87	BOLT	15	25	15.4	30.8	36.4	9.1	7.7	15.4
88	SURPRISE	35	45	38.5	23.1	27.3	27.3	38.5	15.4
89	PRIDE	15	10	15.4	0	27.3	0	0	0

Appendix 5.1a (Continued)

AGE CODE		01		02		03		04	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
	REFERENT								
90	FERN	30	25	23.1	46.2	18.2	9.1	7.7	23.1
91	IVY	35	30	23.1	46.2	27.3	36.4	23.1	30.8
92	SMOKE	45	85	69.2	76.9	18.2	72.7	15.4	76.9
93	STEAM	40	30	38.5	15.4	27.3	36.4	23.1	30.8
94	BALCONY	50	70	23.1	92.3	54.6	72.7	53.9	76.9
95	ARCHES	30	25	23.1	23.1	45.5	36.4	23.1	30.8
96	LINK	15	35	15.4	38.5	36.4	36.4	7.7	15.4
97	XYLOPHONE	20	35	46.2	30.8	36.4	63.6	23.1	30.8
98	HUNTING	30	40	30.8	53.9	18.2	36.4	23.1	23.1
99	SNARLING	30	25	15.4	61.5	9.1	9.1	7.7	38.5
100	BLOOM	15	55	15.4	38.5	0	36.4	0	38.5

APPENDIX 5.1b ITEM ANALYSES- PERCENTAGE OF CORRECT RESPONSES IN ENGLISH AND IN SPANISH FOR EACH ITEM, ACCORDING TO AGE CODE

AGE CODE		01		02		03		04	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
REFERENT									
1	HAND	96.6	100	100	100	92.3	100	93.8	100
2	MONEY	96.6	89.7	100	100	96.2	96.2	93.8	93.8
3	GATE	86.2	44.8	97.4	33.3	100	30.8	96.9	43.8
4	BOAT	93.1	93.1	94.9	97.4	100	100	93.8	100
5	SNAKE	93.1	82.8	94.9	92.3	96.2	84.6	96.9	90.6
6	DRUM	89.7	79.3	97.4	97.4	96.2	96.2	90.6	93.8
7	LADDER	86.2	65.5	89.7	48.7	96.2	61.5	93.8	43.8
8	PENGUIN	89.7	89.7	97.4	97.4	100	100	100	96.9
9	NECK	79.3	86.2	87.2	92.3	92.3	96.2	96.9	96.9
10	BEE	96.6	58.6	100	74.4	96.2	53.9	96.9	43.8
11	FEATHER	65.5	86.2	79.5	100	96.2	92.3	90.6	96.9
12	BRUSHING	93.1	89.7	89.7	82.1	84.6	92.3	84.4	87.5
13	TORCH	79.3	75.9	92.3	71.8	88.5	84.6	87.5	90.6
14	SPANNER	10.3	75.9	28.2	69.2	7.7	57.7	15.6	68.8
15	ARROW	72.4	100	84.6	94.9	96.2	96.2	81.3	90.6
16	CHOPPING	41.4	51.7	51.3	53.9	69.2	69.2	59.4	59.4
17	SHARING	65.5	55.2	74.4	53.9	84.6	46.2	96.9	71.9
18	HORROR	13.8	37.9	53.8	64.1	73.1	92.3	43.8	75
19	FURRY	24.1	6.9	38.5	2.6	26.9	7.7	18.8	6.3
20	DELIVERING	24.1	55.2	41	66.7	46.2	65.4	34.4	56.3
21	LIQUID	58.6	58.6	79.5	84.6	73.1	80.8	68.8	75
22	EAGLE	68.9	72.4	89.7	84.6	84.6	84.6	96.9	90.6
23	PASTING	37.9	55.2	61.5	58.9	61.5	65.4	62.5	59.4
24	VEGETABLE	51.7	68.9	71.8	71.8	53.9	88.5	78.1	87.5
25	ANKLE	41.4	65.5	61.5	58.9	69.2	69.2	46.9	78.1
26	JUG	75.9	65.5	89.7	87.2	92.3	84.6	93.8	87.5
27	DELIGHTED	44.8	44.8	56.4	82.1	61.5	76.9	53.1	56.3

Appendix 5.1b (Continued)

AGE CODE		01		02		03		04	
LANGUAGE		**ENG**	**SPAN**	**ENG**	**SPAN**	**ENG**	**SPAN**	**ENG**	**SPAN**
REFERENT									
28	TUGGING	44.8	75.9	51.3	87.2	42.3	88.5	53.1	84.4
29	TEACHER	75.9	75.9	69.2	82.1	76.9	61.5	71.9	81.3
30	FRUIT	51.7	65.5	66.7	69.2	50	65.4	78.1	81.3
31	DISAGREEMENT	34.5	31	41	10.3	53.6	11.5	53.1	15.6
32	ROOT	31	37.9	48.7	35.9	61.5	38.5	65.6	46.9
33	PAIR	31	44.8	48.7	28.2	46.2	38.5	25	28.1
34	WRIST	17.2	44.8	46.2	48.7	50	57.7	25	62.5
35	WAITER	20.7	68.9	33.3	87.2	26.9	88.5	43.8	96.9
36	SORTING	20.7	27.6	35.9	33.3	34.6	30.8	43.8	37.5
37	GRAIN	24.1	31	41	30.8	34.6	38.5	34.4	43.8
38	TUBULAR	24.1	31	20.5	23.1	26.9	34.6	15.6	6.3
39	GREETING	20.7	55.2	35.9	53.9	19.2	73.1	25	56.3
40	ORNAMENT	17.2	10.3	10.3	7.9	15.4	26.9	9.4	28.1
41	ENTERTAINER	6.9	10.3	5.3	20.5	30.8	19.2	34.4	34.4
42	PLASTERING	17.2	44.8	28.2	38.5	30.8	34.6	34.4	56.3
43	SEED	10.3	13.8	10.3	12.8	26.9	23.1	9.4	21.9
44	TRACK	55.2	55.2	51.3	51.3	65.4	76.9	59.4	78.1
45	TUSK	24.1	3.5	51.3	25.6	42.3	34.6	18.8	28.1
46	LOCKET	6.9	44.8	15.4	35.9	19.2	34.6	25	28.1
47	WEASEL	20.7	27.6	35.9	51.3	30.8	23.1	40.6	31.3
48	ISOLATION	13.8	20.7	5.1	12.8	30.8	19.2	6.3	9.4
49	EMERGING	13.8	20.7	12.8	28.2	23.1	30.8	28.1	34.4
50	GROOMING	6.9	34.5	12.8	41	0	53.9	18.8	56.3
51	SWAMP	10.3	13.8	5.1	15.4	19.2	15.4	15.6	12.5
52	APPLAUDING	10.3	65.5	28.2	79.5	23.1	73.1	6.3	81.3
53	STADIUM	31	24.1	35.9	43.6	30.8	23.1	40.6	21.9
54	TORTOISE	79.3	86.2	89.7	94.9	96.2	100	100	96.9
55	BEAR	96.6	75.9	100	87.2	100	88.5	96.9	93.8
56	YAWNING	55.2	27.6	56.4	43.6	53.9	30.8	81.3	25
57	READING	86.2	89.7	92.3	89.7	88.5	92.3	87.5	90.6
58	TIME	89.7	82.8	89.7	94.9	84.6	96.2	90.6	93.8

Appendix 5.1b (Continued)

AGE CODE		01		02		03		04	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
REFERENT									
59	SCREEN	27.6	34.5	38.5	41	15.4	46.2	15.6	43.8
60	KANGAROO	93.1	86.2	87.2	87.2	92.3	84.6	90.6	90.6
61	COW	82.8	79.3	92.3	87.2	88.5	96.2	96.9	90.6
62	BEEHIVE	48.3	17.2	82.1	5.1	76.9	23.1	90.6	25
63	CANDLE	89.7	96.6	94.9	89.7	80.8	92.3	87.5	93.8
64	HATCH	44.8	13.8	56.4	35.9	34.6	7.7	28.1	18.8
65	ACCIDENT	86.2	89.7	79.5	97.4	88.5	92.3	100	93.8
66	NET	75.9	65.5	82.1	76.9	84.6	84.6	81.3	93.8
67	SAFE	17.2	37.9	23.1	51.3	42.3	53.9	34.4	56.3
68	COBWEB	62.1	89.7	74.4	89.7	50	92.3	50	87.5
69	BROKEN	89.7	93.1	97.4	84.6	80.8	96.2	90.6	87.5
70	ELECTRICIAN	55.2	55.2	69.2	76.9	80.8	61.5	84.4	75
71	DENTIST	93.1	79.3	74.4	84.6	88.5	76.9	87.5	81.3
72	BEAK	51.7	75.9	79.5	66.7	65.4	84.6	71.9	81.3
73	CLAW	37.9	13.8	61.5	20.5	42.3	7.7	21.9	6.3
74	FOREST	34.5	48.3	76.9	69.2	73.1	80.8	75	81.3
75	VALLEY	27.6	20.7	28.2	15.4	15.4	19.2	21.9	18.8
76	FEATHERY	20.7	24.1	43.6	30.8	53.9	38.5	37.5	25
77	WOOLLY	37.9	24.1	51.3	20.5	65.4	34.6	59.4	34.4
78	PADDLING	44.8	37.9	53.9	69.2	61.5	46.2	31.3	62.5
79	DIVING	82.8	0	79.5	15.4	76.9	19.2	93.8	18.8
80	FLASK	20.7	10.3	38.5	25.6	23.1	11.5	15.6	6.3
81	HAMMOCK	20.7	41.4	28.2	48.7	30.8	61.5	18.8	50
82	ANCHOR	41.4	65.5	82.1	79.5	76.9	88.5	62.5	81.3
83	SUNDIAL	17.2	17.2	30.8	38.5	15.4	34.6	21.9	56.3
84	SHOWERING	34.5	93.1	66.7	84.6	57.7	92.3	62.5	84.4
85	DRIPPING	72.4	93.1	66.7	84.6	84.6	80.8	78.1	87.5
86	FILE	17.2	27.6	25.6	33.3	19.2	42.3	18.8	59.4
87	BOLT	10.3	3.5	15.4	2.6	23.1	19.2	12.5	31.3
88	SURPRISE	27.6	27.6	23.1	25.6	42.3	30.8	31.3	37.5
89	PRIDE	20.7	3.5	12.8	0	23.1	19.2	12.5	9.4

Appendix 5.1b (Continued)

AGE CODE		01		02		03		04	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
REFERENT									
90	FERN	10.3	10.3	10.3	0	23.1	7.7	18.8	9.4
91	IVY	10.3	6.9	15.4	17.9	11.5	23.1	15.6	12.5
92	SMOKE	44.8	58.6	74.4	69.2	73.1	84.6	81.3	84.4
93	STEAM	34.5	24.1	41	46.2	42.3	46.2	31.3	46.9
94	BALCONY	41.4	75.9	66.7	94.9	73.1	96.2	78.1	96.9
95	ARCHES	13.8	6.9	23.1	10.3	19.2	7.7	34.4	15.6
96	LINK	3.5	34.5	10.3	38.5	11.5	19.2	9.4	15.6
97	XYLOPHONE	37.9	34.5	46.2	56.4	50	34.6	46.9	37.5
98	HUNTING	31	58.6	46.2	46.2	50	76.9	53.1	78.1
99	SNARLING	20.7	24.1	23.1	43.6	11.5	38.5	15.6	43.8
100	BLOOM	3.5	58.6	5.1	69.2	11.5	50	9.4	71.9

APPENDIX 5.1c ITEM ANALYSES- PERCENTAGE OF CORRECT RESPONSES IN ENGLISH AND IN SPANISH FOR EACH ITEM, ACCORDING TO AGE CODE

AGE CODE		09		10		11		12	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
REFERENT									
1	HAND	100	100	100	100	96.7	100	100	100
2	MONEY	96	100	97.1	97.1	96.7	96.7	96.3	96.3
3	GATE	92	48	94.3	68.6	93.3	63.3	92.6	62.9
4	BOAT	100	100	97.1	100	100	100	100	85.2
5	SNAKE	96	88	100	88.6	100	96.7	100	96.3
6	DRUM	92	100	100	100	100	96.7	100	88.9
7	LADDER	100	32	94.3	48.6	96.7	33.3	96.3	37
8	PENGUIN	96	100	97.1	97.1	100	100	100	96.3
9	NECK	100	92	91.4	100	100	100	100	96.3
10	BEE	100	68	97.1	68.6	96.7	66.7	100	55.6
11	FEATHER	92	60	100	77.1	100	93.3	96.3	96.3
12	BRUSHING	100	96	91.4	94.3	93.3	93.3	96.3	88.9
13	TORCH	100	96	100	88.6	100	96.7	96.3	88.9
14	SPANNER	40	68	42.9	88.6	40	93.3	55.6	85.2
15	ARROW	100	96	100	91.4	100	93.3	92.6	96.3
16	CHOPPING	80	72	74.3	74.3	90	80	85.2	77.8
17	SHARING	100	68	97.1	68.6	93.3	93.3	100	81.5
18	HORROR	84	72	82.9	68.6	93.3	80	92.6	85.2
19	FURRY	60	12	54.3	5.7	66.7	0	59.3	0
20	DELIVERING	80	48	55.9	40	70	56.7	85.2	55.6
21	LIQUID	92	92	88.6	91.4	93.3	83.3	92.6	85.2
22	EAGLE	92	92	88.6	85.7	93.3	96.7	96.3	100
23	PASTING	56	84	60	77.1	76.7	70	81.5	81.5
24	VEGETABLE	64	92	51.4	85.7	73.3	90	96.3	92.6
25	ANKLE	88	80	65.7	85.7	96.7	93.3	74.1	88.9
26	JUG	92	92	88.6	85.7	93.3	73.3	100	77.8
27	DELIGHTED	68	06	70.6	80	83.3	96.7	96.3	88.9

Appendix 5.1c (Continued)

AGE CODE		09		10		11		12	
LANGUAGE	REFERENT	ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
28	TUGGING	64	100	51.4	94.3	80	96.7	88.9	96.3
29	TEACHER	80	84	65.7	54.3	63.3	60	96.3	81.5
30	FRUIT	92	92	94.3	97.1	96.7	100	96.3	100
31	DISAGREEMENT	52	24	57.1	25.7	60	63.3	74.1	51.9
32	ROOT	84	76	65.7	71.4	60	60	81.5	77.8
33	PAIR	64	42	68.6	40	56.7	43.3	88.9	70.8
34	WRIST	68	80	65.7	82.9	73.3	76.7	92.6	96.3
36	SORTING	64	48	71.4	48.6	66.7	53.3	66.7	51.9
35	WAITER	60	80	68.6	82.9	63.3	83.3	51.9	51.9
37	GRAIN	36	56	51.4	62.9	70	46.7	59.3	55.6
38	TUBULAR	48	41.7	25.7	34.3	70	30	29.6	33.3
39	GREETING	68	96	51.4	82.9	76.7	93.3	88.9	85.2
40	ORNAMENT	28	52	11.4	51.4	26.7	56.7	48.2	81.5
41	ENTERTAINER	56	20	51.4	11.4	43.3	20	74.1	25.9
42	PLASTERING	68	72	57.1	51.4	60	80	77.8	77.8
43	SEED	40	40	31.4	28.6	30	26.7	40.7	44.4
44	TRACK	84	72	68.6	68.6	90	73.3	77.8	77.8
45	TUSK	52	52	54.3	49.9	63.3	60	74.1	74.1
46	LOCKET	28	44	31.4	31.4	36.7	53.3	48.2	44.4
47	WEASEL	76	44	54.3	31.4	56.7	40	55.6	51.9
48	ISOLATION	12	40	11.4	17.1	30	23.3	37	37
49	EMERGING	32	56	20	51.4	30	60	37	59.3
50	GROOMING	20	52	11.8	42.9	30	50	18.5	66.7
51	SWAMP	44	28	34.3	25.7	43.3	36.7	51.9	37
52	APPLAUDING	48	88	37.1	74.3	40	73.3	40.7	70.4
53	STADIUM	68	40	57.1	40	73.3	53.3	77.8	44.4
54	TORTOISE	92	100	100	97.1	100	100	100	100
55	BEAR	100	100	94.3	85.7	90	96.7	96.3	92.6
56	YAWNING	88	48	77.1	20	96.7	33.3	96.3	55.6
57	READING	84	92	91.4	91.4	96.7	96.7	88.9	96.3
58	TIME	100	92	100	88.6	100	96.7	92.6	92.6

Appendix 5.1c (Continued)

AGE CODE		09		10		11		12	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
REFERENT									
59	SCREEN	32	56	28.6	62.9	66.7	66.7	66.7	81.5
60	KANGAROO	100	96	94.3	88.6	100	96.7	100	92.6
61	COW	100	96	88.6	91.4	90	96.7	96.3	100
62	BEEHIVE	96	28	80	28.6	86.7	36.7	100	29.6
63	CANDLE	92	88	82.9	80	96.7	96.7	92.6	96.3
64	HATCH	72	20	60	40	80	36.7	85.2	37
65	ACCIDENT	100	92	91.4	85.7	100	96.7	100	96.3
66	NET	88	64	97.1	54.3	96.7	73.3	96.3	74.1
67	SAFE	68	60	60	71.4	76.7	80	66.7	85.2
68	COBWEB	84	92	77.1	91.4	80	96.7	66.7	96.3
69	BROKEN	88	92	97.1	91.4	100	93.3	100	92.6
70	ELECTRICIAN	92	84	77.1	71.4	83.3	76.7	96.3	88.9
71	DENTIST	88	92	85.7	68.6	73.3	83.3	92.6	88.9
72	BEAK	88	72	77.1	94.3	90	93.3	96.3	85.2
73	CLAW	80	4	60	11.4	80	6.7	81.5	14.8
74	FOREST	88	88	77.1	74.3	90	86.7	96.3	96.3
75	VALLEY	48	36	42.9	25.7	43.3	40	51.9	33.3
76	FEATHERY	68	36	48.6	31.4	56.7	33.3	37	44.4
77	WOOLLY	84	52	68.6	51.4	90	46.7	81.5	40.7
78	PADDLING	64	68	51.4	77.1	63.3	63.3	85.2	81.5
79	DIVING	88	0	94.3	11.4	96.7	23.3	96.3	3.7
80	FLASK	64	16	45.7	22.9	33.3	20	48.2	44.4
81	HAMMOCK	44	68	34.3	74.3	26.7	46.7	55.6	81.5
82	ANCHOR	72	72	74.3	77.1	80	83.3	77.8	92.6
83	SUNDIAL	80	80	48.6	54.3	63.3	56.7	70.4	74.1
84	SHOWERING	84	96	80	94.3	83.3	83.3	88.9	85.2
85	DRIPPING	88	92	94.3	94.3	90.0	93.3	92.6	92.6
86	FILE	28	60	25.7	77.1	23.3	70	29.6	77.8
87	BOLT	20	28	17.1	17.1	26.7	26.7	22.2	14.8
88	SURPRISE	52	52	54.3	48.6	70	43.3	70.4	70.4
89	PRIDE	32	4	22.9	28.6	36.7	30	55.6	51.9

Appendix 5.1c (Continued)

AGE CODE		09		10		11		12	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
REFERENT									
90	FERN	28	12	28.6	8.6	40	6.7	25.9	7.4
91	IVY	20	8	20	14.3	23.3	6.7	22.2	3.7
92	SMOKE	76	40	71.4	54.3	70	76.7	77.8	70.4
93	STEAM	64	48	45.7	65.7	60	73.3	70.4	77.8
94	BALCONY	84	96	91.4	91.4	73.3	93.3	88.9	96.3
95	ARCHES	32	44	31.4	22.9	43.3	50	55.6	62.9
96	LINK	16	28	14.3	20	10	20	18.5	37
97	XYLOPHONE	80	72	57.1	65.7	56.7	60	59.3	74.1
98	HUNTING	72	88	65.7	88.6	86.7	83.3	88.9	88.9
99	SNARLING	28	52	17.1	42.9	43.3	53.3	44.4	55.6
100	BLOOM	12	72	17.1	77.1	10	53.3	37	66.7

APPENDIX 5.1d ITEM ANALYSES- PERCENTAGE OF CORRECT RESPONSES IN ENGLISH AND IN SPANISH FOR EACH ITEM, ACCORDING TO AGE CODE

AGE CODE		13		14		15		16	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
REFERENT									
1	HAND	100	100	100	95.2	100	96.9	100	100
2	MONEY	95	100	100	95.2	96.9	96.9	100	100
3	GATE	100	80	100	71.4	96.9	72.7	100	55.6
4	BOAT	100	100	100	80.9	100	96.9	94.4	100
5	SNAKE	100	100	100	90.5	100	93.9	100	100
6	DRUM	100	100	100	100	100	96.9	100	100
7	LADDER	95	45	100	57	96.9	60.6	100	61.1
8	PENGUIN	100	100	100	100	100	96.9	100	100
9	NECK	90	95	100	85.7	96.9	87.9	100	100
10	BEE	95	90	100	71.4	93.9	57.6	100	77.8
11	FEATHER	100	95	100	100	93.9	96.9	100	100
12	BRUSHING	95	100	85.7	85.2	90.9	93.9	100	100
13	TORCH	100	95	95.2	95.2	100	96.9	100	100
14	SPANNER	60	95	71.4	95.2	54.6	90.9	77.8	88.9
15	ARROW	100	95	85.7	95.2	93.9	93.9	100	100
16	CHOPPING	95	75	100	95.2	93.9	78.8	100	83.3
17	SHARING	95	90	95.2	100	96.9	93.9	100	94.4
18	HORROR	100	90	100	100	93.9	87.9	94.4	100
19	FURRY	70	25	85.7	19.1	78.8	3.0	83.3	0
20	DELIVERING	85	85	95.2	85.7	93.9	84.9	88.9	100
21	LIQUID	95	85	95.2	95.2	93.9	96.9	94.4	100
22	EAGLE	100	100	95.1	100	96.9	90.9	94.4	100
23	PASTING	100	85	80.9	80.9	93.9	78.8	100	77.8
24	VEGETABLE	95	85	100	95.2	100	93.9	88.9	88.9
25	ANKLE	95	100	95.2	95.2	96.9	90.9	94.4	88.9
26	JUG	100	95	100	95.2	93.9	93.9	94.4	100
27	DELIGHTED	100	90	100	85.7	96.9	90.9	88.9	94.4

Appendix 5.1d (Continued)

AGE CODE		13		14		15		16	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
REFERENT									
28	TUGGING	100	90	90.5	90.5	93.9	96.9	100	100
29	TEACHER	90	90	85.7	80.9	90.9	90.9	83.3	77.8
30	FRUIT	100	95	100	100	100	96.9	88.9	94.4
31	DISAGREEMENT	100	80	100	90.5	90.9	78.8	88.9	66.7
32	ROOT	90	90	95.2	90.5	90.9	78.8	83.3	72.2
33	PAIR	85	80	61.9	52.4	78.8	63.6	83.3	61.1
34	WRIST	70	90	90.5	85.7	75.7	87.9	55.6	94.4
35	WAITER	75	80	95.2	95.2	84.9	87.9	88.9	88.9
36	SORTING	70	80	80.9	80.9	66.7	72.7	72.2	83.3
37	GRAIN	65	65	76.2	80.9	96.9	87.9	72.2	66.7
38	TUBULAR	50	50	66.7	57.1	48.5	30.3	61.1	61.1
39	GREETING	95	90	76.2	95.2	87.9	87.9	88.9	94.4
40	ORNAMENT	20	35*	14.3	33.3	78.8	84.9	77.8	88.9
41	ENTERTAINER	20	10	47.6	4.8	90.9	60.6	94.4	72.2
42	PLASTERING	80	65	85.7	76.2	75.8	72.7	94.4	94.4
43	SEED	55	45	52.4	47.6	63.6	57.6	77.8	55.6
44	TRACK	90	100	85.7	100	84.9	81.8	88.9	83.3
45	TUSK	75	75	76.2	76.2	69.8	63.6	88.9	61.1
46	LOCKET	75	55	38.1	42.9	57.6	39.4	50	33.3
47	WEASEL	55	60	61.9	57.1	72.7	51.5	72.2	38.9
48	ISOLATION	35	55	61.9	76.2	45.5	51.5	44.4	50
49	EMERGING	25	45	57.1	80.9	42.4	48.5	38.9	33.3
50	GROOMING	20	85	28.6	71.4	18.2	51.5	27.8	44.4
51	SWAMP	45	55	66.7	57.1	62.6	60.6	66.7	50
52	APPLAUDING	80	95	76.2	95.2	87.9	90.9	88.9	88.9
53	STADIUM	95	85	80.9	71.4	84.9	72.7	88.9	83.3
54	TORTOISE	100	100	100	100	100	96.9	100	100
55	BEAR	100	100	90.5	100	96.9	93.9	100	94.4
56	YAWNING	100	50	100	42.9	93.9	30.3	100	27.8
57	READING	100	95	100	100	100	96.9	88.9	100
58	TIME	95	100	95.2	100	96.9	96.9	94.4	77.8

Appendix 5.1d (Continued)

AGE CODE		13		14		15		16	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
REFERENT									
59	SCREEN	90	85	85.7	85.7	78.8	81.8	72.2	88.9
60	KANGAROO	95	95	95.2	100	100	96.9	100	88.9
61	COW	100	95	95.2	95.2	90.9	90.9	94.4	94.4
62	BEEHIVE	90	55	95.2	76.2	90.9	60.6	100	61.1
63	CANDLE	90	100	90.5	100	100	90.9	100	100
64	HATCH	90	50	95.2	61.9	87.9	27.2	94.4	44.4
65	ACCIDENT	95	100	95.2	90.5	96.9	96.9	94.4	94.4
66	NET	90	55	95.2	80.9	100	66.7	94.4	55.6
67	SAFE	75	85	90.5	80.9	75.8	84.9	94.4	94.4
68	COBWEB	80	100	90.5	100	84.9	96.9	100	100
69	BROKEN	90	100	100	95.2	100	93.9	94.4	94.4
70	ELECTRICIAN	85	85	90.5	85.7	84.9	87.9	100	100
71	DENTIST	95	85	95.2	90.5	84.9	93.9	100	100
72	BEAK	100	95	100	100	93.9	93.9	88.9	88.9
73	CLAW	100	45	95.2	47.6	96.9	24.2	94.4	50
74	FOREST	100	100	100	100	100	90.9	100	100
75	VALLEY	75	55	76.2	66.7	75.8	63.6	77.8	66.7
76	FEATHERY	60	55	95.2	76.2	63.6	45.5	66.7	33.3
77	WOOLLY	80	50	90.5	66.7	87.9	75.8	83.3	77.8
78	PADDLING	80	65	66.7	80.9	72.7	45.5	72.2	44.4
79	DIVING	100	10	95.2	14.3	93.9	6.1	100	11.1
80	FLASK	35	20	71.4	42.9	78.8	39.4	77.8	61.1
81	HAMMOCK	60	95	52.4	80.9	66.7	78.8	77.8	94.4
82	ANCHOR	85	80	95.2	95.2	90.9	87.9	83.3	88.9
83	SUNDIAL	80	70	95.2	95.2	84.9	84.9	100	94.4
84	SHOWERING	95	95	95.7	100	78.8	90.9	83.3	88.9
85	DRIPPING	95	95	95.2	90.5	96.9	81.8	94.4	88.9
86	FILE	35	90	42.9	85.7	45.5	84.9	66.7	88.9
87	BOLT	35	35	61.9	47.6	33.3	33.3	55.6	44.4
88	SURPRISE	80	70	90.5	71.4	75.8	60.6	88.9	61.1
89	PRIDE	55	70	52.4	57.1	66.7	60.6	83.3	55.6

Appendix 5.1d (Continued)

AGE CODE		13		14		15		16	
LANGUAGE		ENG	SPAN	ENG	SPAN	ENG	SPAN	ENG	SPAN
REFERENT									
90	FERN	55	30	61.9	14.3	42.4	15.2	61.1	16.7
91	IVY	35	30	71.4	23.8	51.9	15.2	61.1	22.2
92	SMOKE	85	90	85.7	95.2	93.9	90.9	83.3	94.4
93	STEAM	70	85	71.4	85.7	78.8	84.9	88.9	83.3
94	BALCONY	90	95	95.2	100	87.9	96.9	100	100
95	ARCHES	65	75	90.5	85.7	93.9	72.7	100	83.3
96	LINK	25	40	42.9	38.1	36.4	15.2	38.9	22.2
97	XYLOPHONE	65	85	90.5	90.5	84.9	78.8	77.8	88.9
98	HUNTING	95	95	90.5	100	78.8	81.8	100	94.4
99	SNARLING	50	55	52.4	61.9	57.6	60.6	77.8	83.3
100	BLOOM	40	85	52.4	85.7	30.3	75.8	38.9	94.4

APPENDIX 5.2a ITEM ANALYSES - PERCENTAGE OF CORRECT RESPONSES IN BOTH ENGLISH AND SPANISH (i.e. 'BILINGUAL' RESPONSES) FOR EACH ITEM, ACCORDING TO AGE CODE

AGE CODE		01	02	03	04	05	06
REFERENT							
1	HAND	100	92.3	100	84.6	96.6	100
2	MONEY	90	84.6	81.8	76.9	86.2	100
3	GATE	25	30.8	45.5	53.9	41.4	33.3
4	BOAT	100	84.6	100	53.9	86.2	92.3
5	SNAKE	60	30.8	90.9	46.2	75.9	89.7
6	DRUM	85	53.9	90.9	53.9	72.4	94.9
7	LADDER	30	30.8	36.4	30.8	58.6	41
8	PENGUIN	75	69.2	81.8	46.2	89.7	94.9
9	NECK	40	30.8	45.5	30.8	69	82.1
10	BEE	30	53.9	45.5	7.7	55.2	74.4
11	FEATHER	40	23.1	27.3	38.5	55.2	79.5
12	BRUSHING	50	46.2	81.8	38.5	82.8	79.5
13	TORCH	50	38.5	81.8	30.8	69	66.7
14	SPANNER	0	15.4	18.2	0	6.9	15.4
15	ARROW	55	61.5	54.6	53.9	72.4	79.5
16	CHOPPING	10	23.1	9.1	15.4	17.2	33.3
17	SHARING	20	15.4	18.2	23.1	37.9	48.7
18	HORROR	25	38.5	36.4	7.7	31	43.6
19	FURRY	5	15.4	9.1	0	3.5	0
20	DELIVERING	10	7.7	18.2	15.4	13.8	23.1
21	LIQUID	25	38.5	36.4	38.5	41.4	69.2
22	EAGLE	25	23.1	27.3	23.1	44.8	76.9
23	PASTING	20	30.8	27.3	7.7	34.5	43.6
24	VEGETABLE	20	15.4	27.3	0	41.4	61.5
25	ANKLE	15	15.4	9.1	23.1	34.5	46.2
26	JUG	35	38.5	63.6	61.5	55.2	76.9
27	DELIGHTED	10	7.7	18.2	15.4	34.5	48.7

Appendix 5.2a (Continued)

AGE CODE		01	02	03	04	05	06
REFERENT							
28	TUGGING	45	23.1	18.2	30.8	34.5	38.5
29	TEACHER	25	30.8	27.3	30.8	65.5	64.1
30	FRUIT	35	69.2	90.9	53.9	41.4	66.7
31	DISAGREEMENT	0	7.7	18.2	7.7	10.3	5.1
32	ROOT	0	7.7	9.1	15.4	17.2	20.5
33	PAIR	5	0	0	23.1	31	12.8
34	WRIST	5	0	9.1	15.4	6.9	28.2
35	WAITER	15	0	9.1	7.7	17.2	28.2
36	SORTING	5	7.7	9.1	0	6.9	20.5
37	GRAIN	5	7.7	18.2	7.7	10.3	15.4
38	TUBULAR	10	23.1	0	15.4	17.2	10.3
39	GREETING	10	0	18.2	0	17.2	25.6
40	ORNAMENT	10	15.4	0	0	3.5	2.6
41	ENTERTAINER	10	7.7	18.2	0	0	2.6
42	PLASTERING	20	38.5	18.2	15.4	17.2	23.1
43	SEED	0	23.1	0	7.7	3.5	2.6
44	TRACK	5	15.4	36.4	15.4	31	30.8
45	TUSK	0	0	0	7.7	3.5	15.4
46	LOCKET	0	0	9.1	0	3.5	12.8
47	WEASEL	0	0	0	0	6.9	23.1
48	ISOLATION	0	0	18.2	7.7	3.5	2.6
49	EMERGING	0	0	0	7.7	10.3	7.7
50	GROOMING	0	15.4	9.1	0	3.5	7.7
51	SWAMP	5	7.7	0	0	3.5	0
52	APPLAUDING	10	7.7	9.1	7.7	10.3	25.6
53	STADIUM	15	7.7	0	7.7	20.7	28.2
54	TORTOISE	75	92.3	63.6	53.9	68.9	84.6
55	BEAR	45	59.2	90.9	53.9	72.4	87.2
56	YAWNING	20	15.4	36.4	23.1	17.3	23.1
57	READING	70	76.9	100	46.2	82.8	87.2
58	TIME	60	46.2	63.6	46.2	79.3	84.6

Appendix 5.2a (Continued)

AGE CODE	REFERENT	01	02	03	04	05	06
59	SCREEN	0	7.7	0	7.7	6.9	15.4
60	KANGAROO	60	69.2	81.8	46.2	82.8	79.5
61	COW	70	61.5	81.8	69.2	75.9	82.1
62	BEEHIVE	10	23.1	0	15.4	0	5.1
63	CANDLE	35	30.8	63.6	46.2	86.2	84.6
64	HATCH	10	15.4	0	15.4	13.8	25.6
65	ACCIDENT	45	69.2	81.8	69.2	82.8	76.9
66	NET	20	23.1	36.4	23.1	51.7	61.5
67	SAFE	5	7.7	9.1	0	3.5	10.3
68	COBWEB	35	30.8	27.3	46.2	58.6	69.2
69	BROKEN	60	76.9	63.6	46.2	86.2	82.1
70	ELECTRICIAN	20	23.1	45.5	23.1	44.9	58.9
71	DENTIST	30	23.1	54.6	30.8	79.3	71.8
72	BEAK	25	15.4	36.4	30.8	44.8	58.9
73	CLAW	0	0	9.1	0	6.9	17.9
74	FOREST	30	30.8	36.4	15.4	27.6	64.1
75	VALLEY	0	7.7	0	15.4	10.3	10.3
76	FEATHERY	15	15.4	9.1	7.7	10.3	12.8
77	WOOLLY	0	0	0	0	13.8	17.9
78	PADDLING	20	15.4	0	0	13.8	35.9
79	DIVING	30	23.1	18.2	0	0	15.4
80	FLASK	0	0	9.1	7.7	6.9	12.8
81	HAMMOCK	5	7.7	27.3	7.7	6.9	17.9
82	ANCHOR	45	30.8	54.6	46.2	34.5	74.4
83	SUNDIAL	10	15.4	18.2	7.7	3.5	20.5
84	SHOWERING	40	53.9	27.3	15.4	31	61.5
85	DRIPPING	30	15.4	27.3	7.7	68.9	53.9
86	FILE	15	15.4	0	0	6.9	10.3
87	BOLT	5	7.7	0	0	0	0
88	SURPRISE	20	7.7	18.2	7.7	13.8	10.3
89	PRIDE	0	0	0	0	0	0

Appendix 5.2a (Continued)

AGE CODE		01	02	03	04	05	06
REFERENT							
90	FERN	5	15.4	0	0	3.5	0
91	IVY	5	15.4	9.1	0	0	2.6
92	SMOKE	45	46.2	18.2	15.4	27.6	53.9
93	STEAM	5	7.7	9.1	15.4	13.8	23.1
94	BALCONY	35	23.1	45.5	46.2	31	61.5
95	ARCHES	0	0	9.2	15.4	6.9	2.6
96	LINK	5	15.4	18.2	7.7	0	7.7
97	XYLOPHONE	15	23.1	36.4	15.4	20.7	30.8
98	HUNTING	20	23.1	0	15.4	17.2	25.6
99	SNARLING	10	7.7	0	7.7	3.5	15.4
100	BLOOM	10	0	0	0	3.5	5.1

APPENDIX 5.2b ITEM ANALYSES - PERCENTAGE OF CORRECT RESPONSES IN BOTH ENGLISH AND SPANISH (i.e. 'BLINGUAL' RESPONSES) FOR EACH ITEM, ACCORDING TO AGE CODE

AGE CODE		07	08	09	10	11	12
REFERENT							
1	HAND	92.3	93.8	100	100	96.7	100
2	MONEY	92.3	90.6	96	94.3	93.3	92.6
3	GATE	30.8	40.6	44	62.9	56.8	55.6
4	BOAT	100	93,8	100	97.1	100	85.2
5	SNAKE	80.8	87.5	84	88.6	96.7	96.3
6	DRUM	92.4	84.4	92	100	96.7	88.9
7	LADDER	57.7	40.6	32	45.7	33.3	33.3
8	PENGUIN	100	96.9	96	97.1	100	96.3
9	NECK	88.5	93.8	92	91.4	100	96.3
10	BEE	50	40.6	68	65.7	66.7	55.6
11	FEATHER	88.5	87.5	56	77	93	96
12	BRUSHING	80.8	81.3	96	88.6	90	85.2
13	TORCH	76.9	81.3	96	88.6	96.7	88.9
14	SPANNER	3.9	15.6	36	40	36.7	48.2
15	ARROW	92.3	71.9	96	91.4	93.3	88.9
16	CHOPPING	50	40.6	56	54.3	76.7	66.7
17	SHARING	38.5	68.8	68	65.7	86.7	81.5
18	HORROR	69.2	37.5	72	68.6	86.7	81.5
19	FURRY	0	3.1	12	2.9	0	0
20	DELIVERING	19.2	21.9	40	28.6	46.7	55.6
21	LIQUID	65.4	46.9	88	85.7	80	81.5
22	EAGLE	73.1	87.5	84	77.1	90	96.3
23	PASTING	38.5	37.5	48	51.4	56.7	74.1
24	VEGETABLE	53.9	71.9	56	42.9	66.7	92.6
25	ANKLE	50	40.6	72	57.1	90	70.4
26	JUG	76.9	84.4	88	77	73.3	77.8
27	DELIGHTED	46.2	31.3	64	60	80	88.9

Appendix 5.2b (Continued)

AGE CODE	REFERENT	07	08	09	10	11	12
28	TUGGING	34.6	46.9	64	48.6	76.7	88.9
29	TEACHER	57.7	62.5	72	51.4	53.3	81.5
30	FRUIT	50	75	88	94.3	96.7	96.3
31	DISAGREEMENT	3.9	15.6	24	14.3	56.7	51.9
32	ROOT	26.9	34.4	60	62.9	46.7	74.1
33	PAIR	34.6	21.9	36	40	33.3	70.4
34	WRIST	23.1	12.5	56	57.1	60	92.6
35	WAITER	26.9	40.6	48	60	53	51
36	SORTING	3.9	12.5	40	28.6	36.7	37
37	GRAIN	23.1	18.8	24	40	46.7	40.7
38	TUBULAR	19.2	6.3	24	17.1	10	18.5
39	GREETING	11.5	15.6	64	75.7	73.3	77.8
40	ORNAMENT	0	3.1	20	8.6	23.3	44.4
41	ENTERTAINER	15.4	18.8	20	11.4	10	14.8
42	PLASTERING	23.1	28.1	60	48.6	56.7	66.7
43	SEED	19.2	9.4	36	22.9	26.7	40.7
44	TRACK	53.9	43.8	60	48.6	63.3	66.7
45	TUSK	23.1	12.5	32	25.7	50	51.9
46	LOCKET	7.7	6.3	16	5.7	23.3	29.6
47	WEASEL	15.4	15.6	28	25.7	30	48.2
48	ISOLATION	15.4	0	12	8.6	10	22.2
49	EMERGING	7.7	15.6	20	14.3	23.3	33.3
50	GROOMING	0	9.4	12	8.6	20	18.5
51	SWAMP	3.9	3.1	28	14.3	20	25.9
52	APPLAUDING	11.5	6.3	44	34.3	40	33.3
53	STADIUM	15.4	12.5	40	37.1	50	44.4
54	TORTOISE	96.2	96.9	92	97.1	100	100
55	BEAR	88.5	90.6	100	82.9	90	92.6
56	YAWNING	26.9	25	44	14.3	30	55.6
57	READING	80.8	81.3	80	85.7	93.3	88.9
58	TIME	80.8	84.4	92	88.6	96.7	85.2

Appendix 5.2b (Continued)

AGE CODE	REFERENT	07	08	09	10	11	12
59	SCREEN	3.9	6.3	12	20	50	59.3
60	KANGAROO	76.9	84.4	96	85.7	96.7	92.6
61	COW	88.5	87.5	96	85.7	90	96.3
62	BEEHIVE	23.1	21.9	28	25.7	33.3	29.6
63	CANDLE	80.8	84.4	84	77.1	93.3	92.6
64	HATCH	3.9	12.5	16	28.6	30	29.6
65	ACCIDENT	84.6	93.8	92	82.9	96.7	96.3
66	NET	73.1	78.1	52	54.3	70	70.4
67	SAFE	30.8	28.1	48	54.3	63.3	59.3
68	COBWEB	46.2	50	76	71.4	76.7	66.7
69	BROKEN	80.8	78.1	80	88.6	93.3	92.6
70	ELECTRICIAN	46.2	68.8	80	62.9	63.3	88.9
71	DENTIST	65.4	81.3	84	62.9	66.7	85.2
72	BEAK	57.7	65.6	60	71.4	86.7	81.5
73	CLAW	3.9	0	4	5.7	6.7	11.1
74	FOREST	61.5	68.8	80	68.6	80	92.6
75	VALLEY	3.9	9.4	28	22.9	33.3	29.6
76	FEATHERY	26.9	18.8	36	20	30	33.3
77	WOOLLY	23.1	28.1	48	37.1	43.3	29.6
78	PADDLING	30.8	21.9	36	40	40	70.4
79	DIVING	19.2	15.6	0	11.4	23.3	3.7
80	FLASK	3.9	3.1	16	17.1	10	33.3
81	HAMMOCK	26.9	18.8	44	31.4	16.7	51.9
82	ANCHOR	76.9	59.4	64	71.4	76.7	77.8
83	SUNDIAL	11.5	18.8	68	42.9	50	59.3
84	SHOWERING	53.9	53.1	84	77.1	73.3	77.8
85	DRIPPING	69.2	68.8	84	91.4	86.7	88.9
86	FILE	7.7	12.5	20	22.9	16.7	29.6
87	BOLT	7.7	6.3	0	2.9	10	3.7
88	SURPRISE	23.1	25	44	45.7	43.3	68.9
89	PRIDE	3.9	0	4	11.4	23.3	40.7

Appendix 5.2b (Continued)

AGE CODE	REFERENT	07	08	09	10	11	12
90	FERN	0	6.3	0	0	6.7	3.7
91	IVY	0	3.1	0	2.9	3.3	0
92	SMOKE	65.4	68.8	36	40	63.3	62.9
93	STEAM	19.2	21.9	32	31.4	50	55.6
94	BALCONY	69.2	78.1	84	82.9	70	85.2
95	ARCHES	3.9	12.5	16	14.3	30	40.7
96	LINK	0	0	4	0	3.3	7.4
97	XYLOPHONE	23.1	31.3	60	54.3	50	44.4
98	HUNTING	42.3	43.8	64	65.7	76.7	77.8
99	SNARLING	7.7	12.5	16	8.6	23.3	22.2
100	BLOOM	7.7	3.1	12	8.6	6.7	29.6

APPENDIX 5.2c ITEM ANALYSES - PERCENTAGE OF CORRECT RESPONSES IN BOTH ENGLISH AND SPANISH (i.e. 'BILINGUAL' RESPONSES) FOR EACH ITEM, ACCORDING TO AGE CODE

AGE CODE		13	14	15	16
REFERENT					
1	HAND	100	95.2	96.9	100
2	MONEY	95	95.2	93.9	100
3	GATE	80	71.4	69.7	55.6
4	BOAT	100	80.9	96.9	94.4
5	SNAKE	100	90.5	93.9	100
6	DRUM	100	100	96.9	100
7	LADDER	45	57.1	57.6	61.1
8	PENGUIN	100	100	96.9	100
9	NECK	85	85.7	84.9	100
10	BEE	85	71.4	54.6	77.8
11	FEATHER	95	100	90.9	100
12	BRUSHING	95	85.7	87.9	100
13	TORCH	95	90.5	96.9	100
14	SPANNER	60	71.4	48.5	66.7
15	ARROW	95	80.9	87.9	100
16	CHOPPING	70	95.2	75.8	83.3
17	SHARING	85	95.2	93.9	94.4
18	HORROR	90	100	84.9	94.4
19	FURRY	25	19.1	3	0
20	DELIVERING	75	85.7	81.8	88.9
21	LIQUID	80	90.5	90.9	94.4
22	EAGLE	100	95.2	90.9	94.4
23	PASTING	85	71.4	78.8	77.8
24	VEGETABLE	80	95.2	93.9	83.3
25	ANKLE	95	90.5	90.9	88.9
26	JUG	95	95.2	87.9	94.4
27	DELIGHTED	90	85.7	90.9	83.3

Appendix 5.2c (Continued)

AGE CODE		13	14	15	16
REFERENT					
28	TUGGING	90	80.9	90.9	100
29	TEACHER	85	71.4	87.9	77.8
30	FRUIT	95	100	96.9	88.9
31	DISAGREEMENT	80	90.5	72.7	66.7
32	ROOT	85	85.7	75.8	72.2
33	PAIR	80	52.4	63.6	61.1
34	WRIST	60	76.2	72.7	50
35	WAITER	70	90.5	81.8	83.3
36	SORTING	60	61.9	51.5	66.7
37	GRAIN	50	66.7	87.9	55.6
38	TUBULAR	35	47.6	30.3	55.6
39	GREETING	90	71.4	78.8	83.3
40	ORNAMENT	20	9.5	72.7	77.8
41	ENTERTAINER	5	4.8	60.6	72.2
42	PLASTERING	60	76.2	66.7	88.9
43	SEED	45	78.1	51.5	55.6
44	TRACK	90	85.7	66.6	72.2
45	TUSK	65	61.9	48.5	55.6
46	LOCKET	50	28.6	27.3	22.2
47	WEASEL	40	47.6	45.5	27.8
48	ISOLATION	30	57.1	36.4	44.4
49	EMERGING	25	57.1	36.4	22.2
50	GROOMING	20	23.8	18.2	27.8
51	SWAMP	45	47.6	51.5	44.4
52	APPLAUDING	75	76.2	81.8	83.3
53	STADIUM	80	71.4	69.7	72.2
54	TORTOISE	100	100	96.9	100
55	BEAR	100	90.5	90.9	94.4
56	YAWNING	50	42.9	30.3	27.8
57	READING	95	100	96.9	88.9
58	TIME	95	95.2	93.9	77.8

Appendix 5.2c (Continued)

AGE CODE	13	14	15	16
REFERENT				
59 SCREEN	80	76.2	69.7	61.1
60 KANGAROO	90	95.2	96.9	88.9
61 COW	95	90.5	87.9	88.9
62 BEEHIVE	50	71.4	51.5	61.1
63 CANDLE	90	90.5	90.9	100
64 WATCH	50	57.1	27.3	38.9
65 ACCIDENT	95	85.7	96.9	94.4
66 NET	55	76.2	66.7	50
67 SAFE	75	71.4	72.7	88.9
68 COBWEB	80	90.5	81.8	100
69 BROKEN	90	95.2	93.9	88.9
70 ELECTRICIAN	75	80.9	81.8	100
71 DENTIST	80	90.5	81.8	100
72 BEAK	95	100	90.9	77.8
73 CLAW	45	47.6	24.2	50
74 FOREST	100	100	90.9	100
75 VALLEY	55	57.1	54.6	66.7
76 FEATHERY	45	76.2	42.4	33.3
77 WOOLLY	45	66.7	72.7	66.7
78 PADDLING	45	52.4	30.3	33.3
79 DIVING	10	14.3	6.1	11.1
80 FLASK	15	38.1	36.4	44.4
81 HAMMOCK	60	47.6	57.6	77.8
82 ANCHOR	80	90.5	84.9	83.3
83 SUNDIAL	65	90.5	81.8	94.4
84 SHOWERING	90	85.7	75.8	77.8
85 DRIPPING	95	85.7	81.8	88.9
86 FILE	35	28.6	36.4	55.6
87 BOLT	15	28.6	12.1	22.2
88 SURPRISE	65	66.7	60.6	61.1
89 PRIDE	55	42.9	54.6	55.6

Appendix 5.2c (Continued)

AGE CODE	13	14	15	16
REFERENT				
90 FERN	25	14.3	9.1	16.7
91 IVY	20	19.1	9.1	11.1
92 SMOKE	80	80.9	87.9	77.8
93 STEAM	55	66.7	72.7	83.3
94 BALCONY	85	95.2	84.9	100
95 ARCHES	60	85.7	72.7	83.3
96 LINK	15	19.1	6.1	11.1
97 XYLOPHONE	60	90.5	75.8	77.8
98 HUNTING	90	90.5	72.7	94.4
99 SNARLING	40	33.3	33.3	66.7
100 BLOOM	35	42.9	21.2	38.9

APPENDIX 6 RATIOS BETWEEN GRAMMATICAL CATEGORIES (Noun, Verb, Adjectives) FOR BPVS ITEMS

		GRAMMATICAL CATEGORIES OF BPVS ITEMS		
AGE	**RATIOS**	**NOUNS**	**VERBS**	**ADJECTIVES**
2:6-3:11	N/V=7:1	HAND MONEY TORTOISE GATE BOAT SNAKE DRUM	READING	
4-4:11	N/V=14:1	TIME LADDER PENGUIN COW NECK CANDLE BEE		
5-5:11	N/V=17:2 (8.5:1)	ACCIDENT FEATHER NET	BRUSHING	
6-6:11	N/V=27:7 (3.9:1) N/A=27:3) (9:1) V/A=7:3 (2.3:1)	TORCH SPANNER ARROW DENTIST CLAW HORROR LIQUID FOREST EAGLE VEGETABLE	CHOPPING SHARING DELIVERING PASTING DIVING	BROKEN FURRY WOOLLY
7-7:11	N/V=32:8 (4:1) N/A=32:4 (8:1) V/A=8:4 (2:1)	ANKLE FLASK ANCHOR TEACHER FRUIT	TUGGING	DELIGHTED
8-8:11	N/V=38:9 (4.2:1) N/A=38:4 (9.5:1)	DISAGREEMENT ROOT PAIR WRIST	DRIPPING	
8-8:11	V/A=9:4 (2.2:1)	WAITER BOLT		
9-9:11	N/V=41:10 (4:1) N/A=41:5 (8.2:1) V/A=10.5 (2:1)	SURPRISE GRAIN GREETING	SORTING	TUBULAR

Appendix 6 (Continued)

GRAMMATICAL CATEGORIES OF BPVS ITEMS

AGE	RATIOS	NOUNS	VERBS	ADJECTIVES
10-10:11	N/V=48:11	FERN	PLASTERING	
	(4.4:1)	ORNAMENT		
	N/A=48:5	ENTERTAINER		
	(9.6:1)	STEAM		
	V/A=11.5	BALCONY		
	(3:1)	SEED		
		LINK		
11-11:11	N/V=55:15	TUSK	SNARLING	
	(3.7;1)	LOCUST	EMERGING	
	N/A=55:5	WEASEL	GROOMING	
	(11:1)	ISOLATION	APPLAUDING	
	V/A=15:5	BLOOM		
	(3:1)	SWAMP		
		STADIUM		

KEY N/V = NOUN/VERB; N/A = NOUN/ADJECTIVE; V/A = VERB/ADJECTIVE

APPENDIX 7.1 COMPARISONS OF LEXICAL PROFICIENCY BETWEEN SAUNDERS' (1982) STUDY OF HIS TWO CHILDREN AND THE PRESENT STUDY

SUBJECT(S)	*FORM*	NO. OF CORRECT RESPONSES IN: English/ (†English)	*TLR*	German/ (†Spanish)	*TLR*	TLR IN: L1 & L2	Total	CV
Frank	*PPVT* A	66}	136	70	144	136	280	163
5:5 yrs	*PPVT* B	70}		74		144		
	Mean		68		72		140	81.5
Present Study 5-5:5 yrs (N=11)	*BPVS stimuli*		*(42.7)*		*(51.6)*		*(93.9)*	*(64.5)*
Thomas	*PPVT* A	76}	145	75	155	151	300	169
5:5 yrs	*PPVT* B	69}		80		149		
	Mean		50.9		77.5		150	84.5
Present Study 5-5:5 yrs (N=11)	*BPVS stimuli*		*(42.7)*		*(51.6)*		*(93.9)*	*(64.5)*
Thomas	*PPVT* A	80}	159	82	174	162	333	182
7:3 years	*PPVT* B	79}		92		171		
	Mean		79.5		87		166.5	91
Present Study 7-7:5 years (N=26)	*BPVS stimuli*		*(56.4)*		*(57)*		*(120)*	*(73.3)*

† *Results for present study which used 100 items from the first 75 BPVS picture stimuli - Lexical Proficiency for this appears in brackets ( )*

KEY: PPVT = PEABODY PICTURE VOCABULARY TEST; TLR = TOTAL LEXICAL REPERTOIRE; L1 and L2 (German and English, respectively, in Saunders' study; Spanish and English in the present study).CV = CONCEPTUAL VOCABULARY

APPENDIX 7.2 COMPARISONS OF CV & L1, L2 and TLR RATIOS AND PERCENTAGES, AND BETWEEN TLR AND L1 AND L2 RATIOS AND PERCENTAGES BETWEEN SAUNDERS' (1982) STUDY AND THE PRESENT STUDY

		RATIOS AND PERCENTAGES				
Subjects		**CV/E(*E*)**	**CV/G(*S*)**	**TLR/E(*E*)**	**TLR/G(*S*)**	**TLR/CV**
Frank 5:5 yrs	*Ratio*	1.19 *(1.51)*	1.13 *(1.24)*	2.06 *(2.19)*	1.9 *(1.82)*	1.72 *(1.46)*
	%age	19.9 *(50.9)*	13.2 *(24.8)*	106 *(119.9)*	94.4 *(81.8)*	71.8 *(45.7)*
Thomas 5:5 yrs	*Ratio*	1.17 *(1.51)*	1.09 *(1.24)*	2.06 *(2.19)*	1.94 *(1.82)*	1.78 *(1.46)*
	%age	16.6 *(50.9)*	9 *(24.8)*	107 *(119.9)*	93.5 *(81.8*	71.8 *(45.7)*
Thomas 7:3 yrs	*Ratio*	1.14 *(1.3)*	1.05 *(1.26)*	2.09 *(2.13)*	1.91 *(2.01)*	1.83 *(1.64)*
	%age	14.5 *(30 0)*	4.6 *(26.5)*	109 *(112.9)*	91.4 *(107)*	82.9 *(66.7)*

KEY: %age = PERCENTAGE SUPERIORITY OF X/Y; CV = CONCEPTUAL VOCABULARY, E = ENGLISH (in Saunders' study); (*E*) ENGLISH (in the present study); G = GERMAN (in Saunders' study); *S* = SPANISH (in the present study; TLR = TOTAL LEXICAL REPERTOIRE; ( ) = RESULTS OF PRESENT STUDY

APPENDIX 8 LEXICAL ITEMS ARRANGED ACCORDING TO BPVS BASAL AGES AND PERCENTAGE CORRECT RESPONSES IN DOMINANT LANGUAGE, AND IN RELEVANT AGE CODES

KEY Where a number precedes a hyphen, it indicates an Age Code. Where a number precedes a letter, it indicates percentage correct responses for that Age Code, for the dominant language.
E = ENGLISH DOMINANCE; S = SPANISH DOMINANCE

N.B. *Non-Test Items* are those used in this study and for which there are pictorial representations in the BPVS Manual.

PICTURE PLATES	BASAL AGE (& AGE CODES)	LEXICAL ITEMS BPVS TEST ITEMS	NON-TEST ITEMS
1-13	2:6-4:5 (- 01)	HAND (100 E & S) MONEY (95 E & S) TORTOISE (95 S) READING (85 S) GATE (80 S) BOAT (100 E & S) SNAKE (100 E) DRUM (95 S) TIME (80 S) LADDER (70 S) PENGUIN (80 E & S) COW (85 E & S) NECK (90 S)	TORTOISE (95 S) BEAR (85 E) YAWNING (45 S) SCREEN (20 S) KANGAROO (95 E)
14-15	4:6-4:11 (02)	CANDLE (84.6 S) BEE (76.9 E)	BANK (38.5 E)
16-19	5-5:11 (03 - 04)	ACCIDENT (03- 91 S) (04- 92 S) FEATHER (03- 91 S) (04- 85 S) BRUSHING (03- 82 E & S) (04- 69 S) NET (03- 55 S) (04- 54 E & S)	HATCH (03- 36 S) (04- 31 S) SAFE (03- 45.5 S) (04- 38.5 S)
20-27	6-6:5 (05)	TORCH (79 E) SPANNER (76 S) BROKEN (93 S) ARROW (100 S) CHOPPING (52 S) SHARING (65.5 E) DENTIST (93 E) CLAW (38 E)	COBWEB (90 S) ELECTRICIAN (55E & S) BEAK (76 S)

Appendix 8 (Continued)

PICTURE PLATES	BASAL AGE (& AGE CODES)	LEXICAL ITEMS BPVS TEST ITEMS	NON-TEST ITEMS
28-37	6:6-6:11 (06)	HORROR (64 S) FURRY (38.5 E) DELIVERING (67 S) LIQUID (85 S) FOREST (77 E) EAGLE (90 E) PASTING (61.5 E) WOOLLY (51 E) VEGETABLE (72 E & S) DIVING (80 E)	VALLEY (29 E) FEATHERY (44 E) PADDLING (69 S)
38-44	7-7:11 (07-08)	ANKLE (07- 69 E & S) (08- 78 S) FLASK (07- 23 E) (08- 16 E) DELIGHTED (07- 77 S) (08- 56 S) TUGGING (07- 88.5 S) (08- 84 S) ANCHOR (07- 88.5 S) (08- 81.3 S)	JUG (07- 92 S) (08- 94 S) HAMMOCK (07- 61.5 S) (08- 50 S) SUNDIAL (07- 35 S) (08- 56 S)
38-44	7-7:11 (07-08)	TEACHER (07- 77 E) (08- 81 S) FRUIT (07- 65 S) (08- 81 S)	
45-51	8-8:11 (09-10)	DRIPPING (09- 92 S) (10- 94 E & S) DISAGREEMENT (09- 52 E) (10- 57 E) ROOT (09- 84 E) (10- 83 S) PAIR (09- 64 E) (10- 69 E) WRIST (09- 80 S) (10- 83 S) WAITER (09- 80 S) (10- 83 S) BOLT (09- 28 S) (10- 17 E & S)	SHOWERING (09- 96 S) (10- 94 S) FILE (09- 60 S) (10- 77 S)
52-56	9-9:11 (11-12)	SURPRISE (11- 70 E) (12- 70 E & S) SORTING (11- 67 E) (12- 67 E) GRAIN (11- 76 E) (12- 59 E) TUBULAR (11- 30 S) (12- 33 S) GREETING (11- 93 S; (12- 89 E)	PRIDE (11- 37 E) (12- 56 E)

Appendix 8 (Continued)

PICTURE PLATES	BASAL AGE (& AGE CODES)	LEXICAL ITEMS BPVS TEST ITEMS	NON-TEST ITEMS
57-64	10-10:11 (13-14)	FERN (13- 55 E) (14- 62 E) ORNAMENT (13- 35 S) (14- 33 S) ENTERTAINER (13-20 E)(14- 48 E) STEAM (13- 85 S) (14- 86 S) PLASTERING (13- 80 E) (14- 86 E) BALCONY (13- 95 S) (14- 100 S) SEED (13- 55 E) (14- 52 E) LINK (13- 40 E) (14- 42.9 S)	TRACK (13- 100 S) (14- 100 S) IVY (13- 35 E) (14- 71 E) SMOKE (13- 90 S) (14- 95 S) ARCHES (13- 75 S) (14- 90.5 E) XYLOPHONE (13- 85 S) (14- 90.5 E & S)
65-74	11-11:11 (15-16)	TUSK (15- 70 E) (16- 89 E) LOCKET (15- 58 S) (16- 50 E) SNARLING (15- 61 S) (16- 83 S) WEASEL (15- 73 E) (16- 73 E) ISOLATION (15- 51.5 S) (16- 50 S) BLOOM (15- 75.8 S) (16- 94.4 S) EMERGING (15- 48.5 S) (16- 39 S) GROOMING (15- 51.5 S) (16- 44 S) SWAMP (15- 63 E) (16- 67 E) APPLAUDING (15- 91 S) (16- 89 E & S)	HUNTING (15- 82 S) (16- 100 E) BEEHIVE (15- 90.9 E) (16- 100 E)