

**The Acquisition of Some Features
of English Syntax by Four Groups
of Adolescent Migrants
to Australia**

by

Helen Elizabeth Borland

Ph.D.

University of Edinburgh

1983



Abstract

A study of the acquisition of features of English syntax by adolescent immigrants to Australia is undertaken with the purpose of contributing to our understanding of factors which may influence the second language acquisition process. The main aims are to investigate:

- (1) the presence of systematicity underlying the learners' often variable realisation of features of second language syntax, and the environments and forms which may constrain any such systematicity.
- (2) the interrelatedness of the learning of discrete areas of syntax.
- (3) the effect of the learners' native language on any patterns which are found to underlie their use of features.
- (4) the relationship of cross-sectionally and longitudinally determined stages of development.

Aspects of four areas of syntax, copula, predicate complementation, negation and articles, in a number of syntactic environments, are investigated. Implicational Analysis techniques are employed to enable the analysis of variable data. Using two elicitation procedures, a sentence correction task and a modified cloze task, data is collected from learners on four separate occasions at two-monthly intervals. Seventy seven adolescent learners of English from four native language groups, Spanish, Russian, Arabic and Vietnamese, participate in the study. All are attending Melbourne High Schools and have been in Australia less than two and a half years at Time 1.

The analysis reveals that for all groups, when sufficient data is available, the environments and forms hypothesised to constrain the learners' variable realisation of features do so. Variable rules and continua of development are able to be formulated, which describe

the system/s the groups of learners are using. Similarly, the analysis shows that an interrelationship exists between the learning of features from the four structural areas. This interrelationship is found to be particularly strong among features relating to the same main sentence constituent, either NP or VP. The patterns obtained in the learners from the four native language groups are found to share certain common properties. However, important differences are also apparent, especially at the level of the environmental constraints on the realisation of features. The concept of language distance is invoked to account for the degree of similarity and difference in the patterns in the four groups. In addition, the patterns determined cross-sectionally for each group are found to be accurate predictors of the longitudinal developmental patterns evident in individual learners over time.

As a result of the findings some refinements of the 'Interlanguage Developmental Continuum' model of second language acquisition are suggested and some implications of the findings for our understanding of the role of the native language in influencing second language patterns of development are discussed.

Declaration

I declare that this thesis has been composed by myself and that the work involved is entirely my own.

Helen Borland

Acknowledgements

Many people, both in Melbourne and Edinburgh, have assisted in this study. I am extremely grateful to them all for their patient cooperation and assistance. I wish to express my thanks to the Association of Commonwealth Universities which provided me with financial support for three of the years which I have spent in Edinburgh.

Mr Ian Adams, Director of Ethnic Education Services in the Victorian Education Department gave the approval and assistance, without which the study would not have been possible. His staff, especially the Language Consultants at Child Migrant Education Services gave very willingly of their time and also helped with translations.

The study would not have been possible without the enthusiastic cooperation of the staff and students from 11 Melbourne High Schools. To all of them I wish to express my appreciation and gratitude. I would particularly like to mention Marion Maloney and Beryl Phillips of South Blackburn High School, who were so helpful and encouraging in the early stages, and the head ESL teachers at the four schools which most of the students attended; Judy Cameron, Kamal Mansour, Val Rae and Fiona Reed.

My interest in second language acquisition and appreciation of the importance of its study was inspired by reading and, ultimately, listening and talking to S. Pit Corder, who supervised me for four years. I wish to express my thanks to him for the many valuable insights and helpful criticisms which he has given. In addition, I wish to thank my present supervisor, Dr Alan Davies, who has given so willingly of his precious time and made many helpful suggestions. Many other staff have also advised and encouraged me. I would like to thank Dr Ellen Bard, Sylvia Motherwell and, particularly, Mrs Irene MacLeod from the computing section, who never tires of helping to solve all the problems which seem to arise so easily.

Numerous fellow students have contributed to the development of my ideas by giving me the opportunity for stimulating discussion. Among them Latif Al-Jumaily, Juanita War and Maria Pavesi have been particularly patient in listening to my ideas and encouraging me.

My typist, Mrs Lorna Telford, has done an excellent job of typing the thesis and I am grateful to her for her patient assistance.

My family in Australia have been a source of unfailing belief and encouragement to me over the years. My stepdaughters, Amber and Yasmin, and my daughter, Ariel, have all made considerable sacrifices so that the thesis could be completed. My husband, Rodney Currie, has given me invaluable practical and emotional support. To all of them I wish to express my thanks.

C O N T E N T S

CHAPTER ONE

	Page
<u>Background to the Investigation</u>	
1.1 Theoretical Introduction	1
1.2 Context of the Investigation	3
1.3 Definition of Terms	
.1 Acquisition and Learning	3
.2 Systematicity	4
.3 Language Distance	5
1.4 Structure of the Thesis	6

CHAPTER TWO

Related Research in Second Language Acquisition

2.0 Introduction	8
2.1 Research and Ideas regarding the role of the Native Language	8
2.2 Empirical Studies of Second Language Acquisition	
.1 Developmental Studies	12
.2 Morpheme Acquisition Order Studies	13
.3 Studies of the Effect of Non-Linguistic Variables	21
.1 Age on Arrival	21
.2 Length of Residence	23
2.3 Theoretical Models and Hypotheses about Second Language Learning	
.1 The Creative Construction Hypothesis	25
.2 The Approximative Systems Model	28
.3 The Interlanguage Hypothesis	29
.4 The Pidginisation Hypothesis	31
2.4 Theories of the Nature of the Learner's Second Language Competence	
.1 Dual Competence Theories	33
.1 Krashen's Monitor Model	34
.2 Bialystok's Models	35
.2 The Capability Continuum Model	37

	Page
2.5 The Study of Variation in Language	39
.1 Analytical Techniques and Relevant Studies of Inherent Variability	
.1 Frequency and Probability Analysis	40
.2 Implicational Analysis	
.1 Bimodal Scaling	41
.2 Trimodal Scaling	43
.3 Variability Analysis - Multi-Valued Scaling	44
.4 The Bailey Wave Model	46
.2 Application of the Study of Variation to SLA	48
.1 Studies of Inherent Variability in the Acquisition of Syntax	50
.1 Hyltenstam's Work	50
.2 Studies of the Interrelationship of Learning of Areas of Grammar	55
.3 The Interlanguage Developmental Continuum	58
2.6 Integration of the Literature into the Study	61
.1 Aims of the Study	63
.2 Hypotheses	64

CHAPTER THREE

The Structures to Be Investigated

3.0 Introduction	69
3.1 Copula	
.1 English	69
.2 Spanish	71
.3 Russian	72
.4 Arabic	73
.5 Vietnamese	74
.6 SLA Studies of Copula	75
.7 Copula in the Present Study	76

	Page
3.2 Predicate Complementation	
.1 English	77
.2 Spanish	78
.3 Russian	80
.4 Arabic	81
.5 Vietnamese	82
.6 SLA Studies of Predicate Complementation	83
.7 Predicate Complementation in the Present Study	84
3.3 Negation	
.1 English	85
.2 Spanish	86
.3 Russian	87
.4 Arabic	88
.5 Vietnamese	89
.6 SLA Studies of Negation	90
.7 Negation in the Present Study	92
3.4 Articles	
.1 English	94
.1 The Definite Article	94
.2 The Indefinite Article	95
.2 Spanish	96
.3 Russian	97
.4 Arabic	98
.5 Vietnamese	99
.6 SLA Studies of Articles	100
.7 Articles in the Present Study	103

CHAPTER FOUR

Preliminary Study and Design of the Experiment

4.1 The Preliminary Study	
.1 Aims and Objectives	105
.2 Multiple Choice Task	108
.3 Sentence Correction Task	110
.4 Elicited Imitation Task	112
.5 Modified Cloze Task	114
.6 Conclusions	116

	Page
4.2 The Major Study	
.1 General Design	117
.2 The Subjects	
.1 General Characteristics	118
.2 Independent and Control Variables	119
.3 The Four Language Groups	
.1 Spanish	120
.2 Russian	121
.3 Arabic	121
.4 Vietnamese	122
.3 The Tasks	
.1 Introduction	124
.2 Sentence Correction Task	124
.1 Copula	126
.2 Predicate Complementation	126
.3 Negation	130
.3 Modified Cloze Task	132
.1 Format	133
.4 Administration of the Tasks	133
.5 Criteria for Assessment	136

CHAPTER FIVE

The Results of the Investigation

5.0 Introduction	139
.1 General Performance	139
5.1 Copula	
.1 Variability in Environments	
.1 Group Trends	144
.2 Individual Behaviour	154
.2 Development Over Time	
.1 Group Trends	167
.2 Individual Behaviour	170

5.2	Predicate Complementation	
.1	Variability by Complement Type	
.1	Group Trends	172
.2	Individual Behaviour	179
.2	Variability According to the Relationship between Subjects	
.1	Group Trends	184
.2	Individual Behaviour	190
.3	Development Over Time	
.1	Group Trends	192
.2	Individual Behaviour	194
5.3	Negation	
.1	Variability by AUX + NEG Type	
.1	Group Trends	197
.2	Individual Behaviour	203
.2	Variability by Environments within COP + NEG Type	
.1	Group Trends	207
.2	Individual Behaviour	213
.3	Development Over Time	
.1	Group Trends	218
.2	Individual Behaviour	221
5.4	Articles	
.1	Variability According to Article Type	
.1	Group Trends	223
.2	Individual Behaviour	229
.2	Variability According to the Position of the NP in the Sentence	230
.1	The Indefinite Article	
.1	Group Trends	230
.2	Individual Behaviour	236
.2	The Definite Article	
.1	Group Trends	240
.2	Individual Behaviour	246
.3	Development Over Time	
.1	Group Trends	248
.2	Individual Behaviour	252

	Page
5.5 Relationship Between the Learning of Syntactic Features in the Four Structural Areas	256
.1 Group Trends	257
.2 Individual Behaviour	264
5.6 The Effect of the Independent Variables	
.1 Partial Correlations for AOA and LOR	278
.1 Age on Arrival	279
.2 Length of Residence	280
.2 The Relative Effects of the Four Independent Variables	281
.1 Analysis of Covariance	281
.2 Multiple Classification Analysis	283

CHAPTER SIX

Interpretation and Discussion of Results

6.0 Introduction	286
6.1 The Systematicity Underlying the Learners' Second Language Production	
.0 Introduction	286
.1 Copula	288
.2 Complementation	
.1 Complement Types	295
.2 Subject Identity Type	301
.3 Negation	
.1 AUX + NEG Types	304
.2 COP + NEG Environments	308
.4 Articles	
.1 Article Types	312
.2 Article Environments	315
6.2 The Interrelationship of the Learning of the Four Areas of Syntax	322
6.3 The Effect of the Native Language	328
6.4 The Relationship Between Cross-sectional and Longitudinal Patterns	338
6.5 The Relationship between linguistic and non-linguistic variables	350

CHAPTER SEVEN

	Page
<u>Conclusions</u>	
7.1 Summary of Findings	355
7.2 The Nature of the Continuum	359
7.3 The Role of the Native Language	362
7.4 Cross-Sectional Methodology	364
7.5 Concluding Remarks	365
 Appendix A	 366
Appendix B	386
Bibliography	452

CHAPTER ONE

Background to the Investigation

1.1 Theoretical Introduction

During the past two decades there has been an upsurge of interest in the teaching and learning of second languages. This has led to a reappraisal of previously accepted assumptions about the relationship between teaching and learning, and indeed about the nature of the learning process itself. Stimulated by advances in psycholinguistics (Chomsky 1959) which questioned the validity of the behaviourist stimulus response model of learning proposed by Skinner (1957) as a model accounting for the process of first language acquisition, second language learning researchers started to challenge the validity of habit formation as an adequate model of second language learning. Their efforts were motivated by a desire to understand more about the mechanisms involved in the learning of second languages.

One of the most important resulting changes has been a change in the focus of attention from the teacher and the materials presented, to the learner and the language which he produces. This reflects a profound change in attitude to the learner and in orientation in thinking about the learning process. Whereas previously the assumption had been that the teacher basically controlled and directed the learning process, no longer was this the case.

The shift of focus towards the learner has had important consequences. For example, in this view, errors are considered not as evidence of imperfect teaching or as a necessary evil, as they once were, but rather as a valuable source of information about the process of learning which the learner is engaged upon. As in first language acquisition what the learner says is seen as providing evidence about how he learns.

Let us consider at this point what we can hope to gain from focussing on the learner and the actual linguistic forms which he uses. In broad

terms it seems worthwhile and beneficial to study learners' language in order to understand how the process works. Ultimately this greater understanding of the process of second language acquisition (henceforth SLA) may contribute to the development of more efficient teaching methods and enable the adoption of approaches which provide environments which are conducive to learning taking place. Already the research carried out and the findings made are starting to lead to such changes.

Corder (1967, 1971a, 1971b) has advocated an approach to the study of the language of second language learners which is similar to that adopted by those linguists who study first language acquisition in young children. He suggests that at any one time some sort of system underlies the language which is produced by the learner. He uses the term "transitional competence" to refer to the grammatical system which guides a learner's production of forms at any point in time and asserts that by studying these manifestations of the learner's competence at various points in time as his second language progresses we can observe how it develops and thus come to an understanding of the processes and strategies which direct SLA.

Corder's speculative early papers, along with those of Nemser (1971) and Selinker (1972) clearly raised a number of questions. Most research in the past 15 years in SLA has been directed towards providing some of the answers. For example, can it really be said that in producing utterances in a second language a learner's internal grammar is systematic? How can such systems, which if they exist are clearly unstable, be described: and furthermore how universal are any such systems? Are the rules which characterise them essentially shared by all learners, just as in first language acquisition? Or is their distribution more restricted, for example applying only to learners who speak the same first language, or who share other common characteristics, such as the same classroom, work environment or teaching method? Alternatively, are the rules of any such systems idiosyncratic, with no or few elements common to all learners.

It is against the background of these issues in pursuit of greater understanding of the process of acquisition of the syntax of a second language that this investigation is undertaken. In particular, the possible presence and universality of systematicity in learners' "transitional competences" are of interest, especially in the context of the influence of the mother tongue.

1.2 Context of the Investigation

The investigation of SLA of syntax in this study was carried out in Melbourne, Australia. The learners whose language was to provide the corpus of data were all students in Melbourne High schools. All were recently-arrived immigrants to Australia, learning English both through natural exposure and some specialised ESL instruction. To enable a comparison of any systems which can be established, the learners were drawn from four different native language backgrounds. For largely practical reasons the native languages chosen were Spanish, Russian, Arabic and Vietnamese.

Four structural areas within English syntax were singled out for the detailed study which is necessary for any deepening of our understanding of learners' language and the learning process. The intention was to explore some of the possible parameters which may define any systematicity which is evident. The areas chosen were copula, predicate complementation, negation and articles.

1.3 Definition of Terms

In the course of the study several terms are used the meaning of which need to be discussed.

1.3.1 Acquisition and Learning

Much confusion centres on the appropriate use of these two terms. This largely stems from the fact that the term learning has come to be used

not only in a general non-technical sense to describe the processes by which knowledge is internalised and skills mastered, but also in a more restricted sense. In this sense it is used to describe what is learnt through formal instruction (Krashen 1976, 1977a, 1977b), and refers only to a process which is conscious. The term acquisition has always been a technical one, used to refer to the process which is involved in the internalisation of knowledge. This is considered an unconscious process.

In any use of these terms in their strict technical sense problems arise. It is impossible to determine which of the two processes is responsible for the language which the learner uses if he has been given some formal instruction as well as being exposed to the language naturally. In these circumstances any decision between the two as a description of what is involved in mastering a second language can never be definitively tested. However, even when exposure has been entirely in what is considered to be a formal environment, developmental errors occur. These errors do not reflect the forms which have been formally taught and thus their occurrence suggests that in all cases some element of acquisition is involved.

In this study the term acquisition will be used to refer to the process in which the learners are engaged. Thus, the study is one of second language acquisition. The term learning, when it is used, will only be used in its general non-technical sense. When the process and product of formal learning are being referred to the full expression, formal learning will be used. In referring to the subject/s who are being investigated the term learner/s, in accordance with convention, will be used.

1.3.2 Systematicity

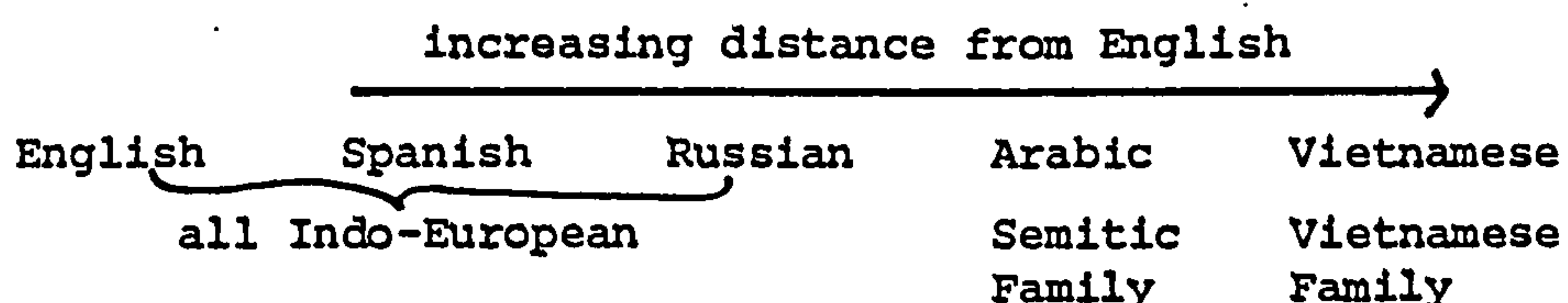
Another set of terms which need to be defined are those associated with the notion of systematicity. If something is systematic this means that there is evidence of a non-random use of forms, such that it is possible to formulate rules which describe the system which is being

used. In many cases in linguistics it is necessary to be able to describe systems which are not stable, ie which are dynamic. This is the case not only in language acquisition, but also where language change is taking place (eg historical linguistics and sociolinguistics). Such dynamic systems can be characterised using rules which allow for non-categorical use of features, such as variable rules.

1.3.3 Language Distance

The concept of language distance is used in this study and requires some explanation. Clearly, it is impossible to measure in any quantitative way the degree of distance (ie of difference) between two languages. However, as Corder (1976) points out, for any member of a particular language community there seems to be generally accepted beliefs about "the magnitude of the task of learning specific second languages". He relates these to the concept of language distance, which he claims correlates "with some notion of genetic relatedness". The concept of language distance can be defined as a measure of the relative distance of languages from each other, which can be determined by the extent of their genetic relatedness and their typological similarities and differences.

In assessing the relative distance of the four native languages spoken by the learners in this study (ie. Spanish, Russian, Arabic and Vietnamese) from the language being learnt, English, this diagram is felt to portray these distances:



1.4 Structure of the Thesis

Altogether the thesis contains seven chapters. In Chapter Two research relevant to this investigation is reviewed. This includes discussion of some of the most important experimental investigations, of models and hypotheses which have been proposed concerning the nature of learners' language and the process of SLA and of studies of variability in language, both in general and specifically in the field of SLA. After these aspects of recent variability research have been reviewed one recent model which employs the concepts related to the study of dynamic linguistic phenomena concerning SLA, the Interlanguage Developmental Continuum model, is discussed. The final section of Chapter 2 deals with the integration of the literature reviewed into the present investigation. Some of the implications of the research findings are summarised and then aims and finally groups of hypotheses are formulated. In Chapter Three the four structural areas which are to be investigated in the study are analysed. First, a short analysis of the form of each structure in English is presented, then the realisation of the features in each of the four native languages is presented. In the penultimate section for each area previous SLA studies of relevant aspects of that area are outlined and discussed. Finally the aspects of the structural area which are to be included in the study are presented and specific hypotheses formulated concerning the constraints which may govern their systematic realisations. In Chapter Four the preliminary study which was undertaken is briefly outlined and discussed. The second half of the chapter is devoted to providing details of the major study. The subjects are described, the tasks outlined and details of the administration of the tasks are described. Finally the criteria used in assessing the subjects' responses are briefly discussed. In Chapter Five the results of the investigation are presented. First the results for each of the four structural areas considered separately are presented. These are followed by the results for the interrelationship of the learning of the four areas. In the final section the results relating to the effect of the independent variables on the learners' second language performance are presented. Chapter Six contains the discussion and interpretation of

the results in relation to the five groups of hypotheses. Each group of hypotheses is considered, one section of the chapter being devoted to each. The final chapter; Chapter Seven contains a brief summary of the findings of the study in regard to the hypotheses. Following this, some of the broader implications of the results of the study are discussed.

CHAPTER TWO

Related Research in Second Language Acquisition

2.0 Introduction

The general context of this investigation in terms of changing concepts of the nature of language learners' language and its development has been outlined in Chapter 1. The purpose of Chapter 2 is to outline and discuss empirical and theoretical studies concerning aspects of second language acquisition and to the description of learners' language. In Section 2.1 ideas and research into the role of the native language in SLA are discussed. This is an area of SLA studies in which some of the most radical changes in thinking have occurred. Section 2.2 deals with the important empirical studies, both developmental and of morpheme acquisition order, which have contributed to the development of hypotheses and models of SLA. In addition research on the relationship between AOA and LOR and learners' achievement is outlined. After this hypotheses and models of the SLA process which have been proposed as a result of empirical study are discussed (Section 2.3) as well as theories about the nature of the learners' second language competence (Section 2.4). Finally in section 2.5 the most recent techniques now available for studying variable language data are outlined, research into SLA of syntax employing these techniques is discussed and one important recent theory of the SLA process which draws on the variability paradigm is discussed.

2.1 Research and Ideas regarding the Role of the Native Language

Until the mid-60s the native language of the second language learner was considered to be the main influence and thus cause of errors in the learner's second language production. Fries (1945) was the first to propose the notions which became the basis for the Contrastive Analysis hypothesis. Drawing on Fries' ideas and those of Weinreich (1953) and Haugen (1953) in their studies of bilingualism Lado (1957) produced a whole theory of second language learning based on the influence of the

learner's native language (L1).

As a result of Lado's theory and suggestions detailed Contrastive Analyses were undertaken to determine possible areas of difficulties for language learners from particular language backgrounds learning a particular second language (L2) (Stockwell, Bowen, ~~and~~ and Martin 1965 is probably the best known and most thorough of these). Other researchers looked for evidence in learner's language of first language influence which they generally called "interference" or "transfer". They generally found what they expected (eg. Duskova 1969, Hocking 1969), and concluded that large proportions of errors could be attributed to the mother tongue. However, even these stalwart followers of CA were forced to admit that there were some errors which could not be explained by recourse to mother tongue interference.

Studies of the type mentioned above were quickly followed by more methodologically rigorous analyses (eg. Nemser 1971, Buteau 1970) and it soon became clear that, as had been suggested by Corder in 1967, there were important influences on the learner's production other than L1. The greater the investigation of the learner's language the less pernicious the influence of the first language was seen to be, particularly in morphology and syntax. Studies of grammar revealed for children, both in second and foreign language situations, a level of interlingual errors of around 4-12% (eg. Dulay and Burt 1974c, Milon 1974, Gillis and Weber 1976, Ervin-Tripp 1974, Hansen-Bede 1975, Wode 1976, Felix 1978). The incidence of interlingual errors in the grammar of adult L2 learners was found also to be unexpectedly low, 8-23%, although still a little higher than for children (White 1977, LoCoco 1975, Hanania and Gradman 1977, d'Anglejan and Tucker 1975). Similarly studies of immigrant worker pidgins also showed a high degree of similarity in the language produced regardless of the workers' native language (Clyne 1968, Schumann 1976).

Along with the small occurrence of inappropriate structures attributable to the mother tongue (so-called "negative transfer"), researchers also noted a lack of "positive transfer": the non-application of rules which

are similar to L2 rules and thus would have produced correct L2 forms (Natalicio and Natalicio 1971, and Hernandez-Chavez 1972).

More recently Felix has suggested that the incidence of transfer errors in natural language acquisition is lower than even these studies concluded. He points out:

"the crucial problem is that we do not possess well-established criteria by which it can be decided in a unique and principled way which ungrammatical utterances are demonstrably instances of language transfer."

(Felix 1980:94)

His point is that just because a structure produced by the learner in L2 is similar to a structure in his L1, it does not constitute proof of transfer is an important one.

Many researchers tend to attribute errors to transfer because of an apparent similarity to L1, when, in fact, exactly the same forms are found in the L2 production of learners with different L1 structures or in learners of the same language as a first language. Examples of this phenomenon are Duskova's interpretation of the lack of articles in the writings of her Czech speaking learners of English (1969) and Butterworth's of the omission of the subject in the copular sentences of his subject, Ricardo (1978). Such errors are now recognised by most researchers as being developmental and non-L1 specific.

Recent research has led to a more sophisticated understanding of the role of the mother tongue in second language use and usage. Newmark (1966) was the first to remark that in grammar and vocabulary the highest incidence of mother-tongue-like features occurred in situations where the learner is required or expected to perform beyond his means. Newmark and Reibel describe the phenomenon:

"A person knows how to speak one language, say his native one. Now he tries to speak another one; but in his early stages of learning the new one, there are many things he has not yet learned to do; that is he is grossly undertrained in the new one. But when he is induced to perform ("perform" may mean understand,

speak, read or write) in that new one by an external teacher or by his internal desire to say something what can he do other than use what he already knows to make up for what he does not know?.... The problem of "interference" viewed thus reduces to the problem of ignorance."

(Newmark & Reibel 1968:159-160)

As Corder (1981) points out transfer, or as he and others have preferred to call it, "borrowing", in this view is a performance phenomenon; a strategy to enable communication, or in non-communicative classroom-type situations mere L2 production, when L2 knowledge is inadequate. This interpretation of the occurrence of mother-tongue-like forms most adequately explains the observed facts about the incidence of these features:

(1) that they occur most frequently in the initial stages of learning (Taylor 1975)

(2) that they occur more frequently in foreign language situations where opportunities for language acquisition are considered to be generally poorer

(3) that they are associated particularly with certain types of language activities, particularly those involving translation (Lado 1978)

(4) that they occur more frequently in the language of adults than of children. (Adults generally have fewer opportunities for exposure to the language but feel the need to express quite complex thoughts.)

Krashen (1977a) and Zobl (1980b) have gone as far as suggesting that before the adult learner has acquired the language, he may use his L1 as an utterance initiator with L2 vocabulary and his explicit knowledge of simple L2 rules.

Kellerman and Jordens, in their excellent studies on "transferability" in grammar and lexicon have added much to our understanding of the

conditions under which "borrowing" from L1 may take place (Kellerman 1977, 1978a, 1978b, Jordens 1978, Jordens & Kellerman 1978). The borrowability of L2 vocabulary or grammatical structures seems to be conditioned by the learner's perception of language distance of the L1 from the language being learned and the markedness of the particular meaning or structure within the L1. Where the language distance is perceived as small (eg. between English and other Germanic languages) there is likely to be considerable use of "borrowing" but relatively few errors resulting. With an L1 moderately similar borrowing may still occur and will probably lead to more errors. When the L1 is perceived as being highly dissimilar to the L2 very little borrowing appears to take place. In such cases the learner may draw on knowledge of other languages which are perceived as being closer to the language being learned (Sjöholm 1976). If this is not possible the learner seems to prefer to avoid the L2 structure altogether. In an important study Schachter (1974) shows that Japanese and Chinese learners of English avoid using English relative clauses. More recently others have recorded similar instances (Kleinmann 1977; Madden, Bailey, Eisenstein & Anderson 1978).

At the present time the heuristic and facilitative role of the mother tongue in second language learning tends to be stressed. Corder (1978, 1981) refers to the "phenomenon of relative facilitation" in suggesting that the learner's L1 may influence his rate of development, but not the sequence. In several recent papers Zobl (1980a, 1980b, 1980c, 1982) supports this facilitation concept, arguing for a more sophisticated form of Contrastive Analysis in which the degree of similarity between the learner's L1 and L2 for a particular feature affects his rate of acquisition of that feature in L2.

Within the constraints of creative construction, a process he regards as central to language acquisition, Zobl goes on to suggest three possible effects of the mother tongue:

- (1) delay in the restructuring necessary to proceed in the continuum

(2) the developmental structure currently being used is extended to other environments

(3) rule changes will tend to be implemented which permit a maximum degree of structural consistency with the preceding developmental forms.

The main difficulty in accepting Zobl's claims on first language influence relates to the empirical evidence which is only anecdotal. If these alterations in the rate of acquisition and the addition of extra developmental stages depending on the similarities and differences between the learners' first and second languages in each structural area re-occurring, we would expect to see differences in studies such as those of morpheme acquisition order between groups of learners with different mother tongues. Most researchers do not find this to be the case (refer to Section 2.2.2). Nevertheless, at this stage it would be premature to dismiss Zobl's ideas.

2.2 Empirical Studies of Second Language Acquisition

2.2.1 Developmental Studies

Determination of stages of development is the classic approach to the study of both primary and non-primary language acquisition. This methodology is basically exploratory. The learner's different realizations of a particular structure (eg. negation, Milon 1974) are extracted from a body of data and used to define what are generally considered to be roughly sequential stages of development. In second language acquisition research developmental studies have often been initiated as error analyses, searching for evidence of first language influence. Such studies have provided the foundation for our study of the process of second language acquisition (SLA). Ravem's (1968) analysis of the sequence and stages of development of English negation and interrogation in the language of his two Norwegian children demonstrated clearly the similarity between first and second language acquisition. Cazden, Cancino, Rosansky and Schumann (1975 and in individual publications) also

found clear patterns in the development of both negation and interrogation in a longitudinal study of 6 Spanish-speaking learners of English. Similarly, Wode (1976 and 1980) has been able to demonstrate developmental sequences in phonology, plural inflection and negation for his German-speaking children learning English. In his data, as in other studies (eg. Hansen-Bede 1975, Huang and Hatch 1978, Pienemann 1980), there is a high degree of similarity in the second language production of the learners and in their developmental stages.

Developmental studies have given and continue to give us valuable insights into the SLA process. Because of their small scale in terms of the number of subjects, they have not been able to provide us with more detailed understanding of the process of development with respect to its rate, the nature of the learning curve or the patterning, if any, of the variability apparent as the developmental sequence is moved through. In fact, the classic presentation of stages of development as discrete steps with no overlap is a misleading idealization of the real data in which stages often appear to be intermingled (see Raven's (1968) data on WH-questions). By building on such studies, employing more sophisticated analytical techniques and larger samples, further understanding and insight can be gained into development both within and between structural areas.

2.2.2 Morpheme Acquisition Order Studies

As the results of error analyses indicated the high frequency of developmental, non-first language related errors, empirical investigation of the similarities between first and second language learning began in earnest (eg. Ervin-Tripp 1974, Dulay and Burt 1972).

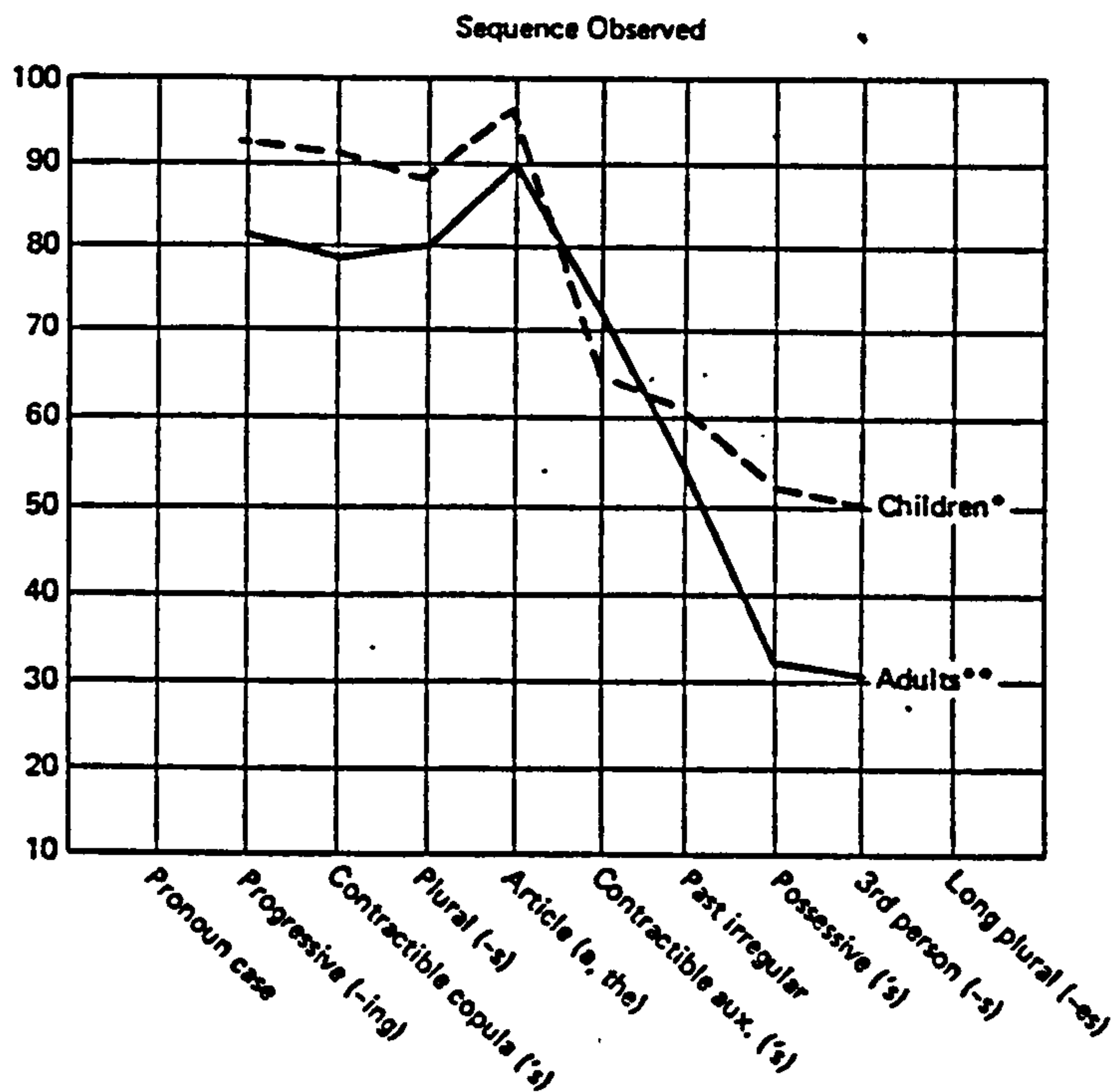
Brown's (1973) report of the results of his longitudinal study of the acquisition of English as a first language by three children, Adam, Eve and Sarah in which a striking similarity is shown in their order of acquisition of 14 grammatical morphemes, provided a lead to SLA researchers. Soon after this, the order Brown obtained was validated cross-sectionally by de Villiers and de Villiers (1973). Because of the frequency and unavoidability of using grammatical morphemes and the

methodological insights which Brown had contributed to their study, they were an obvious focus for SLA researchers seeking to test their hypothesis of there being a "built-in syllabus" in SLA, similar to that in first language acquisition.

The first study of the acquisition sequence (some have preferred the terms "difficulty" or "accuracy" order) of grammatical morphemes in SLA was undertaken by Dulay and Burt (1973). In this cross-sectional study they compare three groups of Spanish-speaking children in the production of 8 English morphemes (progressive, contractible copula, plural (-s), Article (the, a), contractible auxiliary, past irregular, and 3rd person present (-s)) using their own elicitation instrument, the Bilingual Syntax Measure (BSM) to elicit what they call "structured natural conversation" (Dulay and Burt 1980). They found that although the three groups of children differ from each other in terms of the amount and type of exposure to English the acquisition sequences obtained for the groups are strikingly similar to each other, but different from that found in first language acquisition. In a second study Dulay and Burt (1974)² compare the acquisition sequences for 11 grammatical morphemes in two groups of children, one Spanish-speaking and one Chinese-speaking. They report a very high correlation between the two different native language groups in the order of acquisition of morphemes ($\rho > .95$).

Bailey, Madden and Krashen (1974) extend the study of morpheme acquisition sequences to adults. Using the BSM they analyse the production of grammatical morphemes by 73 adults, divided into 2 groups, one of native Spanish speakers and the other with native speakers of 11 different languages. They claim to have found a similar sequence in both groups, which also correlates highly with the sequence reported for children by Dulay and Burt (figure 2.1). The implications of these results are enormous. Despite formal tuition and different language backgrounds adults appear to follow a predetermined sequence of acquisition of grammatical morphemes, a "built-in syllabus".

Figure 2.1: Morpheme Acquisition Orders for Children and Adults.



*Dulay & Burt (1974).
**Bailey, Madden & Krashen (1974).

Correlation Coefficients and Significance Levels:

	Adults (Spanish Ss)
Children	$\rho = .976$ ($p < .01$) (Spearman)

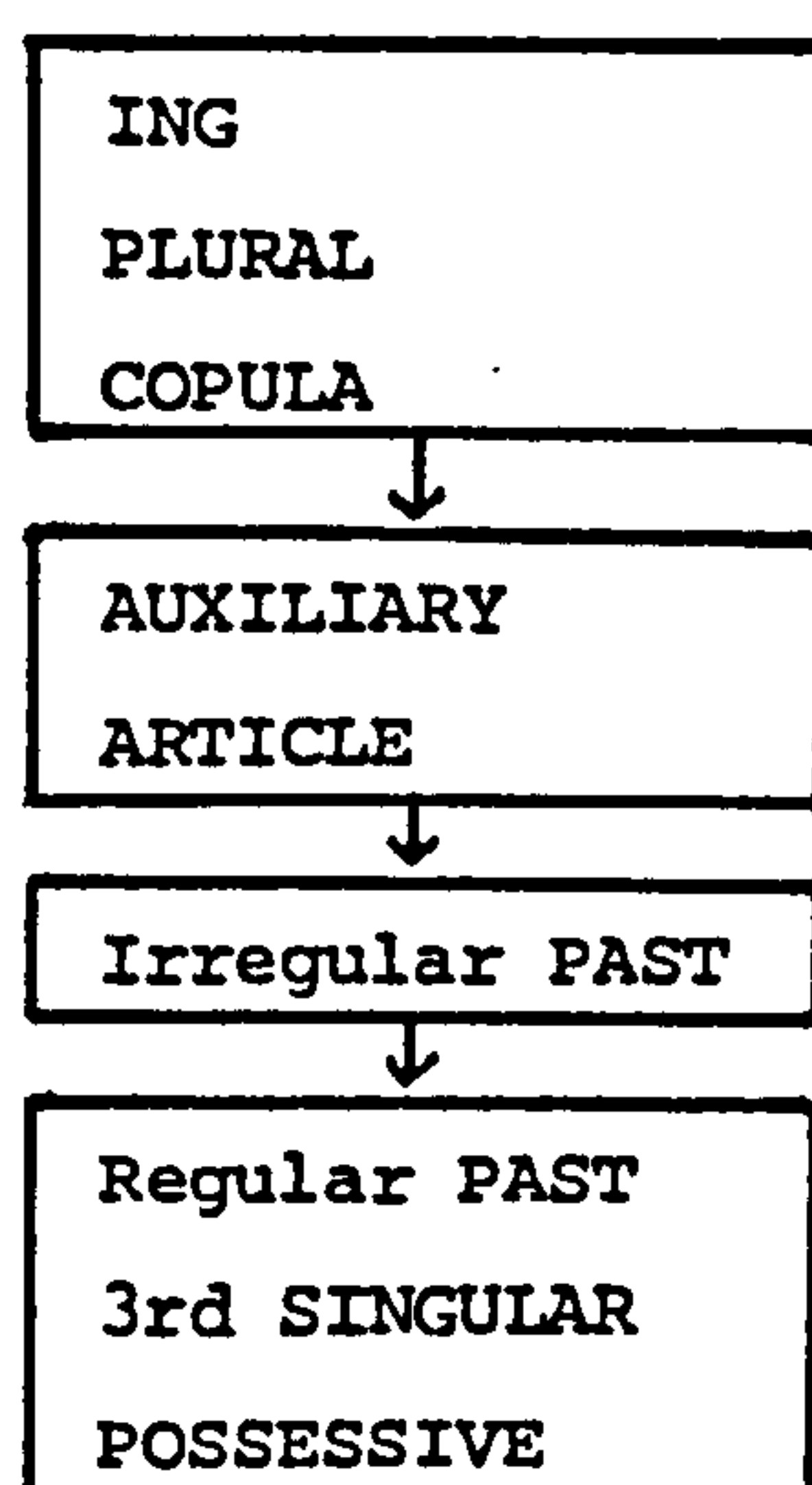
Porter (1977) argues that the results obtained are the product of the elicitation instrument, the BSM. However, by the time Porter's criticisms were published and soon after studies using other oral elicitation techniques, including the SLOPE test for 20 grammatical categories and free speech, for both children (Fathman 1975; Makino 1977; Kessler and Idar 1979) and adults (Larsen-Freeman 1975; Krashen, Sferlazza, Feldman and Fathman 1976; Krashen, Houck, Guinchi, Bode, Birnbaum and Strei 1977; Fuller 1978) appeared and these confirm the findings of the initial studies.

Performance on grammatical morphemes and their ordering in relation to each other appear to be less consistent in written tasks. In general natural writing tasks appear to yield sequences similar to those in oral production (Andersen 1976; Krashen, Butler, Birnbaum and Robertson 1977), although the correlations tend to be lower. In other

written tasks, notably Larsen-Freeman's discrete point writing task, there is no significant correlation. It is results like these which led Krashen to propose his dual competence hypothesis (discussed in section 2.4.1).

In addition, studies by Fathman (1975) and Krashen, Sferlazza, Feldman and Fathman (1976) seem to indicate that formal instruction does not affect the difficulty order of 20 structures in either children or adults. Both these studies used the SLOPE oral production test.

All of the studies discussed above used the rank-ordering technique originally used by Dulay and Burt and R. Brown. Dulay and Burt very quickly pointed out an important methodological problem with this technique. The scores for the grammatical morphemes tend to cluster together in groups (see for example figure 2.1 above). Simple ranking gives the impression all the scores are equidistant from each other. Using the ordering-theoretic method (Bart & Krus 1973) Dulay and Burt (1975) reanalyse their data and obtain acquisition hierarchies in which groups of structures which are clustered together are assumed to be acquired at about the same time and are considered to be unordered with respect to each other, but ordered with respect to the groups above and below. Krashen (1981), pooling data from a large number of studies, proposes such an acquisition hierarchy, "a natural order" for the most frequently studied morphemes.



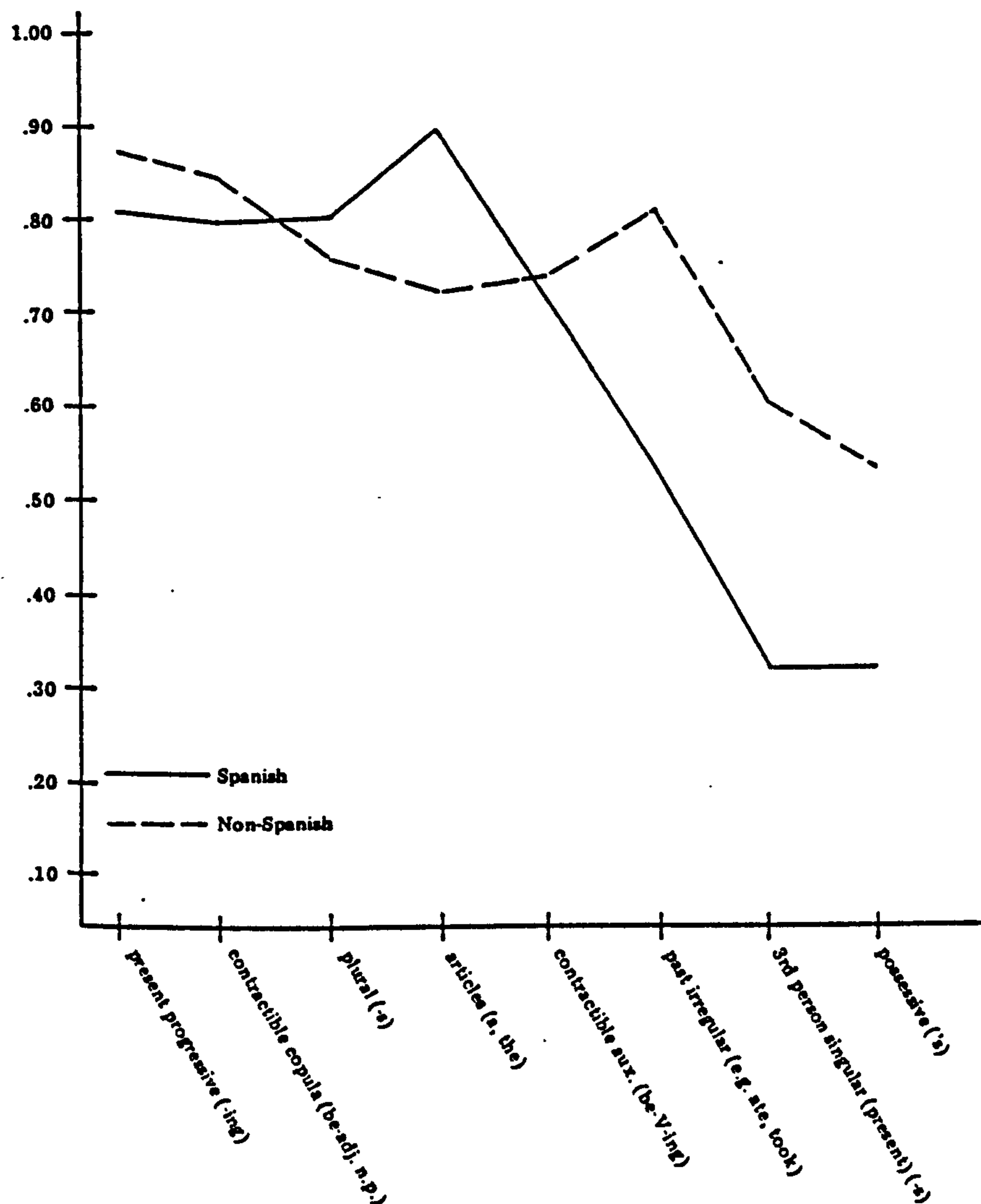
from Krashen (1981:59)

The interpretation of the results and implications of second language morpheme order studies raises a number of serious problems. Many of these problems relate to the methodology of various morpheme order studies and the statistical interpretation of their results, but other criticisms of even more significance in their implications can be made regarding the purpose and contribution of such studies to our understanding of second language acquisition.

Rosansky (1976) raises several methodological problems as a result of her attempt to correlate morpheme accuracy orders obtained using Dulay and Burt's BSM with that obtained in her own free conversation data both cross-sectionally and longitudinally. She attempts to establish that there is little validity in the existence of a morpheme accuracy order. Unfortunately she does not produce any convincing evidence to support her contention and so most of her criticisms must be disregarded. She does however, point to omissions in the presentation of findings in some of the discussions; in particular, the lack of a significant correlation between Dulay and Burt's (1973) Sacramento group and the groups in their 1974 study, suggesting that they deliberately avoided presenting this statistic. Rosansky's point highlights a significant problem in morpheme order studies regarding firstly the presentation and omission of results and second, the interpretation of correlation statistics. A good example of the first problem can be observed in the Bailey, Madden and Krashen (1974) study, in which a Spanish-speaking and a non-Spanish-speaking group are studied. In correlating their performance (Figure 2.1.2), where in previous studies rank order correlations, rightly or wrongly, had been used, in this study BMK sometimes use a Pearson correlation and sometimes a Spearman rank order correlation. The only correlation they produce between their 2 language groups is a highly significant Pearson correlation ($r = .926$, $p < .005$). One is tempted to suggest that this is because the rank correlation between the 2 groups, $\rho = .54$, is not significant.

In fact there are obvious differences between the 2 groups particularly in performance on articles and the irregular past tense. Also scores for particular morphemes are clustered together, so ranking makes the separation appear greater. It may well be that a Pearson correlation

Figure 2.1.2: Comparison of Spanish and non-Spanish Adults (from BMK (1974)).



is more appropriate and gives a truer reflection of the relationship, but this point is not discussed in BMK.

Rosansky and Larsen-Freeman (1975) have both commented on the large amount of individual variability in morpheme order in their data. Rosansky's point that in the process of statistical treatment individual variability may be obscured as scores are averaged, means computed and then ranks assigned, is an important one and is not necessarily invalidated by the unconvincing data she produces to support it. It certainly seems important to determine to what extent the morpheme acquisition order has reality in the second language production of individual learners. After all cross-sectional study is undertaken in

the belief that group performance reflects individual longitudinal order. Andersen (1977) has also addressed this problem and suggests using a group range method which, in addition to establishing an accuracy order for morphemes, tells something about individual's performance on each morpheme.

In the same paper, Andersen has made extensive methodological criticisms of the morpheme order approach. Amongst other things he demonstrates how much of the systematicity and variability present in the raw data is misrepresented and hidden by using traditional morpheme order techniques. He suggests several refinements in addition to the use of group range, such as testing for individual fit, the studying of natural groups of morphemes and the use of implicational scaling to obtain a fuller and more representative analysis of cross-sectional SLA data.

Another contentious point in relation to the interpretation of the results of these studies relates to the interpretation of correlation statistics. Most researchers in seeking to emphasize the similarity in the morpheme orders of groups of learners tend to concentrate on whether or not a particular correlation is significant. However, in statistics measuring the amount of correlation, such as Pearson's r and Spearman's ρ , the significance level merely indicates "whether there is any correlation (over and above chance) between two variables" (Garrett 1965: 175). In addition, when the existence of an association has been established it is necessary to assess "the degree or closeness of relationship" (Garrett 1965:175). Even for eight ranks at $p = .05$ level a ρ of .65 is significant, but would obviously indicate a much weaker relationship between the two variables than a ρ of .90. Bearing this in mind we are able to draw more out of the correlation coefficients than a binary significance distinction. The higher the coefficient for a particular pair of samples (in this case, orders of morphemes) the stronger the relationship. Firstly, it is apparent that although different elicitation instruments designed to elicit non-monitored speech produce orders which are usually, but not always significantly correlated, studies using the BSM correlate more highly with each other than with non-BSM studies (see Krashen 1981:60 for the correlation

values). Second, although the orders obtained for learners with different native languages do generally correlate significantly with one another, the correlations tend to be higher and thus the relationship stronger, between groups of learners with the same first language (eg. Spanish-speaking ESL learners). This evidence for a subtle, but nevertheless measurable first language effect seems to be particularly noticeable among adults. For example it can be seen in the correlation of the orders of four groups of adults for the 20 structures in the SLOPE test (Krashen, Sferlazza, Feldman and Fathman 1976) (see Table 2.1). All the correlations in the matrix are significant beyond the .01 level. But the values of rho suggest that there may be a relationship between language distance of the native languages of the 2 groups being correlated and the strength of the correlation. This possibility warrants further investigation.

Table 2.1: Rank Order Correlations of Difficulty Orders for Adult Learners with different L1s on the SLOPE test (from Krashen, Sferlazza, Feldman and Fathman 1976:147)

	Spanish	Greek	Other Indo-European	Non Indo-European
Spanish n = 18		.88	.86	.74
Greek n = 14			.81	.74
Other Indo-European n = 17				.79
Non Indo-European n = 13				

Quite apart from these methodological reservations other more fundamental objections to the approach have been made. Wode and his colleagues at Kiel University (especially Wode, Bahns, Bedey and Frank 1978) have severely criticised this approach. They argue that it misses the most interesting aspect of language acquisition: the process of acquisition of structures, specifically "the pre-target-like regularities" which "must be regarded as an essential part of the total process of acquiring

a language". Wode et al. (1978) demonstrate that the morpheme order approach necessarily misses important phenomena to our understanding of the SLA process, such as avoidance of particular forms, underlying acquisitional strategies and principles and subtle influences of the first language. They advocate as an alternative the notion of developmental sequence, "the developmental stages that a child passes through on its way toward target-like mastery of a structure". Their point is a valid one and these researchers are not the first to take a developmental approach to the study of the acquisition of particular second language structural areas. However these two approaches are not mutually exclusive. Developmental studies have focussed in detail on the process of acquisition within structural areas whereas morpheme order studies have been concerned with the relationship, undoubtedly in rather crude terms, of development in different, seemingly unrelated areas of language. Implicational scaling and the techniques offered us by variability analysis are one of the few approaches to the study of SLA which allow the integration of these two aspects of second language development. These will be discussed further in section 2.5.

2.2.3- Studies of the Effect of Non-Linguistic Variables

Whilst the present study is chiefly concerned with the influence of linguistic variables on second language acquisition data was collected for two non-linguistic variables, Age on Arrival (AOA) and Length of Residence (LOR) in order to investigate their relationship with the linguistic variables. A number of previous studies have investigated these relationships.

2.2.3.1 Age on Arrival

Popular wisdom has been that younger children are better second language learners than older children (Penfield and Roberts 1959). However, this simplistic misconception has been virtually eradicated, at least among SLA researchers by recent studies (Snow and Hoefnagel-Hohle 1978, Cummins 1981a). Whilst it is recognised that differences do exist which

can be related partially to age, it is recognised that there are a number of different dimensions to language learning and different aspects of success. Thus Cummins (1979) has distinguished between "basic interpersonal communication skills" (called BICS), such as accent and oral fluency, and "cognitive/academic language proficiency" (CALP). CALP is seen as being strongly related to overall cognitive and academic skills whereas BICS are independent of these factors. Cummins believes that this distinction accounts for contradictory findings relating to age and SLA; namely that for a given LOR younger children are superior in measures of pronunciation and oral fluency, whereas older learners are superior in measures of syntactic and morphological development.

Recent findings also highlight the important distinction which needs to be made between rate of acquisition and eventual attainment. Krashen, Long and Scarcella (1979), reviewing available research, conclude that empirical findings indicate that adults and older children initially learn at a faster rate, but ultimately younger children reach a higher level of attainment. These differences in rate of acquisition and ultimate attainment appear to relate to the interaction of four sets of factors; biological, cognitive/developmental, affective and input-related (Dulay, Burt and Krashen 1982).

Although most studies of the relationship of AOA and SLA have focussed on the extremes, children under 10 years and adults, some recent studies have also included older children (11 to 16-17 years). These studies (Fathman 1975, Ramirez and Politzer 1978, Snow and Hoefnagel-Hohle 1978, Patkowski 1980, Cummins 1981a and b) point to this group being the most rapid in syntactic development, having a faster rate than either younger children or adults. Moreover Patkowski's results suggest that all learners less than 15 years old on arrival achieve native or near native proficiency. Walberg, Hase and Rasher's (1978) study is not in agreement with these other studies. Because of the fairly long average LOR of their subjects it seems probable that any age advantage for the older children is obscured. The important point is that their results do not support the popular belief of an early age advantage.

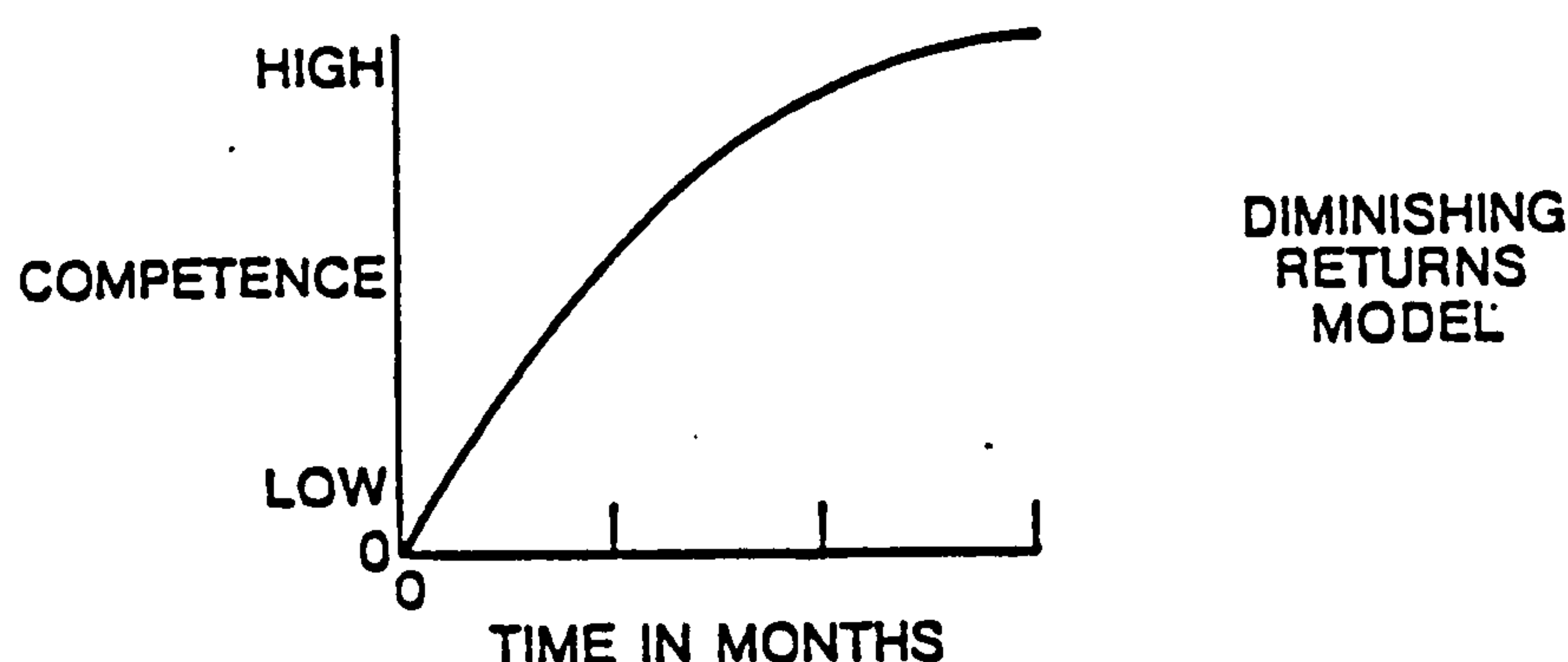
2.2.3.2 Length of Residence

The effect of length of residence (LOR) on SLA has not been extensively investigated, but when it has the results have been inconclusive. Studies such as those by Patkowski (1980), Oyama (1978) and the Heidelberg Project (Klein and Dittmar 1978), in which the average LOR of subjects is quite high (minimum of 5 years, in many cases as long as 10 or 20 years), report no relationship between LOR and proficiency in English. Similarly in Ekstrand's (1976) study of the acquisition of Swedish by immigrant children no correlation is found. In this study the median LOR is very short (10.5 months).

Studies which have reported a correlation have involved subjects with LOR between these two extremes. Fathman (1975) (LOR 1-3 years), Walberg, Hase and Rasher (1978) (LOR mean = 3-4 years) and Cummins (1981a) report a correlation for children between LOR and proficiency. In their study of adult immigrant workers in Germany, Klein and Dittmar (1978) report that any relationship between LOR and proficiency is only possibly present in their less than 2.4 years LOR group.

Amongst the studies concentrating on relatively short LOR, all report increasing proficiency with increasing LOR. Walberg et al. (1978) have contributed most to our understanding of the effect of LOR on second language proficiency. Using teacher and self-report of proficiency in their subjects' native and second languages, they studied the relationship between proficiency and LOR in 352 Japanese-speaking children in the USA from 0 to 12 years. They find that competence in English does not relate to AOA, but depends on LOR. Moreover of the three models they employ (linear, early-age sensitivity and diminishing returns) the diminishing returns model best accounts for the relationship between LOR and proficiency (see Figure 2.2). They conclude: "In children of all ages in the sample, acquisition proceeds at a fast rate initially, but the amounts of gain diminish with time" (Walberg et al. 1978:436). Their teacher ratings suggest that students achieve native-like reading proficiency in 3½ years. From their data Walberg et al. estimate that equal gains in proficiency are made on

Figure 2.2: Acquisition as a function of time



from Walberg, Hase and Rasher (1978:430)

average in the first 2 months, the next 5 months, the following year and the next 8 years. This levelling off effect (apparently at around 3 years LOR)¹ explains the failure to find a relationship between LOR and proficiency in the studies with long LOR. Ekstrand's failure to obtain a significant relationship appears to be related to his biased sampling procedure. Only children attending special language classes are included, so those with longer LOR still attending these classes are the poorer learners from the original population.

¹Cummins (1981b) argues from his data for immigrant children in Canada that it can take up to 7 years for more complex linguistic skills to level off.

2.3 Theoretical Models and Hypotheses about Second Language Learning

2.3.1 The Creative Construction Hypothesis

The notion of second language learning involving a process of creative construction is not new. Corder (1967) attributes the suggestion to Palmer (1917). In more recent times it has been Corder (1967) himself in response to the rethinking that was taking place of behaviourist theories of first language acquisition (Chomsky 1959), who has suggested that the same mechanisms which are used by the infant in acquiring his mother tongue may also be used in non-primary language acquisition. Corder described the mechanism as "an internal mechanism of unknown nature which enabled him [in this case, the human infant] from the limited data available to him to construct a grammar of a particular language" (Corder 1967:164). In his article Corder tentatively postulates the same mechanism for SLA and thus that the procedures and strategies adopted by the first and second language learner are fundamentally the same. In later literature this mechanism became known as creative construction.

Essential to the notion of creative construction is the active role which each individual learner plays in the acquisition process. The learner is seen as being employed on a process of discovery of the language being learnt. In the course of this process he formulates hypotheses and then tests these by comparing his production with the language around him, modifying his hypotheses as he sees it to be necessary. It is a measure of Corder's insight and intuition that all these notions brought together by him have been verified since empirically in the consequent research (see for example, Ervin-Tripp 1974). All the available empirical evidence from developmental and morpheme order studies supports Corder's suggestion that the learner has some sort of "built-in syllabus".

Two Americans, Dulay and Burt, particularly took up the challenges presented in Corder's paper. In a series of studies and drawing on studies by Ravem (1968), Milon (1972) and others they looked first at the errors which children make (Dulay and Burt 1972). They noted the very low incidence of errors attributable to first language transfer and the high incidence of developmental errors similar to those observed in first language acquisition. In later experiments discussed in Section 2.2.2 they concentrate on determining the order of acquisition of a group of morphemes, thus investigating Corder's suggestion of the being a "built-in syllabus" for learning. They consider that their findings support Corder's hypothesis. The fact that the order of morpheme acquisition for first and second language acquisition is not the same is not considered to negate the L1=L2 hypothesis since Corder (1967:165) had suggested that although the processes may be basically the same such differences could exist.

In a later theoretical article Dulay and Burt (1977) discuss in some detail what they mean by creativity in SLA:

"creative construction in language acquisition refers to the process by which learners gradually reconstruct² rules for speech they hear, guided by innate mechanisms which cause them to formulate certain types of hypotheses about the language system being acquired, until the mismatch between what they are exposed to and what they produce is resolved"

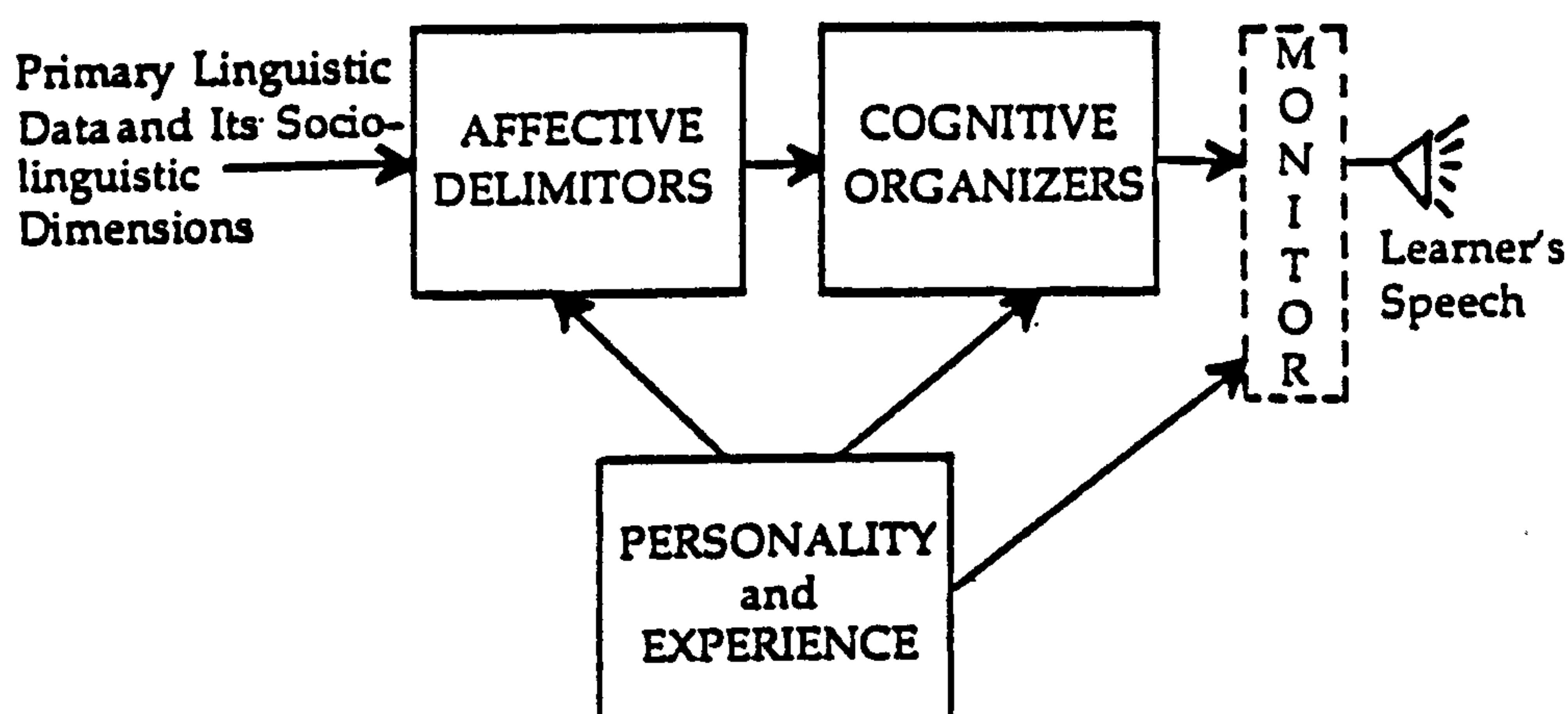
(Dulay and Burt 1977:67)

In an attempt to make their formulation more specific they explore the ways in which the input is mediated, and produce a model which takes into account sources which influence the individual learner's learning capacity (Figure 2.3). In this formulation it is the cognitive organizer, the internal data processing mechanisms, which is responsible

²It is not clear why Dulay and Burt choose to use "reconstruct" here. Reconstruction implies having constructed the entity in question before. Elsewhere they use the term construct.

for the construction of the grammar. Unfortunately Dulay and Burt do not bring us any closer to understanding what these mechanisms are or how they function, although they do relate them to the universal structural properties of the brain.

FIGURE 2.3
Working Model for Some Aspects of Creative Construction in Language Acquisition.



Wode (1977, 1978, 1979, 1981) has set himself the task of studying and comparing different types of language acquisition in attempting to develop an integrated theory of human language acquisition. From his findings he proposes that the human brain's language processing capacity is a bipartite system. One system being "a set of strategies which are precisely geared for handling the formal properties of linguistic devices", the other "a steering mechanism ... that ... determines whether and which of these precise language processing strategies are applied" (1981:99). Although the acceptance of creative construction as the pivotal process in SLA seems intuitively correct no researchers have progressed very far in defining precisely what the internal language data processing mechanisms are, or, in Wode's terms, how the bipartite system of strategies functions.

2.3.2 The Approximative Systems Model

One of the first models for SLA to be proposed following the re-thinking suggested by Corder (1967) was the Approximative Systems model (Nemser 1971). More recently Sampson (1978) has adopted Nemser's model claiming that it more satisfactorily fulfills the requirements of a model than do either the Creative construction hypothesis or Selinker's (1972) Interlanguage Hypothesis.

Nemser (1971) coined the term "approximative system" and defined it as "the deviant linguistic system actually employed by the learner attempting to utilize the target language" (1971:116). The assumptions of his model were:

- (1) that a learner's speech is the product of an internally structured system, distinct from the L1 and the L2
- (2) that a learner's systems at successive stages form an evolving series
- (3) that, although speakers of approximative systems do not usually form speech communities, in a given learning situation, La's [approximative systems] of learners at the same proficiency stage will roughly coincide.

In general a decade later most theorists would agree with the assumptions underlying Nemser's model. Since it does not address the question of the process by which learners' approximative systems evolve, it does not contradict the creative construction theory. This model could be complementary to creative construction theory although in Nemser's formulation this cannot be asserted with any confidence since he puts a great deal of emphasis on the native language and thus on interlingual transfer.

The main problem with Nemser's model comes from the notion of discrete system, "by definition each approximative system is a system and therefore must be at least momentarily stable" (Sampson 1978:446).

To account for the continuously evolving and thus variable nature of learner's language Nemser is forced to qualify his use of system "although one frequently changing with atypical rapidity and subject to radical reorganization" (1971:116). When Nemser proposed his model the study of linguistic variation and the use of variable rules and linguistic continua was very new. He is forced to model the SLA process using the static paradigm, so dominant in linguistics at the time. The work of Bailey and others on dynamic paradigms has since given us the descriptive framework to account for "frequently changing" systems in dynamic terms. In fact, what Nemser is attempting to describe appears to be a continuum of development.

2.3.3 The Interlanguage Hypothesis

In what has come to be known as the Interlanguage (IL) Hypothesis Selinker (1972) defines "interlanguage", a coin termed by him, as "a separate linguistic system based on the observable output which results from a learner's attempted production of a target language (TL) norm" (p214). For Selinker there are three sets of psychologically relevant data necessary for the understanding second language learning; the utterances of the learner in his native language (NL), the learner's IL utterances and the TL utterances of TL speakers. Crucial to Selinker's thesis is the concept of "interlingual identification" which he suggests takes place when the learner is using his "latent psychological structure" to learn a second language. Within this "latent psychological structure" he proposes 5 central processes; language transfer, transfer-of-training, strategies of second language learning, strategies of second language communication, overgeneralization of target language material (1972: 215).

Selinker appears to be suggesting that second language learning is primarily a restructuring process which is dependent on two norms, the learner's NL and the TL (Figure 2.4). A similar proposal is made by Bickerton (1975) in comparing decreolization and second language acquisition. In an early paper Selinker (1969) specifically states that

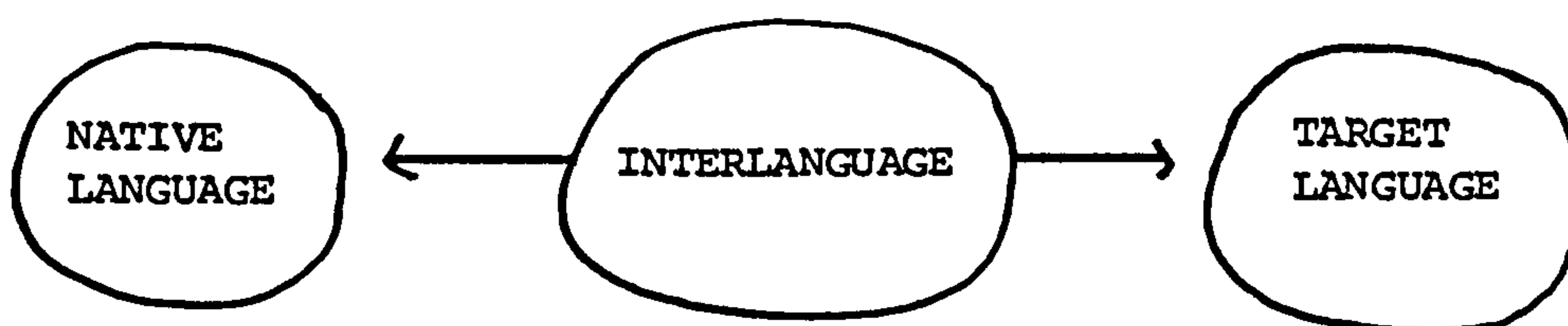


Figure 2.4: Representation of Selinker's model

the starting point for the learner is the NL. In later papers this is not as clearly stated.

Selinker's hypothesis clearly perceives the language of the second language learner as being in some way intermediate between the NL and the TL. He is most adamant that it is a system in its own right. In a later paper with Tarone and Frauenfelder (1976) he even asserts that there is no assumption of directionality in the evolving stages of the learner's IL. However in his formulation it clearly results from the interaction of two competing forces namely the NL and the TL, with the possibility of encroachment from the training methods used.

The IL Hypothesis represents an important advance on the concepts put forward by the contrastive analysts (eg. Lado 1957) in that it does take the TL into account. However, Selinker pays little attention to other potential influences in the learner's system such as the existence of a natural semantax (Traugott 1977) to which learners and native speakers appear to have access. This has been well-established by the study and comparison of simple codes, pidgins and creoles, language acquisition and language loss. The omission of such influences points to a larger problem in the IL hypothesis. Selinker does not recognise qualitative changes in IL over time. He ignores the growing complexity of learner's language, which from the empirical researcher's point of view is one of its most salient features, provided the learner is progressing. His concentration on "fossilized" structures and learners whose learning appears to have stabilized at a particular level may be responsible for his denial of the directionality and changing complexity of the language of most learners.

In the most recent formulation of his ideas about IL with Lamendella

(1981), Selinker states that "non-primary language acquisition is characterized by a progression of ILs". This represents a move towards Nemser's approximative systems concept (although presumably without its directionality assumption). In this paper Selinker and Lamendella acknowledge "the dynamic processual nature of IL learning" but dismiss the notion of a developmental continuum (which is a dynamic model) in favour of what they propose, a cline progression. They argue in favour of discrete autonomous systems which develop in stages and for the "existence of stable configuration"; seemingly a reversion to the static formalisms they dismiss on an earlier page. It is difficult to be persuaded by their formulations and arguments when they are fraught with so many contradictions and inconsistencies. One is tempted to suggest that Selinker and his colleagues are rather too concerned with coining their own jargon terminology and not enough concerned with consistency and the concepts at issue.

2.3.4 The Pidginisation Hypothesis

Hall (1966) and Samarin (1971) introduced the concept of pidginization process, defined by Samarin as "any consistent reduction of the functions of language both in its grammar and its use" (Samarin 1971:126) into pidgin studies. Schumann (1975) proposed that early SLA involves a pidginization process³. His study of the language of Alberto, an adult Spanish speaker learning English, revealed little linguistic development over a 10 month period. Furthermore Alberto's language contained many features characteristic of pidginization⁴. By establishing that Alberto was at a great social and psychological distance from native American English speakers, Schumann was able to deduce a cause and effect relationship between the functional demand of the learner on the language being acquired and the form of the language he uses.

³ John Schumann is best known for applying the concept of pidginization to SLA, but Clyne (1968) was the first to make the comparison when he wrote on the German worker-pidgin of immigrant factory workers.

⁴ 1) use of the uniform negator 'no' for most negative utterances
2) non-inverted questions 3) no auxiliaries 4) tendency not to inflect possessives 5) unmarked verb forms 6) deletion of subject pronouns.

The relationship between the form and the function of learner's language, which Schumann emphasises is an important contribution. However the strong unidirectional causal relationship which he claims between function and form make his hypothesis rather extreme. It seems more satisfactory to view the relationship as being circular as opposed to unidirectional. A learner with a restricted grammar cannot express a diverse range of functions, even if he wishes to do so. Conversely, unless the learner feels he has a communicative need he has no reason to complexify his language. But which of the two factors is pre-eminent is difficult to determine.

The use of the term "pidginization process" by both Samarin and Schumann is something of a misnomer and in need of clarification. The choice of the word "process" suggests some aspect of cognitive functioning, which is activated in the learner's brain in producing his second language grammar from the grammar of the fully-formed language. Yet in no way can the learner be said to actively pidginize or simplify. As Corder (1977a) has pointed out a learner cannot simplify what he does not possess. In fact, the term is only appropriately used by the outside observer to describe reduction of the target or base language.

In later analyses Schumann (1978), Stauble (1977) and Agnello (1977) have also explored similarities between SLA and creolization and decreolization. However, other discussions of the processes involved in pidgin and creole languages and their relationship to SLA come to more fruitful conclusions. Valdman and Phillips (1977) and especially Wode (1981) take a more universalist position. Following suggestions by Bickerton (1974) and Traugott's (1973, 1977) work on natural syntactic processes, they emphasise what the similarities between the various types of language formation and acquisition tell us about the nature and workings of the human language learning mechanisms:

"the language-acquisitional aspects involved in naturalistic second language acquisition on the one hand, and in pidginization-creolization-decreolization on the other hand, are the same, so that neither one can function as a model for the other. Both involve the same set of linguo-cognitive processing strategies which forms man's capacity for language acquisition."

(Wode 1981:198)

Insights that have been gained from the comparison of these processes and the discovery of their common properties and motivations for development have enabled us to develop a more integrated theory of human language acquisition and as a result to move towards understanding how, why, when and to what extent SLA occurs.

2.4 Theories of the Nature of the Learner's Second Language Competence

2.4.1 Dual Competence Theories

In order to accommodate cognitively mature second language learners, most of whom have been exposed to some formal teaching it has been necessary to distinguish between different types of linguistic knowledge. Lawler and Selinker (1971) made such a distinction in proposing that for rule internalisation one can

"postulate two distinct types of cognitive structures:
1) those mechanisms that guide 'automatic' performance ... that is performance ... where speed and spontaneity are crucial and the learner has no time to consciously apply linguistic mechanisms ... and 2) those mechanisms that guide puzzle and problem-solving performance"

(Lawler and Selinker 1971:35)

Similarly, Krashen (1981) has termed the first process language acquisition, a subconscious process similar to the process children use in acquiring first and second languages, and the second language learning, a conscious process in which formal teaching of the structure of the language is important and in which error correction and explicit rules aid in the process. Making a similar distinction Bialystok (1978) refers to implicit and explicit knowledge and Corder to mental and reference grammar. The idea of qualitatively different types of knowledge is not new. Similar notions exist in psychology and philosophy (eq. between descriptive and performative knowledge). The importance of dual competence theories is in the way they have attempted to relate the two hypothesised knowledge sources.

2.4.1.1 Krashen's Monitor Model

In the most controversial theory Krashen (1975, 1977a, 1977b) hypothesises that the two systems for developing second language ability, the acquired and the learned systems, are completely independent. Furthermore he believes that utterances can only be initiated by the acquired knowledge system, the formal conscious learned system being available solely to edit (in his terms "Monitor") the output of the acquired system, before or after the utterance is produced (Figure 2.5). The use of conscious learning is seen as being constrained in several ways.

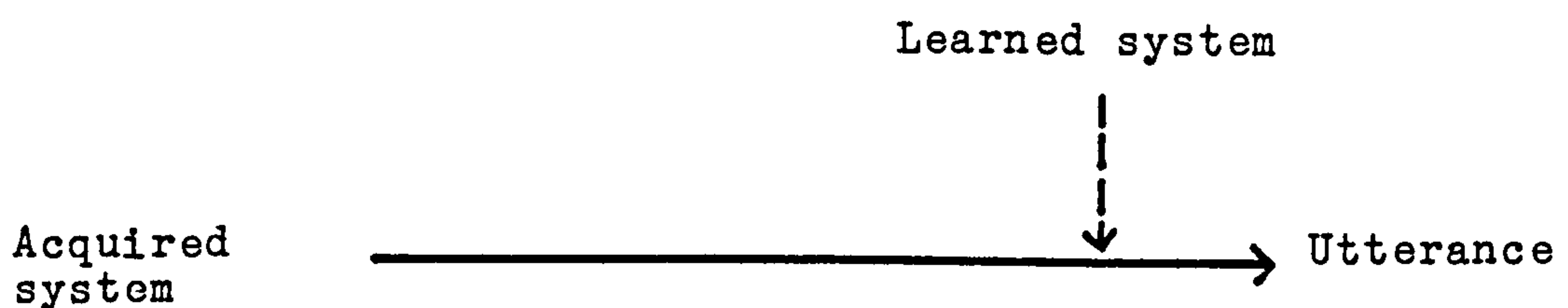


Fig.2.5: Krashen's Model of Second Language Performance

It can only be used to edit the output when the learner has time, is focussed on form and knows the relevant rule. According to this formulation it is very difficult to use conscious learning in performance successfully. In addition, the use of formal learning is dependent on other factors such as the learner's age (Krashen and Galloway 1978) and personality (Krashen 1978, 1980).

Several criticisms can be raised regarding Krashen's model. Firstly it is based entirely on empirical evidence from morpheme order studies, yet claims to encompass acquisition of grammar apart from morphology. It gives formal knowledge a very restricted position and furthermore does not attempt to integrate the role of other knowledge, both linguistic and non-linguistic. Thirdly, it allows no interchange

between the two knowledge systems, and although this may be the case, it would be very difficult to establish it conclusively. Since the theory also allows for monitoring of output "by feel" using the acquired knowledge system, it would be very difficult to establish which system has been responsible for editing the output. Krashen's solution is that if the learned knowledge has been used, the learner will be able to explain the rule. Yet articulated conscious knowledge of the grammar of a language is a very specialised type of conscious knowledge.

2.4.1.2 Bialystok's Models

Bialystok (1978) formulates a model for second language learning in which she attempts to relate the two same knowledge systems, which she calls implicit and explicit. As Figure 2.6 shows Bialystok's

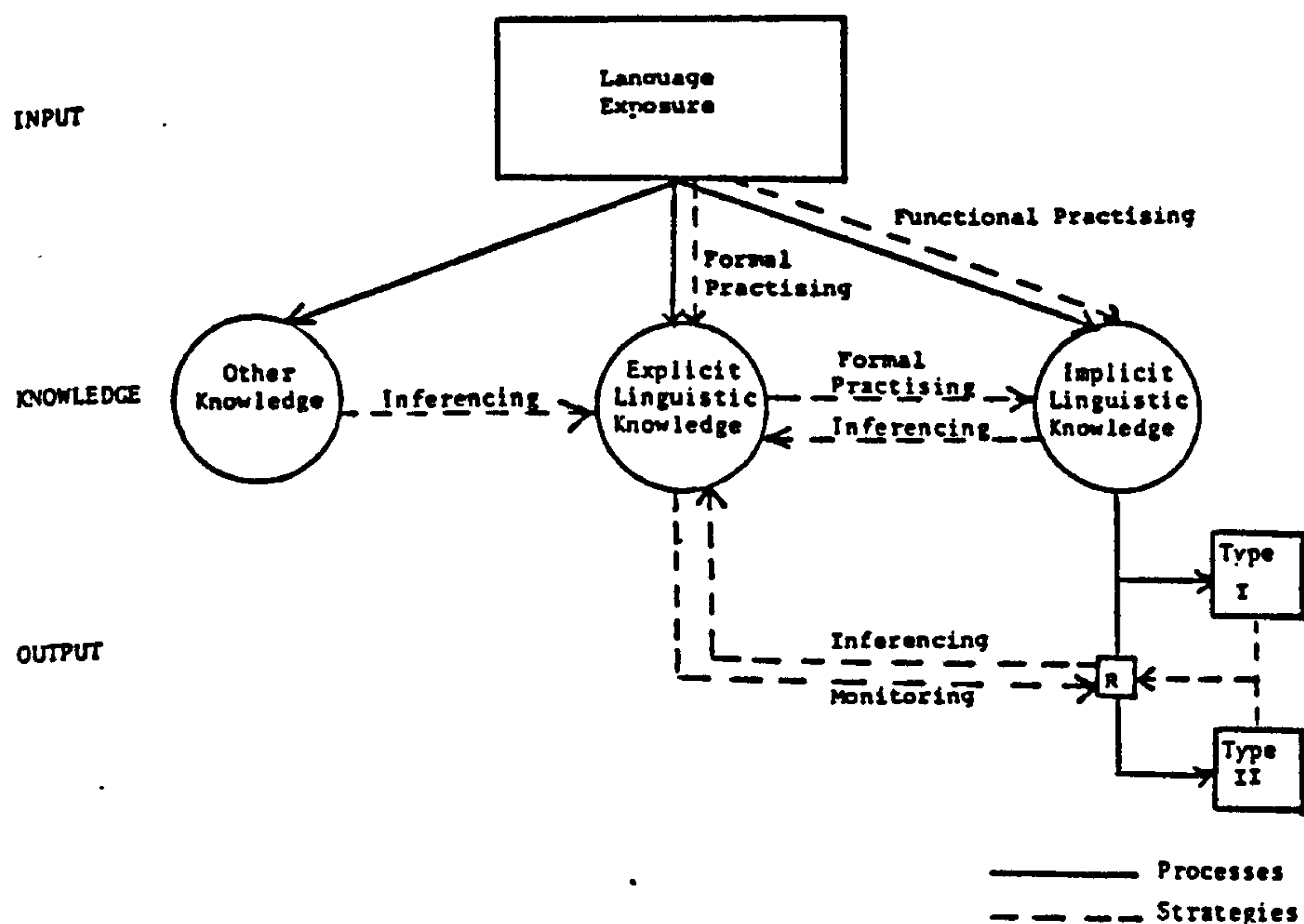


Figure 2.6 Model of Second Language Learning.

model has a broader base than Krashen's and also accounts for the role of other knowledge in language learning. The model shares many features with Krashen's, but is less controversial in that it allows for a relationship between the two knowledge systems. Explicit knowledge may become automatic and implicit by means of the strategy of formal practising, similarly by inferencing, implicit linguistic knowledge may

contribute to explicit.

Both Krashen and Bialystok are seeking in their models to account for individual differences in success in mastering a second language particularly differences in the difficulty experienced in different second language tasks. Both come up with a similar solution, although with the differences discussed above. Unfortunately neither have attempted to account for the variability within each knowledge system. They both seem to conceive each system to be homogeneous and are only interested in the interaction between the two.

In recent work Bialystok (1980, 1981, 1982) has tried to relate the varying proficiency learners show on different tasks to aspects of cognitive functioning. She considers that language proficiency and thus performance is composed of two factors. The first, the analysed factor, relates to the type of mental representation assigned to linguistic information. It differentiates degrees of control over that information. The second, the automatic factor, refers to the procedures for using that information and differentiates relative access to it "in terms of fluent or non-fluent performance". By combining these two factors Bialystok produces a framework on which different learners and different native speakers performing different tasks can be plotted (Figure 2.7).

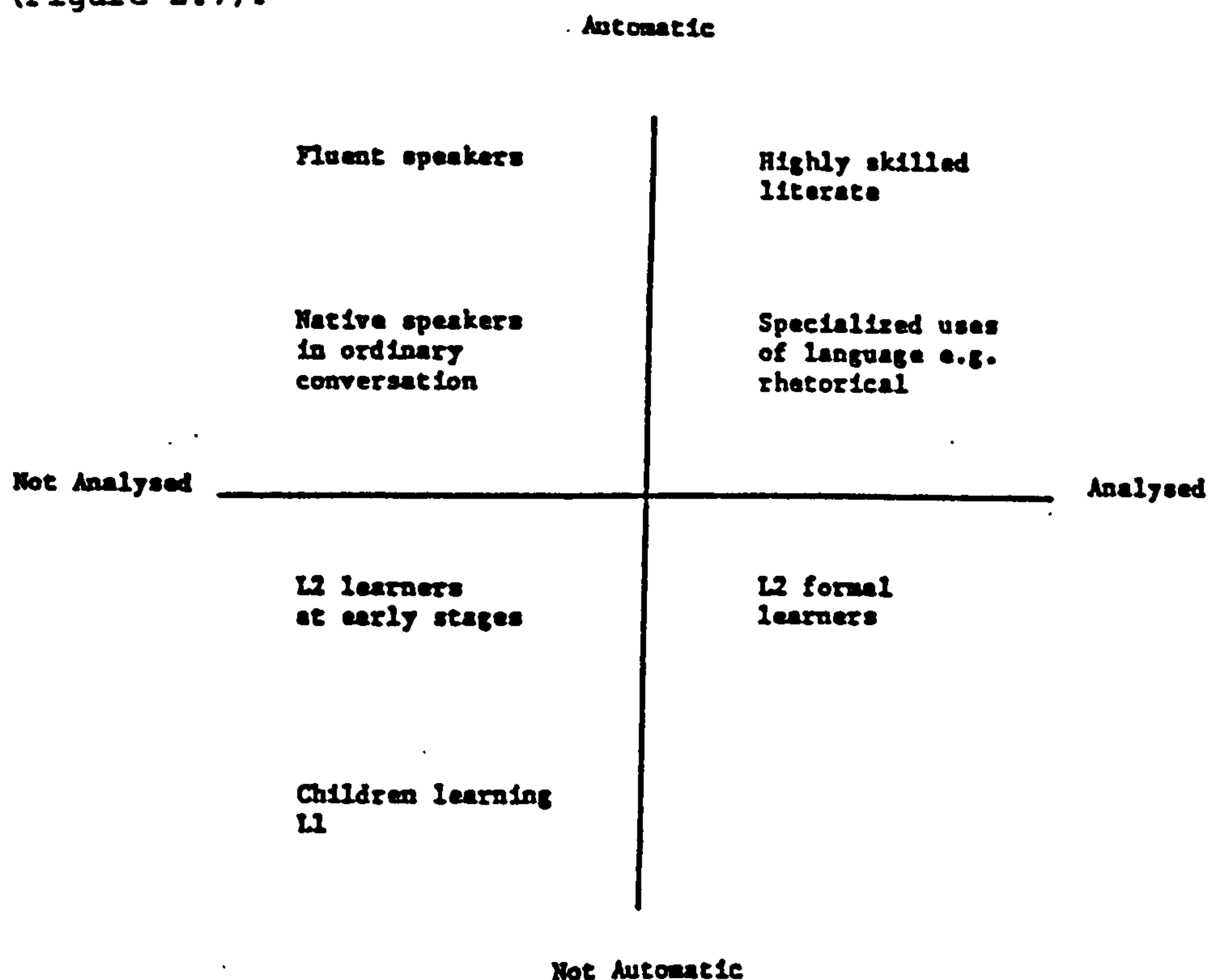


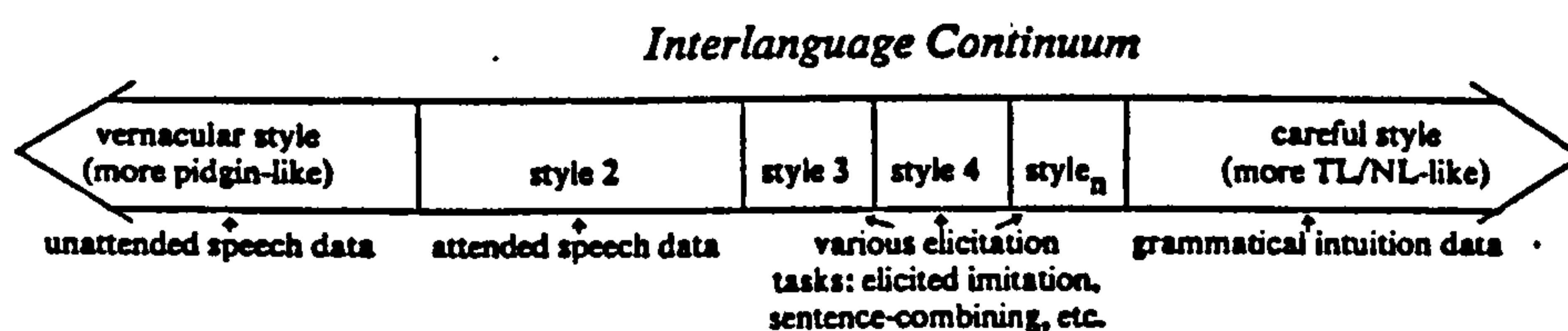
Fig.2.7: Two Dimensions of Language Proficiency.
(from Bialystok 1981:12)

Whilst Bialystok is making a worthwhile psycholinguistic distinction in this model of proficiency, it seems doubtful how much this approach can add to our understanding of SLA. The concepts she is dealing with in her discussion of mental representations are exceedingly abstract and not at all clearly defined. Intuitively it does not seem correct to put early second language learners, first language learners, native speakers in ordinary conversation and "fluent speakers", whatever this means, on a similar level in terms of mental representation. Although the distinctions Bialystok is making are elusive, it appears that to account for differences in proficiency at least one additional factor is necessary. As it stands the framework takes no account of differences in the complexity of the linguistic knowledge. Early second language learners and native speakers differ not only in their access to linguistic information, but also in the quality and complexity of their mental representations.

2.4.2 The Capability Continuum Model

Tarone (1983) has proposed a continuum model to account for learners' intertask variability. She calls her model the Capability Continuum and it provides an alternative to dual competence theories. Tarone hypothesises that the learner's interlanguage capability (a word she chooses in preference to competence) is heterogeneous. She envisages it as a linguistic system consisting of a continuum of styles, which are related to one another in terms of a set of underlying variable and categorical rules. The learner's language is thus systematic and internally consistent, although variable (refer Figure 2.8).

Fig.2.8: Tarone's Capability Continuum Model



According to Tarone, it is the degree of the learner's attention to form which determines which part of the continuum underlies his second language performance. Movement along this continuum is seen as the result of style-shifting.

Tarone's paradigm proposes two means of internalization of regularities/rules into the learner's second language competence. In one means of internalization "the learner spontaneously produces simple structures in the vernacular style" as a result of acquisitional universals. Then acquisition principles enable regularities to be created in a particular order in the vernacular style. The other means of internalization, the one by which according to Tarone TL structures are incorporated in the learner's competence, is by means of right to left movement along the continuum. Thus a TL structure is first incorporated in the superordinate style and then over time moves towards the vernacular style. This possibility presumably parallels Bialystok's mechanism by which explicit knowledge by practice can become incorporated in implicit knowledge.

There are several important points to be raised concerning Tarone's Capability Continuum. The first concerns the type of continuum being envisaged. She has adopted the concept of style-shifting from Labov without considering the differences which may exist between different continua. Labov's concern is with styles of equal complexity, whereas in second language production there is a difference in complexity in the learner's language in the different styles. Tarone appears to envisage movement along the continuum as merely involving a restructuring process. Furthermore she presents the vernacular style as bearing no relationship to the TL. In accordance with Selinker's conception interlanguage is perceived as a discrete entity unrelated to either TL or NL, rather than as a TL-oriented system. It seems difficult to maintain this concept when the observable facts point to the learner's language in the vernacular style (and in other styles) gradually becoming more like the TL as it develops.

The other major criticism of Tarone's account of intertask variability is the quantity and quality of the data she presents to support it. She obviously considers that her model accounts for the variability in all levels of learners' language (i.e. phonology, morphology and syntax). She fails to make a distinction between the nature of the learning problem in the different levels. She mixes evidence from these various levels and does not emphasize the fact that the most convincing evidence for the existence of a continuum of styles comes from phonological studies (Dickerson and Dickerson 1977, Beebe 1980), which are, in any case, the most likely candidate for a restructuring continuum. Neither of the only two non-phonological examples she presents (Fairbanks 1982, Schmidt 1980) are particularly convincing. However these criticisms concerning the evidence do not necessarily invalidate Tarone's paradigm. There is some convincing evidence of intertask variability in syntax (Al-Jumaily 1982), but it tends to support a differing-complexity continuum, rather than a restructuring one.

2.5. The Study of Variation in Language

Until recently the preoccupation of theoretical linguistic study has been with the idealisation of language rather than the actual language in use. Chomsky is particularly dogmatic on this point:

"Linguistic theory is concerned primarily with an ideal speaker-listener, in a completely homogenous speech-community, who knows its language perfectly and is unaffected by such grammatically irrelevant conditions as performance variation "
(Chomsky 1965:3-4)

As Chomsky so insistently states variation both within the individual, between individuals and in and between communities was considered to be a mere performance phenomenon, peripheral to the interests of theoreticians.

Since the mid-1960s sociolinguists and creolists, particularly Labov, Bailey and Bickerton, have advocated a move away from the study of

artificially idealised data towards the study of real language as it is used in the community. Such a shift in emphasis has necessitated the evolution of a dynamic and polylectal view of linguistic competence, the breaking down of the traditional dichotomy between synchronic and diachronic linguistics and the acceptance that variability of language in use and language change over time are patterned and systematic phenomena worthy of study. As Bailey (1974) asserts:

"the study of patterned language variation in its communicative life cannot be omitted from linguistic theory and practice without invalidating them"

(C. Bailey 1974:23)

In this new framework variation in language use is considered to be an integral part of each individual's linguistic competence.

Initial studies of variation in sociolinguistics and dialectology (Labov 1963 & 1966, Bailey 1968) reported patterned variation in the use of phonological variants according to many factors; style, age, social class, environment of the phoneme, and geographical area. This approach was then extended to morphology and syntax (Kessler 1969, Labov 1969, Wolfram 1969), where patterns in the variation were also found. It has also been employed in studying the post-creole continuum (DeCamp 1968, Bickerton 1975).

2.5.1 Analytical Techniques and Relevant Studies of Inherent Variability

2.5.1.1 Frequency and Probability Analysis

The first analytical technique used to describe and display variable language data was frequency analysis (Labov 1966 & 1969, Wolfram 1969). In this approach variable linguistic features are tabulated for the frequency of variants, generally in terms of social factors (Table 2.2).

Table 2.2: Percentage of Zero Realisation of Copula when following a NP and a Pronoun, by social class (from Wolfram 1969:170)

CLASS	ENVIRONMENT	
	NP__	Pro__
UMW	0	0
UMN	1.8	6.2
LMN	6.3	13.8
UWN	18.9	40.7
LWN	30.1	63.1

In this form frequency analysis is basically a descriptive tool enabling the generalisation of findings from empirical data. Classically it has been used to show relationships between linguistic and non-linguistic variables. A natural extension of this type of analysis was the formulation of variable rules and their integration into descriptions of grammatical competence, the frequencies obtained being used to formulate a variable rule for Copula deletion as constrained by the preceding NP:

$$z \quad < \phi > \quad / \quad \begin{matrix} \alpha \text{ Pro} \_ \\ \beta \text{ NP} \_ \end{matrix} \quad \text{(adapted from Labov 1969)}$$

where the variable constraints are features of the environment which are indicated by angled brackets. Weighting of features may be indicated either by vertical order or the assignment of Greek letters.

More recently Cedergren and Sankoff (1974) have used frequencies to estimate probabilities of rule application, which are considered to be "properly part of /a description of/ linguistic competence".

2.5.1.2 Implicational Analysis

2.5.1.2.1 Bimodal Scaling

DeCamp (1968) was the first to apply techniques for scaling individuals and language varieties according to the presence and absence of particular features or attributes in their speech. Implicational scaling of the sort DeCamp proposes was originally proposed by Guttman (1944) for use in sociological research and extended by Torgerson (1957). In analysing seven speakers representative of seven social dialect levels in the Jamaican post-creole continuum DeCamp was able to show a definite implicational pattern in the presence and absence of six socially significant linguistic features such that they formed a hierarchical implicational series (Table 2.3).

Using a binary distinction for features (traditionally "1" indicates the presence of a feature and "0" its absence) implicational analysis shows "the ... relation between linguistic features and language varieties (dialects, styles etc) so selected and so arrayed in order

Table 2.3: Implicational scale for features of Jamaican Creole
(adapted from DeCamp, 1968 printed in Hymes 1971)

Speakers	Features								
	A	B	C	D	E	F	Features	1	0
1	1	1	1	1	1	1			
2	1	1	1	1	1	0	A	child	/ pikni
3	1	1	1	1	0	0	B	eat	/ nyam
4	1	1	1	0	0	0	C	/θ~t/	/ /t/
5	1	1	0	0	0	0	D	/θ~d/	/ /d/
6	1	0	0	0	0	0	E	granny	/ nana
7	0	0	0	0	0	0	F	didn't	/ no ben

to result in a triangular matrix" (DeCamp 1971:33). Such a matrix obviously cannot accommodate a completely random distribution of sets

of features in each of the language varieties. For each variety the presence of a feature on the right of another feature, for example a "1" for feature C, necessarily implies the presence of the features to the left, in this case A and B. Thus the presence or absence of features can be said to be implied by the presence or absence of other features and the features themselves can be hierarchically ordered in terms of how favoured they are across the language varieties being scaled⁵. In the example presented in Table 2.3, A is clearly the most favoured feature; child is preferred to "pikni" in six of the seven varieties. Whereas F is the least favoured; "didn't" is used as opposed to "no ben" in only one of the seven varieties.

Since 1968 this technique of scaling variable data has been shown to have a wide application. Elliot, Legum and Thompson (1969) successfully scaled the acceptability of certain marginally acceptable sentence types in the language of 27 native speaker judges. Kessler (1969) successfully demonstrated an implicational relationship between the environmental conditions under which the plural suffix can be deleted in Washington D.C. Black English in the varieties characteristic of the 4 main social classes.

Implicational analysis provides a very powerful tool for scaling variable linguistic data to determine regular relationships which exist between variables. The scaling has wide application since it can be applied not only to a list of predetermined features, but also to the realisation of a feature or form in its various environments, whether syntactic, morphological or phonological.

One justified criticism of implicational analysis concerns the meaning and theoretical validity of scaling, as DeCamp does, a set of unrelated features, which "cut across established categories of linguistics"

⁵ DeCamp asserts that: "Implicational scales are not a new component added to a grammar; they are only an extension of the redundancy rules and hierarchies of features ..." (1971:37)

(DeCamp 1973:141). DeCamp has suggested that mixed complex scales are merely a combination of a number of simple scales and that the implicational relationship between two closely related variable features will be more clear-cut and replicable than with less closely related ones.

Another important and more fundamental objection to bimodal scaling relates to the binary designation which needs to be assigned to each feature (eg. environment or attribute) being scaled. Whilst a binary choice may be quite suited to the scaling of attitudes (as Guttman originally intended), it is less so to much linguistic data. Most strict implicational analyses are forced to make what must be to some extent an arbitrary judgement as to what performance they assign a "1" or a "0". As Stolz and Bills (1968) state: "thresholds were set post hoc to give the optimal fit between the data and the scalogram model". Such an approach is surely not satisfactory. Even if a pre-determined cutting point is used the essential problem is still present, forcing the inherent variability in language data into a binary framework. From an implicational point of view in linguistics the important relationship tends to be one of more or less rather than all or nothing. Clearly, the traditional Guttman scale can only give us part of the information; the possible presence and direction of implication.

2.5.1.2.2 Trimodal Scaling

A move in the right direction in overcoming this problem is the trimodal scale, in which each feature is marked according to whether it is present, variable or absent. Such a method of scaling was suggested for use in linguistics by Bickerton (1971). A trimodal scale results in a theoretical model as in Table 2.4.

Table 2.4: Theoretical Model obtained from a Trimodal Scale

Variety/ Speaker	Feature/Environment				
	A	B	C	D	
V ₁	+	+	+	+	
V ₂	+	+	+	V	
V ₃	+	+	V	V	
V ₄	+	V	V	V	+ - feature present
V ₅	V	V	V	V	V - feature variably present
V ₆	V	V	V	-	- - feature absent
V ₇	V	V	-	-	
V ₈	V	-	-	-	
V ₉	-	-	-	-	

This trimodal model is in accord with the basic characteristics and stages involved in linguistic change as described by Weinreich, Labov and Herzog (1968), namely 1) a speaker learns an alternative form, 2) old and new forms exist side by side within his competence, 3) the older form becomes obsolete.

As is apparent, the result of trimodal scaling is "simply a more finely grained" (Wolfram and Fasold 1974) implicational chart, still giving no information about actual frequencies. For the measurement of some language phenomena, for example in Creole linguistics (DeCamp 1968; Bickerton 1971 and 1975) the sensitivity of these two scaling techniques is apparently adequate.

2.5.1.2.3: Variability Analysis - Multi-Valued Scaling

The most rigorous scaling technique for variable linguistic data combines implicational analysis and frequency analysis. As Fasold (1970) points out, these two techniques for analysing variability should be viewed as complementary rather than competing. Variability Analysis

essentially involves the amalgamation of the expression of the degree of optionality or variability in the realisation of features or variants, as conveyed by frequency analysis and variable rules, and the hierarchical implicational relationship between these features as expressed by scaling.

Fasold (1970) is the first to combine the two techniques. He demonstrates how Wolfram's (1969) data on consonant cluster simplification in Detroit Black English can be displayed so that the relationship between social class and deletion in a number of environments is apparent. By using scaling the implicational relationship among the phonological environments is revealed (see Table 2.4).⁵

Table 2.5: Frequencies of Simplified Consonant clusters in the speech of Detroit Negroes by linguistic environments (from Fasold 1970:558)

Social Class	Environments			
	C_## C	C#_##C	C_##(V)	C#_##(V)
Lower Working	.97	.76	.72	.34
Upper Working	.94	.73	.65	.24
Lower Middle	.87	.62	.43	.13
Upper Middle	.79	.49	.28	.07

This combination of implicational analysis and frequency analysis enables the identification of three separate aspects of the speech capabilities of a speaker representative of a particular variety:

- (1) the existence of optional and variable rules
- (2) factors favouring rule operation, and
- (3) the hierarchical order in which these factors are ranked and where data is available for an individual's idiolect, also a fourth:

- (4) the probability of a rule operating under conditions defined by the factors.

2.5.1.2.4 The Bailey Wave Model

Bailey (1974) has incorporated empirical observations and the resulting concepts concerning variation in language and linguistic change in a Wave Model of linguistic change. This model is intended as a dynamic and predictive theoretical model of the mechanism of linguistic change suitable for both historical and descriptive analysis.

Bailey sees change as an ordered unidirectional phenomenon:

"patterns of a language are the cumulative result of natural, unidirectional changes, which begin variably and spread across the social barriers of age, sex, space and the like in waves"
(Bailey 1974:36)

He emphasises that differences in patterns are the result of time and believes that data shows that "incipient changes begin slowly, that after they get going they quickly pick up momentum, and that they begin to slow down as they near 100% categoricity" (1974:7). He describes the rate of change as generating an f -curve (Figure 2.9). The result of this shape of curve is that "the statistical differences among isolects in the middle relative times of the change will be greater than the statistical differences among the early and late isolects" (1974:77). This is because of the bunching towards either end, $< 20\%$ and $> 80\%$, resulting from the changing momentum of change. The wavelike nature of the statistics generated when rate is taken into account is depicted in Figure 2.10.

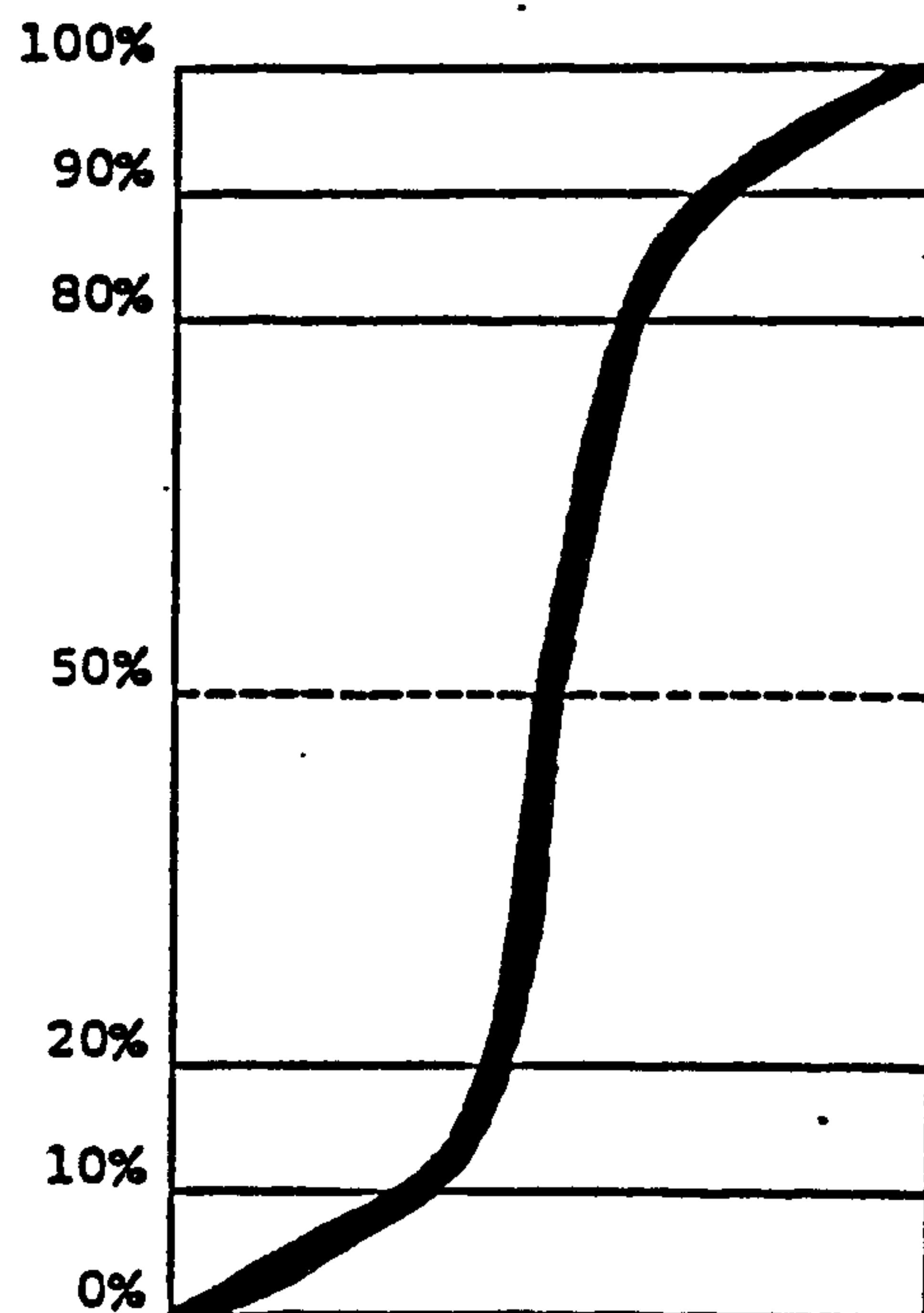


Fig.2.9 The $\int$ -curve .

Figure 2.10: Portrayal of the wave-like nature of the statistics (from Bailey 1974:80) at Time v.

Locale/Lect	Environment			
	A	B	C	D
0	100	90	80	20
1	90	80	20	10
2	80	20	10	
3	20	10		

Bailey places great emphasis on the patterns which are determined by the model in terms of implications, directionality and rate of change as opposed to actual frequencies. He considers these internalized patterns to be part of the speaker's competence. In the strict Baileyian

Wave Model constraints are envisaged as being rigidly implicationally ordered and Bailey is only prepared to accept the possibility of the reordering of constraints in the case of linguistic environments (1974: 82-3).

There is one fundamental problem in applying the Baileyan Wave Model to the study of higher levels of language and to language acquisition. It is primarily based on phonological data. Quite apart from the still unresolved question of whether the mechanisms of phonological and grammatical change are the same, there is a more practical problem. Many of the principles Bailey states, particularly relating to feature marking, markedness and hierarchies of constraints, are not easily transferable to syntax or morphology. The model is intended to have predictive power, and it appears to have it in phonology. Because of such problems, in the study of SLA of syntax Bailey's model can only provide an explanatory, theoretical basis to findings rather than a predictive framework.

The number of books (eg. Bailey and Shuy 1973, Fasold and Shuy 1975, Sankoff 1978) and articles published in the past decade discussing models and methods in the study of linguistic variation attests to the tremendous amount of interest in this field. Theoretical issues are being vigorously debated and many still remain to be resolved, as the discussion in the previous paragraph demonstrates. But even without the resolution of fine theoretical points it is possible to apply the models and analytical techniques developed for the study of language variation to the study of SLA. Conversely, empirical study, equally in SLA as in any other field, should ultimately contribute to the resolution of the theoretical and methodological issues under consideration.

2.5.2 Application of the Study of Variation to SLA

Dynamism and its concrete manifestation, variation, are two of the most striking characteristics of the language of the second language learner in the process of acquiring a second language. Traditionally,

variation in learners' language was considered to be a random performance phenomenon, but investigation has not supported this position. Other essential features of learners' language which are emerging are its systematicity and its change being goal-oriented and thus directional and nonrandom. With these characteristics in mind it is not difficult to see the necessity of studying second language learners' language using techniques which enable the study of its variability. As Hyltenstam so aptly states: "to ignore variation is to ignore data that may throw light on the mechanisms of language development" (Hyltenstam 1978:2).

Studies in the past decade have highlighted the extent and importance of variability in learners' second language production. Three basic types of variation have been shown to be present:

(1) variability in production on different language tasks, so-called intertask variability. Studies of this type of variability (eg. Dickerson and Dickerson 1977, Beebe 1980, Al-Jumaily 1982) contribute to our understanding of the nature of linguistic competence (refer to section 2.4.2).

(2) variability in learners' realisation of features within a task (ie. intratask variability). This is the inherent, dynamic variability in learners' language which results from the process of development. As such its study is important for the determination of the mechanisms of SLA. This variability is observable on two levels; within a particular area of language (eg. negation) between the use of particular variants which may be constrained by the linguistic environment of the form and second, patterns of variability in the learning of different areas of language in relation to each other.

- (3) variability over time. Since learners' language is dynamic, becoming increasingly more complex and target-like variability can also be observed over time. This can be documented longitudinally in each individual learner or cross-sectionally by examining the language of a group of learners at different stages of learning.

In the following sections, given the interests of this study, the discussion of relevant empirical studies will be restricted to the last two types of variability, that within a task and over time, which are relevant to our understanding of the learning process. The earliest studies of aspects of variability in learners' production were in phonology (L.Dickerson 1975; W.Dickerson 1976; Gantbonton 1977), but the concepts and analytical techniques were quickly applied to morphology and syntax.

2.5.2.1 Studies of Inherent Variability in the Acquisition of Syntax

2.5.2.1.1 Hyltenstam's Work

Hyltenstam (1977, 1978b, 1978c) has studied the acquisition of Swedish syntax by immigrants to Sweden using the developmental continuum framework and the techniques offered by variability analysis. He has concentrated on the acquisition of changes in Swedish word order in four areas of syntax (negative placement, Yes/No question formation and WH-question formation in both main and subordinate clauses, and with a sentence initial non-subject) dependent firstly on whether the verb in the sentence contained an auxiliary (AUX) or was a main verb (MV), and, second on whether the subject NP was pronominalised or in its full form.

Of the four areas studied, the investigations into the acquisition of negative placement in both clause types and in simple Yes/No questions provided the most interesting and conclusive results. Using variability analysis Hyltenstam was able to distinguish two major stages in acquisition:

- (1) non-differentiation between the two clause types
- (2) differentiation between the clause types.

Within these stages, in learners who varied their negative placement a clear implicational pattern emerged. In the non-differentiation stage and in main clauses in the differentiation stage the AUX context was more favoured for the application of the negative placement rule (i.e. after the AUX or MV). Conversely, in subordinate clauses in the differentiation stage the MV context was more favoured for the modification of the rule. Using the data obtained Hyltenstam was able to place all of his 160 subjects on one continuum of increasing complexity according to their placement of the negator (Figure 2.11).

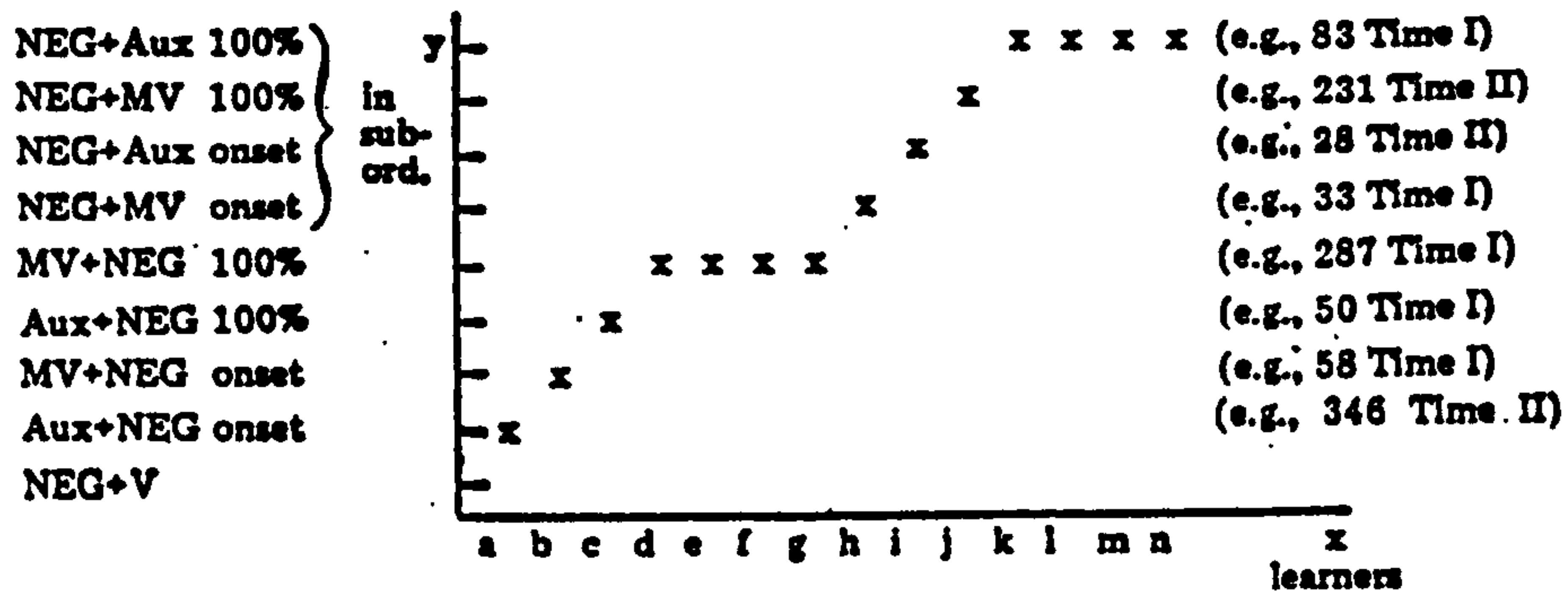


Figure 2.11 The build up of the interlanguage continuum for syntax of negation with Swedish as the target language.

Hyltenstam's study combines cross-sectional and longitudinal data collection and learners from a number of different language backgrounds. Two important findings emerged from his study in relation to these two aspects:

- (1) all learners who changed their behaviour from Time 1 to Time 2 (whether the change represented progress or regression)



kept to the same implicational pattern.

(2) learners with the same native language or in some instances from a homogenous grouping of native languages spread over the continuum, thus demonstrating that particular stages or patterns are not limited to learners with particular native languages.

In the study of inversion in Yes/No questions Hyltenstam (1978b) found a similar favouring of the AUX context over the MV by learners in the non-differentiation stage and for those differentiating in the simple questions. However, no clear pattern was apparent for learners who differentiated between clause types in embedded clauses. In the remaining two structural areas which Hyltenstam investigated, word order WH-question and inversion after a sentence initial non-subject (in which in fact there was the greatest amount of non-categorical rule application) no obvious patterns were discernable, constrained by the verb type (MV or AUX). The other possible contextual constraint, $\int + \text{pronominal} \int$ of the subject NP, did not constrain the variability in any of the four areas.

In correlating progress with non-linguistic variables Hyltenstam reports a positive relationship between the amount of progress and the number of years of formal education subjects had received and an inverse relationship between the length of stay (ie. LOR) and the rate of progress. Rate of progress from Time 1 to Time 2 was great among learners with only 2-4 months length of residence. From this Hyltenstam concludes: "that the greatest progress is made in the initial stages of learning in the syntactic areas studied". He sees this, along with the pattern of development suggested by his data on inversion in sentence initial non-subjects, as confirmation of the validity of the Baileyan Wave Model and in particular of the $\int$ -curve for the rate of change in modelling the process of SLA.

Hyltenstam (1978a) attempts to relate the direction and stages of change in second language development to theoretical notions of markedness. He sees the initial stages of learners' language as being "characterised

by unmarked categories" and development towards the target being achieved "from unmarked to marked categories" (1978a:75). He believes that the isolation of contexts which influence the development of the target language has broad theoretical implications and that such findings will provide the basis for the construction of a universal hierarchy of markedness for syntax. While this may well be so in the long term, it should be stressed that we appear to be very far from this goal at the present. It is undoubtedly important to seek to understand the significance of elements (contexts) which constrain variability. Patterns which result must be accepted to have some cognitive validity. However Hyltenstam's findings themselves demonstrate how far we are from understanding the reasons and mechanisms of the functioning of such constraints. For example, the implicational relationship between the MV and AUX environments in simple and subordinate clauses are clearly not uniform. If they were Hyltenstam would have found similar patterns to the variability in all four areas he investigated.⁶ At the present such hypotheses, which, if confirmed, would give a much firmer theoretical basis, conceptual generality and predictive power to our understanding of second language acquisition, are hampered by the lack of a clearly defined and universally accepted theory of linguistic markedness. There are at least three different approaches currently used to define markedness and these approaches, which can be contradictory, only cover some small areas of the grammar of human languages (Pavesi 1983, personal communication).

Full credit should be given to Hyltenstam for the rigour of his analysis of the data. Nevertheless criticisms can and have been made of his results and conclusions. Using Hyltenstam's data on negative placement Jordens (1980) suggests an alternative explanation of the process (and thus stages) of acquisition which he claims has greater psychological

⁶ Another recent study by Hyltenstam (1981) calls into question the appropriacy of typological markedness conditions for predicting the SLA sequence in relative clause acquisition.

validity. Regardless of whose explanation you accept (Hyltenstam (1982) contests Jordens' alternative), an important point emerges. While linguistic theory and our understanding of cognitive functioning is so undeveloped and imprecise, several explanations, each claiming "psychological" validity and superiority cannot readily be appraised and either accepted or discarded.

Other criticisms of Hyltenstam's study are methodological. The first concerns his elicitation technique in the main study (1977-78). This took the form of a discrete point fill-in-the-blanks task in which the subjects had to choose between placing the word provided in one of the two places marked by an underlined space.

For example:

inte	Ulf	_____	vill	_____	stanna.
(not)	(Ulf		will		stay).
köper	_____	han	_____	biljetter i kväll?	
(buy)	(	he		tickets this evening)?	

Such a task necessarily focusses the subjects on form and more importantly, allows only a binary choice. Whilst the difficulties of designing elicitations which will provide data on all contexts and thus circumvent avoidance (and other practical problems) are well appreciated, one is always left wondering whether the regularity of the findings and the very clear patterns in the one and a half areas in which they were found were partly the result of the very tight restriction on possible realisations imposed by the task.

Other implicational studies of the acquisition of aspects of second language syntax have been undertaken, generally with a high degree of success (Simukoko 1981, Al-Jumaily 1982, Hyltenstam 1981). Some of these are discussed in Chapter 3.

2.5.2.1.2 Studies of the Interrelationship of Learning of Areas of Grammar

Andersen (1978), as an alternative to cross-sectional morpheme order studies, used implicational analysis and various other related techniques, to study the systematicity and variability in the use of 13 grammatical morphemes in the English of 89 Spanish-speaking learners. His rigorous, if somewhat laborious, analysis clearly demonstrates the superiority of implicational analysis both for determining groups of more strongly related morphemes and for displaying individual variation. When all 13 morphemes (ANY COP, THE, A, ANY AUX, -ING, PLU, Past Irregular, NsN, Past Regular, Have and V-en, 3rdS ZERO-ART₁) were combined in one complex bimodal scale (with 80% = "1") a significant coefficient of scalability was obtained. Closer examination of the data enabled Andersen to determine that within this complex scale certain morphemes were unordered in relation to each other. By dividing his complex scale into a number of smaller scales he was able to demonstrate that a stronger implicational relationship exists between morphemes which formed natural groups according to two dimensions:

- (1) whether the morpheme is associated with the NP or the VP
- (2) whether the morpheme is bound or free.

He was able to demonstrate that the strongest relationship and best individual fit to the pattern (over 90% conforming to the pattern in each group) were obtained when the morphemes were divided into four groups by combining the two dimensions (Table 2.6).

Table 2.6: Implicational Series for the Four Morpheme groups,
resulting from Andersen's analysis (adapted from Fig. 2
Andersen 1978:239)

VERB
COP $\rightarrow \left\{ \begin{array}{c} \text{AUX} \\ \text{-ING} \end{array} \right\} \rightarrow \left\{ \begin{array}{c} \text{PaI} \\ \text{PaR} \end{array} \right\} \rightarrow \left\{ \begin{array}{c} \text{Hv} \\ \text{3rd} \end{array} \right\} \rightarrow \text{Vn}$

NOUN PHRASE
THE $\rightarrow \left\{ \begin{array}{c} \text{A} \\ \text{PLU} \end{array} \right\} \rightarrow \left\{ \begin{array}{c} \text{ZERO ART}_1 \\ \text{NsN} \end{array} \right\}$

Andersen's study suggests that whilst there is some relationship between the learning of distinct areas of morphology such that an implicational series can be determined, by far the strongest interrelationship exists between the learning of subgroups of morphemes, which can be considered to be associated linguistically. Such a finding is more in accord with our intuitions about the relationship between learning in different areas of grammar than the rather simplistic approach of traditional cross-sectional morpheme order studies.

In attempting to demonstrate that Singapore English is a creoloid, Platt (1977b) combines five morphemes (3NP and 2 V) into an implicational series. The order he obtains is identical to that Andersen finds for the same morphemes. Using multi-valued scales for the performance of the individual learners he does not obtain a significant scale. However, a closer examination of his data reveals that if he had employed bimodal or trimodal scaling (with an 80% cut-off = "1"), the scalability obtained, as in Andersen's case, would have been near perfect. This observation in turn raises serious questions about Andersen's finding and generally about the choice of scaling method. Bimodal and trimodal scaling can obscure serious deviations in the quantitative implicational pattern. We are not provided with all of Andersen's quantitative data so the extent of such deviations can not be determined. For the four free V morphemes for which such a comparison can be made, a similarly greater number of deviations from the pattern are apparent in the quantitative (ie. multi-valued) scale, 22 as opposed to 7 in the

bimodal scale. In one sense Andersen can be criticised for obscuring individual variability in an equivalent way using the implicational model as he himself has criticised traditional morpheme order research. Additionally, such comparisons between the results using the different scaling techniques, highlight the rather unsophisticated statistics available for the assessment of the scalability of implicational scales. The available statistical test of scalability, the coefficient of reproducibility, takes no account of the severity of deviations and the sensitivity of the scaling method.

Using polynomial approximation curves Hyltenstam (1978b) explores the inter-relationship of the learning of three areas of grammar in which the development was linear (post-verbal placement of negation in main clauses, inversion in simple yes/no questions and inversion of subject and verb after a sentence initial non-subject). The curves obtained for these three areas in relation to the X-axis which represents the learners' overall development as indicated by these factors combined can be seen in Figure 2.12. The most important findings to emerge from

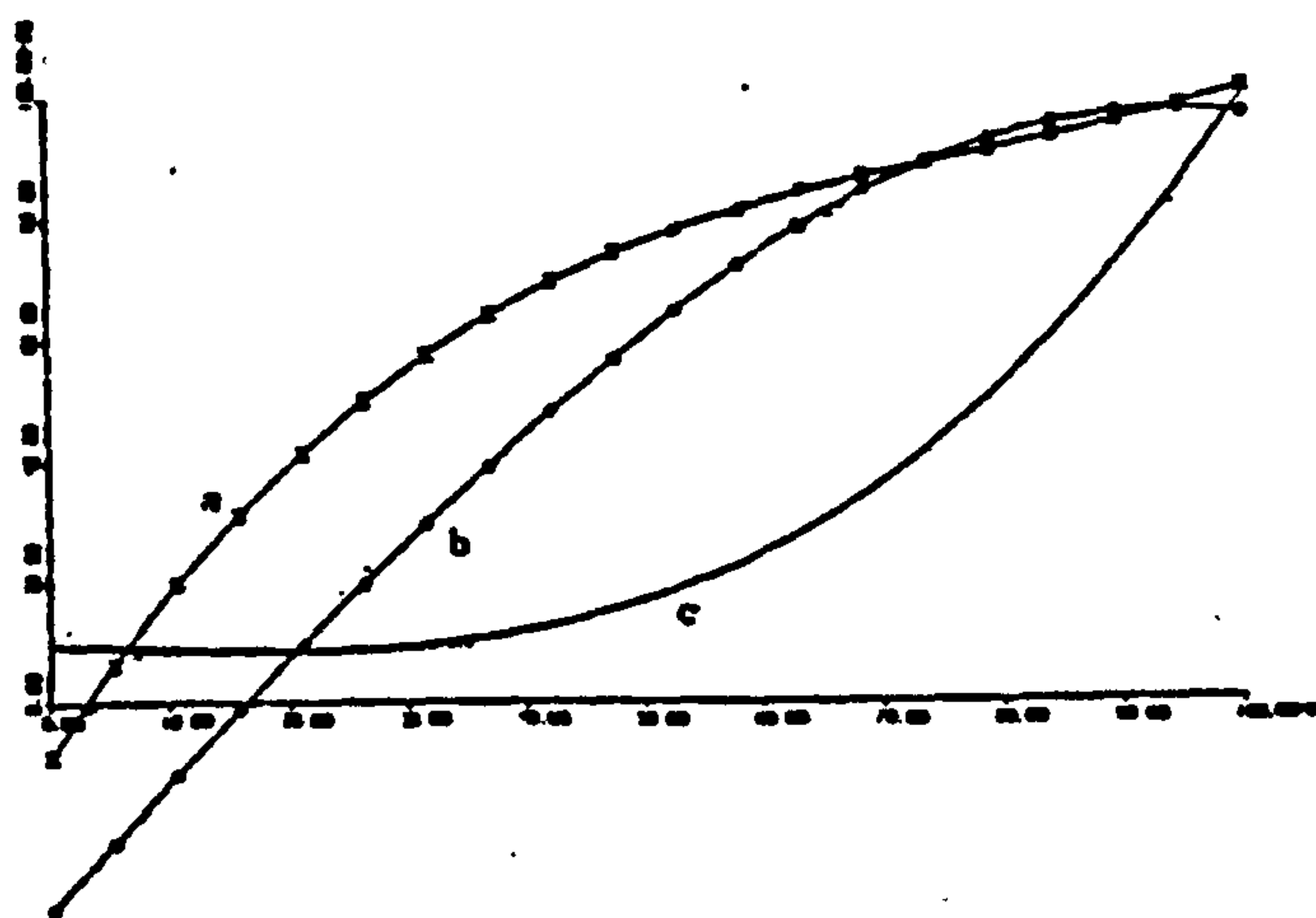


Figure 2.12: Post-verbal placement of negation (curve marked a. $r = .70$), inversion in yes/no questions (curve marked b. $r = .81$), and inversion after sentence-initial non-subject (curve marked c. $r = .93$) at Time II.
X = post-verbal neg. in main clauses + inversion in simple yes/no questions + inversion after sentence-initial non-subjects.

(from Hyltenstam 1978b:46)

Hyltenstam's analysis of the interrelationship are that with the exception of the very earliest stages (index development score of < 20% (X-axis)), the relative (ie. implicational) ordering of the three structures is maintained until a level of approximately 80% is reached on negative placement and yes/no questions, after which the curves for these two areas meet and follow each other. Inversion after a sentence initial non-subject shows a much slower development, although, once it has gained momentum (as predicted by Bailey's $\int$ -curve), development proceeds rapidly.

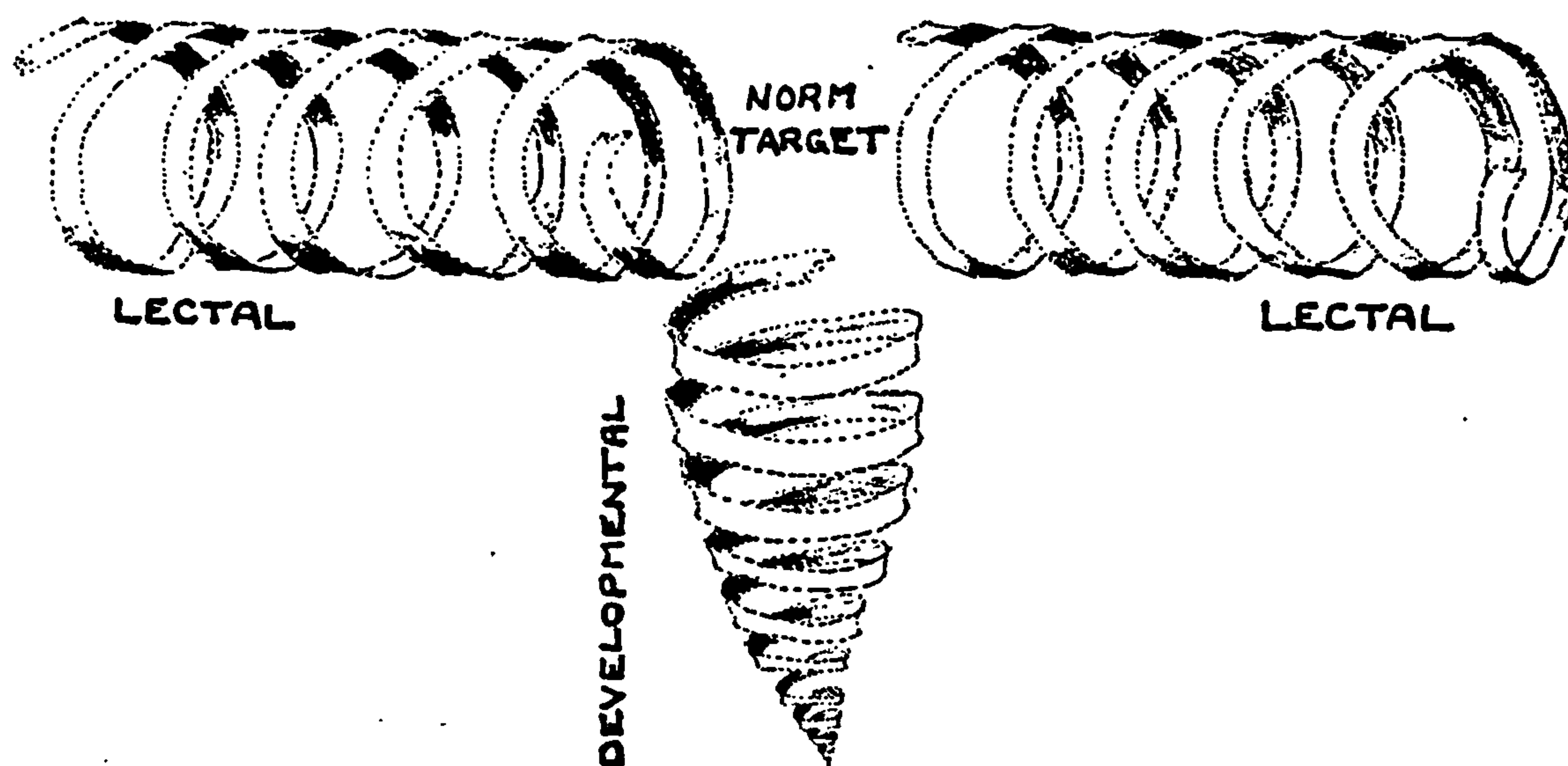
2.5.3 The Interlanguage Developmental Continuum

Corder (1977b) has turned to these new advances in linguistic theory in an attempt to improve on early attempts by himself (1967, 1971) and others (Selinker 1972, Nemser 1971) to provide a satisfactory paradigm for learners' second language development. He suggests that the apparent inconsistency and lack of regularity in learners' language which proved so difficult to account for when static linguistic models were used are "an artefact of the theoretical model we are forced to use to describe data". Using new concepts based on a dynamic approach to the study of language variation and change he proposes the notion of continuum, specifically of a developmental continuum.

Drawing on the accumulated evidence Corder defines learners' language as "a dynamic goal-oriented language system of increasing complexity" showing relatively little evidence of the influence of learners' first language. He proposes in a series of papers (1977a, 1977b, 1978, 1980) that the language of individual learners through time or of a group of learners at different stages in learning form a continuum. In invoking the concept of the Interlanguage Continuum, he makes a distinction between two basic types of linguistic continua; lectal and developmental. The chief difference between the two types is in their complexity. Lectal continua can be related to the norm with which they are associated in terms of "restructuring at an equal degree of complexity". Examples of such continua are dialect chains, sociolectal continua and the post-creole continuum. Developmental continua, such as the interlanguage

continuum, are characterised by increasing complexity in the direction of a norm or target (figure 2.13). In addition to the SLA continuum Corder suggests that first language acquisition and the pre and post-pidgin continua are developmental. He also points to the ability of speakers of a fully complex form of a language to move down the continuum of increasing complexity as evidenced by their use of simplified codes, such as baby talk and foreigner talk.

Fig.2.13: The Two Types of Continua Differentiated by Corder.



Corder sees developmental continua as sharing a number of common properties. Firstly, the starting point of all developmental continua is a basic simple grammar which appears to be based on either a language neutral "natural semantax" (Traugott 1973 and 1977) or pragmatic structure (Givón 1979), in which semantic categories and relations are overtly expressed. From this starting point movement along the continuum involves the employment of cognitive processes to create and test hypotheses about the structure of the target resulting in the gradual goal-oriented complexification of the language being acquired.

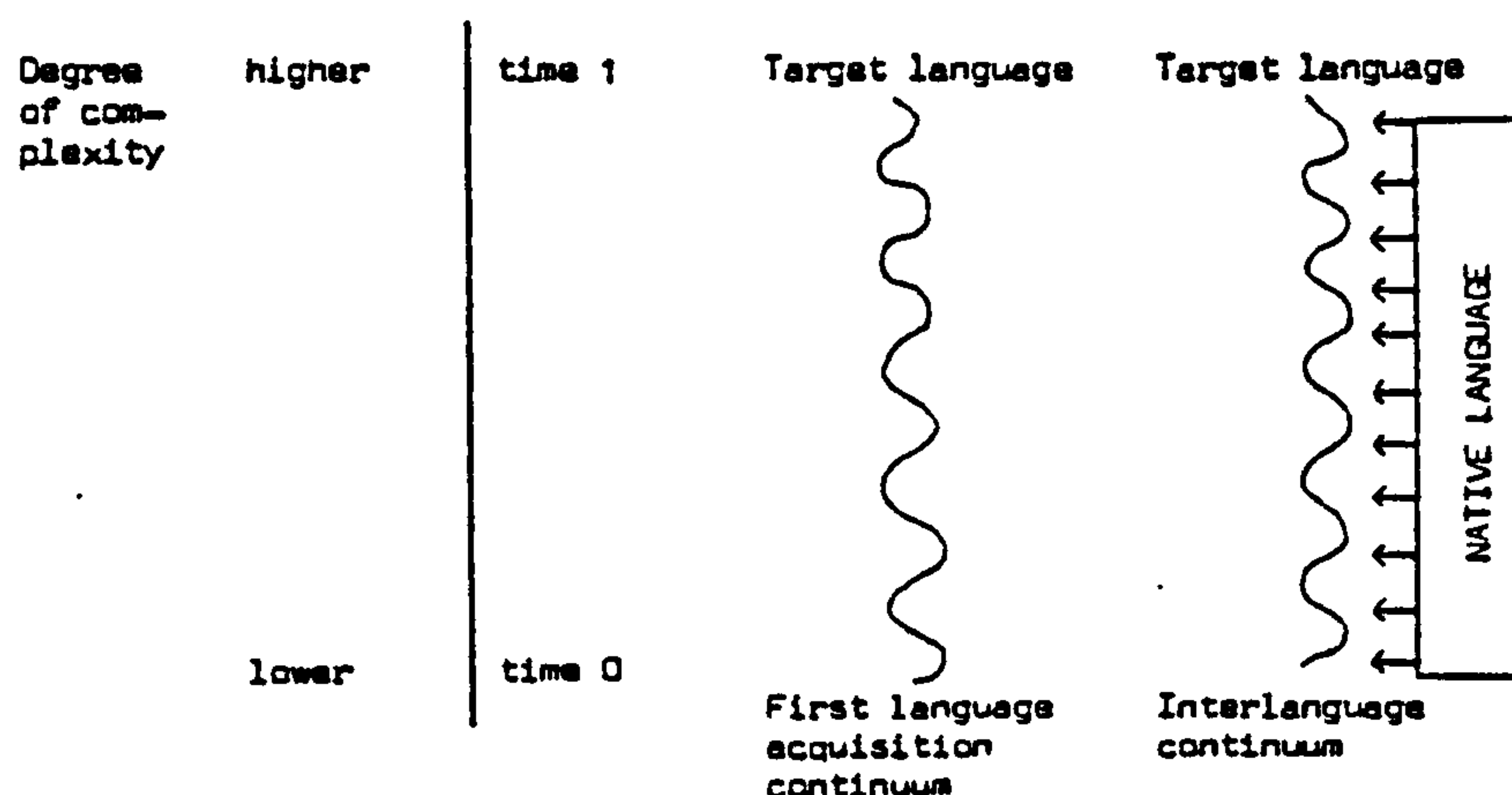
Corder (1977b) considers second language acquisition is principally a developmental process yielding in the individual a developmental continuum. He does not however completely dismiss the restructuring aspect in SLA, particularly in the learning of the second language phonological system:

"In practice, second language learning in any particular individual is probably a mixture in varying proportions of restructuring and recreating"

(Corder 1977b in Corder 1981:93)

Hyltenstam (1978a) adopts Corder's distinction between two basic types of linguistic continua. Drawing on empirical research he proposes that the learner moves along a developmental continuum in his second language syntactic development. Whilst remarking on the similarity of the Interlanguage continuum to the first language developmental continuum in terms of its starting point and increasing structural complexity over time⁷. Hyltenstam emphasises the difference in terms of the "interference structures" which are constantly operating in second language learners' language (see Figure 2.14) and which are involved in the "active and creative learning process" and thus contribute to the learner's movement along the developmental continuum.

Fig.2.14



(from Hyltenstam 1978a:73)

⁷ Felix (1978) would not agree that the starting point for first and second language acquisition is the same.

2.6 Integration of the Literature into the Study

The preceding discussion of recent empirical and theoretical research in SLA indicates that considerable growth and dramatic change have occurred in our understanding of the language of language learners. It is also apparent that few aspects of learners' syntactic development have been fully studied and, even when they have, few firm conclusions have been reached.

One current theory of the nature and development of learners' language, supported by Corder, Hyltenstam, Wode and others, discussed in Sections 2.3 and 2.5, views the language of the second language learner as a dynamic goal-oriented system in which syntactic development is seen as constituting movement along a continuum of increasing complexity. This paradigm of the process of second language acquisition is at present necessarily broad in its formulation and is based on a relatively small, but steadily, increasing amount of empirical evidence. It is in the context of this paradigm, with the intention of providing evidence relevant to it, that this study is conducted.

In formulating the aims of the investigation current SLA research has been taken into account. Studies by Hyltenstam, Al-Jumaily and Simukoko and others (section 2.5.2.1.1 and in Chapter 3) employing the most recent techniques for analysing variable linguistic data have been able to show that in many cases systematicity is evident in the learners' realisations of aspects of TL syntax, even when their use of the feature under consideration is not categorical. Such findings suggest the value of further more detailed study of learners' often variable realisations of forms and, in particular, of the constraints which may underlie the patterning of these variable realisations.

Morpheme acquisition order studies (section 2.2.2) and comparable studies of the interrelationship between the learning of discrete areas of syntax and morphology using implicational analysis (section 2.5.2.1.2) have tended to show significant correlations although their strength needs to be investigated further. In particular Andersen's (1978) study

has indicated that the strongest interrelationship between the learning of grammatical morphemes is between those which relate to the same main sentence constituent (NP or VP) and which have a similar form (bound vs. free). These findings suggest that the interrelationship of the learning of discrete areas of grammar warrants further investigation.

Virtually all recent research on the role of the native language in SLA has indicated the need both for a lessening in the emphasis placed on its influence and for a change to a more positive attitude concerning this influence. From research findings (Section 2.1) it is apparent that in the realisation of features of the syntax of a second language we can expect to see a high degree of similarity among learners regardless of their NL. Evidence from a number of studies, some of which are discussed in Sections 2.2, 2.3 and 2.5, suggests that this similarity may be stronger in certain areas (eg. negation and relative clauses) and weaker in others (eg. articles). In discussion of the role of the native language the concept of language distance has been introduced to assist in defining the relative effect of a learner's NL. In particular it has been suggested that the greatest differences between groups of learners will be between those whose NLs are considered to be furthest from each other in terms of language distance. Moreover, several researchers have independently hypothesised on the basis of the evidence available that the language distance, or degree of difference between the NL and TL, may affect the rate of acquisition, but have little effect on the sequence of acquisition, at least in the area of syntax.

Most SLA studies have involved large numbers of subjects at different stages of learning and used the cross-section obtained to infer stages in the development of the individual learner over time. Hyltenstam's findings that in changing over time his learners followed the stages of development which he had derived cross-sectionally supports the validity of cross-sectional methodology (as does the correlation in first language acquisition research between Brown's (1973) longitudinally determined order of morphemes and the cross-sectionally determined order of de Villiers and de Villiers (1973)).

But criticisms of cross-sectional methodology have been made (section 2.2.2) and there is a need to further test the validity of cross-sectionally determined stages as a reflection of individual longitudinal development.

In section 2.2.3 studies of the relationship of two non-linguistic variables, Age on Arrival and Length of Residence, were discussed. In particular an effort was made to interpret the meaning of the often conflicting results. It was concluded that current evidence indicates that older children and adults are faster at learning second language syntax and morphology, although younger children may ultimately progress further. Unfortunately no studies have examined in detail the existence of a relationship between AOA and rate of acquisition and level of attainment in the comparatively advantaged 11-17 years age group (such as was the range of the learners in this study). Secondly, the sometimes contradictory studies of the relationship between LOR and rate of acquisition and attainment point to the rate of learning being fastest in the initial 2 years after which it tails off. Both these aspects seem worthy of further investigation.

2.6.1 Aims of the Study

Using these aspects of current SLA research and taking into consideration the situation in which the study was conducted, the following six aims of the investigation can be isolated:

- (1) to investigate the systematicity and variability in the language of adolescent ESL learners in the production of the following four areas of English syntax: copula, negation, predicate complementation and articles.
- (2) to determine whether and in what way either the linguistic environment or the form required within these syntactic areas constrains the variability evident in the learners' language.

- (3) to investigate the interrelatedness of the learning of these four seemingly discrete areas of syntax.
- (4) to compare the language and specifically, the variability, in the second language production, of learners speaking different native languages to determine whether, in what way and to what extent they are similar.
- (5) to investigate how far the cross-sectional implicational order derived from each group of learners reflects the longitudinal development of those learners.
- (6) to investigate how the language levels of the learners and their rate of learning correlates with two non-linguistic variables, Age on Arrival and Length of Residence.

2.6.2 Hypotheses

Using the evidence provided by the research reviewed in the previous sections and the aims of the investigation just presented a number of hypotheses can be formulated. These are to be tested in the course of the investigation and if they are found to be proved, or otherwise, will contribute to our understanding of the nature of the process of SLA among adolescent ESL learners from different native language groups. The hypotheses fall into five groups, according to the aspect of learners' language which they address. In the case of those in Group 1, the hypotheses presented here are general hypotheses which are not directly testable, but which will be tested through the specific hypotheses which are presented in Chapter 3 after the structural areas to be investigated have been discussed. In the case of all the remaining four groups of hypotheses, which are directly testable, both the null hypothesis which is to be tested and its alternative hypothesis are presented in the following sections.

Group 1

The hypotheses in this group relate to the general characteristics of the language of the learners in the study within each structural area. They are general hypotheses which will be tested indirectly by means of the specific hypotheses for each area which are presented in Chapter 3.

General Hypothesis 1: the language produced by each group of learners and of individual learners within each group is systematically constrained by either the linguistic environment of the syntactic feature or by the syntactic form required in that environment.

General Hypothesis 2: Using the hypothesised syntactic environments and forms an implicational pattern for each group of learners is evident for each structural area.

General Hypothesis 3: Using the data obtained from each group of learners variable rules can be constructed and a developmental continuum for each structural area defined.

Group 2

The hypotheses in group 2 deal with the interrelationship between the learning of discrete areas of syntax.

Hypothesis 2.1

H_0 : The correlations between groups, as measured by group mean and implicational rank orders, and within groups, as measured by implicational scales, are not significant.

H_1 : There are significant correlations for the learning of the four discrete areas of syntax both between groups, as measured by group mean and implicational rank orders, and within groups, as measured by implication scales.

Hypothesis 2.2

H_0 : The correlations obtained under H2.1 are not higher where the features correlated relate solely to one of the main sentence constituents, NP or VP.

H_1 : The correlations obtained under H2.1 are higher where the features correlated relate solely to one of the main sentence constituents, NP or VP.

Group 3

The hypotheses in Group 3 address the question of the nature and scope of the influence of the native language on the learners' production of the features of English syntax chosen for study.

Hypothesis 3.1

H_0 : The correlations between groups of learners from four different native languages, as measured by group mean and implicational rank orders, are not significant

H_1 : The correlations between groups of learners from four different native languages are significant.

Hypothesis 3.2

H_0 : The correlations obtained between the groups from four different native languages for the ordering of environments and forms within each structural area are not higher in some of these four areas than in others.

Hypothesis 3.3

- H_0 : The correlations obtained under Hypotheses 3.1 and 3.2 are lower between groups of learners whose native languages are considered to be more closely related to each other in terms of language distance.
- H_1 : The correlations obtained under Hypotheses 3.1 and 3.2 are the same or higher between groups of learners whose native languages are considered to be more closely related to each other in terms of language distance.

Hypothesis 3.4

- H_0 : When non-linguistic factors are neutralised, the rate of acquisition, as measured by the mean scores, is not greater in groups whose native languages are closer to English in terms of language distance.
- H_1 : When non-linguistic factors are neutralised the rate of acquisition is greater in those groups whose native languages are closer to English in terms of language distance.

Group 4

The one hypothesis in this group deals with the relationship between the group cross-sectional and individual longitudinal patterns.

- H_0 : Within each structural area the developmental patterns obtained from analysing a cross-section of learners at different levels of learning do not correspond to the patterns observed in individual learners over time.

H_1 : Within each structural area the developmental patterns obtained from analysing a cross-section of learners at different levels of learning correspond to the patterns observed in individual learners over time.

Group 5

The three hypotheses in this group deal with the relationship between the two non-linguistic variables, Age on Arrival and Length of Residence, and the learners' performance on the tasks.

Hypothesis 5.1

H_0 : The correlations between AOA and the two linguistic variables, Acquisition Score at Time 1 and rate of acquisition as measured by the change in Acquisition Score from Time 1 to Time 4, are not positive and significant.

H_1 : The correlations between AOA and the two linguistic variables, Acquisition Score at Time 1 and change in Acquisition Score from Time 1 to Time 4, are positive and significant.

Hypothesis 5.2

H_0 : The correlation between LOR and the learners' level of performance at Time 1, as measured by the Acquisition Score, is not positive and significant.

H_1 : The correlation between LOR and the learners' Acquisition scores at Time 1 is positive and significant.

Hypothesis 5.3

H_0 : The correlation between LOR and the learners' rate of acquisition, as measured by the change in the Acquisition Score from Time 1 to Time 4, is not negative and significant.

H_1 : The correlation between LOR and the learners' rate of acquisition is negative and significant.

CHAPTER THREE

The Structures to Be Investigated

3.0 Introduction

Having reviewed the literature relevant to this investigation, it is necessary to turn to the four structural areas, copula, predicate complementation, negation and articles, from which the syntactic features selected for investigation have been drawn. First, a short analysis of these features in English syntax will be made after which a short discussion of the realisation of the features in each of the four native languages of the learners in the study will be presented. The next section for each of the structural areas will be devoted to a short discussion of previous SLA studies of the acquisition of that aspect of English syntax. Finally, as a result of these analyses the specific hypotheses, which will be used to test the three general hypotheses of Group 1 (section 2.6) will be presented for each structural area.

3.1 COPULA

3.1.1 English

In cases of what Quirk et al. (1972) have termed "intensive complementation", in which a coreference relation exists between the subject and the subject complement, English requires the use of a linking verb which is generally termed a "copula". The copula itself carries little meaning but it functions as a link between the subject and its complement. The typical, neutral copular verb in English is "BE".

Quirk et al. (1972) outline three basic complement types which require the use of a preceding copula: noun phrase complement (sentence 1), adverbial complement (sentence 2) and adjective phrase complement. Within the adjective phrase complement two forms are included, adjective and adjectival participle (sentences 3 and 4). Although the participial

form is derived from the passive it functions in such sentences like an adjective.

Noun phrase complement:

- (1) John is a student

Adverbial complement:

- (2) He is at school today

Adjective phrase complement

- (3) John is (very) bright

- (4) Mary is scared

In one of the few typologically oriented studies of the copula Ferguson (1971) defines two types of languages in terms of the presence or absence of an overt linking verb or copula. Type A languages, such as English, have a copula in all normal, neutral, equational sentences. Type B languages, in contrast, normally have no copula in equational sentences. In such languages:

"the copula is invariantly absent in a main clause when both members of the clause (subject and complement) are present, the clause is timeless or unmarked present in time, the complement is attributive (ie. adjectival rather than nominal), and the subject is third person"

(Ferguson 1971:142)

In many Type B languages the absence of the copula goes beyond these minimum limits which Ferguson has defined. Of the four native languages spoken by the learners participating in this study one, Spanish, is a Type A language, whilst the remaining three, Russian, Arabic and Vietnamese, according to Ferguson's definition are Type B languages. In the following sections the realisation of copula in all four of these languages will be considered briefly.

3.1.2 Spanish

Castilian Spanish is one of the languages of the Romance group of the Indo-European family. In terms of language distance it is considered to be closest of all four languages to English, but nevertheless it differs from English in many respects in the detail of its morphology and syntax.

In the use of copula it is closest of all four languages to English, being in Ferguson's Type A category. However, unlike English, Spanish possesses two neutral copular verb forms, "ser" and "estar". The choice of verb is determined by another important semantic distinction commonly made in languages of the world in equational sentences; this is the distinction between characteristics of persons, states and things which are essential, characteristic and permanent, "ser", and those which are transitory, "estar" (i.e. temporary or accidental). With a following NP "ser" is generally used, with a following locative "estar" is the more common of the two (sentences 2 and 5). Regardless of the copula verb which is appropriate, Spanish always requires a form of the verb to be used in all following linguistic environments comparable to the English ones included in the study in all tenses (sentences 1 to 6). In certain cases the subject pronoun may be omitted. Both meanings associated with the copula in Spanish are included in this study.

with "ser"

- (1) El es rico
He is rich
- (2) Roberto es cartero
Robert is (a) mailman
- (3) Yo soy de Mejico
I am from Mexico

with "estar"

- (4) La muchacha está feliz
The girl is happy
- (5) Yo estoy en Escocia
I am in Scotland
- (6) Juan está empleado
Juan is employed

3.1.3 Russian

Russian, like Spanish, is an Indo-European language. It is a member of the Slavic family. Overall, in terms of structure it differs considerably from English, having a highly developed case system and a complex verb system which includes an important aspectual component. Comrie (1981) has remarked in comparing English and Russian on the separation of pragmatic roles and grammatical relations which Russian has as the result of its ability to mark grammatical relationships through its morphology.

In terms of its realisation of copula Russian clearly fits into Ferguson's Type B category. In fact it is one of the languages he uses as an example of this category. In all persons in present tense neutral, equational sentences there is no copula realised, even when the subject NP is pronominalised (sentences 1 to 3). Like English, Russian has participial adjectives formed from the passive which can be used in the predicate of equational sentences (sentence 4).

(1) Ona studentka she student	(2) Ya schastliva I happy
(3) Ivan v shkole Ivan at school	(4) Dver' otkryta Door open (form: past participle)

In exposed positions and where special emphasis is required a special present tense copula form ("jest") is used (sentence 5).

- (5) prikaz jest' prikaz
(An) order is (an) order

In non-present tense the copula is realised in order to carry tense and aspect (sentences 6 and 7).

(6) ona byla studentka She was a student	(7) Ivan budet v shkole Ivan will be at school

3.1.4 Arabic

In Arabic-speaking speech communities there is a marked difference between the form of the language used in everyday speech and in formal speech and writing. This form of bidialectalism has been named Diglossia by Ferguson (1959). Colloquial spoken vernaculars which vary considerably from region to region are used in everyday speech. In writing and more formal speech situations a standard form of the language, generally referred to as Classical or Standard Arabic, is used throughout the Arabic-speaking world. In contrast to the colloquial dialects, standard Arabic "maintains in toto the old system of case suffixes and the five so-called subjunctives" (Voegelin and Voegelin 1964:331). Since the written form of the language is the only uniform one and the tasks in this study are written, description of the structures will be confined to their form in Standard Arabic.

In its realisation of the copula Arabic shares a great deal of similarity with Russian. It is also a Type B language and the occurrence and non-occurrence of copula has a similar distribution to that in Russian. In neutral present tense equational sentences the copula is not realised (sentences 1 to 4). As sentence 4 demonstrates,

(1)	'akhi tilmidhun brother-my pupil	(2)	'ana saa'id I happy
(3)	'akhi fi al-makthaba brother-my in the library	(4)	'ana kha'ef I frightened

Arabic permits the use of the past participle adjectivally. In non-present tenses the copula is required to carry the tense marking. Since verbs in Arabic also carry number, if the subject NP is in pronoun form it is redundant and is omitted (sentence 5). Arabic is a VSO language so that when it is realised the copula is in sentence initial position.

- (5) kāna tilmidhan
was - 3rd sing. pupil

3.1.5 Vietnamese

According to Voegelin and Voegelin's (1966) analysis Vietnamese belongs to a language family of its own, which Haudricourt believes is loosely related to the Mon-Khmer family. It is a monosyllabic language and scholars who have studied it (eg Duong Thanh Binh 1971, Emeneau 1951, Thompson 1965) have experienced considerable difficulty in classifying its structures in terms of word classes which are largely derived from the analysis of Indo-European languages. This suggests that Vietnamese is structurally very different from such languages, and thus from English.

In terms of the Copula Vietnamese is classified as a Type B language, although it appears to conform to little more than the minimum requirements which Ferguson stipulates. Unlike the other languages discussed, it makes a distinction between complement types in terms of the realisation of copula. The copula is not realised when the complement is adjectival (sentence 1) (Ferguson's minimum stipulation), but is realised if the complement is a noun or a locative. In the case of nominal complements the copula form is invariant "là" in both present and past tenses (sentence 2).

(1) Cái bàn dài
Table long

(2) Tôi là một sinh-viên
I be one student

When the complement in the equational sentence is a locative expression a different invariant copula form, "ở", is used (sentence 3). This is derived from a locative verb but functions as a simple linking copula in such sentences.

(3) Nguoi con trai ở trong lop hop
Boy is in classroom
(stay)

Vietnamese has no verb form equivalent to the past participle in English, and thus no form comparable to the adjectival participle.

3.1.6 Second Language Acquisition Studies of Copula

Only three studies of the environmental constraints on the acquisition of the copula by second language learners have been undertaken. Of these only one, Al-Jumaily (1982), is a full implicational study although Platt (1976 and 1979) uses implicational analysis techniques to a lesser extent.

Rashid (1980) studied cross-sectionally the frequency of Copula realisation by 3 groups of Kurdish-speaking learners of English in three environments; preceding an adjective (ADJ), a NP (NP), a locative prepositional phrase (PP). In each group, the same invariant order of means was observed in which ADJ > NP > PP. Al-Jumaily (1982) studied cross-sectionally and longitudinally the realisation of copula in the language of Arabic-speaking learners of English in Iraq. He studied the same three environments which Rashid studied and included detailed Implicational Analysis. In Translation and Elicited Imitation he reports an order in which NP > ADJ > PP. In the third task, Error Recognition and Correction, he reports an order in which the two most favoured environments, NP and ADJ are very close to each other, with ADJ being marginally favoured.

In the context of a larger study of Singapore and Malaysian English Platt (1976 and 1979) studied the implicational patterning of the environmental constraints on the realisation of BE in the three environments, which correspond to those of Al-Jumaily. The fourth environment studied was AUX "BE" when followed by a verb in the progressive (Ving). Using trimodal scaling he claims to have obtained significant scales for Copula in Singapore English with an order in which PP > Ving > NP > ADJ. In a non-implicational variability study of Copula realisation in Malaysian English (Platt and Weber 1980) the order of means which he reports corresponds more closely to the orders in the SLA studies already discussed, and incidentally, in most similar studies of non-standard English (eg. Labov 1969, Wolfram 1969). This order is NP > ADJ > PP. Platt distinguishes the status of English in Singapore and Malaysia from that in a normal SLA environment or any other situation. He argues that Singapore English

is a "creoloid", and thus that the patterns observed are not directly comparable to those of genuine second language learners. Nevertheless Platt attributes the different sequence of environments in Singapore and Malaysian English to differences in the speakers' native language realisation of the copula. Detailed appraisal of Platt's data shows that there are many problems with his analysis. Firstly, his locative category includes adverbs such as "there" and "here". Second, his __PP and __Ving environments have only a very small number of obligatory contexts (average of about 4), whereas the average for __ADJ is 20. This suggests that the use of forms requiring copula in these environments is avoided by Singapore English speakers except in the case of a few standard expressions, with other forms not requiring a copula being preferred (eg. the use of full locational verbs such as "live", "stay"). Platt's study provides a good example of how in natural data where there is no control over the number of obligatory contexts and what these contexts are from learner to learner unexpected results can emerge and aspects of the true situation may be obscured.

3.1.7 Copula in the Present Study

Studies of the variability in the realisation of the copula dependent on the following linguistic environment suggest that these environments do constrain the learners' realisation of the copula and thus contribute to the systematicity which underlies their variable realisation of this feature. In defining the environments to be included in this analysis the environments included in these studies were taken into account along with the specification of environments made by Quirk et al. (1972). This meant that four environments of copula, __NP, __ADJ, __PP (the three considered in previous SLA studies) and in addition, a fourth, preceding an adjectival participle (__PART) were considered worthy of investigation.

When the hypotheses to be tested in the course of the study were presented in Chapter 2 (section 2.6), only general hypotheses concerning the systematicity underlying the learners' possible variable performance were presented (Group 1 Hypotheses). It was stated that these general

hypotheses were to be tested indirectly, by means of separate specific hypotheses relating to each of the structural areas. The specific hypothesis dealing with the environmental constraints on the realisation of copula can now be formulated.

Specific Hypothesis 1 - Copula Environments

H_0 : The learners' variability in the realisation of the copula is not constrained by any of these following syntactic environments; ADJ, NP, PP, PART.

H_1 : The learners' variability in the realisation of the copula is constrained by these four following environments.

3.2 PREDICATE COMPLEMENTATION

3.2.1 English

Rosenbaum (1967) has made a comprehensive study of English predicate complement constructions using transformational analysis techniques. Predicate complements share a common property, that of being marked with a unique set of complementisers. The THAT complementiser is used to introduce finite predicate complement constructions, the FOR-TO complementiser to introduce the most common of the two non-finite predicate complement constructions, and the gerundial complementiser, POSS-ING, to introduce the second non-finite predicate complement. The choice of complementiser is largely dictated by the verb in the main clause under which the predicate complement is subordinated. Some verbs can take complements of all three types, eg. "believe" or "like" (although usually one or two of the possible types is more common), whilst others require one particular type obligatorily, eg. "enjoy". In addition to complementing verbs predicate complements can complement predicative adjectives. As with full verbs, it is the adjective in question which determines the appropriate complementiser (sentences 1 to 3).

(1) THAT Mary is glad (that) John has gone.

(2) FOR-TO Her mother was happy for her to see him again

(3) POSS-ING I'm sad about her leaving so soon.

In more colloquial language the THAT complementiser, the possessive in the POSS-ING type, and FOR in certain FOR-TO constructions are optionally deleted.

A second important distinction in predicate complement constructions is that regarding the relationship of the subject of the main clause to the subject of the subordinate clause. In non-finite complements if the subject in the main clause is identical to the subject in the subordinate clause it is deleted. In transformational terminology this happens as the result of a transformation referred to as EQUI-NP deletion. When the predicate complement is finite the EQUI-NP is pronominalised (sentences 4 to 6). Sentences in which the subject of the subordinate clause is different from the subject of the main clause are commonly referred to as NON-EQUI types (sentences 7 to 9).

EQUI (4) THAT John knows (that) he is going to France

(5) FOR-TO He wants to go to France this summer

(6) POSS-ING John will enjoy going to France

NON-EQUI

(7) THAT John knows that his father is coming

(8) FOR-TO John is waiting for his father to come

(9) POSS-ING John enjoys his father('s) visiting.

3.2.2 Spanish

The means of forming predicate complement constructions in Spanish is much more restricted than in English. There are two means of forming

complements, one finite, using the complementiser "que", ("that"), the other non-finite in which the infinitive form of the verb is used in some cases preceded by the preposition "de" ("of"). In the case of EQUI subject identity relationship both forms of complement can generally be used (sentences 1 to 3).

- (1) Maria piensa que vendra temprano
Maria thinks that will come-3rd sing early
- (2) Maria piensa venir temprano
Maria thinks to come early
- (3) Maria dijo de venir
Maria said to come

When the subject of the subordinate clause is not identical to the subject of the main clause only the finite type with "que" can be used, with the exception of with the verb "decir" (to say, tell) (sentence 4 and 5).

- (4) Maria piensa que Juan vendrá temprano
Maria thinks that Juan will come early
- (5) Yo le dije de venir
I to him said to come

When the main clause contains a predicative adjective the adjective is always followed by "de" before the complement (sentence 6).

- (6) Juan está feliz de que Maria venga
Juan is happy of that Maria is coming

3.2.3 Russian

Like English Russian possesses both finite and non-finite means of forming predicate complement constructions. However the range of complements and their distributional restriction means that overall the choice of complement in most situations is not as great as it is in English.

The main finite complementiser is "shto" ("that") (sentences 1 and 2).

- (1) Ya dumayu, shto on budet pozdno (NON-EQUI)
I think that he will be late

- (2) On verit shto on prav (EQUI)
He believes that he right

As the examples show "shto" can be used both when the main subject is the same as the subject in the complement (EQUI), (2), and when it is not (NON-EQUI), (1).

The non-finite complementiser is the infinitive suffix, "t'". In general the use of this means of complementation is restricted to cases where the subject of the complement is identical to the subject of the main clause (sentence 3).

- (3) Ya khochu kupit' novuyu shlyapu (EQUI)
I want buy-inf new hat

In certain restricted cases, with verbs of requesting and wishing, the infinitival complement can be used with a NON-EQUI type predicate (sentence 4).

- (4) Prashu vas prijekhat' k nam
Ask-1st you come-inf to us (ie. to our place)

Two other finite complementisers, "shtoby" and "kak", are used instead

of "shto" with certain verb types (sentences 5 and 6).

- (5) On poprosil, shtoby druz'ya yemu pomogli
He asked that friends to him helped

- (6) My slyshali, kak ona pela
We heard how she sang ie We heard her singing

When "kak" is used with verbs of sensory perception it is clearly the Russian equivalent of the gerundial complement.

3.2.4 Arabic

In Arabic there are several ways of forming predicate complement constructions. Because of its case system all types can be used regardless of the relationship which exists between the subjects in the main and subordinate clauses. The first is by means of the complementiser "ana" (that) which is followed by a suffix when the subject relationship is the EQUI type (sentences 1 and 2).

- (1) Yālam Latif anaho sawfa yadhbo
Know Latif that-he will go

- (2) Yadhno Latif ana Fatima sawfa tadhabo
Think Latif that Fatima will go

The second means is using the particle "an" with the infinitive form of the verb (sentence 3).

- (3) Orido an ashtari daradzah
Want-she buy-inf bicycle

Thirdly the preposition "bi" ("in") can be prefixed to the verb. This is similar to the English gerundial complement (sentence 4).

- (4) Tastamte ho Meri biadhahabi fi edzazah
enjoy-3rd sing Mary in go-3rd sing on holiday.

In addition for certain verbs and predicative adjectives, the complement is formed by using a preposition followed by the verbal complement (sentence 5).

(5) Meri motakedatuu men zyarat Latif laha

Mary sure from visit Latif for her (ie of Latif's visiting her)

3.2.5 Vietnamese

Vietnamese possesses two means of forming predicate complement constructions, one finite and one non-finite. The finite complementiser is "rằng" or less commonly "là". Finite complementation is used with verbs such as "say, tell, hope, guess, feel, see" (sentences 1 and 2).

(1) Ông ấy cảm thấy rằng cô ấy sẽ đi
He feel that she would go
(ie he felt that she would go)

(2) Ông ấy bảo tôi rằng ông ấy đã gặp cô hôm qua
He tell me that he had seen you yesterday
(ie. He told me that he had seen you yesterday)

The second means of forming predicate complements is equivalent to the English infinitival complement. Since Vietnamese does not have an infinitive marker the base verb form is used. This complement form is exceedingly widespread in Vietnamese. It can be used when either EQUI and NON-EQUI relations exist between the subjects in main and subordinate clauses (sentences 3 and 4). In Vietnamese, as in English, the main indicator of grammatical relationships is word order.

(3) EQUI Ông ấy muốn gặp họ
He want see they

(4) NON-EQUI Họ để cho chúng tôi đợi bên ngoài
They leave us wait outside
(ie. They left us waiting outside.)

In certain restricted contexts, with main verbs expressing physical perception denoting an incomplete action a correlate of the English gerund, the auxiliary "dang" is used to express an incomplete action (sentence 5).

(5) Tôi nhìn thấy một đứa bé đang đứng gần cửa sổ
 I notice one child ↓ stand near window
 AUX of incomplete action

(ie. I noticed a child standing near the window)

3.2.6 Second Language Acquisition Studies of Predicate Complementation

Three SLA studies of predicate complement constructions have been reported in the literature. As part of a larger study of the comparative acquisition of a number of complex constructions in learners from different native language backgrounds Hart and Schachter (1976) studied the three types of verb complementation which are used in English. They report that in their 5 groups of advanced learners verbal complementation is fairly well-acquired, especially the TO-type. Unfortunately, they provide no data as to the percentage correct realisation of the various types, being more concerned with the frequency of use of each type regardless of its formation. For this reason their study does not provide any information about the relative acquisition of the three complement types, only their relative frequency of occurrence in relation to each other, which is probably primarily a function of the frequency of each type in the language.

Using a multiple-choice task Anderson (1978) studied the acquisition of aspects of predicate complementation by Spanish-speaking EFL learners. She uses the ordering-theoretic method of determining the order of acquisition of the various forms with a level of 80% to denote acquisition and reports an order in which the TO-type of complementation is acquired before THAT, which in turn precedes ING. She also studies the EQUI/NON-EQUI distinction and reports that complements in which there is an EQUI relation between the subject in the main and subordinate clauses are acquired before those in which the subjects are different.

Simukoko (1981) studied the acquisition of the three means of predicate complementation by Zambian learners of English using an elicited imitation task. All but one of his sentences were of the NON-EQUI type. Using bimodal scaling with the rather low division point of 66% he reports an order in which the THAT type is most favoured, followed by TO, with the ING type being the least favoured.

3.2.7 Predicate Complementation in the Present Study

The distinctions in the type of complementiser required, in the relationship between the subjects in the two clauses and in the form of the verb phrase in the main clause, as discussed in section 3.2.1, form the basis of the designation of categories included in this study.

Evidence from the few SLA studies of this aspect of English syntax suggests that the variability in the learners' correct use of the three complement types may be constrained by both the complementiser required (THAT, TO or ING) and the relationship between the subjects in the main and subordinate clauses (EQUI or NON-EQUI). Table 3.1 summarises the types of predicate complements included in this study.

Table 3.1: The Types of Predicate Complement Constructions in the Study.

<u>Complementiser</u>	<u>Main Clause VP</u>	<u>SI Type</u>	<u>Example</u>
THAT	Pred. ADJ	Both	Mary is sure (that) John is coming
	MAIN VERB	EQUI	John thinks (that) he will be there
		NON-EQUI	John thinks (that) Mary will come too.
FOR-TO	Pred. ADJ	Both	Jane is happy to take her holidays in May.
	MAIN VERB	EQUI	I want to buy a bicycle.
		NON-EQUI	Mary wants her mother to visit her.
POSS-ING	Pred. ADJ	Both	Sue is keen on going to Hong Kong.
	MAIN VERB	EQUI	Paul enjoys helping his mother.
		NON-EQUI	Mary enjoys her friend('s) visiting her.

From the evidence available the specific hypotheses addressing both of these two parameters can be formulated:

Specific Hypothesis 2 - Complement Type

- H_0 : Variability in the learners' use of predicate complement constructions is not constrained by which of the complementisers, THAT, TO or ING, is required.
- H_1 : Variability in the learners' use of predicate complement constructions is constrained by which of the three complementisers is required.

Specific Hypothesis 3 - Subject Identity Relationship

- H_0 : Variability in the learners' use of predicate complement constructions is not constrained by whether the relationship between the subjects in the main and subordinate clauses is of the EQUI or NON-EQUI type.
- H_1 : Variability in the learners' use of predicate complement constructions is constrained by whether the subject identity relationship between the subjects of the main and subordinate clauses is of the EQUI or NON-EQUI type.

3.3 NEGATION

3.3.1 English

In cases where an auxiliary is present in the affirmative, the negative is formed by placing the negator "not" after the first auxiliary (which can be a modal, copula or one of the aspectual auxiliaries, BE and HAVE), preceding any other auxiliaries and the main verb or non-verbal predicate (sentences 1 to 3).

- (1) John is not going home yet
- (2) I have not been out today
- (3) They will not be at school tomorrow

In colloquial language the negator is usually abbreviated to "n't" which is then attached to the auxiliary preceding it (sentence 4)

- (4) Mary wasn't sure about the dress.

In cases where there is no auxiliary in the affirmative, which occurs if the finite verb is in either the simple present or past tense, the periphrastic, dummy auxiliary, DO, is inserted in the appropriate number, person and tense and then the placement of the negative particle follows the same rule as applies when an auxiliary is present. The form of the verb following the negator is then the base form, otherwise called the "bare infinitive" (Quirk et al. 1972) (sentences 5 and 6).

- (5) Paul did not go to London
- (6) She doesn't want a new bicycle.

From the transformational point of view the derivation of such negative sentences from the deep structure requires the additional transformation of DO-insertion.

3.3.2 Spanish

The formation of the negative in Spanish is more uniform and straight forward than it is in English (Kauffman 1973). Spanish negation is exclusively preverbal and thus conforms to a pattern which, according to Dahl (1977), is the most widespread typologically among the languages of the world. The invariant negative particle "no" is placed immediately before the verb (sentence 1). In contrast to English in

tenses in which auxiliaries are used (eg. passive, perfective), the particle precedes the auxiliary (sentences 2 and 3). Since person and number are indicated by the verbal suffix in cases where the subject is a pronoun it is characteristically omitted. In such cases the negator is in sentence initial position (sentence 4).

(1) Yo no voy a la fiesta

I not go to the party

(2) Ella no ha veruido hoy

She not has come today

(3) El no fue ayudado por nadil

He not was helped by nobody

(4) No me dijo nada

Not to me said-3rd sing nothing

3.3.3 Russian

Russian, like Spanish, has preverbal negation with an invariant negator, "ne" (sentence 1). Since Russian does not use auxiliaries to mark features such as aspect, the complication of the positioning of the particle in relation to the auxiliary does not arise. In the case of the neutral present copula, which is not realised in Russian the negative particle immediately precedes the non-verbal complement (sentences 2 and 3). In past and future tenses in which the copula is realised and carries the tense and number the negator precedes it (sentences 4 and 5).

(1) On ne khochet novuyu shlyapy

He not wants new hat

(2) Ona ne studentka

She not student

- (3) Ivan ne v Londone
Ivan not in London
- (4) Ya ne byla schastliva
I not was happy
- (5) Dver' ne byl otkryt
Door not was open (past participle)

3.3.4 Arabic

Negation in Arabic is similarly consistently preverbal. Since in most cases the verb is in first position the negative particle in a negative sentence is usually in sentence initial position. The negative particle carries inflection for tense and aspect and this determines its form:

		<u>Aspect</u>	<u>Tense</u>	
NEG	+	perfect	past	lam
		imperfect	present	lā
		..	future	lan (alternative future "sawfa lā")

Sentences 1 to 3 provide examples of some of these forms:

- (1) lā yaktubu al-waladu
Neg - imperfect write-(he) the-boy
present
- (2) lam yaktuba al-waladu
Neg - perfect write-(he) the-boy
past
- (3) Sawfa lā yakutubu al-waladu
Will neg write-(he) the-boy

Sentence 3, in which the alternative future form sawfa + Verb is used, is clearly the closest to the English positioning of the negator in

that the negator follows the auxiliary "sawfa" and precedes the main verb. A similar positioning also occurs with the modal "yajib" ("must").

In present tense neutral equational sentences a special negative copula, ("lays-", "las-") inflected for person and number, is used in sentence initial position (sentences 4 to 6).

(4) laysa l-waladu dhakiyyan
cop/neg-3rd sing the-boy clever

(5) lastu fi al-madrasa
cop/neg-1st sing at the-school

(6) lasta dhaliban
cop/neg-2nd sing student

3.3.5 Vietnamese

Vietnamese possesses a large number of simple and complex (di- and trisyllabic) negative particles. The neutral negator is "không", which, incidentally, assumes the function of a question marker when it is placed in sentence final position. In negative sentences it precedes the verb or adjectival complement (sentences 1 to 3). The other form which is relevant to the formation of negative in the cases which are being considered here is the complex negator "không phải" which is used to negate the equative copula "là" which occurs preceding a NP complement (sentence 4).

(1) Bà Hai không tốt
Mrs Hai not nice

(2) Ông không hát
He not sing

(3) Tôi không thổi cơm
I not cook rice (ie. I did not cook rice)

(4) Tôi không phải là một sinh viên
I not be one student

To clarify the relation of the negative particle to the other elements in the Vietnamese sentence it is necessary to consider briefly the expression of tense and aspect in the language. The Vietnamese expression of time relationships is quite different to that in English and is summed up well by Dương Thanh Bình (1971):

"Since a Vietnamese verbid does not show time, a Vietnamese sentence is not time-oriented, although it may show time-relationship (ie same time, earlier time, of later time) with reference to a specified time or with reference to another event. Such time-relationship is shown by means of certain listable lexemes called TIME-RELATIONSHIP PARTICLES"

(1971:163)

Many Vietnamese sentences do not overtly express time relationships, but when they do the negative particle follows the time-relationship particle and precedes the verb. This order of constituents obviously bears some similarity to the order of constituents in English negative sentences (sentence 5).

(5) Ông đang không hát
He in the process of not sing (đang = TR particle)

3.3.6 Second Language Acquisition of Negation

Following Klima and Bellugi's (1966) pioneering study of the development of negation in English-speaking first language learners, numerous second language acquisition researchers have studied the development of negation in the second language learner (eg. Nielsen 1974, Ravem 1974, Milon 1974, Wode 1976, Cazden, Cancino, Rosansky and Schumann 1975). Following Klima and Bellugi's approach these studies have concentrated on studying the development of the expression

of negation, from the use of a sentence external negator to target English negation. In their analyses they have concentrated on transitional forms which learners use in the course of the development of the target forms. From our point of view many of these studies do not provide the data which is necessary for the determination of the relative order of acquisition of the various target AUX + NEG forms in the appropriate following environments. All studies provide examples of non-target, transitional forms for environments requiring copula (COP) and AUX 'BE' (eg. 'no Ving' (AUX absent) and 'no is'), but most concentrate on the forms of DO + NEG in the later stages where production is becoming target-like.

Schumann's (1978) analysis of the development of negation in Spanish speakers does include the forms of BE + NEG. The stages he distinguishes are presented in Table 3.1b. From this analysis it is apparent that the target forms of BE + NEG are acquired in Late Stage IIa, as opposed to analysed DO + NEG which is in Late Stage IIc. Wode's (1976) analysis is also suggestive of this trend. Hatch (1974) analysed 15 studies of the development of the Auxiliary system (AUX) and of negation in second language learners of English. In AUX development she reports an

Table 3.1b: Schumann's (1978b) Analysis of the Sequence of Acquisition of English Negation by Native Speakers of Spanish.

1. Stage I—pre-verbal negation rule.
 - a. *No + verb constructions—No saw him*
 - b. *No + phrase constructions—No in Colombia*
 - c. *Some don't + verb constructions—Don't like*
2. Early Stage II—preverbal and post-auxiliary negation rules.
 - a. Dominant use of unanalyzed *don't + Verb constructions—I don't saw him (=didn't)*
 - b. *Some cop/cux + negator constructions—The dog can't bark*
 - c. *No/Nor + Phrase constructions in variation—No this week. Nor today*
3. Mid-stage II—Pre-verbal and post-auxiliary negation rules.
 - a. Decline of *No + Verb constructions*
 - b. Expansion of *cop/cux + negator constructions—I'm not old enough. I will don't see you tomorrow (=will not)*
 - c. Increase of *Nor + Phrase constructions over No + Phrase constructions*
4. Late Stage II—loss of pre-verbal negation and establishment of English post-auxiliary negation rule.
 - a. Innovation of past/present distinction among negative forms (i.e. the use of past tense *cop* and *cux* and *do*)—*He wasn't talking to the teacher. I didn't went to Costa Rica*
 - b. Elimination of non-standard negative forms (i.e. *no + phrases* and pre-verbal negation)
 - c. Restructuring of unanalyzed *don't* (i.e. the appearance of *didn't, doesn't, do not* etc.) such that *do* is used as carrier of both negation and tense
5. Stage III—Final elimination of all non-standard interlingual forms and the establishment of standard English negation.

order of acquisition in which COP is acquired first followed by AUX 'BE', DO and HAVE in that order. In her analysis of the development of negation in the same 15 studies she only reports non-target forms for COP and AUX 'BE' + NEG, but the data which she does present suggests an order in which target COP and AUX 'BE' + NEG are acquired before target forms requiring DO-insertion, which in turn are acquired before target HAVE + NEG.

3.3.7 Negation in the Present Study

Drawing on the differences between the languages two aspects of negation are the focus of this study; the formation of the auxiliary and the placement of the negator in relation to it. This leads to the inclusion of four environments in each of which the auxiliary required is different. The purpose of the investigation is thus to analyse the relative acquisition of target negation in four environments. Table 3.2 outlines the environments and the AUX morphemes required.

Table 3.2: Environments and Forms of AUX Morphemes.

Environment	AUX	Examples
— Non-Verbal Comp	COP 'BE'	Mary is not late I am not a student any more Jane is not at home They are not worried about the exam
— V-ing	AUX 'BE'	John is not meeting me until 7pm.
— V _{main}	DO	I do not want a new shirt
— V _{pp}	HAVE	John has not finished his breakfast

Two specific hypotheses can be formulated for negation. The first addresses the learners' formation of AUX + NEG.

Specific Hypothesis 4 - AUX + NEG forms

H_0 : Variability in the learners' realisation of AUX + NEG constructions is not constrained by which of the following forms of AUX; COP, AUX 'BE', DO or HAVE, is required.

H_1 : Variability in the learners' realisation of AUX + NEG constructions is constrained by which of these four AUX forms is required

The second specific hypothesis relates only to the realisation of copula when it is in the negative. The same four following syntactic environments presented and discussed in section 3.1 were included for comparison in the negative. Thus a specific hypothesis concerning the variability constrained by these environments can be formulated.

Specific Hypothesis 5 - COP + NEG Environments

H_0 : Variability in the learners' realisation of COP + NEG is not constrained by any of these following linguistic environments; __ADJ, __NP, __PP and __PART.

H_1 : Variability in the learners' realisation of COP + NEG is constrained by which of these four environments follows it.

3.4 ARTICLES

3.4.1 English

Unlike many of the languages of the world, English has a well-developed system of articles in addition to other deictic and referential forms such as the demonstratives, pronouns and comparatives. The English definite article "the" is derived historically from the demonstrative "that" and the indefinite article "a, an", is derived from the numeral, "one".

3.4.1.1 The Definite Article

Halliday and Hasan (1976) classify "the" as a neutral specifying agent, one which is non-selective semantically in terms of location and time. Furthermore it has no content of its own, merely indicating "that the item in question is specific and identifiable, that somewhere the information necessary for identifying it is recoverable" (Halliday and Hasan 1976:71). This information may be recovered from either the situation or from the text itself. This distinction gives rise to a basic division of types of reference between that which is exophoric and that which is endophoric. In cases where exophoric reference is operating the information needed to identify the referent is identifiable from the situation. In cases where the reference is endophoric the source of the identification can be found within the text.

In this particular study the concern is with the subjects' ability to use the definite article when this second type of reference, endophora, is involved. Mastery of the use of the definite article in endophoric reference is essential to discourse structuring and comprehension in English. Within endophoric reference there are two possible directions of reference. When the information necessary for identification follows the definite NP, the reference is cataphoric (sentence 1).

- (1) The wines of France are very good.

More commonly, when the information precedes the definite NP, the reference is termed anaphoric (sentence 2). Only this second anaphoric use of the definite article is included in this investigation. Once a referent has been introduced into the text, on every occasion when it is referred back to in the discourse in its full DET + NOUN form, the definite article, signifying anaphoric reference is required if one of the other selective specific referents (eg. a demonstrative) is not used.

- (2) Yesterday a man came into the shop The man

3.4.1.2 The Indefinite Article

The indefinite article is used in precisely those places where it is not appropriate to use a definite article because the referent is either not specific or is not identifiable from either the situation or the preceding discourse. Within the class of indefinite referents, as indicated by the determiner being the indefinite article, Lyons (1977) isolates two distinct interpretations. He provides this sentence to demonstrate the distinction:

- (1) Every evening at six o'clock a heron flies over the chalet.

Under one interpretation 'a heron' is taken to refer to "a specific, though unidentified, individual" (1977:188), in other words it could be paraphrased as "a particular heron". In the second possible interpretation such specificity is not indicated. In this sense the indefinite article can be taken to mean "some heron or other".

In all the instances of the use of the indefinite article in this investigation, it is the first meaning of the indefinite article which is being considered. In this meaning it is used to introduce into the text for the first time a specific, but unidentified member of a class of animals or things, which once introduced and identified then assumes a definite status within the text.

Givón (1979) discusses the concepts of definiteness and indefiniteness in the context of discourse and presuppositional markedness. Of particular relevance to this study is his analysis of the frequency of definiteness and indefiniteness as a property of NPs in four positions. Subject, Direct Object, and Dative and Locative Objects. Having analysed 8 narrative texts representing a number of different discourse types, he tabulates the overall percentage of definite and indefinite in each position (Table 3.3).

Table 3.3: Percentage of Definite and Indefinite of Nouns in four positions in English declarative, affirmative, active clauses (from Givón 1979:52-54)

	Definite (%)	Indefinite (%)
Subject	91	9
Direct Object	56	44
Locative Object	84	18
Dative Object	96	4

Givón uses these figures firstly to demonstrate that in English "the major avenue for introducing new referential arguments into discourse" is the direct object (82% of indefinites are in this position), and secondly to argue that the subject of the neutral (i.e. unmarked) sentence type is definite.

3.4.2 Spanish

Spanish is like English in that it has distinct definite and indefinite articles as well as demonstratives. Unlike English the Spanish definite and indefinite articles are marked for gender and number:

DEFINITE	sing. masc. el	plur. masc. los
	fem. la	fem. las
	neut. lo	
INDEFINITE	sing. masc. un	
	fem. una	

In terms of its use for endophoric reference the use of the definite article is identical to English. The use of the indefinite article on the other hand is more restricted than in English. In particular it is omitted before nouns in the predicate, when they are "employed as adjectives to express some quality or character of the subject" (Ramsey 1965:58) (sentence 1).

(1) Soy español y soldado (I) am (a) Spaniard and (a) soldier

If the predicate noun is qualified by an adjective an indefinite article is usually used, except when the expression has become stereotyped (sentences 2 and 3).

(2) Es un gran embustero (He) is a great liar

(3) Es buen católico (He) is (a) good Catholic

3.4.3 Russian

Unlike Spanish and English, Russian does not have specific definite and indefinite articles. However, as every language, it does have the means to express the feature of definiteness. The expression of definiteness and indefiniteness is not obligatory and tends only to be used in cases where it is important to the context.

When the indefinite has a truly indefinite meaning of "some X or other" usually no form precedes the noun. If for special emphasis a form is required then the indefinite pronoun "kakoi-nibud'" can be used (sentence 1). When the indefinite has the meaning of "a certain X from the class of Xs", the use of the indefinite article comparable to that in the texts used in this study, the word "odin", which means one, can be used (sentence 2), although generally only when special emphasis is required.

(1) Ya nadeyus', shto my skoro naidem (kakoi-nibud') magazin
I hope that we soon will find "a" shop

- (2) Ya kupil neskol'ko starykh knig v odnom magazine v Londone
I bought some old books in one shop in London

Definiteness is expressed in Russian, where required by demonstratives. Borras and Christian (1971) make the distinction between "weakly demonstrative the", which is frequently translated into Russian by "etot" ("this") (sentence 3) and the "more emphatic definite article" which is rendered by "tot" ("that"). In comparison with English the use of these demonstratives as definite markers is much more restricted, being used for special emphasis or in certain positions, such as when the definite noun is qualified with a relative clause (ie. when cataphoric reference is involved) (sentence 4).

- (3) Shto-to v etom rode
Something of this sort (ie "the")

- (4) Ta dama, kotoraya sidit v kresle - maya zheni.
That woman who is sitting in (the) chair - my wife (ie "the")

3.4.4 Arabic

Arabic differs considerably from English in its Article system. It has one article form with which a noun can be marked. The contrast is made between the use of this form and zero marking. Beeston (1970) identifies two functions of the Arabic article: "the particularising one, and the generalising one". The contrast in Arabic between the article and zero marking is one of "unambiguousness versus ambiguousness". According to his analysis "definition for Arabic is the quality of lacking ambiguousness, whether that be occasioned by the inherent nature of the entity term or by the use of the article in either of its functional values" (1970:37). This means in effect that the Arabic equivalent of the English definite article is used more widely than in English. It is used appropriately in Arabic in cases where English requires either an indefinite article or zero article followed by a plural (sentence 1).

- (1) Al-ghar maliya daiman bial-ishaāt(i)
 the-village full always of-the-rumours
 (ie. a village is always full of rumours)

The definite article in Arabic serves the same anaphoric function as in English, since something which has been previously mentioned in the text is unambiguous in its reference. (sentence 2).

- (2) 'ana raiytu waladan al-waladu
 I saw (a) boy-object the-boy

3.4.5 Vietnamese

Vietnamese has no direct correlate of the English article system. It does however possess a highly developed system of classifiers which precede the noun in the noun phrase. According to Vuong Gia Thuy (1970) they are used "to identify individual members of general categories of things or concepts" (1970:96). If the noun is not preceded by a classifier it conveys "a general reference in terms of category and quantity". As such classifiers clearly play an important role in shifting the reference to "individual units of the general category mentioned". Classified nouns can be either singular or plural. The distinction is primarily one between general and specific reference (sentences 1-3). Among the most common classifiers are "chiếc", "tờ", "cây", "con" and "cái". "Cái" is a general classifier used to refer to inanimate objects of no particular specification (eg. "cái bàn" (a) table) "con" is used to refer to (living) animals (eg. "con chó" (a) dog).

- (1) Tôi mất chiếc nhẫn
 I lost (a) ring
- (2) Tôi mất vài chiếc nhẫn
 I lost some rings
- (3) Tôi có thể mua nhẫn ở đâu? (without classifier)
 I can buy rings where

In cases where the indefinite article is used in the sense of "a certain X" this can only be rendered in Vietnamese by the use of the numeral "một" (one). It is not obligatory and this form is only used when special emphasis is required (sentence 4). Likewise there is no equivalent to the English definite article, but where special emphasis is required the demonstratives "này" ("this") and "đó" ("that"), which occupy the final position in the noun phrase can be used (sentence 5).

- (4) Cô ấy là một giáo sư
She be one teacher

- (5) Tôi chưa mua cái đồng-hồ đó
I have not bought watch that

According to Duong Thanh Binh (1971), in certain restricted cases an identifier "cái" may precede the noun and act in a similar way to the English definite article in endophoric reference. This form is used when the demonstrative post-determiners cannot be used (eg when the nucleus noun is modified by a prepositional phrase, a possessive or a clause) (sentence 6).

- (6) Cái Ông Ba ở phố Gia Long
the Mr Ba in street Gia Long

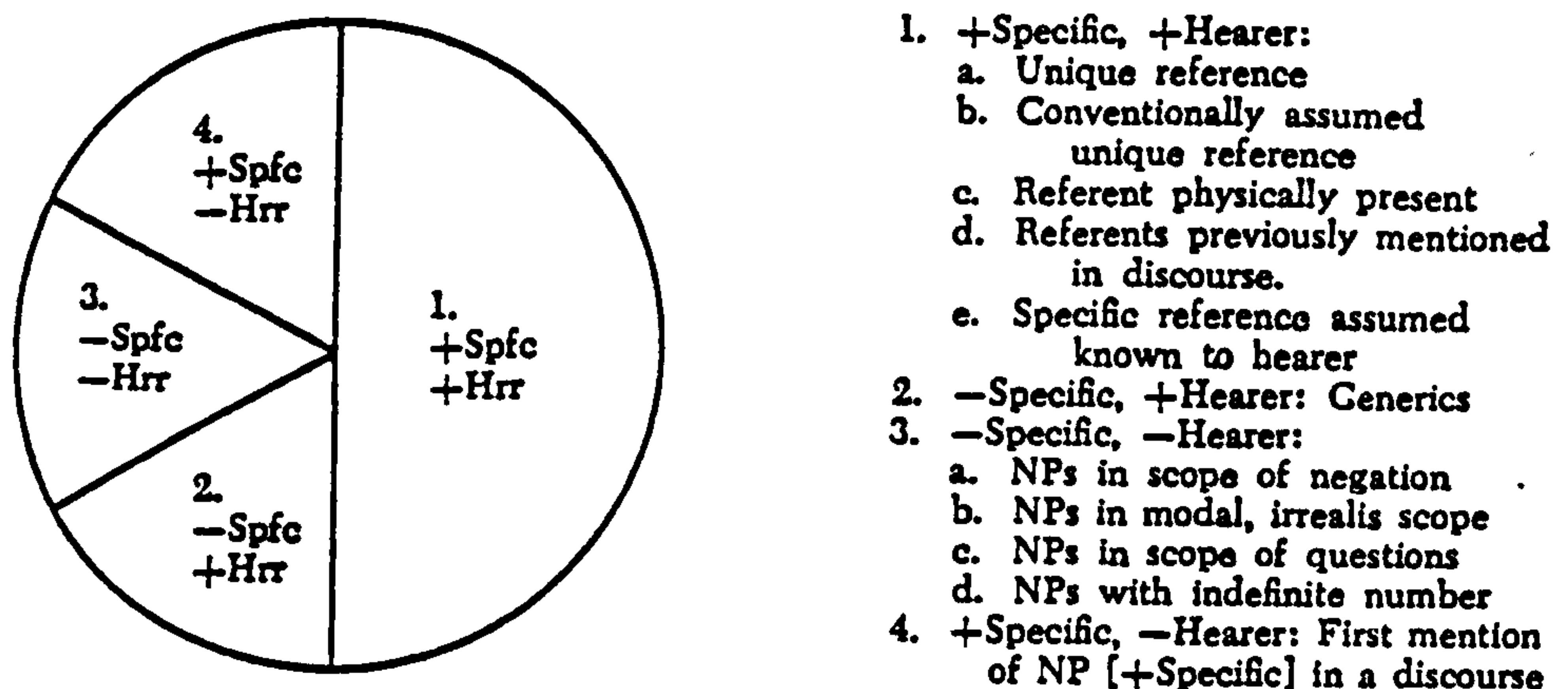
3.4.6 Second Language Acquisition Studies of Articles

Few detailed SLA studies have investigated the acquisition of the English Articles, although the class of Article (including both a and the) has been included in many morpheme order studies (eg. Dulay and Burt 1973 and 1974a, Bailey, Madden and Krashen 1974).

The only detailed published study of the use and acquisition of articles by a learner of English is that of Huebner (1979). He studied the longitudinal development in a single Hmong speaking learner of English in Hawaii over the first year after his arrival from Laos.

He analyses the semantic field for noun phrase reference in terms of the binary features [$\pm$ specific referent] and [$\pm$ Assumed hearer's knowledge] and classifies the different article functions accordingly. The semantic wheel he produces and the referents included in each type are shown in Figure 3.1.

Fig.3.1: Semantic Wheel for Noun Phrase Reference
(from Huebner 1979:25)



The anaphoric use of the definite article included in this study fits into Huebner's segment 1(d) and the use of the indefinite article when the NP is first introduced into the discourse into segment 4. Huebner's results for his subject show that at all four times the percentage of the correct use of the definite article in endophoric and exophoric reference (segment 1) is consistently and considerably greater than the percentage of the correct use of the first mention indefinite article. This finding agrees with those of Andersen (1978) and Yamada and Matsuura (1982).

Although Huebner does not study the environmental constraint on his learner's use of either article in detail he does remark that at Time 1 the overwhelming majority of the correctly marked definite articles are in non-subject position (90%). 77% of the obligatory non-subject contexts for the definite article are correct, whereas only 19% of those contexts in subject position have the definite article correctly

realised. Huebner relates this environmental constraint to the subject's employing the topic-prominent structure of his native language in his formation of English sentences. In topic-prominent languages the topic, which coincides with the English subject in terms of position, is by definition definite (Li and Thompson 1976 and Chafe 1976).

Other studies of the use of the article system by second language learners which have focussed to a larger extent on the influence of the environment of the noun to which the determiner is attached in the sentence, have likewise concentrated on the definite article in its various endophoric and exophoric functions. Tawari (1976) studied the use of definite articles by Hindi speakers in written compositions. His results suggest that the learners favour the non-subject position over the subject position for the correct realisation of the definite article. As such his findings agree with those reported by Huebner.

In contrast several other studies have pointed to the subject position (Subj) being more favoured than non-subject (non-subj). Wilkinson (1982) studied both exophoric and endophoric uses of the definite article by Slovak speaking learners of English. Overall he reports an order in which Subj is the most favoured with the two non-subject positions, object (Obj) and prepositional phrase (PP), following in that order. However in the subsection of his analysis which deals with the anaphoric definite article the best order appears to be Obj > Subj > PP. In overall percentage terms there does not appear to be clear differentiation in the use of the anaphoric definite article dependent on the environment of the NP. All three groups of Thai learners, studied by Leisching (1982) show the same order of environmental constraint on the use of the definite article in which Subj is clearly the most favoured environment (100% in all groups) followed by PP followed by Obj (which are quite close together (each about 70%)).

Other studies have produced even less conclusive results. Al-Kary (1977) studied the effect of NP environment on the correct use of the

definite article in Arabic speaking learners of English and reports finding no ordering of the learners' variable production in terms of the position of the NP. Nidue (1979) reports different orders for the same three environments in his two groups of Papuan and New Guinean learners of English. His Form 3 group favour non-Subj, whilst his Form 4 group favour Subj.

The results of the studies of the effect of the position of the NP on the learners realisation of the definite article produce conflicting and by no means conclusive results. These studies have tended to concentrate on relatively small numbers of subjects and have often only contained relatively few contexts for the use of the definite article in the three environments. The question of whether the learners' use of the definite article is constrained by the position of the NP, therefore remains an open one, which deserves further investigation.

3.4.7 Articles in the Present Study

From the analysis two aspects of the use of articles appear to be worthy of investigation. Firstly, the relative correct realisation of each of the articles, definite and indefinite, in relation to each other warrants investigation. Second, the effect of the position of the noun to which the article is attached on the correct realisation of that article needs to be further investigated. For each of the articles the three positions generally included in the previous SLA studies (Subj, Obj and PP) have been singled out for inclusion.

Consequently two specific hypotheses can be formulated, each addressing one of these aspects.

Specific Hypothesis 6 - Article Type

H_0 : Variability in the realisation of Article is not constrained by which of the two types of article, definite or indefinite, is required.

H_1 : Variability in the realisation of Article is constrained by which of the two types of article is required.

Specific Hypothesis 7 - Environment of NP

H_0 : Variability in the learners' realisation of each article type is not constrained by which of the three positions, Subj, Obj or PP, is the position of the noun to which the article is attached.

H_1 : Variability in the learners' realisation of each article is constrained by which of these three positions is the one of the noun to which it is attached.

CHAPTER FOUR

Preliminary Study and Design of the Experiment

4.1 The Preliminary Study

4.1.1 Aims and Objectives

The structural areas outlined in Chapter 3 were those chosen for study. Evidence from previously conducted SLA studies of the acquisition of features within these areas led to the specific hypotheses which have been formulated regarding the patterns underlying the learners' variable realisation of these features. In this context preliminary study was undertaken at the end of 1979 with the primary purpose of choosing suitable tasks to elicit data concerning learners' performance in these four structural areas along the parameters outlined.

Several recent SLA studies (Schachter 1974, Hart and Schachter 1976, Kleinmann 1978) have pointed to a tendency in learners in their spontaneous production to avoid the use of structures which they do not feel confident in using, particularly if the realisation of the structure in the TL differs considerably from that in their NL. This phenomenon was discussed in section 2.1. In section 3.1.6 it was noted that Platt's (1979) implicational study of the realisation of copula in Singapore English was hampered by the marked difference in the number of contexts created in some environments (notably, __PP) as compared to others (eg. __NP and __ADJ). Similar problems in determining implicational patterns because of a lack of sufficient obligatory contexts were noted in the studies of the use of the definite article using spontaneous, uncontrolled data.

In this investigation, if we are to be able to obtain sufficient data for individual subjects to determine the existence of patterns in their realisation of a feature in different environments, or of different forms within the same structural area it is obviously necessary to ensure that sufficient data for each of these environments and forms

is collected for each individual. This requirement suggests the need to employ structured elicitation procedures, rather than relying on uncontrolled, spontaneous data. In any study of a learner's realisation of particular aspects of the language being learnt in his own "inter-language", which reflects his "transitional competence" at that particular point in the learning process there is a need to elicit language from the learner which reflects the structure of his internal grammar at that time and which is not merely a reflection of the formal learning of rules which he may have achieved. The work of Krashen and Bialystok on the existence of two discrete knowledge systems in the cognitively mature learner (discussed in section 2.4) has drawn our attention to the fact that the learner performs differently on different tasks. There is considerable current debate about how the facets of this "variable competence" relate to each other (Tarone 1983, Corder personal communication). One recent study (Al-Jumaily 1982) suggests that while different elicitation tasks may produce different levels of performance in the learner, they do not alter the patterns which underlie that performance in terms of environmental or other constraints. In making decisions as to the type of task to be used there is an unavoidable tension between the desire to elicit information about a learner's grammar at as close a level as possible to the level of his spontaneous unattended speech and the need to ensure sufficient occurrences of the feature being studied in the environments which have been designated for study. Any solution clearly necessitates a compromise between these two factors. In coming to this compromise it is obviously important to choose a task which fulfills the requirement for obligatory contexts whilst obtaining evidence of the second language grammar of the learner which is as close to his spontaneous level as possible.

The preliminary study was undertaken in this context to experiment with possible elicitation procedures and additionally, to test the choice of vocabulary and items in the procedure which is decided on. In addition to the two requirements outlined above a number of others were isolated and had to be taken into consideration when designing possible tasks. The task:

- (1) needs to discriminate between learners at different levels in their learning
- (2) needs to tap the learners' second language productive ability
- (3) must have the same format for learners from different NL groups (ie. translation is not suitable)
- (4) must be capable of being administered with minimal equipment and facilities
- (5) must be acceptable to the learners, especially since the same format is to be used on four occasions
- (6) needs to be acceptable to the teachers and administrators in the participating schools in terms of the time taken and level of disruption to normal school classes.

With these requirements in mind several test formats were piloted with a relatively small number of subjects. The first consideration was whether the same task could be used for all the structural areas. A task using isolated sentences was acceptable for the elicitation of the learners' use of copula, negation and predicate complementation, but given the referential nature of the use of the "first mention" indefinite and anaphoric definite articles a task involving connected discourse was necessary for this fourth structural area. Four elicitation techniques were experimented with in the course of the preliminary study; a multiple choice task and a sentence correction task for the areas where isolated sentences could be used, a modified cloze task for the articles, and elicited imitation for all four areas, since this procedure could be used for either isolated or connected sentences. In the proceeding sections each task will be briefly outlined and the results will be briefly recounted.

4.1.2 Multiple Choice Task

The Task

A task containing 78 multiple choice items (24 for copula, 24 for complementation and 30 for negation) was composed. Sentences containing simple, frequently used vocabulary (First Things First, by L.G. Alexander, a textbook commonly used by the teachers, was used as a guide) were devised in which the element under consideration was deleted and replaced by an underlined blank. Below the blank three or four alternatives for the blank were provided, one of which was the correct form, the other alternatives being non-target forms commonly used by learners. These non-target forms were determined from a sample of written work collected from the teachers and from evidence from previous SLA studies.

eg. (1) I hungry. It's nearly lunchtime.

- () can
- () is
- () Ø
- () am

(7) Kim wants

- () her friends visit
- () her friends visiting
- () her friends to visit
- () that her friends visit

The subjects were asked to work through the sentences quickly, placing a tick beside the alternative which they considered to be correct.

The Subjects

Fourteen subjects from two Melbourne High schools completed the task. Of these, four were Russian native speakers, four Vietnamese, four Chinese and two Hungarian. All conformed to the criteria intended for the main study in terms of the non-linguistic variables, AOA (10.5 to 17.5 years) and LOR (≤ 2 years).

The Results

As expected variability was evident in the learners' realisation of features in these three structural areas dependent on the constraints which were intended for study. Table 4.1 shows the means for the group for each of the environments for copula and predicate complementation.

Table 4.1: Means for Subjects in Multiple Choice Task for Copula and Complementation

COPULA				COMPLEMENTATION		
NP	ADJ	PP	PART	THAT	TO	ING
$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$	$\bar{x}$
94%	92%	84%	53%	60%	90%	25%

The results of the analysis of the multiple choice task revealed these most important points:

- (1) Variability was evident on both group and individual level in terms of the environments and types hypothesised.
- (2) In terms of the means the scoring was very high for most of the environments and forms with the exception of the two complement types, THAT and ING, and __PART and HAVE
- (3) This high level of performance indicated that even comparatively newly-arrived learners (< 12 months) scored very well.
- (4) The task appeared to tap a fairly high level of the learners' competence.
- (5) The presence of the correct form in addition to the others seemed to give the learners special assistance and probably also led to their receptive rather than productive knowledge being tapped.

As a result of this analysis a second task was devised which was expected to make more demands on the learners' productive knowledge. This task was sentence correction.

4.1.3 Sentence Correction Task

The Task

66 sentences (20 for copula, 14 for complementation, 32 for negation) were composed for the sentence correction task. Sentence correction is an established elicitation technique, which has been used successfully as a means of getting learners or speakers to reveal what is acceptable in their idiolects Labov et al. (1975) successfully used this technique to obtain information about the grammar of Black English vernacular speakers.

Each sentence in the task used a non-target form of the structure under consideration. The choice of non-target forms was dictated by the same criteria outlined for the choice in the multiple choice task. In addition, in composing the non-target sentences it was essential that the learner not be given any indication of what the correct form should be.

eg. It wet today

Me no at school today

The learner was required to read the sentence and if he considered it not to be good English to correct it. Presumably if he marks a sentence as correct it means that in his grammar this sentence is acceptable. If he corrects it, the correction can be assessed. His correction may still be incorrect in comparison with the target or it may, alternatively, be correct. Both these responses give an indication of the learners' internal grammar.

The Subjects

20 secondary school ESL learners from one Melbourne secondary school undertook the task. Eight were Vietnamese native speakers, nine Chinese, two Hungarian and one Spanish. Of the twenty, ten had a couple of weeks earlier completed the multiple choice task described above. This meant that comparison could be made between their performance on the two tasks.

The Results

The learners responded well to the task. They could easily identify with what they were required to do, because although it was quite different from their normal school exercises, it was what the teachers do to their own work all the time.

When their responses were analysed the following results were obtained:

- (1) the task discriminated between individuals
- (2) variability was evident on both the group and individual level according to the environments and forms which were hypothesised.
- (3) scores for the ten who had also completed the multiple choice task indicated that learners' scores on the correction task were lower than those for the multiple choice task.

To demonstrate this third point the mean scores for the Copula in the four following linguistic environments can be used. Table 4.2 gives the means for each of the environments and overall on each task for the ten subjects who completed both.

This comparison demonstrates that the ordering of environments in terms of the group means is the same on the two tasks, but the level of scores is considerably lower on the correction task. There was

Table 4.2: Mean Scores for Ten subjects for Realisation of Copula when followed by each of Four Environments

Environment	Task Multiple Choice	Sentence Correction
NP	92%	68%
ADJ	90%	61%
PP	72%	47%
PART	52%	31%
	—	—
Total	77%	52%

greater variability in the learners' realisations on the correction task, and it appears to discriminate more between the learners than the multiple choice task. It appears that the responses that the learners produced were closer to their spontaneous production, than those on the multiple choice task.

Some of the responses in correcting the sentences highlighted the need in using this type of task to carefully plan the form of the sentences to be corrected. This point is discussed further in the next section when the tasks in the main study are outlined.

4.1.4 Elicited Imitation Task

The Task

The third task which was experimented with was Elicited Imitation. This technique, which has generally been used with young children in both first and second language acquisition (Slobin and Welsh 1973, Naiman 1974) enables the control of the number of contexts in which a form is required and the environments created for that form, whilst tapping a level of productive ability which is a great deal closer to that of spontaneous speech than most other tasks. The mechanisms underlying elicited imitation rely on the fact that, apparently, if an individual

is asked to imitate accurately a sentence, the length of which means that it cannot simply be retained in short term memory, then he must decode it and in reproducing it encode it using his own rule system (i.e. internal grammar).

The principles behind elicited imitation tasks are comparatively straightforward. The execution is more difficult. In composing sentences to be imitated it is necessary to use utterances which are too long to be retained in short term memory (STM). Since learners may vary in their STM span sets of sentences of different lengths need to be composed. When the task is implemented in a one-to-one oral situation the administrator has to first determine by presenting sentences of different syllable lengths to be imitated, when the learner is having to decode and encode the imitated sentence. In practice this often proved rather difficult as the discussion below emphasises.

Sentences of lengths of 9, 12 and 15 syllables were composed. For the three structural areas where isolated sentences were able to be used, the sentences were unrelated to each other. For articles, sentences of the lengths stipulated were composed which formed a piece of connected discourse.

The Subjects

Six adolescent ESL learners and two adolescent native speakers were interviewed and asked to repeat each sentence uttered by the experimenter as accurately as possible.

The Results

The following points were noted in assessing the results of the use of this elicitation procedure:

- (1) in all cases, even with quite recently arrived learners, it was necessary to present very long sentences to avoid repetition from short term memory. For many of the

subjects even the 15 syllable sentences were able to be repeated in this way. These cognitively developed older learners appear to have a longer STM span than younger children. This seems to be the result of their greater ability to chunk information, which enables a greater amount to be retained in STM. In addition, it was difficult to determine the precise point at which the learner was no longer using STM and having to decode and encode.

- (2) the task seemed to cause considerable distress in the subjects. Being older and thus more self-conscious they were very aware of the fact that they could not remember the sentence to be imitated verbatim.
- (3) the teachers were unhappy about the task for two reasons. The first was that it caused considerable disruption as individual subjects were withdrawn to be tested one at a time. Their second objection was the effect the task had on the learners, who returned to class demoralised and obviously quite distressed by their ordeal.

From this third point it is clear that for learners who are mostly refugees, many of whom have undergone traumatic experiences and are still suffering from emotional disturbance and lack of confidence, this type of one-to-one task is not acceptable. Because of both the practical difficulties in using elicited imitation with cognitively and emotionally mature learners and the unacceptability of the technique to both subjects and teachers, the possibility of using it was excluded.

4.1.5 Modified Cloze Task

The Task

A task was required to elicit evidence of the use of the definite and indefinite articles in the three NP positions which were hypothesised to constrain their variable realisation. As previously discussed this

necessitated the use of the articles in a text.

Cloze testing (Oller 1972, Alderson 1978) is a well-established form of integrative testing in which words are excluded from a passage. The learner is then required to supply the appropriate words in the designated contexts. A form of modified cloze task was experimented with in which spaces were left in a passage and the learners were required to insert either "the, a or nothing" in each space as they considered necessary to make the passage good English:

eg. The Chen family live in flat. They like it there.
 flat is big. It has living room, ... two bedrooms,
 kitchen and bathroom. The Chens have only been
 living in flat for a week.

Spaces were left in all three positions in which articles are required for the purpose of the study (3 for each) as well as in other places where either cataphoric and exophoric definite articles, or no article were required.

The Subjects

The same 14 subjects who did the multiple choice task did this modified cloze task.

The Results

The following results were noted:

- (1) the subjects understood what was required and carried out the task without any problems.
- (2) analysis of their responses showed that as expected they often left gaps where articles were in fact required (a response expected from learners using a simpler grammar than that of the target language), as well as sometimes choosing the incorrect one of the two article types.

- (3) the task discriminated between the subjects in their realisation of articles
- (4) variability constrained by the position of the NP to which the article was to be attached was noted for all but three of the subjects. These three obtained perfect scores for each article type in each environment
- (5) overall, the mean score for definite was greater than that for indefinite. The mean scores obtained for each type in each environment are given in Table 4.3.

Table 4.3: Mean Scores for Definite and Indefinite Articles, Overall and in 3 Positions

Environment	Definite	Indefinite
Subject	60%	72%
Object	74%	81%
PP	81%	38%
TOTAL	72%	64%

4.1.6 Conclusions

As a result of the preliminary study two tasks were chosen to be used in the main study; sentence correction for Copula, Negation and Predicate Complementation and modified cloze for Articles. In addition to allowing the choice of the most suitable tasks for fulfilling the requirements outlined, the preliminary study enabled the assessment of the approximate level of SLA of newly-arrived ESL learners, indicated suitable vocabulary and enabled the eradication of items and expressions which seemed to be responded to uncharacteristically because they had been learnt as holophrases. In addition valuable information was obtained concerning the number of items which were required in each environment or for each form. These findings were incorporated into the design of the items for the main study and will be discussed in the following sections.

4.2 The Major Study

4.2.1 General Design

The experimentation with various elicitation techniques, presented in Section 4.1 led to the choice of two tasks to be included in the main study. The tasks chosen were sentence correction for copula, predicate complementation and negation and a modified doze task for articles. Both these tasks were found to discriminate between learners at different levels of acquisition and to show variability in the learners' realisation of forms dependent upon the environmental constraints selected for study. In addition, both tasks proved to be acceptable to teachers and school administrators in that they enabled minimum disruption to be caused to classes and did not cause an unacceptable level of anxiety in their students. From the experimenter's point of view both tasks were satisfactory in that they forced the learners to provide evidence of their internal grammars of English in the environments designated for study.

Results from the preliminary study concerning the level of scores of subjects in relation to LOR led to a decision to include, if possible, more than 50% of subjects in each group with LOR of less than 12 months. The preliminary results indicated, as did Hylténstam's results (1977, 1978), that an enormous amount of learning takes place rapidly in the first few months after arrival.

As a result of the analysis of responses to items in the preliminary study some revision was made with respect to the choice of vocabulary. In the correction task observation of the learners' responses led to the definition of principles guiding the choice of incorrect forms. This aspect will be discussed in detail below, in section 4.2.3.2.

4.2.2 The Subjects

4.2.2.1 General Characteristics

Seventy seven adolescent immigrants participated in the major study. They were drawn from four native language groups: Spanish, Russian, Arabic and Vietnamese. The intention was to have a similar number of subjects in each group, each of approximately 20. The final number in each group was dictated by the number of subjects available conforming to the control and independent variable criteria.

The ESL learners who participated in the study were drawn from 10 Melbourne state government secondary schools. Specialised ESL instruction is widely provided in Victorian secondary schools, particularly those, as in this study, with a relatively large number of immigrant children. All the subjects in the study had undertaken some ESL instruction. The organisation, method and intensity of this instruction varies considerably from school to school, however all programmes tend to focus on using the language and developing vocabulary and reading and writing skills and contain very little formal grammar teaching. Given this fact and the questionable benefit of formal grammar teaching, particularly in non-adult learners, the effect of formal explicit linguistic knowledge, gained as a result of ESL teaching programmes was considered to have very little influence on subjects' second language production. The primary importance of ESL programmes for mixed language groups is in providing the simplified rhetoric and contextualised use of language, which many now agree is essential to the pre-intermediate learner (Corder 1980, Krashen 1980). Within the school environment, outside the ESL classroom exposure to English is considerable, particularly during lessons. Playground exposure and use of English varies according to the concentration of speakers of a single migrant language in the school. Borland (1981) has highlighted the lack of opportunity and need to use English among a large group of learners sharing a common first language in one school. Outside school the majority of subjects have relatively little chance to use English communicatively, although the language is all around them on the street

and in the media. As confidence and knowledge grow use of English outside school increases concomitantly.

4.2.2.2 Independent and Control Variables

A number of controls were placed on the selection of subjects for the language groups. The first was that subjects have no or at most minimal knowledge of languages other than their mother tongue and English. This was considered necessary to minimise the facilitation which studies have shown may take place from another second language if it is perceived as being more similar to English than the learner's NL. Some of the Lebanese, Vietnamese and older Russian children had a smattering of French because of colonial background and the educational system in their native countries. In no cases was this considered to be sufficient to enable facilitation. The second requirement was that the subjects have no or at most a minimal knowledge of English prior to arrival in Australia. The two groups who had generally spent time in refugee camps (Vietnamese and Russian) had the opportunity to attend optional English classes, but the impact of these was considered to be minimal.

The male/female distinction was not considered to be particularly important, but was expected, given population distribution, to be approximately equal. In the event the Spanish group had a slight female bias. It was not possible in the study to control for socio-economic or motivational and affective variables. In the course of the study it became clear that there were differences in the groups in terms of these variables, which may have contributed to differences in the extent of acquisition on average within each group. Since there is no evidence to suggest that such differences influence the sequence of development, they were not considered to interfere with the aims of the investigation.

The two variables for which data was collected and which were strictly controlled were Age on Arrival (AOA) and Length of Residence (LOR). LOR at the commencement of the study (Time 1) had to fall in the range of

1 month to 2½ years with the majority of subjects in each group having a LOR of less than 12 months. All subjects had to have been at least 10½ years of age on arrival in Australia. The average AOA and LOR for each group are given in Table 4.4.

An important aspect of the study was the combination of cross-sectional and longitudinal design. The tasks in the study were administered to each group on four separate occasions. Given the mobility of newly-arrived immigrant families, it was inevitable that in the course of the four data collections at two monthly intervals a small number of subjects in each group would drop out. Full detail of the missing subjects at each time are given in Appendix B, Table 1. The principle reason for these absences were children either leaving school completely or moving to other schools without giving notification of where they were moving. As a result of these absences, in each group there was a core of subjects who completed the tasks on all four times and another smaller group who were absent for any number from 1 to 3 of the times. Henceforth the subjects in each group who participated in all four test times will be called the core group. In studying performance longitudinally only these groups will be considered. In other analyses where it is appropriate data from non-core subjects will be included (eg. in the cross-sectional study of linguistic variability). Characteristics of the full groups and their respective cores are given in Table 4.4.

4.2.2.3 The Four Language Groups

4.2.2.3.1 Spanish

The 21 subjects in this group are all South American Spanish speakers. All, but one, were concentrated in two schools, both of which had high concentrations of non-English native speakers. Because of changes in immigration patterns great difficulty was experienced in finding subjects in the LOR 1-6 months category.

South American immigrants generally do not receive official refugee status. They tend to be from lower socio-economic classes and come to Australia chiefly for economic reasons. From the motivational point of view this group is probably the most disadvantaged. The large number of dropouts in the course of the study reflects their lower motivation and educational aspirations. All five subjects who dropped out did so because they left school to get unskilled jobs. Of these, 3 had quite low overall performance.

4.2.2.3.2 Russian

The 22 subjects in this group are all Soviet Jewish immigrants. Although they do not qualify for formal refugee status, they are political refugees and have left their homeland chiefly for political and religious reasons. Prior to arrival in Australia most had spent a number of months in refugee hostels in Europe run by international Jewish Welfare agencies. In general, but not exclusively, the children in this group come from professional and semi-professional families. Their families have exceedingly high expectations and aspirations for their children, who are consequently under considerable pressure to succeed. This group was particularly concentrated geographically. All attended the same school. The concentration of Russian speakers in the school (almost 10% of the school population) has led to a particular type of problem: a lessening of the communicative need to learn and use English. Some of the subjects had also been observed to be experiencing problems adapting to the vastly different Australian school system (Borland 1981). Of the four subjects who did not complete all four test times, 2 left school completely and the other two moved to other schools following discipline problems.

Because of immigration patterns it proved difficult to find subjects in the 12-30 month LOR range for this group.

4.2.2.3.3 Arabic

Suitable subjects in this language group proved exceedingly difficult to find. The pattern of migration to Australia at the time of the study

meant that there was considerable difficulty finding a sufficiently large number of speakers of a non-Indo-European language which, in terms of language distance, could be considered intermediate between Russian and Vietnamese. The Victorian Child Migrant Education Services advised that Arabic-speaking immigrants would be the best choice, believing there to be a considerable concentration of this language group in certain areas of the city. In actuality it proved exceedingly difficult to find Arabic-speaking children who conformed to the AOA and LOR criteria. There are many children of Lebanese origin in Melbourne secondary schools, but in 1980 most had been in Australia at least 4 years. No Arabic-speaking subjects in the 1-6 months LOR category were able to be found.

After testing had commenced further complications relating to the group emerged. It proved to be the least homogeneous of the four groups, with vast differences in aptitude, motivation, aspiration and socio-economic background among the small number of subjects making up the group. Four of the subjects in the group (6, 7, 8, 9) were reported by their teachers to be exceedingly highly motivated, intelligent and hard-working. The presence of such an important minority in a statistically small sample may be expected to lead to atypical results for the group, which may not be representative of Arabic-speaking adolescent immigrants, especially in terms of their rate of acquisition. In addition, because of the lesser concentration of newly-arrived Arabic speakers in the schools it was inevitable that they had a greater communicative need to learn English. Unfortunately in the course of the study two of the longer resident, less highly motivated subjects left school, thus making the sample even more biased.

4.2.2.3.4 Vietnamese

Because of the pattern of immigration at the time of the study, this group was the easiest to find and select. In 1978 and 1979 large numbers of South-East Asian refugees were arriving in Australia. In comparison to others these immigrants are considered to be privileged, since by obtaining formal refugee status they are entitled to considerable government help in settling, in learning English and in obtaining employment.

Table 4.4: Characteristics of each Native Language Group

	FULL GROUP				CORE GROUP					
	Number in Group		Independent Variables		Number in Group		Independent Variables			
	M	F	TOTAL	AOA (yrs) $\bar{x}$	LOR (mnths) $\bar{x}$	M	F	TOTAL	AOA (yrs) $\bar{x}$	LOR (mnths) $\bar{x}$
SPANISH	8	13	21	14.1	11.9	6	10	16	13.4	12.6
RUSSIAN	12	10	22	13.9	6.4	9	9	18	13.9	6.4
ARABIC	5	4	9	13.4	14.4	4	3	7	13.4	13.1
VIETNAMESE	13	12	25	13.6	8.0	12	10	22	13.8	6.8

All 25 subjects in this group were native speakers of Vietnamese. Their chief reason for leaving Vietnam was generally political, but was often also economic. Like the Russian group this group contained a large proportion of children from professional or semi-professional families. Additionally, in Vietnamese society and culture, regardless of class, education is highly prized and the value of education is stressed to children. Given this background there is little surprise that the subjects in this group seemed to be generally highly motivated, extremely conscientious and hard-working. Nevertheless, in the course of the study some of the subjects were observed to be having considerable emotional and psychological difficulties fitting into their schools. This particularly seemed to be the case when they were moved from a special program in a school with a large number of SE Asian children to new schools where they were not so protected. Such moves coincide with the move from Migrant Hostel to a flat or house in the community, which is a traumatic time for the family in any case.

Table 4.4 summarises the characteristics of each full and core language group. Full details of the subjects can be found in Appendix B, Table 1.

4.2.3 The Tasks

4.2.3.1 Introduction

Two tasks were used in the major study, one, sentence correction, was to elicit responses for the three areas in which isolated sentences could be used (i.e. copula, predicate complementation and negation), the other, modified cloze, was used to elicit evidence of the learners' use of articles in connected discourse. In composing both tasks simple vocabulary was chosen which was familiar to learners who had been learning as short a time as one or two months. In the following sections each task will be discussed in detail.

4.2.3.2 Sentence Correction Task

The sentence correction task contained 186 unconnected sentences containing errors in the three structural areas, copula, predicate

complementation and negation, as well as other grammatical errors. The sentences with errors from the three areas were randomly mixed and the task divided into two parts, A and B. Part A contained 87 sentences and Part B, 99.¹

In deciding on the incorrect forms to be included for correction two general principles were used to guide the choice. These two principles state that incorrect forms:

- (1) should represent common erroneous realisations in the language of second language learners. Such forms to be determined from samples of learners' language, reports of learners' language in previous SLA studies and the erroneous forms used in the preliminary study.
- (2) should, as far as possible, not give assistance to the learner in determining the correct form. For example, although the use of unanalysed "don't" is exceedingly common in learners' language, using this form constantly in negative sentences would possibly lead to a falsely high incidence of analysed "DO + neg" since the presence of so many forms of "don't" could act as a trigger to the learner for the rules for forming negative with DO + neg.

The correction task was administered on four separate occasions at approximately 2-monthly intervals (the tasks are in Appendix A.1). Although the possibility of either individual items being learnt and remembered across this interval or of there being a learning effect with such a mixture of sentence types and errors was considered remote, changes were made in the vocabulary (eg. names, nouns, verb) from time to time. The same basic format and sentence types were maintained to enable longitudinal comparison of the production of the forms in the specified environments.

¹ At Time 1 one extra sentence was included in Part B.

Items for Each Structure

4.2.3.2.1 Copula

Of the 186 sentences in the correction task 60 necessitated the use of the copula, fifteen obligatory contexts for each of the four environments outlined in Chapter 3. Table 4.5 shows in diagrammatic form the division of the 60 sentences. Appendix A.3 gives which sentences in the task necessitated the use of a copula form.

In all the sentences to be corrected for copula, the copula was absent. This choice of incorrect form conformed to both general principles stated in section 4.2.3.2. The omission of the copula form does not in any way direct the learner's attention to that aspect of syntax or provide any indication of the correct form.

To avoid the possibility of the form of the subject NP, either full or pronominalized N, affecting the variability in the learners' realisation of the copula the use of full and pronouns forms was evenly distributed among the 60 sentences.

4.2.3.2.2 Predicate Complementation

Of the 186 sentences in the correction task 27 required the use of one of the three means of predicate complementation, which were discussed in Chapter 3. For each type of complementation there were nine contexts. The division of sentences is shown diagrammatically in Table 4.6. Appendix A.3 gives the sentences in the task which necessitated the use of predicate complementation.

As discussed in Chapter 3 it is the verb in the main clause which determines which of the 3 types of predicate complementation is required. In the case of some verbs more than one type of complementation is possible, although one is generally more common than the other/s. In composing the sentences it was necessary to choose simple, frequent vocabulary, especially words which occur frequently in the classroom and

Table 4.5: Division of 60 Sentences in the Correction Task for Copula

<u>ENVIRONMENT</u>	<u>TENSE</u>	<u>NUMBER</u>	<u>PERSON</u>	<u>FORM</u>	<u>NO. OF ITEMS</u>
_ADJ	present	sing.	1st	am	3
		plural	3rd	is	3
	past	sing.		are	3
		plural		was	3
		sing.		were	3
		plural			
_NP	present	sing.	1st	am	3
		plural	3rd	is	3
	past	sing.		are	3
		plural		was	3
		sing.		were	3
		plural			
_PP	present	sing.	1st	am	3
		plural	3rd	is	3
	past	sing.		are	3
		plural		was	3
		sing.		were	3
		plural			
_PART	present	sing.	1st	am	3
		plural	3rd	is	3
	past	sing.		are	3
		plural		was	3
		sing.		were	3
		plural			

Table 4.6: Predicate Complementation Sentences in the Correction Task

<u>COMPLEMENTISER</u>	<u>VP FORM</u>	<u>SI TYPE</u>	<u>NO OF SENTENCES</u>	<u>TOTAL</u>
THAT	V	EQUI	(3)	9
		NON-EQUI	(3)	
		PREDICATIVE ADJECTIVE	(3)	
TO	V	EQUI	(3)	9
		NON-EQUI	(3)	
		PREDICATIVE ADJECTIVE	(3)	
ING	V	EQUI	(3)	9
		NON-EQUI	(3)	
		PREDICATIVE ADJECTIVE	(3)	

the school environment. Table 4.7 gives the main clause verbs and predicative adjectives used in the sentences.

In the sentences to be corrected all complementisers were omitted. For the TO and ING types this meant that the sentence had an uninflected verb form (i.e. without either the infinitive 'to' or the 'ing' suffix).

eg. Paul wants buy a bicycle. (A49, Time 1)

Jenny enjoys Karen visit her. (B67, Time 3)

This form for the incorrect sentences clearly conforms to both of the general principles stated in section 4.2.3.2.

Table 4.7: Main Clause Verbs and Predicative Adjectives used in the Complementation Sentences

VP FORM	COMPLEMENTISER		
	THAT	TO	ING
Verb	believe	want	give up
	think	ask	enjoy
	say	decide	like
	hope	expect	hate
	know	tell	stop
PREDICATIVE ADJECTIVE	sorry	angry	keen on
	unhappy	glad	sure of
	sure	happy	interested in

Suitable sentences for THAT proved much more difficult. The insertion of the 'that' complementiser was not considered to be necessary, let alone obligatory, since in colloquial language it is generally not used. However, providing the uninflected or incorrect verb form gives some clue to what is necessary and the responses tend to be more an indication of knowledge of verb morphology than of the appropriate means of predicate complementation. For the THAT type then the most satisfactory incorrect form was the use of the wrong means of complementation, in all cases the TO type. This ensured that the learner could only correct to the appropriate complement form if he genuinely knew it. The majority of sentences requiring THAT were of this form with the remainder to avoid uniformity containing an uninflected base verb.

4.2.3.2.3 Negation

99 sentences in the correction task required the production of appropriate forms of the negative. The forms of the negative selected for investigation have been discussed in Chapter 3. The division of negative sentences is shown diagrammatically in Table 4.8. Appendix A.3 gives the sentences in the task which necessitated the use of negation.

The choice of incorrect forms for the negative sentences was much more difficult than for those relating to the copula and predicate complementation. The difficulties arose in conforming to the 2 general principles. There are several distinct transitional forms commonly used by learners at different stages in the process of learning English negation (eg. no, not, unanalysed don't). So unlike copula and complementation, where one incorrect realisation was the most common in learners' language, several different forms had to be used and distributed among the different sentences requiring negation. In addition, general principle 2 had to be conformed to. This meant that unanalysed 'don't' could not be used in sentences with contexts, requiring DO + NEG. The best incorrect forms to use for DO + NEG were thus judged to be "no" and "not". For the other auxiliaries to be negated, COP, AUX 'BE' and HAVE, "no" and "not" were also widely used. However the use of "not" did aid subjects who responded by mechanically inserting "is" throughout the task (see section 4.2.4 for further discussion of this phenomenon). From Time 2 a significant number of "don't"s were used in these sentence types. This introduced more variety into the task, made guesswork less likely to be successful and thus provided a truer picture of each learner's productive knowledge. To add to this variety a very small incidence of other commonly observed incorrect forms were included where these did not contradict Principle 2, (eg. doesn't, don't was, am not, aren't, isn't). Table 4.9 gives the average occurrence of the various transitional negative forms in the task.

In these sentences, as for those relating to the other two areas, there was an even distribution of full and pronominalised subject NP.

Table 4.8: Division of the 93 Negative Sentences in the Task which were analysed.

<u>AUX TYPE</u>	<u>ENVIRONMENT</u>	<u>TENSE</u>	<u>NUMBER</u>	<u>PERSON</u>	<u>FORM</u>	<u>NO. OF ITEMS</u>
COPULA	_ADJ	present	sing.	1st	am	3
				3rd	is	3
		past	plural		are	3
			sing.		was	3
	_NP	present	plural		were	3
			sing.			
		past	sing.			
			plural			
	_PP	present	sing.	1st	am	3
				3rd	is	3
		past	plural		are	3
			sing.		was	3
	_PART	present	plural		were	3
			sing.			
		past	sing.			
			plural			
AUX 'BE'	_ V-ing	present	sing.	1st	am	3
				3rd	is	3
		past	plural		are	3
			sing.		was	3
DO	_ V _{main}	present	plural		were	3
			sing.			
		past	plural			
HAVE	_ V _{pp}	present		3rd	does	3
				rest	do	3
		past			did	3
		present		3rd	has	3
				rest	have	3
		past			had	3

Table 4.9: Average Occurrence of Possible Transition Forms in the Correction Task (in %)

Target AUX + NEG Type	FORM "no"	"not"	"don't"	others
COP + NEG	10	52	33	5
AUX 'BE' + NEG	13	47	40	0
HAVE + NEG	22	56	22	0
DO + NEG	44	44	0	12

To ensure the necessity of using a particular tense and aspect (eg. progressive, perfect or a simple tense) expressions of time and such like were included in the sentences which led to the necessity of using a particular tense and aspect. While this proved relatively straightforward for tense and aspect it was very difficult for the negative modals, "cannot" and "will not". These could always be corrected to non-modal forms without rendering the resulting sentence unacceptable. Because of this problem the responses for these two modals were excluded from consideration.

4.2.3.3 Modified Cloze Task

To elicit the use of the articles chosen for study a modified cloze task was used. As discussed in Chapter 3 one use of each of the two articles was to be studied; the indefinite article for the first mention of a person, place or thing and the definite article when used as a cohesive device for the 2nd or later mention of the same person, place or thing. Given the referential function of these uses of the articles it was necessary to compose connected discourse in which the correct use of the two articles is essential to the comprehensibility of the passage. In addition, it was necessary to ensure the need for each article type in each of the NP positions chosen for study (Subj, Obj and PP) on at least 3 occasions.

4.2.3.3.1 Format

A piece of connected discourse was composed necessitating the use of indefinite and definite articles in each of the noun positions. To necessitate the use of article + N to make the reference clear the passage had to introduce several participants and relate them and places and things to each other. In addition, in the passage several contexts for exophoric and cataphoric definite articles were included as well as contexts where either of the two article types were acceptable depending on the extent of the assumed shared sphere of knowledge of the world.

Once the passage was composed all the articles were replaced by blanks. In addition a number of extra blanks were inserted, so that approximately 25% of the blanks were not obligatory contexts for the article. Using the same basic format, a new passage was constructed for each test time, with different vocabulary and content. Appendix A.2 contains the passages used for each test time.

Of all the articles included in the passages only those relating to the particular uses of the definite and indefinite articles chosen for study were analysed. For each time this was 9 occurrences of the indefinite² and 12 of the anaphoric definite article.

4.2.4 Administration of the Tasks

The two tasks were administered in the schools participating in the study, with each successive test time approximately two months after the last. In all the tasks were administered on four separate occasions, in most instances by the experimenter. On the few occasions when this was not possible at Time 4 they were administered by her assistant.

²

At Time 4 there were only 8 occurrences of the indefinite

The same procedure was followed in each school. Arrangements were made with the school authorities and the relevant staff beforehand, so that a classroom was allocated and permission obtained where necessary for subjects to be withdrawn from their usual classes. No teachers were present when the tasks were administered. The intention was to create, as far as possible, a relaxed, informal atmosphere. To assist in this an attempt was made to distance the exercise from any association with the school authorities and teachers in the eyes of the subjects who were participating. Before each test time it was explained that the tasks were not a test with marks and the subjects were given the reassurance that the teachers would not be seeing their work or being told about what they had done.

To carry out the tasks the subjects were seated in a classroom, spaced from each other as far as possible. They were given a preliminary explanation of the purpose of the exercise in English and at Time 1 also in their native languages through an interpreter. Firstly, it was explained that they were participating in study to help in understanding how children learn English. It was stressed that they should therefore each do their own work and not get help from their classmates.

After these introductory remarks they were given a short explanation of what they were required to do in English, with a demonstration using examples on the blackboard. The need to work quickly through the tasks was stressed. This was to minimise the time available for monitoring and to encourage spontaneous responses. Each group was given a time for finishing each task, or in the case of the sentence correction each part of the task, to encourage speed. If any of the subjects had not finished when this time limit was reached they were allowed the extra time they needed to finish.

After the oral explanation the subjects were handed out written instructions for Part A of the correction task along with the sheets containing the sentences to be corrected. The written instructions were in the subjects' native languages to ensure that they understood what they were required to do. The English equivalent of the

instructions reads as follows:

"Here are some English sentences, Read each sentence quickly. If you think it is correct, put a tick () beside it and go on to the next sentence. If you think it is not correct, correct it by writing the correct English on the line beside the sentence.

There is not much time, so do not spend time thinking about each sentence. Work quickly. Please read every sentence. You have _____ minutes.

Here are some examples:

[Five Examples given]

"2

As soon as each subject had completed Part A of the correction task, his paper was removed and he was given the sheet containing the modified cloze task, along with the related instruction sheet which reads:

"Here is a piece of English. There are some gaps in it. Read the passage and put 'the' or 'a' where you think they are necessary to make it GOOD English.

There is not much time, so work quickly, Here is an example:

[Two line piece of text given]

The instructions in each of the four native languages are given in Appendix A.2.

As soon as the subject had completed the cloze task it was removed and he was given Part B of the correction task along with the same instruction sheet which accompanied Part A.

² Since the rewriting of incorrect sentences proved very time consuming especially for the subjects who were able to detect a large number of the errors, from Time 2 a slight alteration was made in the instructions so that the subjects were only required to make the corrections to each sentence in the way the teacher corrects their own work. This proved to be very successful since it encouraged speed and the idea of being like their teachers appealed to the learners.

Unfortunately the conditions under which the subjects had to work were not always as good as could have been wished. Sometimes there was noise outside as other classes in the school changed. Even when the subjects were spaced around the classroom, they were still able to see their fellows well enough to be able to see whether or not they were making a lot of corrections. This could put doubts in their minds over their own responses. In the case of a small number of subjects this led to a tendency to mechanically insert a common form in a meaningless way (eg. "is" added to every sentence). Presumably they did this because they felt that all the sentences which they considered to be correct could not be,³ although they did not really know what the correct forms were. The use of such a strategy among this small number of subjects may have led to a slightly greater incidence of correct copula and COP + NEG responses, but because of the requirements of the task was not generally successful.. Such a response strategy can be viewed as a type of unsuccessful monitoring which occurs in situations where the learners, because of their age and other factors are not able to apply explicit rules successfully. This phenomenon, also observed by War (forthcoming) and Elder (1983) seems to occur if the learners have been taught to pay attention to form, but do not know the forms and the associated rules. This problem highlights the inevitable and unavoidable difficulties in having to administer the same task to learners at vastly different stages of learning. The use of a uniform task is necessary to compare the production of learners at different stages in order to determine a continuum of development.

4.2.5 Criteria for Assessment

Before presenting the results obtained from the analysis of the learners' responses it is necessary to outline the criteria used in assessing these responses. For copula, COP + NEG and AUX 'BE' + NEG, since our interest is in whether or not the learner uses a form of the verb BE where it is obligatory, the presence of any form of BE was

³ Receptively they may even have been able to sense that a form was not target-like.

considered acceptable. The use of this criterion also enables the results which we obtain to be compared to those of other studies where a similar presence/absence criterion has been used (eg. Dulay and Burt 1973 and 1974a; Andersen 1977 and 1978, Al-Jumaily 1982).

For the sentences which required the use of predicate complement constructions evidence of the correct choice of complementiser and thus of means of complementation had to be provided by the learner's correction. So in the case of the non-finite complementation the complementiser, either TO or ING, had to be provided. The omission of the additional complementisers for these types, FOR with TO and POSS (possessive) with ING, both of which can be, or are always, optional in colloquial language, was not considered to make the correction unacceptable. In the case of the finite means of predicate complementation it was not considered necessary for THAT to be provided, since this complementiser is optional and is normally omitted in less formal language. For the correction to be considered to provide evidence of the learner having made a choice to use this means of complementation there had to be clear evidence of the formation of a finite subordinate clause with a conjugated verb form and, if necessary, the deletion of the infinitive "to".

In judging the acceptability of the negative sentences requiring the use of the auxiliaries HAVE and DO, as for BE, any form of the auxiliary was accepted. This criterion was used because our interest is not in the subjects' use of English morphological rules, but rather in their ability to discriminate environments where one of these auxiliaries is required as opposed to the others.

In assessing the responses to the modified cloze task for articles, only the correct choice of article was accepted. Either of the two allomorphs of the indefinite article (ie. "a" or "an") were acceptable in any environment where an indefinite article was required, since our concern is not whether or not the learners have internalised the rules for the distribution of these two allomorphs.

Despite the care taken in designing and composing the sentences in the correction task it was still possible for subjects to occasionally avoid the necessity to use the expected form or structure (eg. replacing a negative with an affirmative of similar meaning). Such cases did not seem to involve the intentional avoidance of difficult aspects of syntax, but rather represented the facility of some of the subjects and their ability to discern a number of alternative solutions yielding correct sentences. These responses were excluded from the analysis, and the subject's score normalised from the other responses given. Since this 'unintentional' avoidance was infrequent and generally only affected one item from a total of 9 or 15 in an environment this did not distort the learners' overall scores to any significant extent.

CHAPTER FIVE

The Results of the Investigation

5.0 Introduction

The subjects' responses on the tasks for the four test times were scored in accordance with the criteria for assessment outlined in the previous chapter and then the results were analysed. The results of this analysis are presented here. As a preliminary the overall performance of the subjects in the groups is presented. After this the results for the groups and the individual subjects within the groups in each of the four structural areas and for the interrelationship of the areas are presented. Lastly, the effect of the independent variables is analysed.

In all analyses which necessitate the comparison of scores over the four times, only those subjects belonging to the core groups are considered.

5.0.1 General Performance

Following the criteria for assessment outlined in Chapter 4, the subjects' overall production was scored. This yielded what has been called the Acquisition Score for each subject at each test time. It was obtained by adding the scores obtained for each structural area yielding in percentage form a measure of the subject's overall performance. The scores are given in Appendix B, Table 2.

Development over Time

Table 5.0.1 and Figure 5.0.1 show the mean score for each group at each test time. In all groups there is an increase in the mean score from Time 1 to Time 4. In all cases where there is not an increase for a group from one time to the next (eg. Vietnamese 1-2 and Spanish 2-3) the decrease is very small (<1%).

Fig. 5.0.1: Mean Acquisition Scores, Time 1 to Time 4.

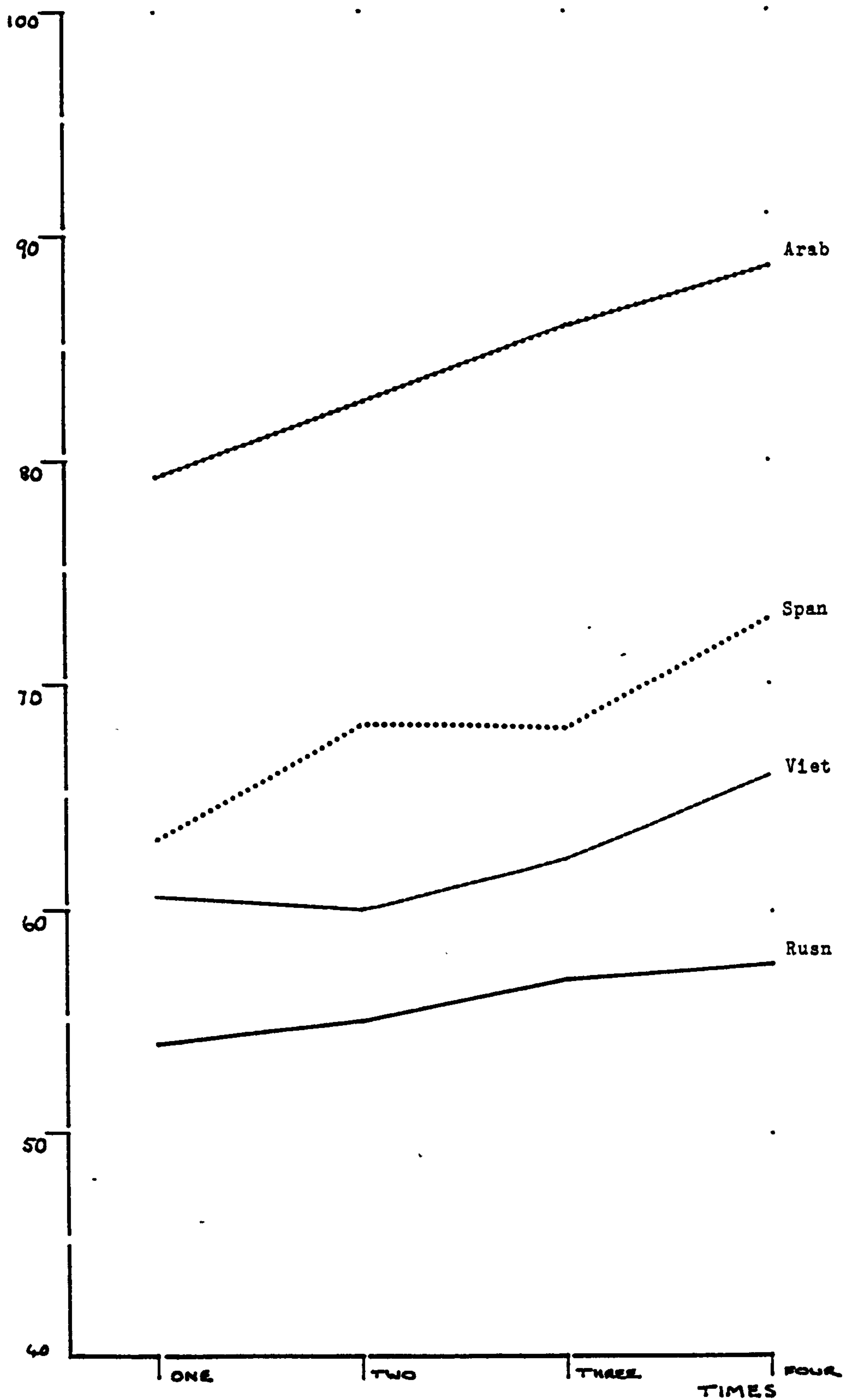


Table 5.0.1: Mean Acquisition Scores at each Time for Core Groups
(in %)

	TIME	SPANISH	RUSSIAN	ARABIC	VIETNAMESE
ACQUISITION SCORES	1	63.1	54.0	79.3	60.6
	2	68.2	55.0	82.2	59.9
	3	67.9	56.9	85.9	62.2
	4	72.9	59.6	88.6	66.4

In order to evaluate whether the difference between means is large enough to be statistically significant t values were computed for the difference between means at each time for each of the language groups, using the formula for the calculation of t for paired samples:

$$t = \frac{\bar{x}_d}{\sqrt{\frac{\sum x_d^2}{N(N-1)}}}$$

where

$\bar{x}_d$ = mean of the N differences of paired observations

x_d = deviation of a difference from the mean of the differences

N = number of paired observations

The results obtained are displayed in Table 5.0.2. For 3 groups there is a significant difference between means from Time 1 to Time 4, all at the .01 level of significance. The difference for the Vietnamese group fails to reach this level of significance. For all of the groups the change from Time 2 to Time 4 and Time 3 to Time 4 is also significant.

Table 5.0.2: t-values for Mean Acquisition Score over time

Times	Group			
	SPANISH	RUSSIAN	ARABIC	VIETNAMESE
	t	t	t	t
1-4	- 3.03 ⁺	- 3.11 ⁺	- 2.95 ⁺	- 1.97 p=0.06
2-4	- 3.54 ⁺	- 4.27 ⁺	- 3.54*	- 2.75 ⁺
3-4	- 4.57 ⁺	- 2.09*	- 3.99 ⁺	- 2.37*
1-2	- 1.74	- 1.08	- 1.98*	0.46
1-3	- 1.13	- 1.76	- 2.04*	- 0.77
2-3	0.24	- 1.43	- 1.66	- 1.50

+ p = 0.01 level of significance
* p = 0.05 level of significance

To determine the relative change in the scores of the subjects in each group from time to time Pearson Product-Moment correlations were computed, where r was calculated according to the following formula:

$$r = \frac{\sum_{i=1}^N X_i Y_i - (\sum_{i=1}^N X_i)(\sum_{i=1}^N Y_i)/N}{\left\{ \left[\sum_{i=1}^N X_i^2 - (\sum_{i=1}^N X_i)^2/N \right] \left[\sum_{i=1}^N Y_i^2 - (\sum_{i=1}^N Y_i)^2/N \right] \right\}^{1/2}}$$

where X_i = ith observation of variable X
 Y_i = ith observation of variable Y
N = number of observations

The resulting values of r are presented in Table 5.0.3. The coefficients show a highly significant (in all cases $p < .01$), and in most cases strong correlation between subjects' scores on the four test times.

Table 5.0.3: Values of Person's r for Acquisition Score over time

A: SPANISH

Time	1	2	3	4
1		.91	.82	.85
2			.97	.97
3				.98

B: RUSSIAN

Time	1	2	3	4
1		.81	.76	.74
2			.92	.95
3				.93

C: ARABIC

Time	1	2	3	4
1		.98	.87	.87
2			.92	.93
3				.97

D: VIETNAMESE

Time	1	2	3	4
1		.95	.91	.88
2			.95	.92
3				.96

all significant beyond $p = 0.01$ level

92% of the coefficients are greater than .8. Amongst the coefficients a pattern can be discerned; in general, the longer the test times from each other the lower the value of r . This suggests that within

each group subjects are progressing at different rates so the longer the time between the repetition of the tasks, the lesser the relationship between the subjects' scores on the two correlated times. The comparatively lower correlations in the Russian and, to a lesser extent, the Spanish groups between Time 1 and the other times indicates the greatest disparity in these groups in terms of the changes in the subjects' scores from Time 1 to the other times.

Performance in the Structural Areas

5.1 COPULA

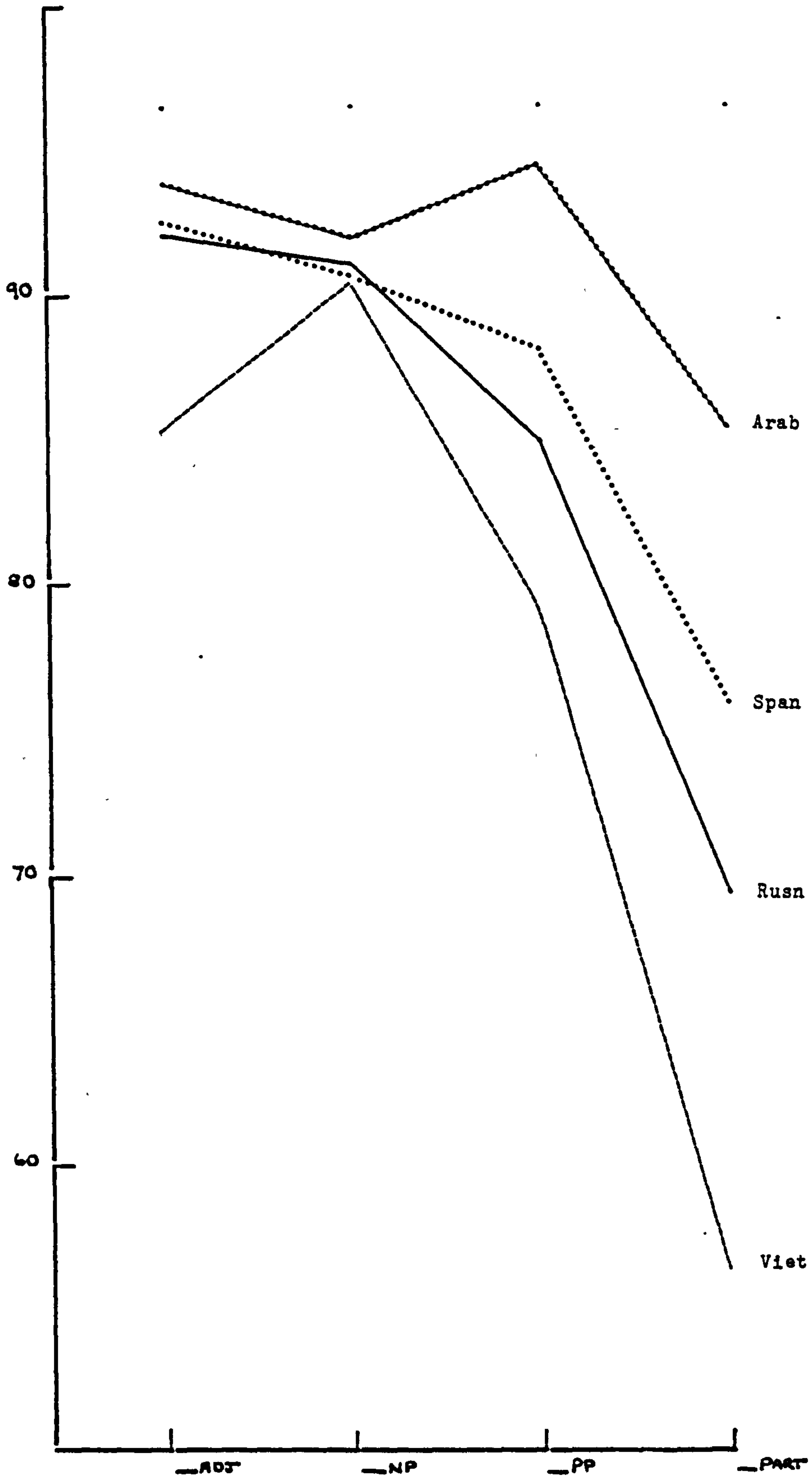
5.1.1 Variability in Environments

5.1.1.1 Group Trends

In order to determine whether variability exists in the subjects' performance in terms of the environments postulated a preliminary analysis of group performance was made. Firstly the mean score for each group in each of the four Copula environments; preceding a predicate noun phrase (NP), predicative adjective (ADJ), locative prepositional phrase (PP), and adjectival participle (PART) were calculated. Figure 5.1.1 shows for each group the mean scores for each environment. For the purposes of this preliminary, cross-sectional analysis the four times were combined.

The analysis shows that at the group level there is variable realisation of Copula in the four environments in each group. The mean scores for the three most favoured environments, ADJ, NP, PP, are all very close to or over 80%, the level at which on an individual level acquisition is generally considered to be slowing down. For all groups the Part environment is considerably less favoured and thus the realisation of Copula is more variable.

Table 5.1.1: Mean Scores for Copula in Four Environments, Times Combined.



Using these means as a guide it appears that the order of environments from most to least favoured is not uniform in the four language groups, although there are similarities. The order of means in the Russian and Spanish groups are identical. The Vietnamese group differs from the other three in favouring __NP over __ADJ. In the Arabic group the means for all three most favoured environments are all over 90% and within 2.5% of each other. So although the order shows __PP > __ADJ > __NP, caution obviously needs to be exercised in the interpretation of these results.

To determine if the difference in means for the realisation of Copula in the environments is significant, "correlated" t was calculated for each of the six comparisons between the environments (Table 5.1.1).

For the group with the lowest mean scores for all the environments, the Vietnamese, all the differences are highly significant. For the Russian group all the differences, except that between the __ADJ and __NP environments, are highly significant. For the Spanish group the differences between __ADJ and __NP and __NP and __PP are not significant. The only significant differences for the Arabic group are those between the means of the three highest means (for __ADJ, __NP and __PP) and the lowest mean for the __PART environment.

To further investigate the variability constrained by these environments a modified version of Andersen's (1978) group range method of displaying the data was used. This shows for each group for all the times combined the number of subjects receiving scores in each of the five possible ranges for each of the environments (Tables 5.1.2a to d).

Table 5.1.1: Correlated t values for Mean Scores in four Copula environments, times combined.

Environments	SPANISH t	RUSSIAN t	ARABIC t	VIETNAMESE t
___ADJ ___NP	1.43	1.27	1.18	- 3.46
___ADJ ___PP	2.78 ⁺	5.36 ⁺	- 0.62	3.48 ⁺
___NP ___PP	1.48	4.45 ⁺	- 1.75	4.93 ⁺
___ADJ ___PART	9.31 ⁺	10.71 ⁺	3.44 ⁺	11.16 ⁺
___NP ___PART	8.48 ⁺	9.13 ⁺	3.37 ⁺	12.11 ⁺
___PP ___PART	7.67 ⁺	6.75 ⁺	4.16 ⁺	8.24 ⁺

+ p = 0.01 level of significance

Figures 5.1.2 a and b show some of the information obtained from the modified group ranges, namely the percentage of subjects in each group who obtained a score > 80% and > 90% in each of the four environments, in graph form. The group ranges and the resulting graphs clearly show variation in the realisation of the Copula depending on the following linguistic environment. A similar trend emerges to that in the analysis of means concerning the order of the environments within each language group.

Table 5.1.2: Modified Group Range for each group, times combined.

A: SPANISH

RANGE	No. of subjects in range for environment				TOTAL in %
	___ADJ	___NP	___PP	___PART	
0-49	0	2	4	14	6.9
50-79	11	12	10	14	16.3
80-89	7	8	9	22	16.0
90-99	12	9	6	13	13.9
100	42	41	43	9	46.9
	---	---	---	---	
	72	72	72	72	
% $\geq$ 80%	84.7	80.6	80.6	61.1	
% $\geq$ 90%	75.0	69.4	68.1	29.2	

B: RUSSIAN

RANGE	No. of subjects in range for environment				TOTAL in %
	___ADJ	___NP	___PP	___PART	
0-49	1	1	6	17	8.1
50-79	7	11	13	27	18.8
80-89	11	10	13	15	15.9
90-99	21	20	14	10	21.1
100	37	35	31	8	36.0
	---	---	---	---	
	77	77	77	77	
% $\geq$ 80%	89.6	84.4	75.3	42.9	
% $\geq$ 90%	75.3	71.4	58.4	23.4	

Table 5.1.2 (continued): Modified Group Range for each group, times combined

C: ARABIC

RANGE	No. of subjects in range for environment				TOTAL in %
	___ADJ	___NP	___PP	___PART	
0-49	1	2	1	3	5.3
50-79	2	2	2	3	6.8
80-89	2	3	0	8	9.9
90-99	3	1	4	4	9.1
100	25	25	26	15	68.9
	___	___	___	___	
	33	33	33	33	
% ≥ 80%	90.9	87.9	90.9	81.8	
% ≥ 90%	84.9	78.9	90.9	57.6	

D: VIETNAMESE

RANGE	No. of subjects in range for environment				TOTAL in %
	___ADJ	___NP	___PP	___PART	
0-49	8	4	16	41	18.2
50-79	14	9	17	21	16.1
80-89	18	17	7	9	13.2
90-99	12	14	7	7	10.5
100	43	51	48	17	41.8
	___	___	___	___	
	95	95	95	95	
% ≥ 80%	76.8	86.3	65.3	34.7	
% ≥ 90%	57.9	68.4	57.9	25.6	

Fig. 5.1.2a: Percentage of Subjects Scoring $>80\%$ in Each Environment, Copula, Times combined.

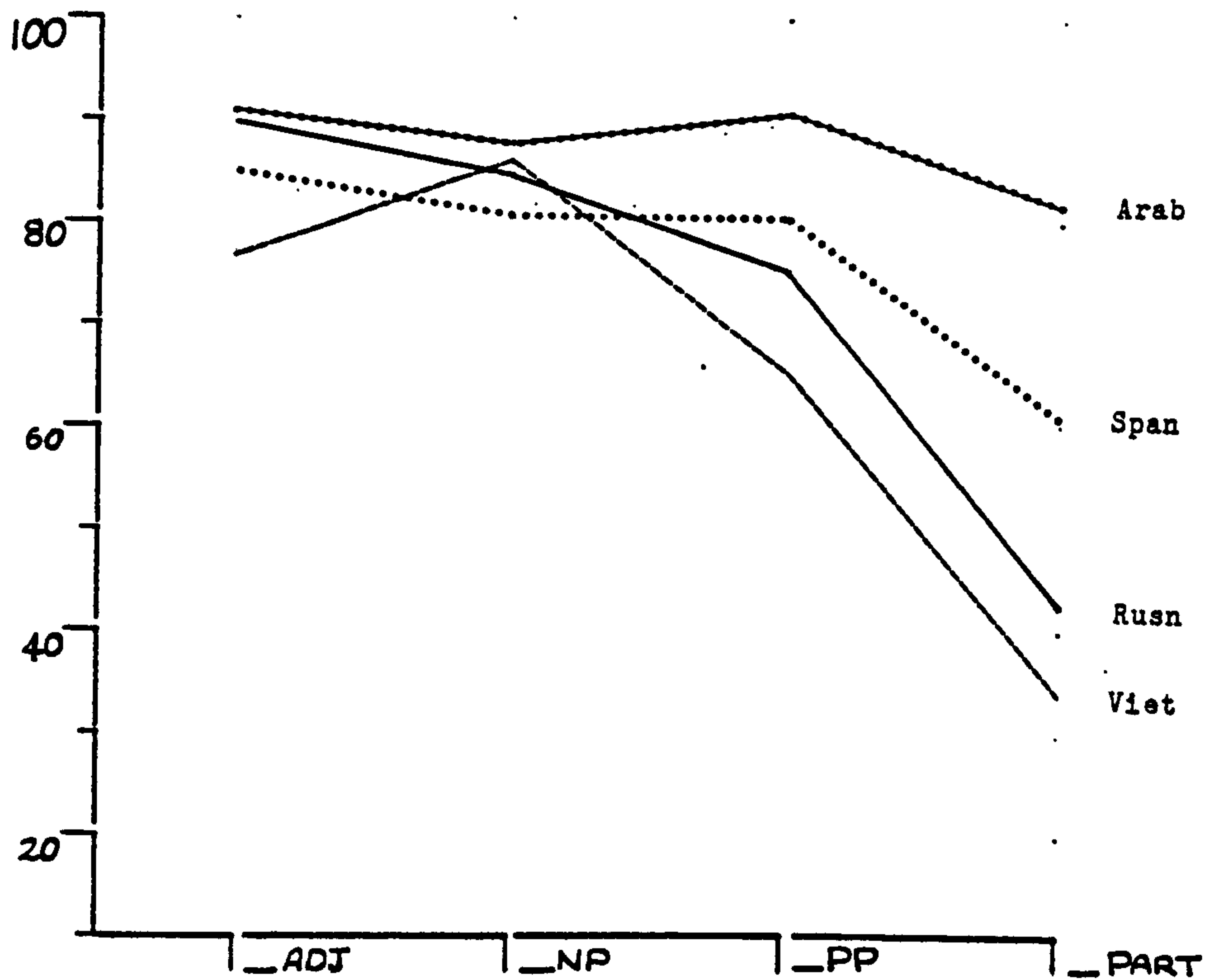
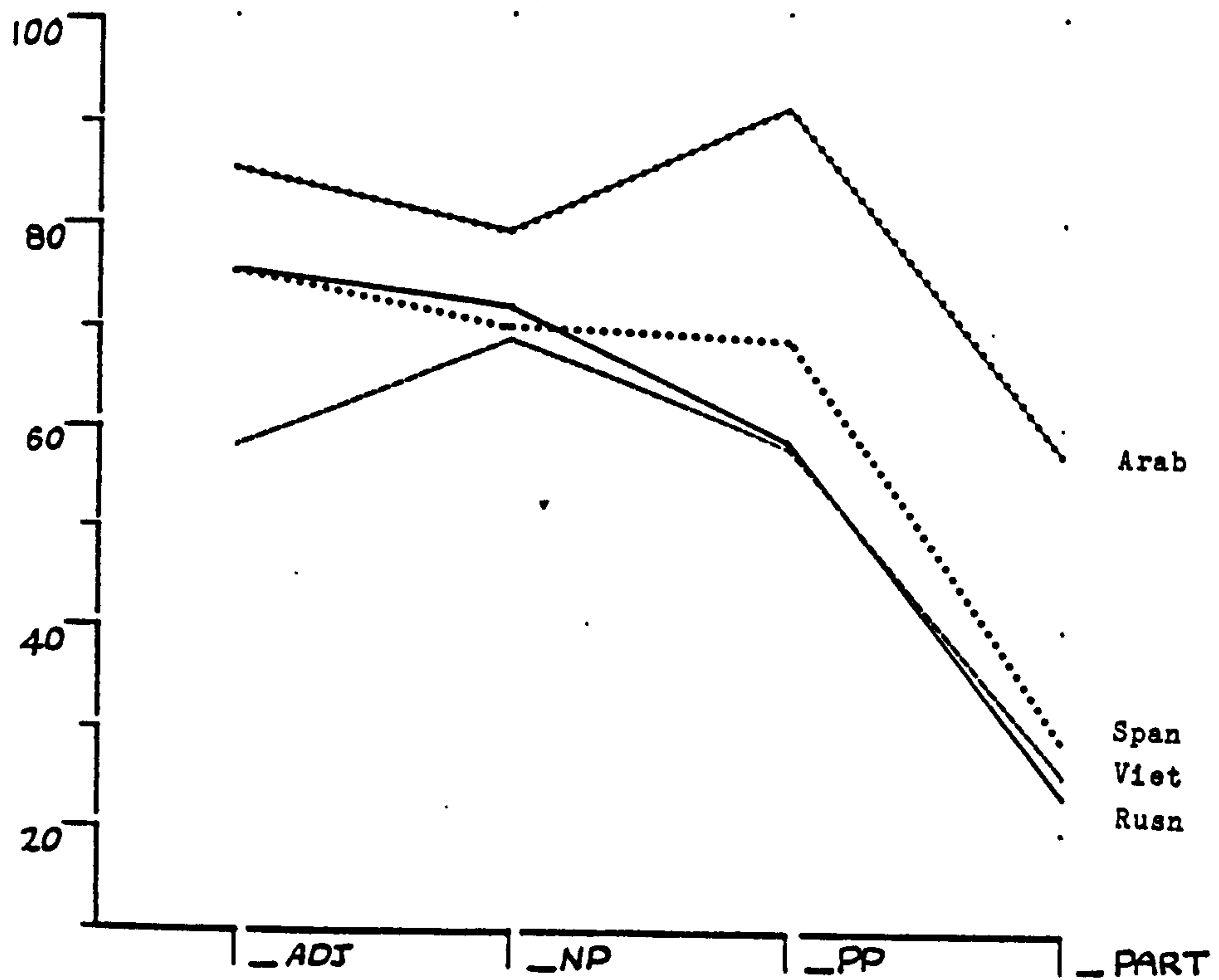


Fig. 5.1.2b: Percentage of Subjects Scoring $\geq 90\%$ in Each Environment, Times Combined.



Approximation Curves

A third analysis of group trends allows the examination of the relationship between the learning of Copula in the four hypothesized environments for each group over the range of possible scores. This is achieved by taking the scores of the subjects in each group both in each separate environment and for the realisation of the Copula overall (Total Copula) and using them to produce a scattergram, plotting the score for a particular environment (y-axis) against the Total Copula (x-axis). Figure 5.1.3 provides an example of the output obtained, in this case for Vietnamese (with all test times combined) in ___PART environment. To enable the processing of large amounts of data the Scattergram Program provided by the Statistical Package for the Social Sciences (SPSS) (Nie, Hull et.al 1970) was used to draw the scattergrams. Although a linear r can be calculated, examination of the scattergrams which are obtained show that in most cases the relationship is not strictly linear, but nevertheless quite strong. By drawing a curve which best fits the scatter of the data, an approximation curve is obtained which provides an approximation for the group of the relationship between the score for a particular environment (in this case, ___PART) and the learners' overall score for the structure (in this case, Copula). This process can be repeated for each environment and the resulting approximation curves combined on the one graph to provide an "average" picture of the realisation of the Copula in the four environments in relation to each other.

The process for deriving approximation curves described above was followed using all the data for each group. Figure 5.1.4a to d show the resulting approximation curves. The relationship between environments revealed by the curves supports the results of the other analyses of group trends. The technique provides a means to represent diagrammatically the "average" relationship of the learning of a structure in its hypothesized environments throughout the course of the acquisition of the structure. This is done by pooling the data from individual subjects over a number of times on the same graph.

Fig.5.1.3: Example of Scattergram used to Estimate Approximation Curve.
In this case for Vietnamese PART (environment for Copula
Realisation) against Total Score for Copula (x-axis).

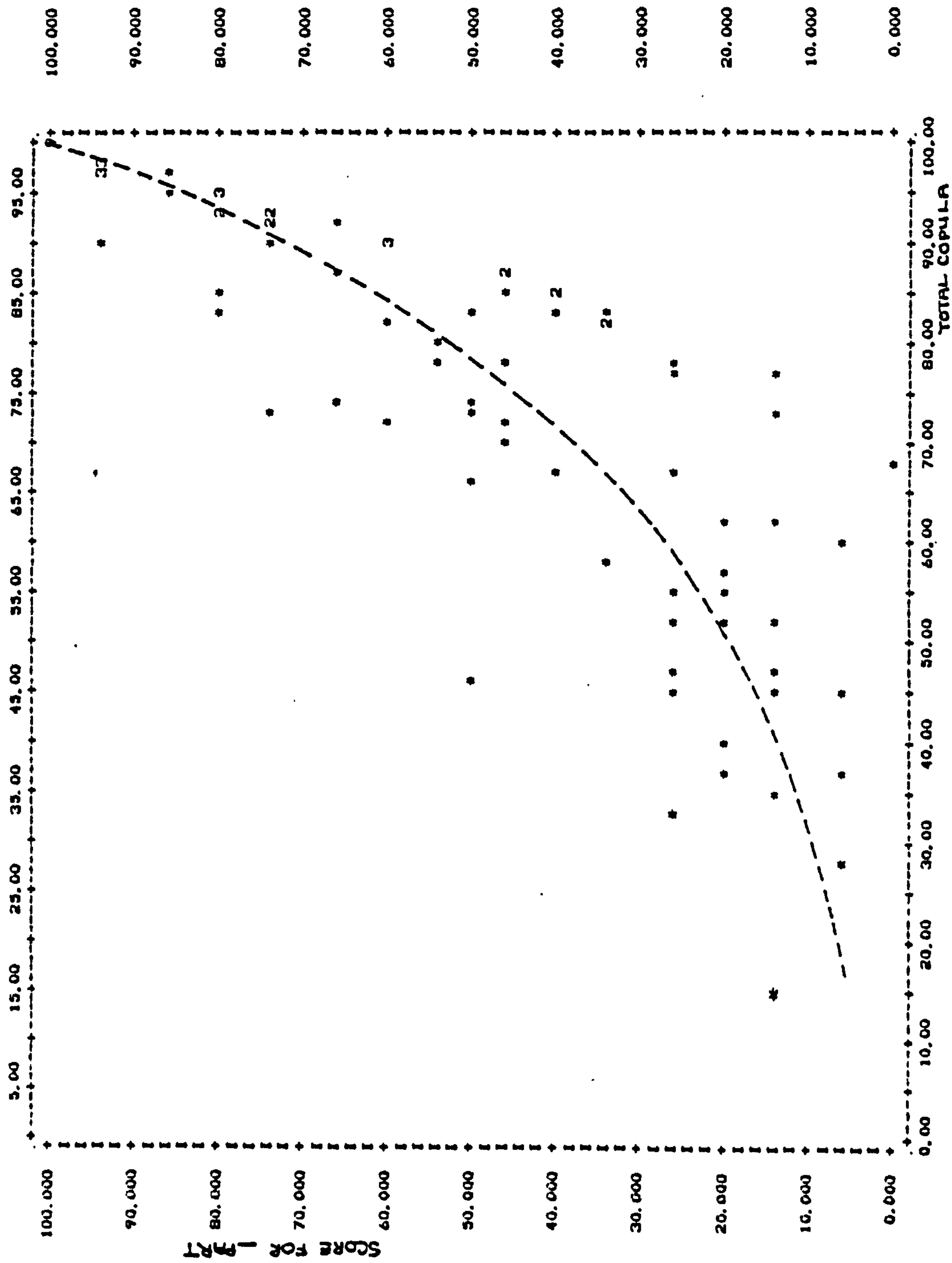
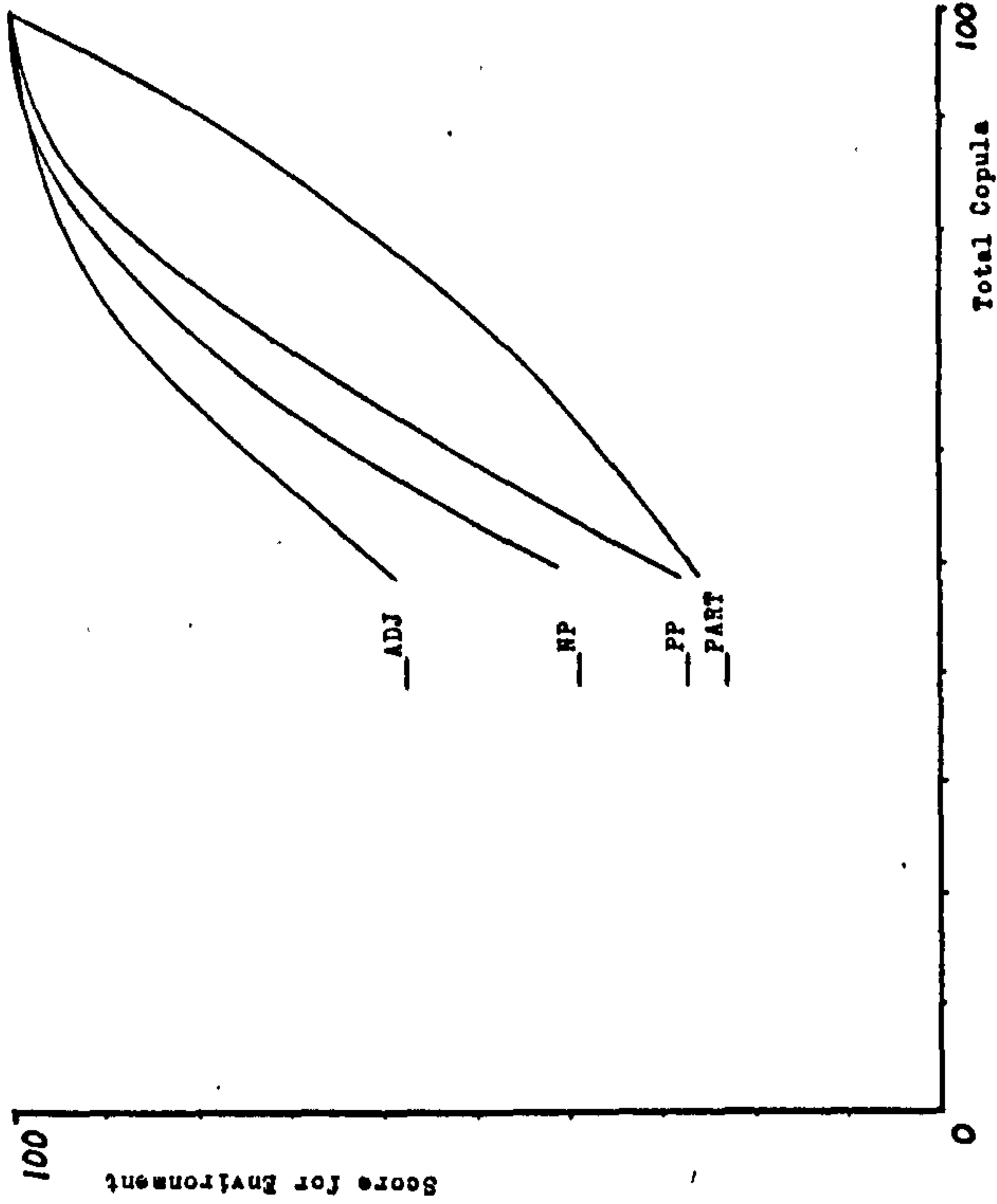
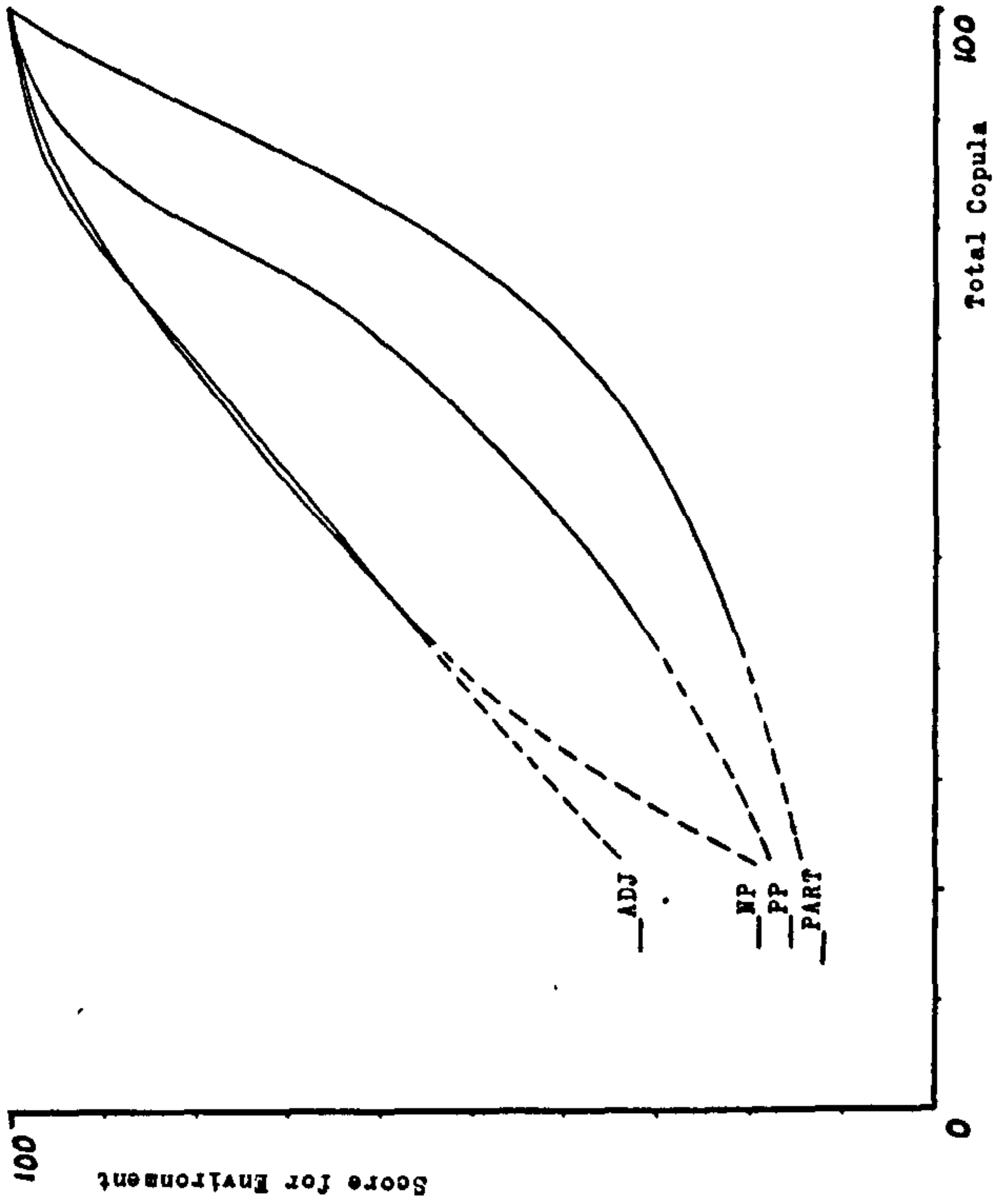


Fig.5.1.4: Approximation Curves for Copula Environments (y-axis) and Total Copula (x-axis)

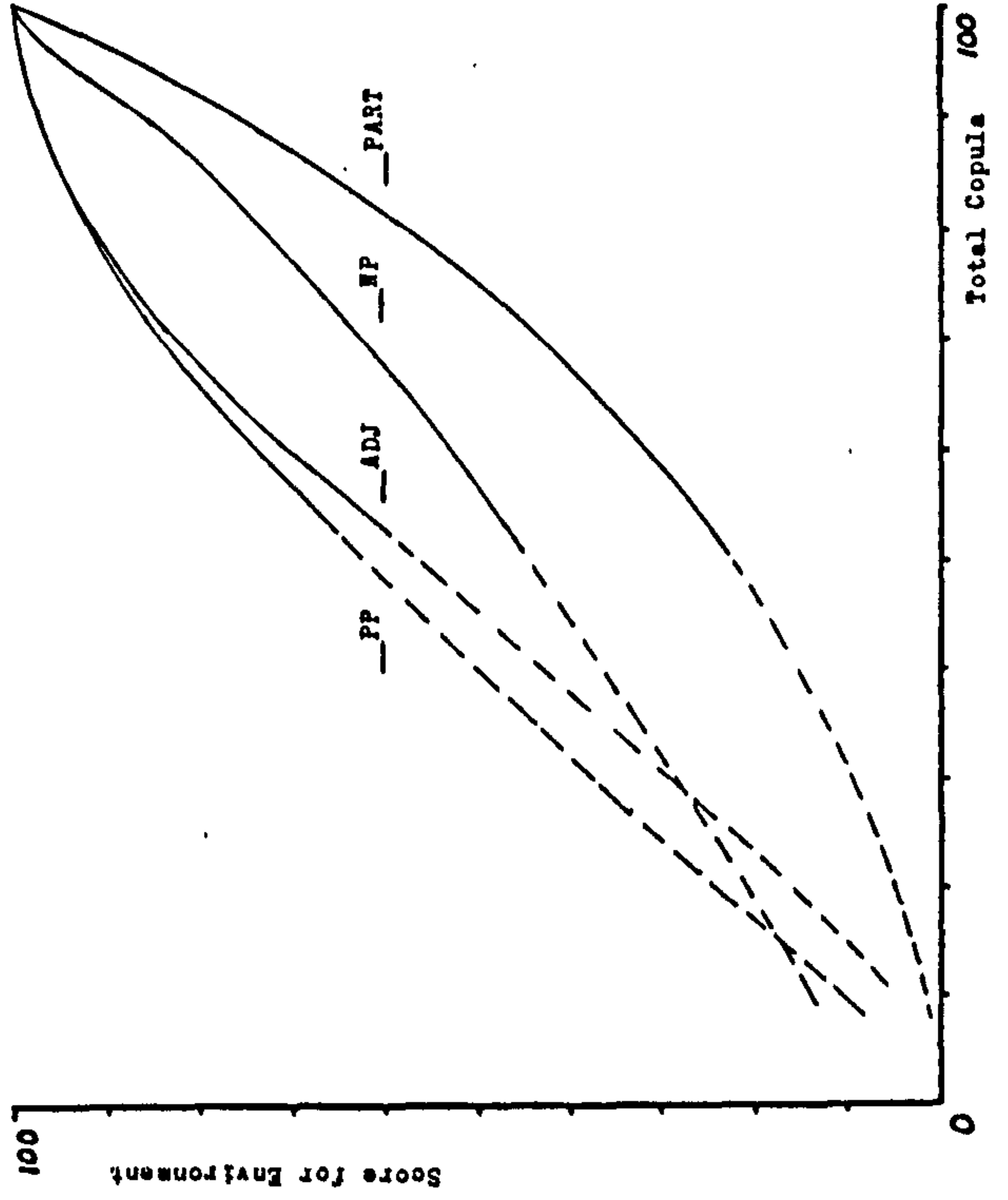
A: Spanish



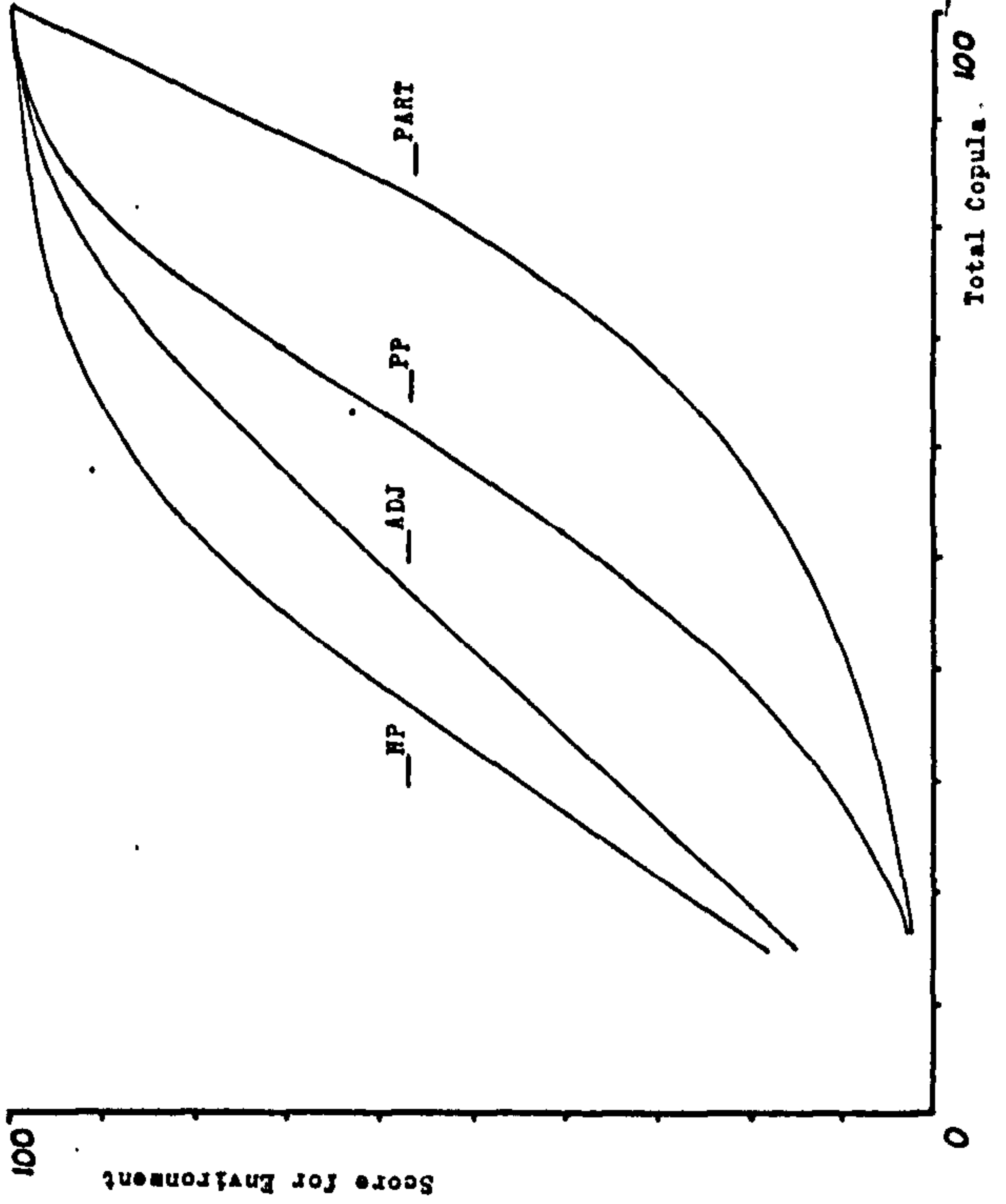
B: Russian



C: Arabic



D: Vietnamese



5.1.1.2 Individual Behaviour

Implicational Analysis

Having established group trends a closer examination of the groups can be made. On the group level variability is evident in the realisation of Copula and it appears that the variation may be conditioned by the following linguistic environment. Examination of the behaviour of subjects within the groups is necessary to determine whether and to what extent these same trends are evident on the level of the individual learner and can thus provide data concerning the systematicity of the learners' variable realisation of the Copula. Implicational Analysis allows the measurement of movement towards or away from a particular entity or form. In the case of this analysis what is being measured is the degree of movement towards the realisation of Copula in the four obligatory environments included in the task.

As explained and discussed in detail in Chapter 2 implicational scaling is a valuable analytical technique in analysing variable behaviour. Implicational scales are hierarchical and cumulative, so that a certain level of performance in a particular environment necessarily implies the same or higher performance in a more favoured environment and the same or lower performance in a less favoured one. The process of scaling involves attempting to fit the set of data (in our case sets of scores for Copula realisation in each environment) into a scale pattern. Statistics, described in detail below, have been devised which enable the degree of fit of the group to the proposed pattern to be determined and thus indicate whether there is a significant implicational relationship between the environments being scaled. Such significant patterns are able to provide evidence of systematicity, underlying learners' variable production. Significantly-scaled data for a group can then provide evidence of possible developmental stages and thus of a developmental sequence in the acquisition of Copula in the environments studied.

Bimodal Scaling

As discussed in Chapter 2 there are 3 basic types of implicational scaling; bimodal, trimodal and multi-valued. Each type of scaling has a different degree of sensitivity to the implications in the data. Bimodal scaling is the least sensitive of the scaling methods. Data is scaled in terms of a binary distinction. In the case of linguistic data, this involves the choice of a suitable division point above which a learner's performance will be considered to indicate acquisition. The choice of such a division point is necessarily arbitrary, but with data which conforms to an implicational pattern the same or very similar results should occur regardless of what this division point is. Bimodal scaling provides a good initial indication of the scalability of the data and is a useful preliminary to the more sensitive scaling techniques.

All the data for each language group was scaled bimodally using the Guttman Scale Program in SPSS (1970). For each group scales were obtained for the data at each test time and for all times combined into one scale. The division point of 80% was used to delineate the binary $\left[\begin{smallmatrix} + \\ - \end{smallmatrix} \right]$ acquired distinction in line with criteria in other studies (for example; Cazden, Cancino, Rosansky and Schumann 1975) and because traditional learning curves have been shown to begin to slow down at this level.

To demonstrate the scaling procedure and the results obtained, the data for Vietnamese subjects at Time 1 was chosen. Table 5.1.3a gives the scores for the 25 subjects in the four environments and Table 5.1.3b gives the same scores in bimodal form using the 80% division point. The data in bimodal form shows clearly the five different scale types. The first is that of the lowest scoring subjects, V17 - V07 (V25 is a non-scale pattern), who have not reached the level of acquisition designated in any of the environments ('0000').

The next group, V10 to V03, have achieved $\geq 80\%$ for Copula realisation in the NP environment, but not in any of the others

Table 5.1.3: Scores and Bimodal form of Scores for Vietnamese, Time 1

A: Scores for
Vietnamese, Time 1

B: Bimodal Scores for
Vietnamese, Time 1

Subject

Number	Environment					Environment			
	NP	ADJ	PP	PART		NP	ADJ	PP	PART
VO2	100	100	100	100		1	1	1	1
V11	100	100	100	100		1	1	1	1
V20	100	100	100	100		1	1	1	1
V24	100	100	100	100		1	1	1	1
VO4	100	100	100	100		1	1	1	1
V18	100	100	100	100		1	1	1	1
V22	100	93	100	93		1	1	1	1
V21	100	100	100	80		1	1	1	1
V15	87	93	87	93		1	1	1	1
V12	80*	93	87	80		1	1	1	1
V14	100	100	100	60		1	1	1	0
V13	100	100	100	40		1	1	1	0
V19	100	100	93	33		1	1	1	0
VO9	100	87	67	80*		1	1	0	1
V23	100	87	53	47		1	1	0	0
VO1	80	80	73	7*		1	1	0	0
VO3	93	33	7	20		1	0	0	0
VO6	87	67	33	20		1	0	0	0
V16	80	73	67	73		1	0	0	0
VO5	80	67	60	20		1	0	0	0
V10	80	27	20	13		1	0	0	0
V25	73	80*	73	40		0	1	0	0
VO7	67	60	27	27		0	0	0	0
VO8	60*	73	27	50*		0	0	0	0
V17	47	33	27	27		0	0	0	0

('1000'). In the third scale type the subjects (V01 to V09) have acquired the use of a Copula form in the two most favoured environments, NP and ADJ, but not in the remaining two ('1100'). In the fourth type ('1110'), the subjects (V19 to V14) have reached the 80% level in all environments but the least favoured, PART. In the fifth and final type the Copula is realised at $\geq 80\%$ level in all four environments ('1111'). Subjects V12 to V02 conform to this scale type. The implicational hierarchy among the environments can be clearly seen in Table 5.1.3b. If a subject has not reached the 80% level in the most favoured environment, in this case NP, this necessarily implies non-criterion performance in the remaining three environments. Similarly, a '1' in the ADJ environment implies a '1' in the more favoured NP environment, but does not imply anything about whether Copula realisation has been acquired in the two less favoured environments. A '1' in the least favoured environment, PART, implies that there is a '1' in all the other, more favoured environments.

Further examination of Table 5.1.3b reveals 2 subjects, V09 and V25, who do not fit into any of the implicational scale types. It is to account for these discrepancies and to assess the validity of scales obtained that the statistics for implicational scaling have been devised. The statistics enable the determination of whether the scale produced is meaningful. The main statistic is R, the coefficient of Reproducibility. It is calculated according to the following formula:

$$R = 1 - \frac{\text{number of deviations}}{\text{number of rows} \times \text{number of columns}}$$

Thus, for the data in Table 5.1.3b.

$$R = 1 - \frac{2}{25 \times 4}$$

$$= .98$$

An $R \geq .90$ is considered to be significant, and thus to indicate a valid scale. Another statistic, the coefficient of Scalability, S , is often also used. Its calculation is somewhat more complex than that of R and involves the use of two further statistics, Minimal Marginal Reproducibility (MMR) and the Percentage Improvement (PCI). The statistics required in the calculation of S are defined below.

MMR = minimum coefficient of Reproducibility that could have occurred for the scale given the division point used and the proportion of respondents passing and failing each item.

$$PCI = R - MMR$$

$$S = \frac{PCI}{1 - MMR}$$

For a scale to be "truly unidimensional and cumulative" (Nie, Hull et al 1970: 533) S should be $> .60$. Because of the complexity of its calculation S tends only to be calculated when the calculations are being made non-manually.

The SPSS Guttman Scale Program enables the scaling of data using a specified division point and calculates the statistics defined above. The print out from the program for the data given in Table 5.1.3b is displayed in Table 5.1.4. Comparison of the manual analysis in which there were considered to be 2 deviations from the implicational pattern (and thus $R = .98$) and the computer analysis which counted the errors as being 4 ($R = .96$) highlights a point of contention concerning the assessment of scale validity. As Torgerson stresses:

"the problem is to assign scale positions to those subjects that do not have perfect scale patterns" (1958: 328)

Torgerson goes on to outline several different methods which have been used in assigning these non-scale patterns. One procedure is to

Table 5.1.4: SPSS Printout for Bimodal Scale,
Vietnamese Time 1.

QITEM..	PART	PP	ADJ	NP	TOTAL
0RESP..	0	1 I 0	1 I 0	1 I 0	1 I
	-----I-ERR-----	I-ERR-----	I-ERR-----	I-ERR-----	I
C	I	I	I	I	I
O	4 I 0	10I 0	10I 0	10I 0	10I 10
P	I-----ERRI	I	I	I	I
U	I	I	I	I	I
L	3 I 3	1I 1	3I 0	4I 0	4I 4
A	I	I-----ERRI	I	I	I
	I	I	I	I	I
	2 I 2	0I 2	0I 0	2I 0	2I 2
	I	I	I-----ERRI	I	I
	I	I	I	I	I
	1 I 6	0I 6	0I 5	1I 1	5I 6
	I	I	I	I-----ERRI	I
	I	I	I	I	I
	0 I 3	0I 3	0I 3	0I 3	0I 3
	I-----	I-----	I-----	I-----	I
SUMS	14	11	12	13	8 17 4 21 25
PCTS	56	44	48	52	32 68 16 84
ERRORS	0	1	1	3	3 1 1 0 4

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.96
 MINIMUM MARGINAL REPRODUCIBILITY = 0.65
 PERCENT IMPROVEMENT = 0.31
 COEFFICIENT OF SCALABILITY = 0.89

assign them to the scale pattern to which it is most similar. This is the procedure usually employed when the scaling is done manually. The SPSS program uses another alternative, more suited to machine data processing, in which the number of '1's in the set of scores is used to determine the scale pattern to which the deviant pattern is assigned. In effect this means that no deviant patterns will be assigned to either the all '1' (pattern 4) or all '0' (pattern 0) type and usually means that each deviation is counted as two errors.

Guttman Scale Analysis, using SPSS, was carried out on all the data using the 80% division point for acquisition. Table 5.1.4a to d

Table 5.1.4: Bimodal Scales for Copula Environments, Times Combined.

A: SPANISH									
ITEM.. PART		NP		PP		ADJ		TOTAL	
RESP.. 0		1	I	0	1	I	0	1	I
		I-ERR		I-ERR		I-ERR		I-ERR	
C	I		I		I		I		I
O	4	I	0	42	I	0	42	I	0
P	I	I-ERR		I-ERR		I-ERR		I-ERR	
U	I		I		I		I		I
L	3	I	8	3	I	2	9	I	0
A	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	2	I	8	0	I	3	5	I	2
	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	1	I	5	0	I	3	2	I	5
	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	0	I	6	0	I	6	0	I	6
	I	I-ERR		I-ERR		I-ERR		I-ERR	
SUMS		27	45	14	58	14	58	11	61
PCTS		38	63	19	81	19	81	25	85
ERRORS		0	3	2	7	3	0	5	9

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.93
MINIMUM MARGINAL REPRODUCIBILITY = 0.77
PERCENT IMPROVEMENT = 0.16
COEFFICIENT OF SCALABILITY = 0.70

B: RUSSIAN									
ITEM.. PART		PP		NP		ADJ		TOTAL	
RESP.. 0		1	I	0	1	I	0	1	I
		I-ERR		I-ERR		I-ERR		I-ERR	
C	I		I		I		I		I
O	4	I	8	29	I	0	29	I	0
P	I	I-ERR		I-ERR		I-ERR		I-ERR	
U	I		I		I		I		I
L	3	I	27	2	I	2	27	I	0
A	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	2	I	6	2	I	6	2	I	4
	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	1	I	6	0	I	6	0	I	3
	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	0	I	5	0	I	5	0	I	5
	I	I-ERR		I-ERR		I-ERR		I-ERR	
SUMS		44	33	19	58	12	65	8	69
PCTS		57	43	25	75	16	84	10	90
ERRORS		0	4	2	2	4	3	3	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.94
MINIMUM MARGINAL REPRODUCIBILITY = 0.77
PERCENT IMPROVEMENT = 0.15
COEFFICIENT OF SCALABILITY = 0.78

C: ARABIC									
ITEM.. PART		NP		PP		ADJ		TOTAL	
RESP.. 0		1	I	0	1	I	0	1	I
		I-ERR		I-ERR		I-ERR		I-ERR	
C	I		I		I		I		I
O	4	I	0	25	I	0	25	I	0
P	I	I-ERR		I-ERR		I-ERR		I-ERR	
U	I		I		I		I		I
L	3	I	3	2	I	1	4	I	0
A	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	2	I	0	0	I	0	0	I	0
	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	1	I	1	0	I	1	0	I	1
	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	0	I	2	0	I	2	0	I	2
	I	I-ERR		I-ERR		I-ERR		I-ERR	
SUMS		6	27	4	29	3	30	3	30
PCTS		18	82	12	88	9	91	9	91
ERRORS		0	2	1	0	1	1	1	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.97
MINIMUM MARGINAL REPRODUCIBILITY = 0.88
PERCENT IMPROVEMENT = 0.08
COEFFICIENT OF SCALABILITY = 0.75

D: VIETNAMESE									
ITEM.. PART		PP		ADJ		NP		TOTAL	
RESP.. 0		1	I	0	1	I	0	1	I
		I-ERR		I-ERR		I-ERR		I-ERR	
C	I		I		I		I		I
O	4	I	0	32	I	0	32	I	0
P	I	I-ERR		I-ERR		I-ERR		I-ERR	
U	I		I		I		I		I
L	3	I	29	1	I	1	29	I	0
A	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	2	I	9	0	I	8	1	I	0
	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	1	I	14	0	I	14	0	I	12
	I	I-ERR		I-ERR		I-ERR		I-ERR	
	I		I		I		I		I
	0	I	10	0	I	10	0	I	10
	I	I-ERR		I-ERR		I-ERR		I-ERR	
SUMS		62	33	33	62	22	73	13	82
PCTS		66	35	35	65	23	77	14	86
ERRORS		0	1	1	1	0	2	3	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.98
MINIMUM MARGINAL REPRODUCIBILITY = 0.73
PERCENT IMPROVEMENT = 0.25
COEFFICIENT OF SCALABILITY = 0.92

shows the scale profiles obtained for each language group with all the data from the test times combined. For each group the environments were ordered to produce the best scale in terms of the coefficients described above. In all cases this corresponds to the order suggested by the analysis of group trends (see Fig 5.1.2a).

Examination of the coefficients of reproducibility and scalability for each of the scales shows that for the orders used all the scales are significant, indicating a high degree of conformance of individual subjects to the group pattern. It is worth remembering that manual calculation of R would have yielded considerably higher coefficients, making these scales exceedingly regular compared to those obtained in some other SLA studies (eg. Platt, 1976 and Andersen, 1978).

The same analysis was carried out for each time separately and in addition, because of discrepancies between the groups in the ordering of environments, scales were calculated for other possible best orders. Table 5.1.5 gives the best order/s and its coefficients for each group at each time and for the times combined. When two environments are grouped together and surrounded by curly brackets this indicates that either order of these environments yields the same value of R. As such it appears that there is no clear implicational order between such environments in this analysis. Since the scales obtained from combining all the times provide the largest corpus of data, it is these ones which can be expected to be most accurate in showing the group pattern. From the scales it is possible to define the best order for each group using this 80% division point. These are given in Table 5.1.6.

Table 5.1.5: Best order/s for each Group for each Time and overall,
with coefficients obtained

GROUP	TIME	BEST ORDER/S	R	S
SPANISH	1	$\left\{ \begin{array}{l} \text{ADJ} \\ \text{NP} \end{array} \right\} \succ \text{PP} \succ \text{PART}$ $\left\{ \begin{array}{l} \text{ADJ} \succ \text{PP} \succ \text{NP} \end{array} \right\}$	.93	.78
	2	$\text{ADJ} \succ \text{PP} \succ \text{NP} \succ \text{PART}$	.92	.46
	3	$\text{PP} \succ \text{NP} \succ \text{ADJ} \succ \text{PART}$ $\text{ADJ} \succ \text{NP} \succ \text{PP} \succ \text{PART}$	.97	.88
	4	$\left\{ \begin{array}{l} \text{ADJ} \\ \text{NP} \end{array} \right\} \succ \text{PP} \succ \text{PART}$	.94	.67
	1-4	$\text{ADJ} \succ \left\{ \begin{array}{l} \text{NP} \\ \text{PP} \end{array} \right\} \succ \text{PART}$	.93	.70
RUSSIAN	1	$\text{ADJ} \succ \text{NP} \succ \text{PP} \succ \text{PART}$	.93	.75
	2	$\text{ADJ} \succ \left\{ \begin{array}{l} \text{NP} \\ \text{PP} \end{array} \right\} \succ \text{PART}$	.97	.90
	3	$\text{NP} \succ \text{ADJ} \succ \text{PP} \succ \text{PART}$	.94	.71
	4	$\left\{ \begin{array}{l} \text{ADJ} \\ \text{NP} \end{array} \right\} \succ \text{PP} \succ \text{PART}$	.97	.86
	1-4	$\left\{ \begin{array}{l} \text{ADJ} \\ \text{NP} \end{array} \right\} \succ \text{PP} \succ \text{PART}$	.94	.75
ARABIC	1	$\text{PP} \succ \left\{ \begin{array}{l} \text{ADJ} \\ \text{NP} \\ \text{PART} \end{array} \right\}$	.89	
	2	ALL SAME	1.00	1.00
	3	$\text{ADJ} \succ \left\{ \begin{array}{l} \text{NP} \\ \text{PP} \end{array} \right\} \succ \text{PART}$	1.00	1.00
	4	$\left\{ \begin{array}{l} \text{ADJ} \\ \text{NP} \\ \text{PP} \end{array} \right\} \succ \text{PART}$	1.00	1.00
	1-4	$\text{ADJ} \succ \left\{ \begin{array}{l} \text{NP} \\ \text{PP} \end{array} \right\} \succ \text{PART}$	.97	.75
VIETNAMESE	1	$\text{NP} \succ \text{ADJ} \succ \text{PP} \succ \text{PART}$	.96	.89
	2	$\text{NP} \succ \text{ADJ} \succ \text{PP} \succ \text{PART}$	.98	.92
	3	$\text{NP} \succ \text{ADJ} \succ \text{PP} \succ \text{PART}$	.98	.91
	4	$\text{NP} \succ \text{ADJ} \succ \text{PP} \succ \text{PART}$	1.00	1.00
	1-4	$\text{NP} \succ \text{ADJ} \succ \text{PP} \succ \text{PART}$	.98	.92

Table 5.1.6: Best Order/s of Environments for each Group using 80% division point

GROUP	ORDER/S	R	S
SPANISH	$\text{--ADJ} \gg \left\{ \begin{array}{l} \text{--NP} \\ \text{--PP} \end{array} \right\} \gg \text{--PART}$	.93	.70
RUSSIAN	$\left\{ \begin{array}{l} \text{--ADJ} \\ \text{--NP} \end{array} \right\} \gg \text{--PP} \gg \text{--PART}$	.94	.75
ARABIC	$\text{--ADJ} \gg \left\{ \begin{array}{l} \text{--PP} \\ \text{--NP} \end{array} \right\} \gg \text{--PART}$	.97	.75
VIETNAMESE	$\text{--NP} \gg \text{--ADJ} \gg \text{--PP} \gg \text{--PART}$	.98	.92

From the implicational analysis presented to this point the following trends have emerged:

- (1) For all groups PART is the least favoured environment.
- (2) For the Spanish and Arabic groups the ordering of the remaining three environments does not point to a particular order being clearly superior, although ADJ appears to be more favoured than NP or PP.
- (3) For the Russian and Vietnamese groups PP environment is clearly less favoured than either of the remaining two environments.
- (4) For the Russian group there appears to be no clearly superior order between the two remaining most favoured environments.
- (5) For the Vietnamese group an invariant and clearly superior order can be defined.

Since it appears that the inconclusive results for the ordering of some of the environments may be the result of the large number of scores over 80% obtained in all groups, but the Vietnamese, in the three most favoured environments, a similar analysis was conducted using the higher point of 90% for the binary division.

This level is the same as that used by Brown (1973) in his first language morpheme acquisition studies. In the task to obtain a score $\geq 90\%$ a subject had to obtain a raw score of 14/15. Table 5.1.7 gives the coefficients for the overall best orders using the 90% division point. As predicted the results are more conclusive

Table 5.1.7: Best order for each Group, division point 90%

GROUP	BEST ORDER	R	S
SPANISH	_ADJ $\succ$ _NP $\succ$ _PP $\succ$ _PART	.94	.79
RUSSIAN	_ADJ $\succ$ _NP $\succ$ _PP $\succ$ _PART	.96	.87
ARABIC	_PP $\succ$ _ADJ $\succ$ _NP $\succ$ _PART	.99	.93
VIETNAMESE	_PP $\succ$ _NP $\succ$ _ADJ $\succ$ _PART	.96	.88

for the highest scoring three groups. The Vietnamese group marginally favours $\text{PP} \succ \text{NP} \succ \text{ADJ} \succ \text{PART}$ over the 80% division point order, for which, using the 90% point, $R = .95$ and $S = .87$.

Multi-valued Scaling

The Guttman Scale analysis reported in the previous section has shown a high degree of conformity to the implicational pattern within each language group using bimodal scaling. This suggests the possibility of further investigation of the systematicity of the subjects' responses using their actual scores in what is generally called multi-valued scaling or Variability Analysis.

Working with the relatively small number of items per environment

in the task (15) it was considered necessary to allow for chance factors such as fluctuations in concentration whilst working through the 186 sentences presented at each test time. Accordingly discrepancies in the numerical scale pattern were only considered to be deviations when they amounted to more than one item difference (in this case > 7%). This meant that given two environments A and B, where A is more favoured than B, a deviation in the implicational pattern was only considered to exist if:

$$\text{Score B} - \text{Score A} > 7\%$$

Such an allowance is consistent both with conventions in Guttman Scaling where a division point below 100% is usually used when assigning '0' and '1' values and in work concerning morpheme acquisition orders where fluctuations in the 80 - 100% or 90 - 100% range are discounted. Using once again the data in Table 5.1.3a for the Vietnamese group at Time 1 we can see that there are 5 such deviations, so:

$$R = 1 - \frac{5}{25 \times 4}$$

$$= .95$$

which indicates that the data is significantly scalable.

The coefficients obtained for each group with all the Times combined are given in Table 5.1.8. The scales and the coefficients for each time for the four groups for the best order/s are in Appendix B, Tables 3.1 and 4.1.

Table 5.1.8: Coefficients of Reproducibility for the Best Order for each Group with all the test times combined, using Multi-Valued Scaling

GROUP	BEST ORDER	R
SPANISH	$\begin{Bmatrix} \text{--ADJ} \\ \text{--NP} \end{Bmatrix} > \text{--PP} > \text{--PART}$	.95
RUSSIAN	$\begin{Bmatrix} \text{--ADJ} \\ \text{--NP} \end{Bmatrix} > \text{--PP} > \text{--PART}$	.95
ARABIC	$\text{--PP} > \text{--ADJ} > \text{--NP} > \text{--PART}$	.97
VIETNAMESE	$\text{--NP} > \text{--ADJ} > \text{--PP} > \text{--PART}$	.96

The results summarised in Table 5.1.8 support the findings of the Guttman Scale Analysis. All groups were able to be scaled significantly and thus all the scales are valid. Since Variability Analysis takes into account deviations from the implicational pattern throughout the score range from 0-100%, we can be more confident of the significance of the scales and of the accuracy of the orders they indicate.

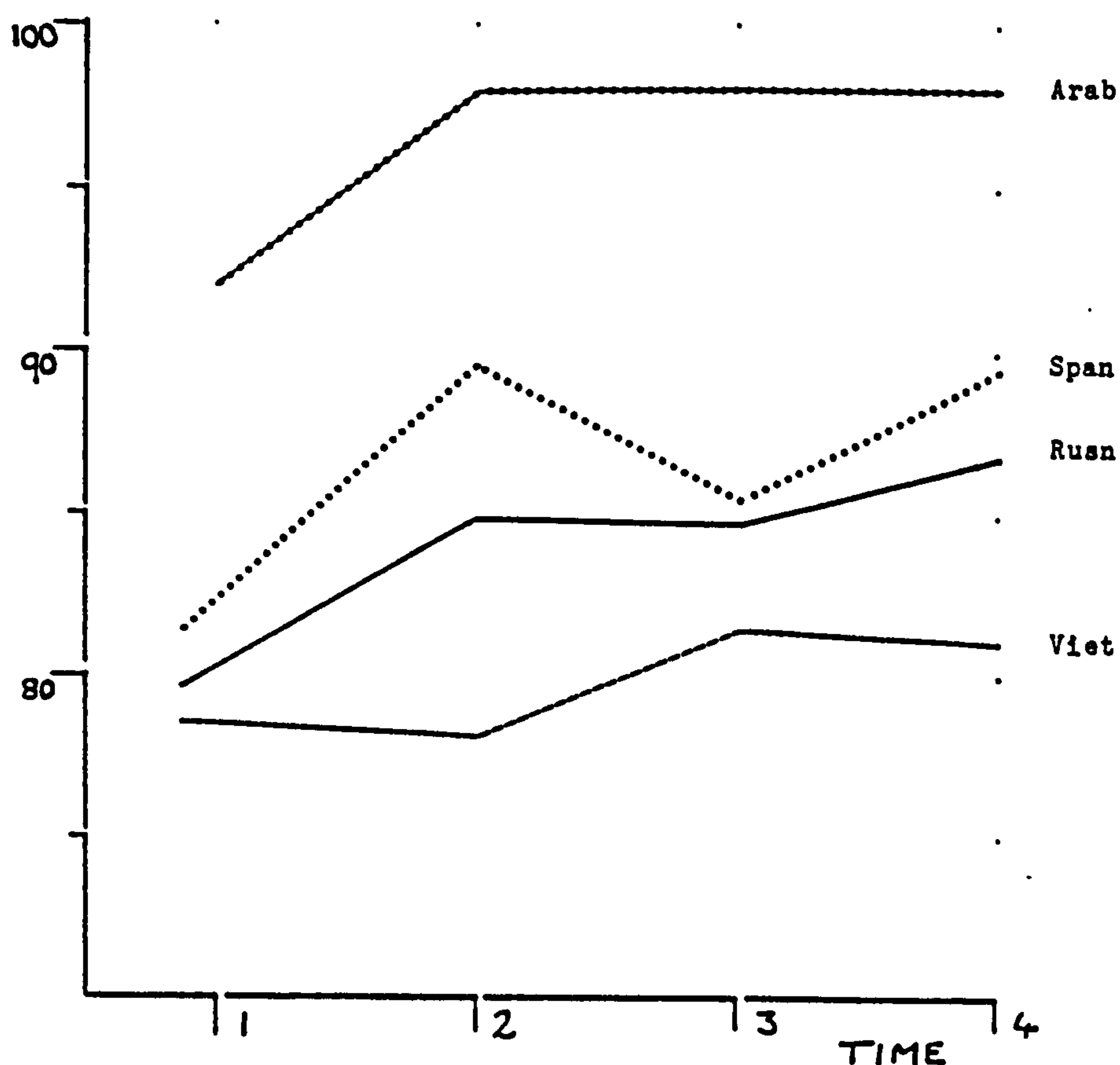
At this detailed level of analysis neither the Spanish nor the Russian group show any clear preference in the ordering of ADJ and NP in relation to each other in terms of implicational analysis, however at the 90% level ADJ is slightly more favoured than NP. Although the Arabic group produced the best order in terms of its reproducibility, the results concerning the ordering of the three most favoured environments in relation to each other cannot be considered conclusive. More than 75% of data scores for these environments for this group were over 90% and thus did not provide any data concerning the ordering of these environments in relation to each other. Only 6 cases in all the test times were able to provide any information about the ordering of these environments in relation to each other.

5.1.2 Development Over Time

5.1.2.1 Group Trends

To determine the development of each group as a whole over time the mean scores for each group at each of the four test times were plotted on a graph (Figure 5.1.5). From Time 1 to Time 4 there was an increase in the mean score for each group. This ranges from 2.7% for the Vietnamese group to 8.2% for the Spanish group. At each time the groups maintained their positions relative to each other in terms of their mean scores.

Fig. 5.1.5: Mean Scores for Copula , Time 1 to Time 4.



To determine whether the difference between the means at the four test times was large enough to be statistically significant, t-tests were conducted. The results are given in Table 5.1.9.

Table 5.1.9: Results of t-tests for Difference in Means at 4 test Times

TIMES	GROUP			
	SPANISH	RUSSIAN	ARABIC	VIETNAMESE
	t	t	t	t
1 - 4	- 3.27 ⁺	- 1.55	- 3.23 ⁺	- 0.81
1 - 3	- 1.33	- 1.55	- 3.07 ⁺	- 1.13
1 - 2	- 3.13 ⁺	- 1.82*	- 4.09 ⁺	0.50
2 - 4	- 0.08	- 0.68	- 0.16	- 1.37
2 - 3	1.96*	0.00	- 0.14	- 2.38 ⁺
3 - 4	- 1.88*	- 0.53	0.00	0.15

+ p = 0.01 level of significance }
 * p = 0.05 level of significance } one tail probability

Two groups, Spanish and Arabic, show significant increases in means between Time 1 and Time 4, as well as between some of the other times. In contrast the Russian and Vietnamese groups' increases from Time 1 to Time 4 are not large enough to be statistically significant. For each of these groups only one increase for one time to the next is large enough to be significant (Russian, 1 to 2; Vietnamese, 2 to 3). The results suggest considerable differences between the groups in terms of the rate of development over time.

In order to determine the relationship between each group's performance on successive test times Pearson's r was computed. The results are presented in Table 5.1.10. All but three of the correlations are significant at the $\leq .05$ level of significance

Table 5.1.10: Pearson Correlations for Scores for Copula at the Four Times.

A: Spanish

	T1	T2	T3	T4
T1	1.0000 (3) P=0.000	0.7686 (16) P=0.000	0.7233 (16) P=0.001	0.7863 (16) P=0.000
T2	0.7686 (16) P=0.000	1.0000 (0) P=0.000	0.8977 (16) P=0.000	0.9010 (16) P=0.000
T3	0.7203 (16) P=0.001	0.8977 (16) P=0.000	1.0000 (3) P=0.000	0.8802 (16) P=0.000
T4	0.7863 (16) P=0.000	0.9010 (16) P=0.000	0.8802 (16) P=0.000	1.0000 (0) P=0.000

B: Russian

T1	1.0000 (3) P=0.000	0.7310 (18) P=0.000	0.6145 (18) P=0.003	0.3527 (18) P=0.076
T2	0.7310 (18) P=0.000	1.0000 (0) P=0.000	0.7498 (18) P=0.000	0.7608 (18) P=0.000
T3	0.6145 (18) P=0.003	0.7498 (18) P=0.000	1.0000 (0) P=0.000	0.6278 (18) P=0.003
T4	0.3527 (18) P=0.076	0.7608 (18) P=0.000	0.6278 (18) P=0.003	1.0000 (0) P=0.000

C: Arabic

T1	1.0000 (0) P=0.000	0.9502 (7) P=0.001	0.5437 (7) P=0.104	0.6389 (7) P=0.364
T2	0.9502 (7) P=0.001	1.0000 (0) P=0.000	0.7246 (7) P=0.033	0.7429 (7) P=0.028
T3	0.5437 (7) P=0.104	0.7246 (7) P=0.033	1.0000 (0) P=0.000	0.9523 (7) P=0.000
T4	0.6389 (7) P=0.364	0.7429 (7) P=0.028	0.9523 (7) P=0.000	1.0000 (3) P=0.000

D: Vietnamese

T1	1.0000 (3) P=0.000	0.8391 (22) P=0.000	0.8134 (22) P=0.000	0.6999 (22) P=0.000
T2	0.8391 (22) P=0.000	1.0000 (0) P=0.000	0.9217 (22) P=0.000	0.7821 (22) P=0.000
T3	0.8134 (22) P=0.000	0.9217 (22) P=0.000	1.0000 (0) P=0.000	0.8778 (22) P=0.000
T4	0.6999 (22) P=0.000	0.7821 (22) P=0.000	0.8778 (22) P=0.000	1.0000 (0) P=0.000

and all but two of these at the .01 level. The non-significant correlations are between Time 1 and Time 4 for both the Arabic and the Russian group and also for Time 1 and Time 3 for the Arabic group.

Although significant, many of the correlations are not particularly strong. This is not necessarily unexpected in groups of learners learning, and in a few cases even regressing, at different rates. The correlation matrix for the Vietnamese group shows a clear pattern: the further away in time from each other the test times the lesser the strength of the correlation between the scores for the subjects at those times. This pattern clearly reflects the differences in rate of learning of individuals within the group.

5.1.2.2 Individual Behaviour

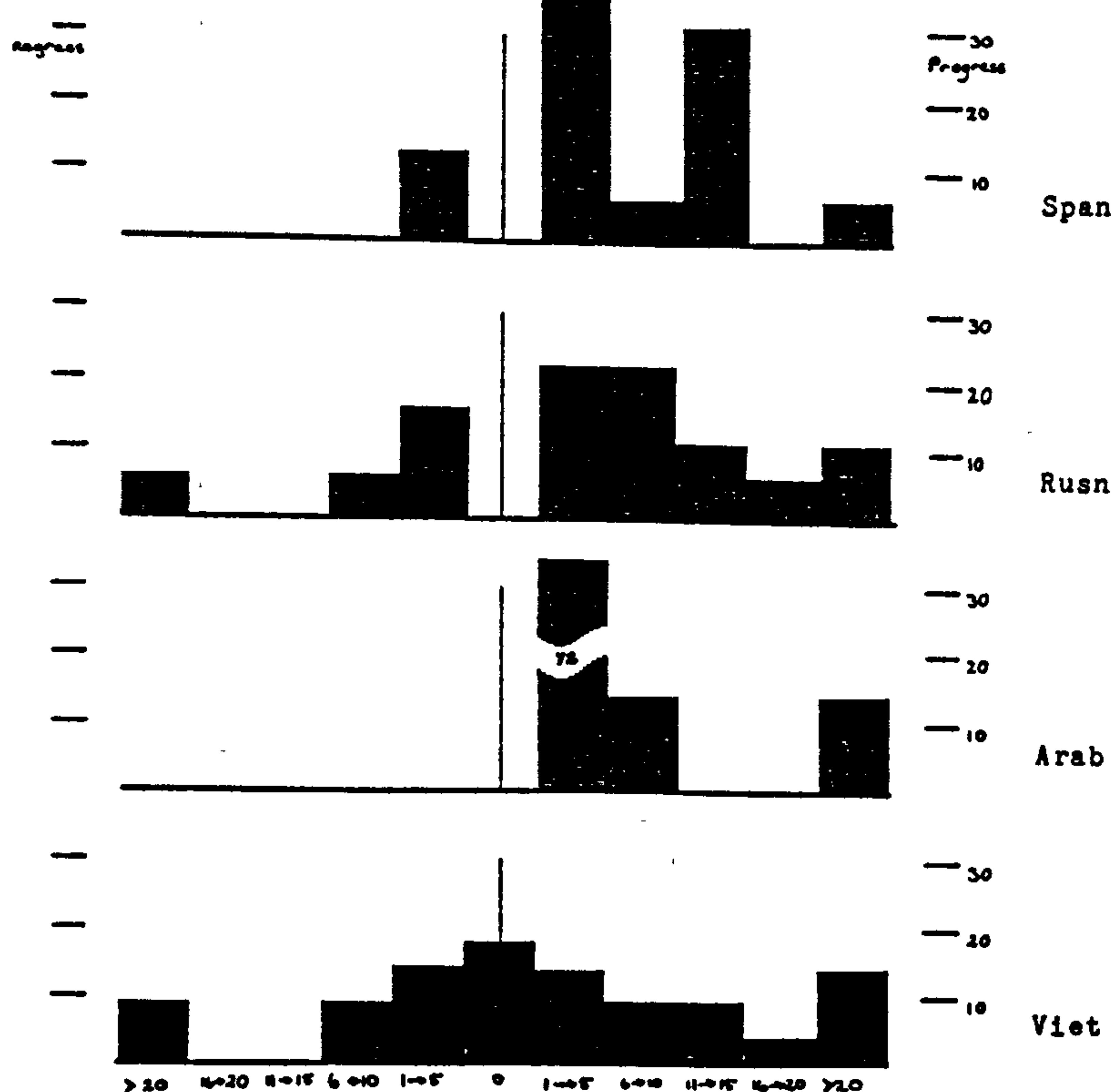
To examine the development of individuals within each core group the percentage of subjects progressing, remaining the same and regressing from one time to the next and from Time 1 to Time 4 was calculated. The results are presented in Table 5.1.11. All groups show at least 50% of the subjects progressing from Time 1 to Time 4. There is clearly less progress in a greater number of individuals in the Vietnamese group than in the other 3 groups. The Russian group also contains a significant minority of regressers. The progressers and regressers were broken down into groups according to their amount of change from Time 1 to Time 4. The results are shown in Figure 5.1.6.

It is apparent that for the Spanish and Arabic groups a large proportion of those progressing from Time 1 to Time 4 only progress slightly. This is generally because their scores are so high that there is little room for improvement. The majority (57%) of regressers only regressed by a maximum of 5%. The Vietnamese and Russian groups show a much greater diversity among individuals in terms of the direction and extent of change from Time 1 to Time 4.

Table 5.1.11: Percentage of Subjects in each core Group
Changing over Times

GROUP	MOVEMENT	TIMES			1-4
		1-2	2-3	3-4	
SPANISH	PROGRESSING	82	19	69	88
RUSSIAN		61	61	45	72
ARABIC		100	14	14	100
VIETNAMESE		41	54	45	50
SPANISH	NO CHANGE	6	12	12	0
RUSSIAN		11	6	22	0
ARABIC		0	72	72	0
VIETNAMESE		18	23	14	18
SPANISH	REGRESSING	12	69	19	12
RUSSIAN		28	33	33	28
ARABIC		0	14	14	0
VIETNAMESE		41	23	41	32

Fig. 5.1.6: Percentage Change for [REDACTED] of Subjects in Each of Ranges of Copula, Time 1 to Time 4.



5.2 PREDICATE COMPLEMENTATION

5.2.1 Variability by Complement Type

5.2.1.1 Group Trends

Initially to determine if variability existed in the correct use of predicate complement constructions dependent on the complement type required by the verb in the main clause, the mean score overall for each type THAT, TO and ING for each language group was plotted (Figure 5.2.1). The actual mean scores for each group are given in Appendix B Table 5.2. Once again the Arabic groups' mean scores are considerably higher than those of the remaining 3 groups. From the mean scores variability appears to exist in terms of the correct formation of the complement dependent on the complement type. In the Arabic group the order of mean scores from highest to lowest is TO > THAT > ING. For the remaining three groups the order is THAT > TO > ING.

The values of *t* for paired samples were calculated to determine whether the difference between means for the 3 complement types were statistically significant. The values of *t* obtained for the data in Figure 5.2.4 are given in Table 5.2.1. The results show that for all groups the difference in means between both THAT and TO, and ING is highly significant. For all groups but the Russian the difference in means for THAT and TO is not large enough to indicate a significant difference.

To further investigate variability according to the complement type on the group level, in particular for the THAT and TO types where no clear trend regarding their ordering has emerged from the mean scores the number of subjects in each of 6 score ranges for each complement type was calculated (Table 5.2.2 a to d). In defining the ranges the actual scores out of a maximum of 9 for each type were used. Figure 5.2.2 shows in graph form the percentage of subjects scoring ≥ 7 (78%), ≥ 4.5 (50%) and ≥ 3 (33%) for each complement type

Fig. 5.2.1: Mean Scores for Complement Types, Times Combined.

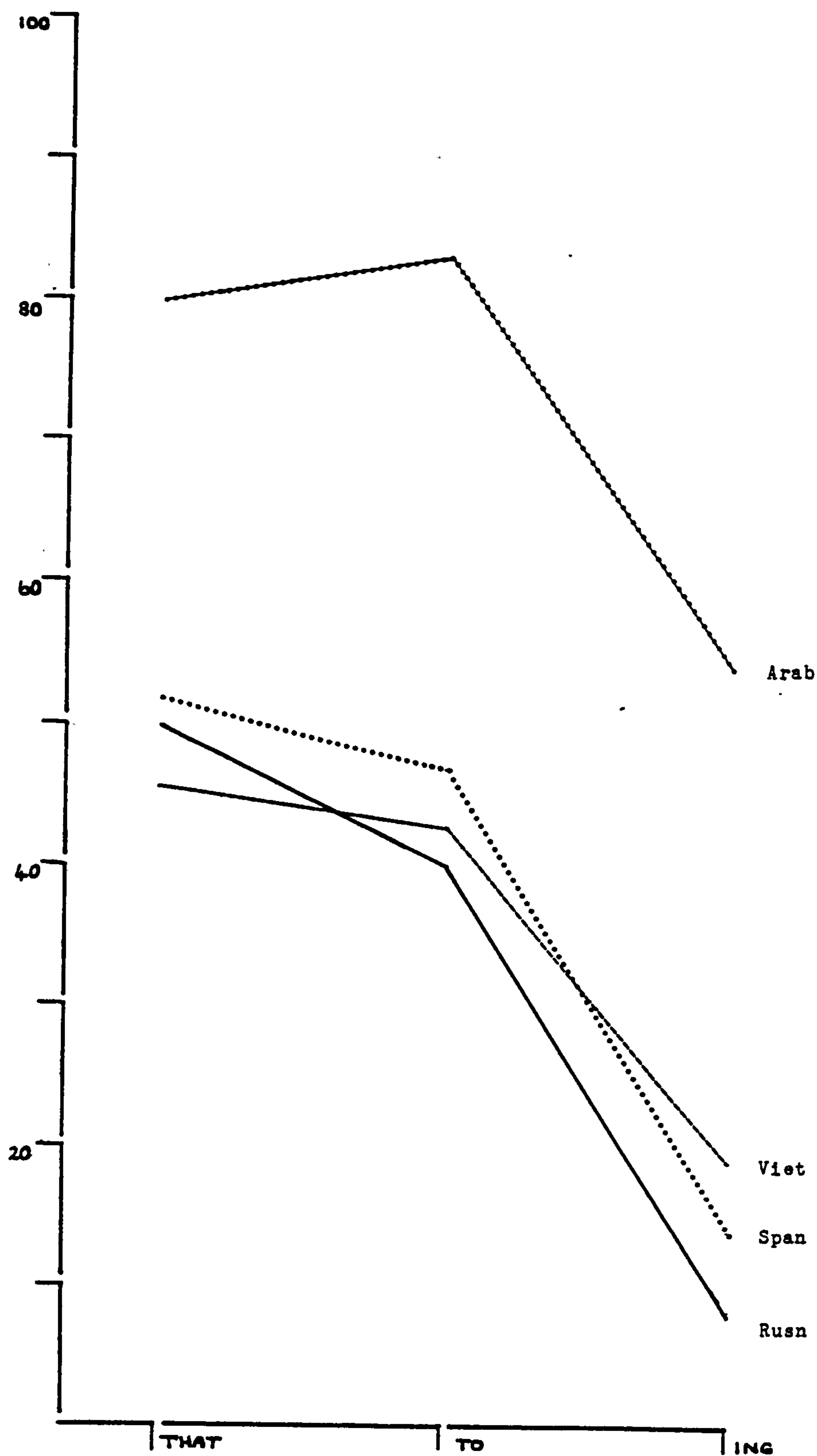


Table 5.2.1: Values of t for each Group for difference according to Complement Type, Times Combined

Types	Group Spanish t	Russian t	Arabic t	Vietnamese t
THAT TO	1.51	3.29 ⁺	- 1.02	0.93
THAT ING	12.75 ⁺	16.94 ⁺	5.14 ⁺	10.26 ⁺
TO ING	8.21 ⁺	8.82 ⁺	5.52 ⁺	8.15 ⁺

+ p = 0.01 level of significance

Table 5.2.2: Number of Subjects in each Score Range in Each Complement Type, Times Combined

A. SPANISH

Range	Complement Type		
	THAT	TO	ING
0	6	19	44
1-2	15	10	15
3-4	13	9	4
4.5-6	16	8	4
7-8	17	13	3
9	5	13	2
	<u>72</u>	<u>72</u>	<u>72</u>
% > 7	30.6	36.1	6.9
% > 4.5	52.8	47.2	12.5
% > 3	70.8	59.7	18.1

B. RUSSIAN

Range	Complement THAT	Type TO	ING
0	1	23	58
1-2	17	16	9
3-4	17	7	6
4.5-6	28	8	2
7-8	10	13	2
9	4	10	0
	77	77	77
$\% \geq 7$	18.2	29.9	2.6
$\% \geq 4.5$	54.6	40.3	5.2
$\% \geq 3$	76.6	49.4	13.0

C. ARABIC

Range	Complement THAT	Type TO	ING
0	1	2	7
1-2	2	1	6
3-4	1	1	0
4.5-6	7	2	4
7-8	7	10	10
9	15	17	6
	33	33	33
$\% \geq 7$	66.7	81.8	48.5
$\% \geq 4.5$	87.9	87.9	60.6
$\% \geq 3$	90.9	90.9	60.6

D. VIETNAMESE

Range	Complement THAT	Type TO	ING
0	5	27	63
1-2	29	16	8
3-4	18	9	6
4.5-6	20	16	3
7-8	17	12	10
9	6	15	5
	95	95	95
$\% \geq 7$	24.2	28.4	15.8
$\% \geq 4.5$	45.3	45.3	19.0
$\% \geq 3$	65.6	54.7	25.3

as derived from Table 5.2.2. Table 5.2.2 and Figure 5.2.2 provide more detailed information about the variability in correct use of the three complement types. From the analysis the following points are apparent:

- (1) For all groups for all sections of the group range ING is clearly the least favoured and thus most difficult of the complement types.
- (2) For all groups for the higher score ranges (~~ie.~~ ^{ie.} ≥ 7) there are a larger number of subjects using TO (correctly) than using THAT correctly.
- (3) At the ≥ 4.5 (50%) level the situation is reversed for the Russian and Spanish groups, so that THAT is favoured over TO; whereas the percentage of subjects the Vietnamese and Arabic groups is identical for the 2 types.
- (4) At the ≥ 3 score level all but the Arabic group have a greater percentage attaining this level for THAT than for TO. (Once again the Arabic results are identical for the 2 environments).

Fig. 5.2.2a: Percentage of Subjects Scoring >3 for Each Complement Type, Times Combined.

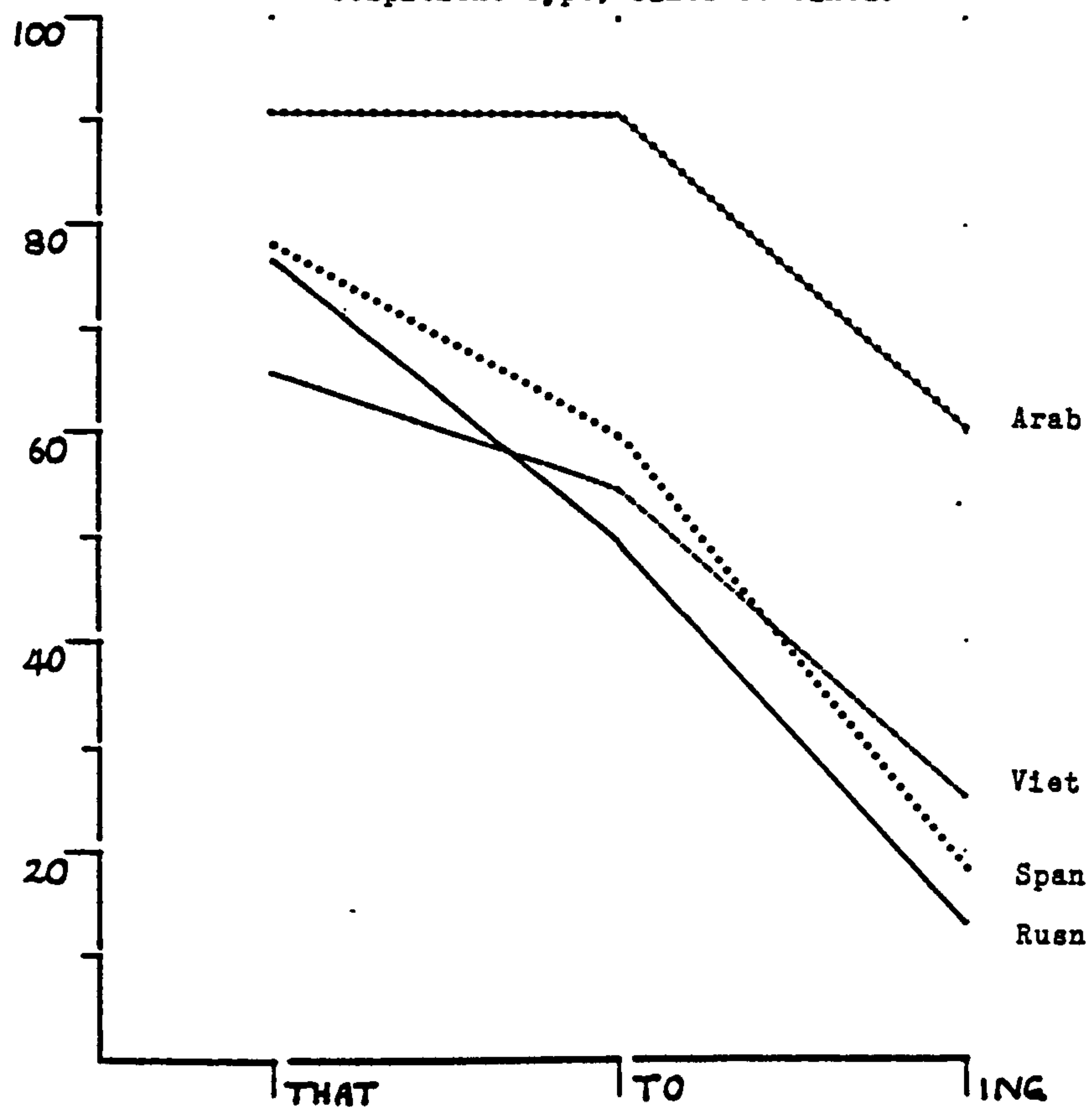


Fig. 5.2.2b: Percentage of Subjects Scoring >4.5 for Each Complement Type, Times Combined.

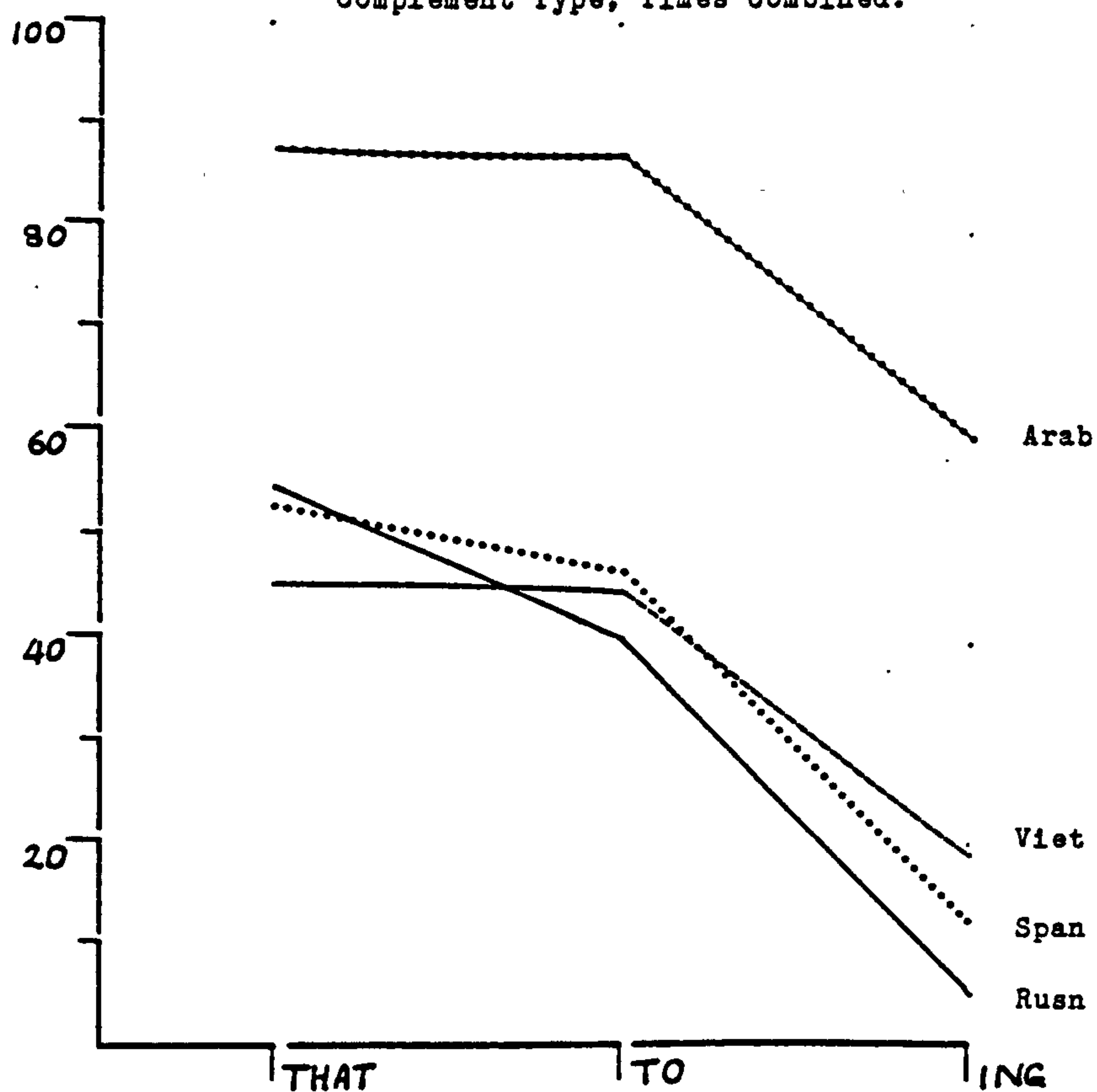
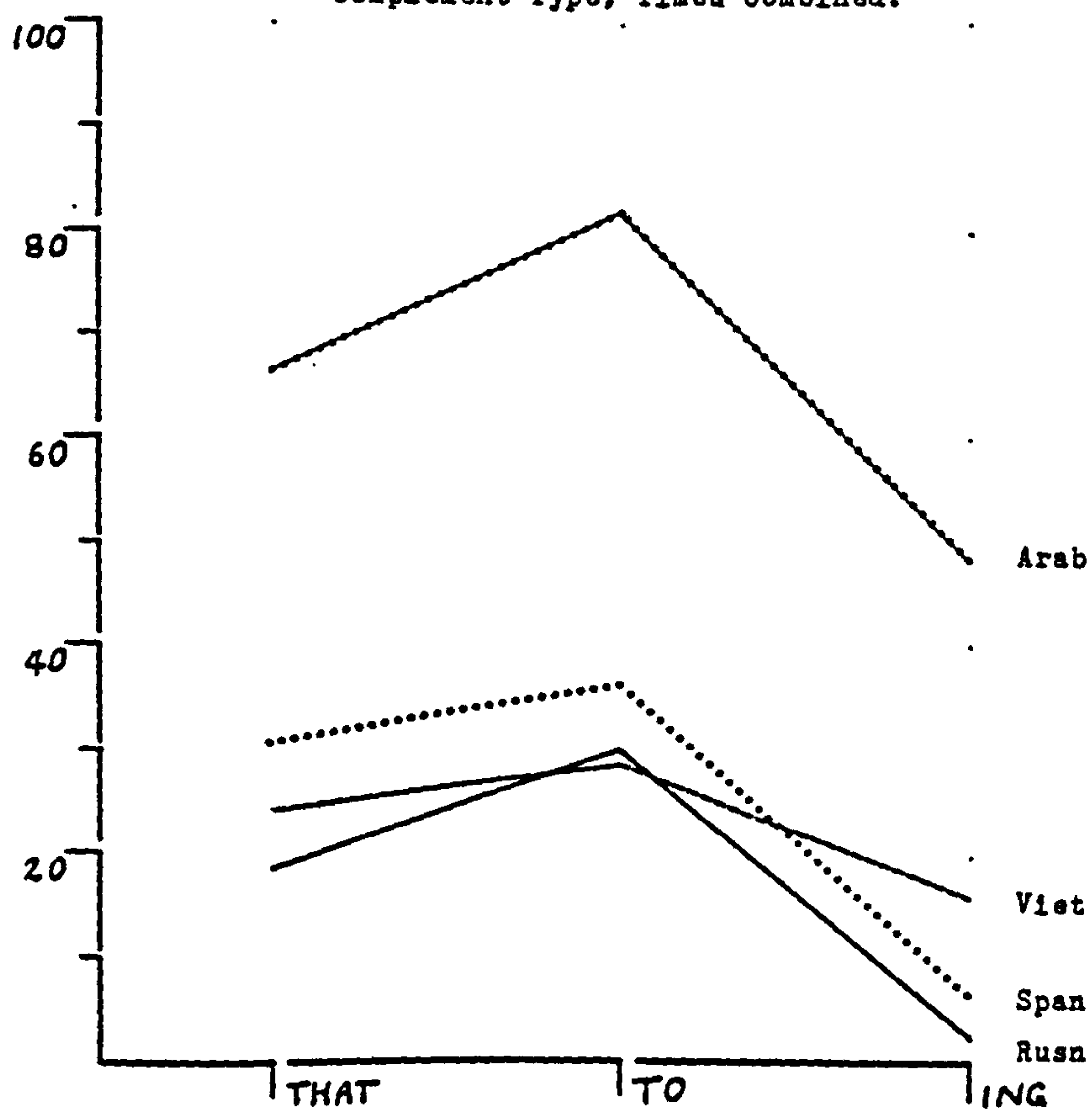


Fig. 5.2.2c: Percentage of Subjects Scoring > 7 for Each Complement Type, Times Combined.



In addition, when the performance of the different language groups as a whole is examined it is clear that they do not constantly maintain their positions in relation to each other across the three complement types. Comparatively the Russian group seems to perform slightly better than would be expected on the THAT type complement and the Vietnamese group rather worse. The Vietnamese group comparatively also appears to perform rather better on the ING type than would have been expected. The Arabic group appears to perform better than expected on the TO type.

The clearly different order obtained for THAT and TO in Fig. 5.2.2 a and c suggests the possibility that the learning of these two complement types is occurring at different rates causing a reordering of the target realisation of the types in the course of acquisition. The use of approximative curves, as described in Section 5.1.1, enables the visual representation of the relationship between the learning of the 3 complement types. Approximation curves were fitted to the scatter of subjects scores for each complement type (y-axis) against the total scores for the complement (x-axis). Figure 5.2.3 shows the resulting curves for the 3 types for each language group. The crossover suggested by the group range data is evident for each of the groups. THAT appears to be the more favoured of the two types in the initial stages (when total score is very low, until at most 40%). Although the correct use of the TO complement is less favoured initially, once the learning of this complement type has commenced it appears to progress very rapidly and at a total score of > 30-40% TO becomes more favoured. On average the reordering appears to occur when the scores for each of the two types is between 45% and 70%, precisely as the group range data suggests.

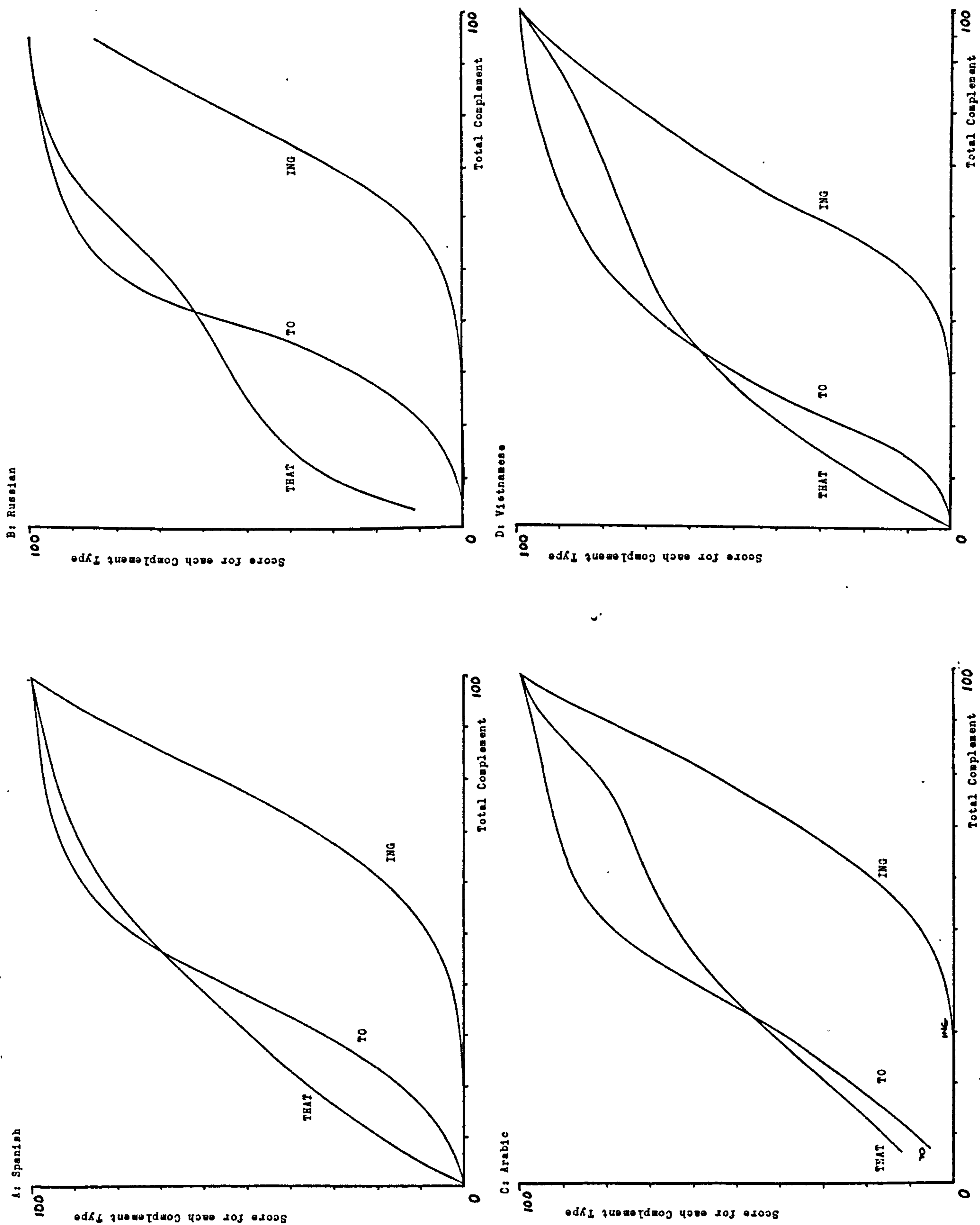
5.2.1.2 Individual Behaviour

Implicational Analysis

Bimodal Scaling

The scores for the subjects were scaled using the SPSS Guttman Scale

Fig.5.2.3: Approximation Curves for Complement Types (y-axis) and Total Complement (x-axis).



Program for two division points, >4 (44%) and >7 (78%), at each test time and for the times combined. The values of R and S obtained are given in Appendix B, Table 4.2.1. The scales show that the best orders overall for each of the two division points are the same for all the groups, namely THAT $>$ TO $>$ ING at the lower division point (4) and TO $>$ THAT $>$ ING at the higher division point (7). The full scale details for each group for the times combined are given in Table 5.2.3 a to d. As may have been expected from the analysis of group trends, for all groups there is a change in the best order depending on the division point. Nevertheless, for each group at each time and for the times combined the scales are significant and valid for this best order, thus indicating a high degree of individual conformance to the group pattern.

Multi-Valued Scaling

As in Section 5.1.1.2 having established the presence of significant scales using the bimodal technique, manual scaling was carried out using the more sensitive multi-valued technique. As for Copula only discrepancies which amounted to a difference of more than one item (out of the 9 possible for each type) were considered to constitute deviations from the pattern. The resulting values of R are presented in Table 5.2.4a and the actual scales in Appendix B Table 3.2.1. For the three lower scoring groups the THAT $>$ TO $>$ ING order provides the best fit for the data scaled. For the two later test times the Vietnamese group favours the second order, TO $>$ THAT $>$ ING. This order also provides the best fit for the Arabic groups score patterns. This preference for the order in which the TO type is more favoured for the correct use of predicate complementation reflect the greater number of sets of scores in the higher ranges ($> 4-5$) for the two most favoured types, THAT and TO, and thus at the level of acquisition where the apparent crossover in the learning of these two types has taken place.

For all the groups virtually all the deviations in the pattern in the individuals' sets of score arise from the ordering of THAT and TO.

Table 5.2.3: Bimodal Scales for Complement Types, using division points of 4 and 7. Times Combined.

A: SPANISH

ITEM..	ING	TO		THAT		TOTAL
RESP..	0	1	0	1	0	1
C	I	I	I	I	I	I
O	3	0	10	0	10	10
M	I	I	I	I	I	I
P	I	I	I	I	I	I
4	2	21	0	21	0	21
I	I	I	I	I	I	I
1	19	0	13	6	6	13
I	I	I	I	I	I	I
0	22	0	22	0	22	0
I	I	I	I	I	I	I
SUMS	52	19	35	37	28	44
PCTS	96	14	49	51	39	61
ERRORS	0	0	0	6	6	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.94
MINIMUM MARGINAL REPRODUCIBILITY = 0.66
PERCENT IMPROVEMENT = 0.29
COEFFICIENT OF SCALABILITY = 0.84

ITEM..	ING	THAT		TO		TOTAL
RESP..	0	1	0	1	0	1
C	I	I	I	I	I	I
O	3	0	4	0	4	4
M	I	I	I	I	I	I
P	I	I	I	I	I	I
7	2	11	1	12	1	11
I	I	I	I	I	I	I
1	17	0	11	6	6	11
I	I	I	I	I	I	I
0	39	0	39	0	39	0
I	I	I	I	I	I	I
SUMS	57	5	50	22	46	26
PCTS	93	7	69	31	64	36
ERRORS	0	1	0	6	7	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.94
MINIMUM MARGINAL REPRODUCIBILITY = 0.76
PERCENT IMPROVEMENT = 0.18
COEFFICIENT OF SCALABILITY = 0.74

B: RUSSIAN

ITEM..	ING	TO		THAT		TOTAL
RESP..	0	1	0	1	0	1
C	I	I	I	I	I	I
O	3	0	7	0	7	7
M	I	I	I	I	I	I
P	I	I	I	I	I	I
4	2	27	0	27	0	27
I	I	I	I	I	I	I
1	14	0	14	0	0	14
I	I	I	I	I	I	I
0	29	0	29	0	29	0
I	I	I	I	I	I	I
SUMS	79	7	43	34	29	48
PCTS	91	9	56	44	38	52
ERRORS	0	0	0	0	0	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 1.00
MINIMUM MARGINAL REPRODUCIBILITY = 0.70
PERCENT IMPROVEMENT = 0.30
COEFFICIENT OF SCALABILITY = 1.00

ITEM..	ING	THAT		TO		TOTAL
RESP..	0	1	0	1	0	1
C	I	I	I	I	I	I
O	3	0	2	0	2	2
M	I	I	I	I	I	I
P	I	I	I	I	I	I
7	2	9	0	9	0	9
I	I	I	I	I	I	I
1	15	0	12	3	3	12
I	I	I	I	I	I	I
0	51	0	51	0	51	0
I	I	I	I	I	I	I
SUMS	75	2	63	14	54	23
PCTS	97	3	82	18	70	35
ERRORS	0	0	0	3	3	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.97
MINIMUM MARGINAL REPRODUCIBILITY = 0.83
PERCENT IMPROVEMENT = 0.14
COEFFICIENT OF SCALABILITY = 0.85

Table 5.2.3 (cont.): Bimodal Scales for Complement Types,
using division point of 4 and 7, Times Combined.

C: ARABIC									
ITEM..		ING		TO		THAT			
RESP..	0	1	I	0	1	I	0	1	I
-----I-----		-----I-----		-----I-----		-----I-----		-----I-----	
C	I	I	I	I	I	I	I	I	I
0	3	I	0	20	I	0	20	I	0
20	I	0	20	I	0	20	I	0	20
M	I	-----ERR	I	I	I	I	I	I	I
P	I	I	I	I	I	I	I	I	I
4	2	I	9	0	I	3	9	I	0
9	I	0	9	I	0	9	I	0	9
-----I-----		-----ERR		-----I-----		-----I-----		-----I-----	
1	I	1	0	I	1	0	I	0	1
1	I	0	1	I	0	1	I	0	1
-----I-----		-----ERR		-----I-----		-----I-----		-----I-----	
3	I	0	3	I	0	3	I	0	3
3	I	0	3	I	0	3	I	0	3
-----I-----		-----I-----		-----I-----		-----I-----		-----I-----	
SUM	13	20	4	29	3	30			33
PCTS	39	51	12	88	9	91			
ERRORS	1	0	3	4	1	0			0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 1.00
 MINIMUM MARGINAL REPRODUCIBILITY = 0.80
 PERCENT IMPROVEMENT = 0.20
 COEFFICIENT OF SCALABILITY = 1.00

JITEM..		ING		THAT		TO				
1PESP..	G	1	I	0	1	I	0	1	I	TOTAL
-----I-ERR-----I-ERR-----I-ERR-----I										
C	I	I	I	I	I	I	I	I	I	
0	3	I	0	15	I	0	15	I	0	15
M	I	-----	ERR	I	I	I	I	I	I	
P	I	I	I	I	I	I	I	I	I	
7	2	I	7	1	I	1	7	I	0	8
I	I	I	I	I	-----	ERR	I	I	I	
I	I	I	I	I	I	I	I	I	I	
1	I	4	0	I	4	0	I	0	4	4
I	I	I	I	I	I	I	I	-----	ERR	I
I	I	I	I	I	I	I	I	I	I	
0	I	6	0	I	6	0	I	6	0	6
-----I-----I-----I-----I-----I										
SUMS		17	16	11	22	6	27			33
PCTS		32	49	33	57	18	82			
ERRORS		0	1	1	0	0	0			2

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.98
 MINIMUM MARGINAL REPRODUCIBILITY = 0.67
 PERCENT IMPROVEMENT = 0.31
 COEFFICIENT OF SCALABILITY = 0.94

O: VIETNAMESE										
JITEM..		ING		TO		THAT				
RESP..	0	1	I	0	1	I	0	1	I	TOTAL
C	I		I		I		I		I	
0	3	0	20	0	20	0	20	0	20	20
M	I		I		I		I		I	
P	I		I		I		I		I	
4	2	18	0	3	18	0	18	0	18	18
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I		I		I	
	I		I		I					

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.94
 MINIMUM MARGINAL REPRODUCIBILITY = 0.60
 PERCENT IMPROVEMENT = 0.34
 COEFFICIENT OF SCALABILITY = 0.86

JITEM..	ING	THAT		TO		TOTAL	
JRESP..	0	1	0	1	0	1	
	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	
C	I						
0	3	0	12	0	12	0	12
M	~~ERR~~	~~ERR~~					
P	I						
7	2	5	3	1	7	2	6
	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	
	I						
	I						
	1	13	0	9	4	6	9
	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	
	I						
	0	62	0	62	0	62	0
	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	~~ERR~~	
SUMS	80	15	72	23	62	27	95
PCTS	34	15	70	24	72	28	
ERRORS	0	3	1	4	6	0	14

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.95
 MINIMUM MARGINAL REPRODUCIBILITY = 0.77
 PERCENT IMPROVEMENT = 0.18
 COEFFICIENT OF SCALABILITY = 0.79

Table 5.2.4a: Coefficients of Reproducibility for Best Order
for Multi-Valued Scaling, times combined.

Group	Best Order	R
Spanish	THAT $\geq$ TO $\geq$ ING	.94
Russian	THAT $\geq$ TO $\geq$ ING	.93
Arabic	TO $\geq$ THAT $\geq$ ING	.96
Vietnamese	THAT $\geq$ TO $\geq$ ING	.94

Traditional scaling techniques do not make provision for dealing with such reordering. When the crossover is allowed for virtually all these deviations are eradicated.

5.2.2 Variability According to the Relationship between Subjects

5.2.2.1 Group Trends

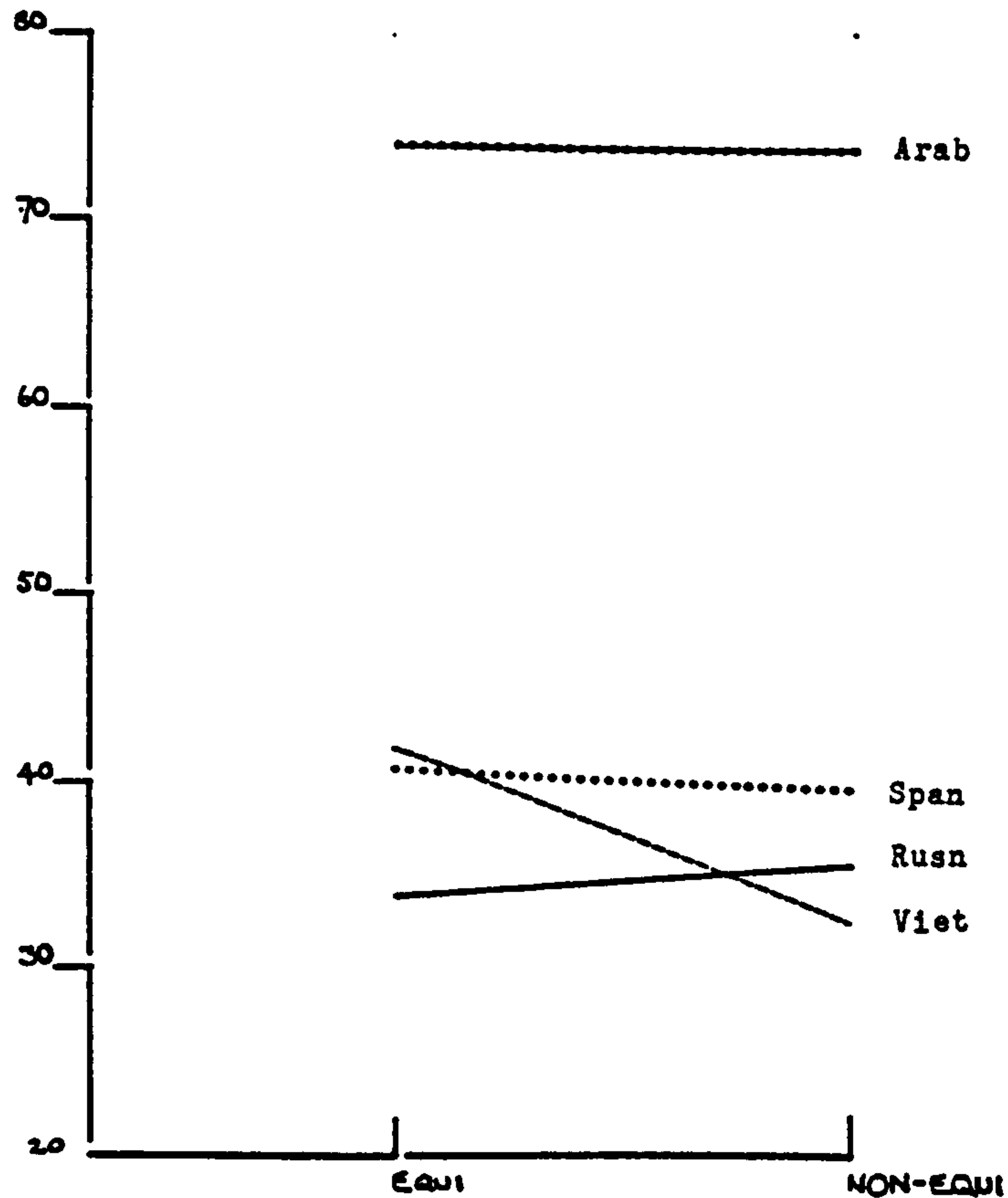
In addition to the main analysis of the learning of the three forms of predicate complementation, a secondary analysis was made. The relationship between the subjects in the main and subordinate clause (i.e.: EQUI or NON-EQUI) was investigated to determine if the variability in the subjects' correct realisation of complementation was affected by this aspect of the syntax of predicate complement constructions. To analyse group trends the mean score for each Subject Identity type was calculated (Appendix B, Table 5.3). Figure 5.2.4 shows the means obtained in graph form. It is clear that for all groups but the Vietnamese very little variability in realisation would appear, at least at the group level, to be constrained by the subject identity type. Values of t for the difference in means for EQUI and NON-EQUI were calculated (Table 5.2.4). Only the difference in mean between the two types in the Vietnamese group is significant.

Table 5.2.4: Values of t for Difference in Mean for Subject Identity Types, times combined

Type	Group Spanish	Russian	Arabic	Vietnamese
	t	t	t	t
EQUI-NON EQUI	0.59	- 0.73	0.14	4.71 ⁺

+ $p = 0.01$ level of significance (two tail test)

Fig. 5.2.4: Mean Scores for SI Types, Times Combined.



To further investigate the existence of variability dependent on the relationship between subjects in main and subordinate clauses, the number of subjects in each of 6 score ranges was determined (Table 5.2.5). Figure 5.2.5 shows in graph form the percentage of subjects in each group obtaining scores ≥ 7 for each of the two Subject Identity Types. It is apparent from the distribution of scores for the two types that all groups score more highly for EQUI than NON-EQUI. In all but the Vietnamese group, however, the difference in terms of the number of subjects scoring ≥ 7 is small. The Vietnamese group shows a marked preference for the EQUI SI type for the correct realisation of predicate complementation, which is apparent through the whole range of scores.

Table 5.2.5: Number of Subjects in each Score Range for each Subject Identity (SI) Type, times combined.

A: SPANISH

Range	Subject Identity Type	
	EQUI	NON-EQUI
0	9	13
1-2	19	17
3-4	14	13
4.5-6	17	19
7-8	8	6
9	5	4
	72	72
$\bar{x} \geq 7$	18.1	13.9

B: RUSSIAN

Range	SI Type	
	EQUI	NON-EQUI
0	10	9
1-2	30	29
3-4	14	14
4.5-6	13	17
7-8	9	6
9	1	2
	77	77
$\bar{x} \geq 7$	13.0	10.4

Table 5.2.5 (continued): Number of Subjects in each Score

Range for each SI Type, times combined

C: ARABIC

Range	SI Type EQUI	NON-EQUI
0	0	1
1-2	4	3
3-4	2	3
4.5-6	5	5
7-8	11	11
9	11	10
	33	33
% ≥ 7	66.7	63.6

D: VIETNAMESE

Range	SI Type EQUI	NON-EQUI
0	12	17
1-2	32	40
3-4	10	12
4.5-6	17	14
7-8	16	7
9	8	5
	95	95
% ≥ 7	25.3	12.6

Approximation curves were drawn for the score for each SI type (y-axis) against the score for predicate complementation as a whole (x-axis). The curves obtained for each group are presented in Figure 5.2.6. They show that in terms of the average relationship between the learning of the two SI types, only the Vietnamese group shows a clear separation between the types. For the Spanish, Russian and Arabic groups the two curves are very similar to each other in position and shape with little separation between them.

Fig. 5.2.5: Percentage of Subjects Scoring 7 for Each SI Type,
Times Combined.

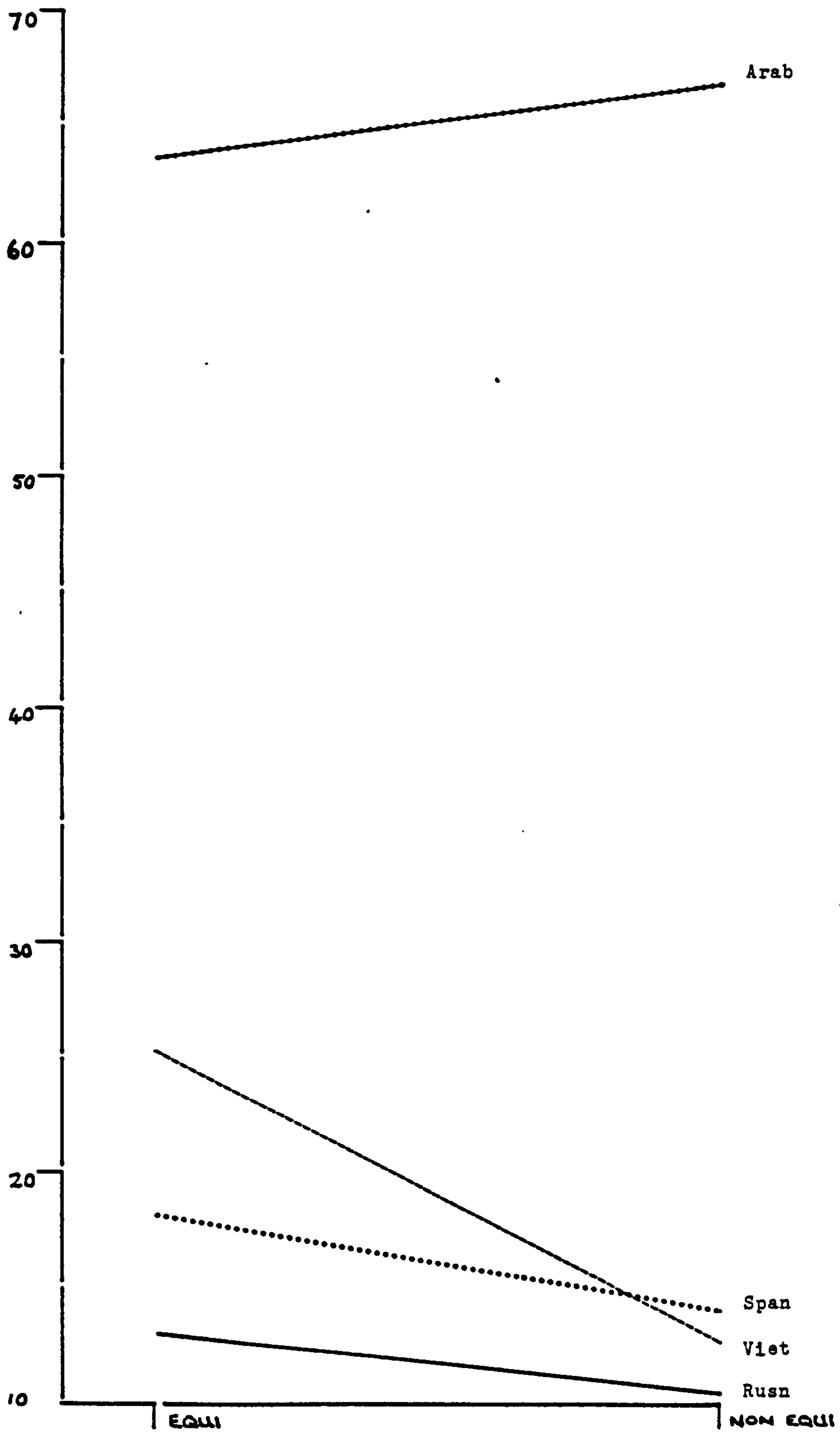
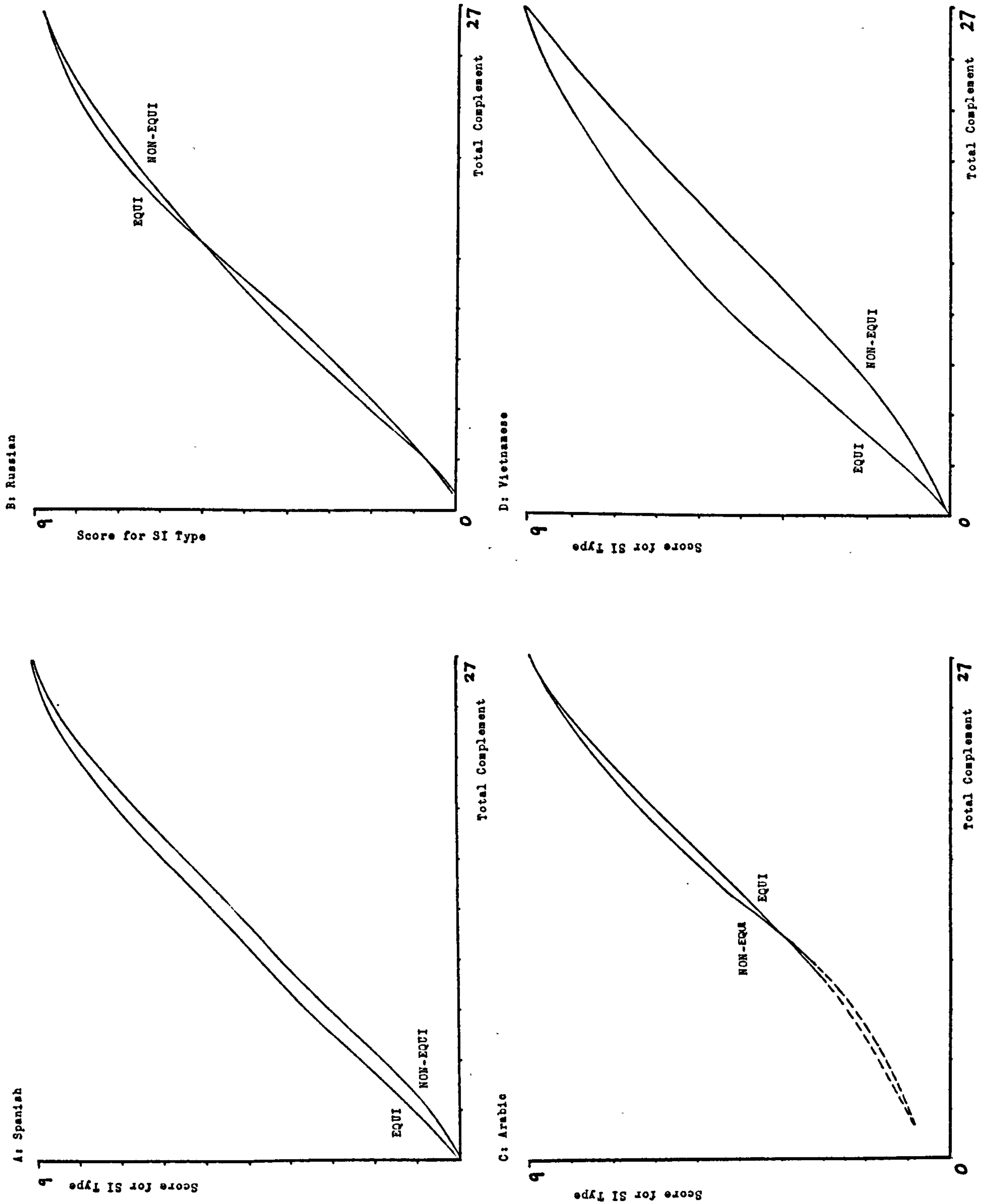


Fig.5.2.6: Approximation Curves for Subject Identity Types (y-axis) and Total Complement (x-axis).



5.2.2.2 Individual Behaviour

Implicational Analysis

Bimodal Scaling

The existence of variability in the subjects' scores according to the SI type has been established, although the extent of this variability for three of the groups, judging from the analysis of group trends, does not appear to be large. Implicational scaling was carried out in order to establish the degree of individual conformance to the apparent group pattern. First the scores for the subjects in each group was scaled bimodally using a division point of >7 . The scales obtained for the times combined are in Table 5.2.6. (The values of R and S for each time separately are given in Appendix B, Table 4.3.1.) All the scales are significant and indicate an order in which the EQUI type is favoured over the NON-EQUI type for the correct realisation of predicate complementation. The scales for the Spanish, Russian and Arabic groups show a relatively small number of subjects in the scale type (pattern 1, "0 1") in which there is differentiation between the two SI types ($\leq 10\%$). For the Vietnamese group the percentage of subjects in the differentiating pattern is 50% greater.

Multi-Valued Scaling

The existence of valid scales at the bimodal level suggested the possibility of their being an implicational relationship in terms of the numerical scores throughout the range of possible scores. As in previous sections for the same reasons only discrepancies > 1 item (out of 9) in each subjects's scores were considered to constitute deviations from the implicational pattern. The full scales obtained are given in Appendix B, Table 3.2.2. The coefficients of reproducibility for each time separately are given in Appendix B, Table 4.3.2. Table 5.2.7 shows the best overall order and value of R for each group. All the scales are highly significant and all show the

Table 5.2.6: Bimodal Scales for SI Types using a division point of 7.

Times Combined.

A: SPANISH

OITEM..	NONEQUI			EQUI			TOTAL
ORESP..	0	1	I	0	1	I	
	-----I-ERR-----			-----I-ERR-----			
E	I			I			
G	2	I	0	8I	0	8I	8
U	I			-----ERRI			
I	I			I			
7	1	I	3	2I	2	5I	7
	I			I		-----ERRI	
	I			I			
	0	I	37	0I	57	0I	57
	I			I			
SUMS	62	10		57	13		72
PCTS	86	14		82	18		
ERRORS	0	2		2	0		4

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.97
 MINIMUM MARGINAL REPRODUCIBILITY = 0.84
 PERCENT IMPROVEMENT = 0.13
 COEFFICIENT OF SCALABILITY = 0.83

B: RUSSIAN

OITEM..	NONEQUI			EQUI			TOTAL
ORESP..	0	1	I	0	1	I	
	-----I-ERR-----			-----I-ERR-----			
E	I			I			
G	2	I	0	5I	0	5I	5
U	I			-----ERRI			
I	I			I			
7	1	I	3	3I	3	5I	8
	I			I		-----ERRI	
	I			I			
	0	I	64	0I	64	0I	64
	I			I			
SUMS	69	8		57	10		77
PCTS	90	10		87	13		
ERRORS	0	3		3	0		6

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.96
 MINIMUM MARGINAL REPRODUCIBILITY = 0.88
 PERCENT IMPROVEMENT = 0.03
 COEFFICIENT OF SCALABILITY = 0.67

C: ARABIC

OITEM..	NONEQUI			EQUI			TOTAL
ORESP..	0	1	I	0	1	I	
	-----I-ERR-----			-----I-ERR-----			
E	I			I			
G	2	I	0	20I	0	20I	20
U	I			-----ERRI			
I	I			I			
7	1	I	2	1I	1	2I	3
	I			I		-----ERRI	
	I			I			
	0	I	10	0I	10	0I	10
	I			I			
SUMS	12	21		11	22		33
PCTS	36	64		33	67		
ERRORS	0	1		1	0		2

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.97
 MINIMUM MARGINAL REPRODUCIBILITY = 0.65
 PERCENT IMPROVEMENT = 0.32
 COEFFICIENT OF SCALABILITY = 0.91

D: VIETNAMESE

OITEM..	NONEQUI			EQUI			TOTAL
ORESP..	0	1	I	0	1	I	
	-----I-ERR-----			-----I-ERR-----			
E	I			I			
G	2	I	0	10I	0	10I	10
U	I			-----ERRI			
I	I			I			
7	1	I	14	2I	2	14I	16
	I			I		-----ERRI	
	I			I			
	0	I	69	0I	69	0I	69
	I			I			
SUMS	83	12		71	24		95
PCTS	87	13		75	25		
ERRORS	0	2		2	0		4

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.98
 MINIMUM MARGINAL REPRODUCIBILITY = 0.81
 PERCENT IMPROVEMENT = 0.17
 COEFFICIENT OF SCALABILITY = 0.89

Table 5.2.7: Best Orders and Values of R for Multi-Valued
Scaling for SI Types, times combined

Group	Best Order	R
SPANISH	EQUI $\succ$ NON-EQUI	.94
RUSSIAN	EQUI $\succ$ NON-EQUI	.94
ARABIC	EQUI $\succ$ NON-EQUI	.98
VIETNAMESE	EQUI $\succ$ NON-EQUI	.97

same implicational hierarchy, in which EQUI is favoured over NON-EQUI. The ordering of SI types is more apparent when the relationship between the two types along the full course of their learning is examined. Although from the scales (Appendix B, Table 3.2.2) there are clearly a number of subjects who score very similarly for the two types, there are also a large number who score considerably higher on the EQUI type.

5.2.3 Development Over Time

5.2.3.1 Group Trends

The mean scores for complementation for each core group at each test time are presented in Figure 5.2.7. From the graph it is apparent that the means of all groups increase from Time 1 to Time 4 and in all cases but one (Vietnamese 1-2) from each time to the next. T values were calculated for each group to determine if the difference in mean scores at the various test times was large enough to be significant. The values of t obtained are presented in Table 5.2.8. For all groups the difference between Time 1 and Time 4 is large enough to constitute a statistically significant difference. Those between Times 2 and 3 and Time 4 are also significant for all but the Arabic group.

Fig. 5.2.7: Mean Scores for Predicate Complementation,
Time 1 to Time 4.

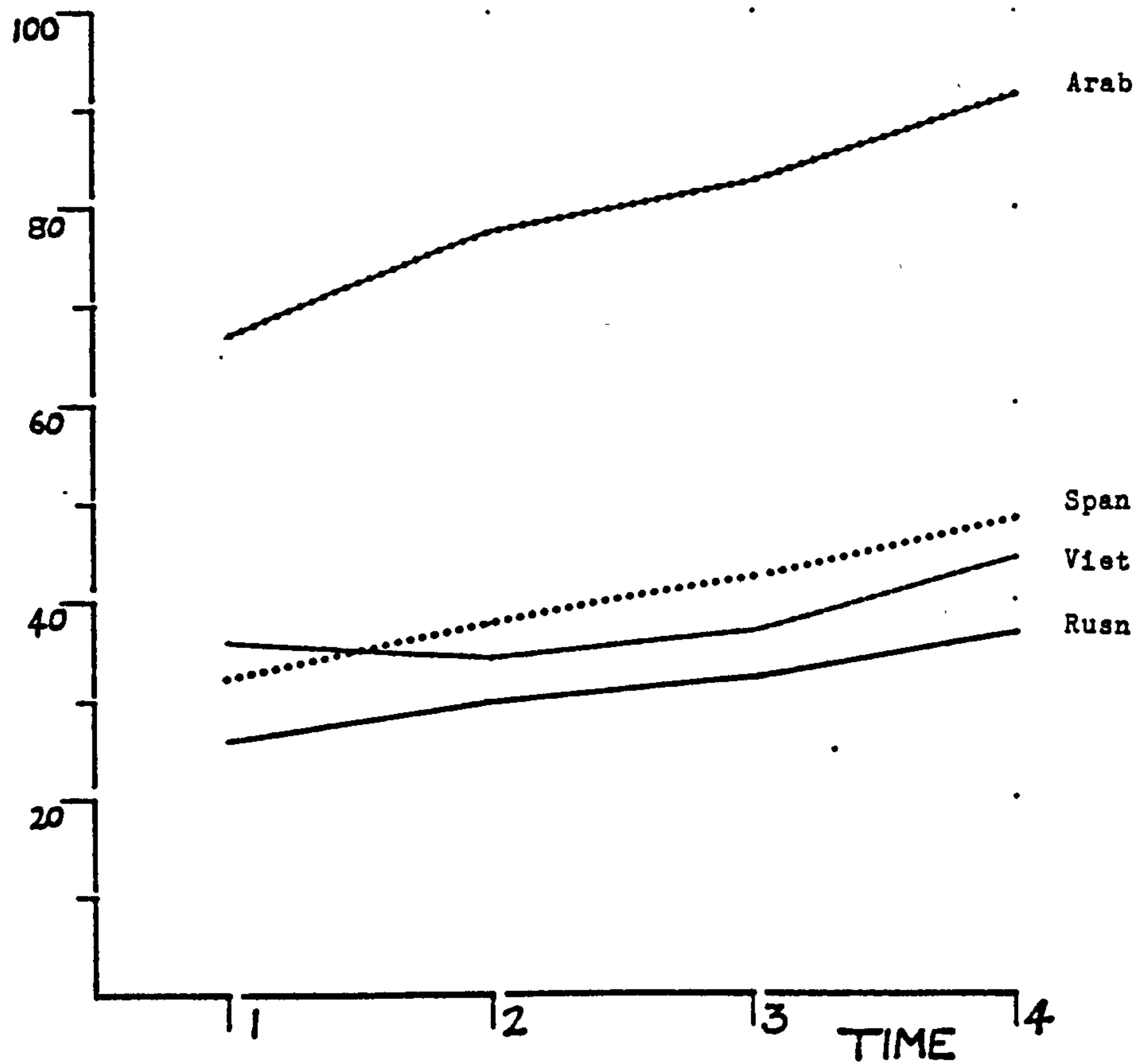


Table 5.2.8: Results of t-tests for difference in Means
at 4 test times for Total Complement Score

TIMES	GROUP			
	Spanish t	Russian t	Arabic t	Vietnamese t
1-4	- 3.05 ⁺	- 2.63 ⁺	- 2.61*	- 2.92 ⁺
1-3	- 1.98*	- 1.68	- 2.80*	- 0.41
1-2	- 1.42	- 1.85*	- 2.74*	1.16
2-4	- 3.74 ⁺	- 2.17*	- 1.83	- 4.35 ⁺
2-3	- 1.15	- 0.61	- 1.16	- 1.41
3-4	- 2.95 ⁺	- 2.43 ⁺	- 0.83	- 3.47 ⁺

+ p = 0.01 level of significance
 * p = 0.05 level of significance } one-tail significance

To investigate the relationship between the scores of the subjects for complementation at the four test times, Pearson's "r"s were calculated for each group. The results are presented in Table 5.2.9 a to d. All but one of the correlations (Arabic 1-4) are significant and for all but 2, $r > .7$. In general the correlations tend to be highest for each group between scores at times closest to each other. In addition, there appears to be a stronger relationship between the scores in Times 2, 3 and 4, than between Time 1 and Times 2, 3 and 4. These results suggest differences in the rate of change among subjects in each group. The strongest correlations between the scores at the 4 test times are found in the Vietnamese group.

5.2.3.2 Individual Behaviour

Investigation of the development of individuals within the groups required the calculation of the percentage of subjects progressing, maintaining the same level and regressing from each time to the next and from Times 1 to 4. The results are given in Table 5.2.10. In the lower scoring three groups, Spanish, Russian and Vietnamese, a considerable proportion of the group regressed from Time 1 to Time 4. This proportion was a quarter for Spanish and a third for the other two groups.

Figure 5.2.8 shows the proportion of progressers and regressers in each of the ranges of score changes from Time 1 to Time 4. These results reveal that for all groups, but the Arabic (for which the scope for progress, given the already high scores, was more limited), those who progressed tended to make a considerable improvement; approximately 80% improved by more than 10 percentage points. In contrast, of the regressers all regressed 15% or less. In the case of the Vietnamese and Spanish groups more than 50% regressed 5% or less.

Table 5.2.9: Pearson Correlations for Scores for Complementatation at the Four Times.

A: Spanish

	T1	T2	T3	T4
T1	1.0000 (0) P=*****	0.8144 (16) P=0.000	0.7808 (16) P=0.000	0.7152 (16) P=0.001
T2	0.8144 (16) P=0.000	1.0000 (0) P=*****	0.9435 (16) P=0.000	0.9284 (16) P=0.000
T3	0.7808 (16) P=0.000	0.9435 (16) P=0.000	1.0000 (0) P=*****	0.9379 (16) P=0.000
T4	0.7152 (16) P=0.001	0.9284 (16) P=0.000	0.9379 (16) P=0.000	1.0000 (3) P=*****

B: Russian

T1	1.0000 (0) P=*****	0.8828 (18) P=0.000	0.7788 (18) P=0.000	0.6647 (18) P=0.001
T2	0.8828 (18) P=0.000	1.0000 (0) P=*****	0.8839 (18) P=0.000	0.8480 (18) P=0.000
T3	0.7788 (18) P=0.000	0.8839 (18) P=0.000	1.0000 (0) P=*****	0.9437 (18) P=0.000
T4	0.6647 (18) P=0.001	0.8480 (18) P=0.000	0.9437 (18) P=0.000	1.0000 (0) P=*****

C: Arabic

T1	1.0000 (0) P=*****	0.9136 (7) P=0.002	0.8052 (7) P=0.014	0.6116 (7) P=0.072
T2	0.9136 (7) P=0.002	1.0000 (0) P=*****	0.8477 (7) P=0.008	0.7886 (7) P=0.018
T3	0.8052 (7) P=0.014	0.8477 (7) P=0.008	1.0000 (0) P=*****	0.7865 (7) P=0.018
T4	0.6116 (7) P=0.072	0.7886 (7) P=0.018	0.7865 (7) P=0.018	1.0000 (0) P=*****

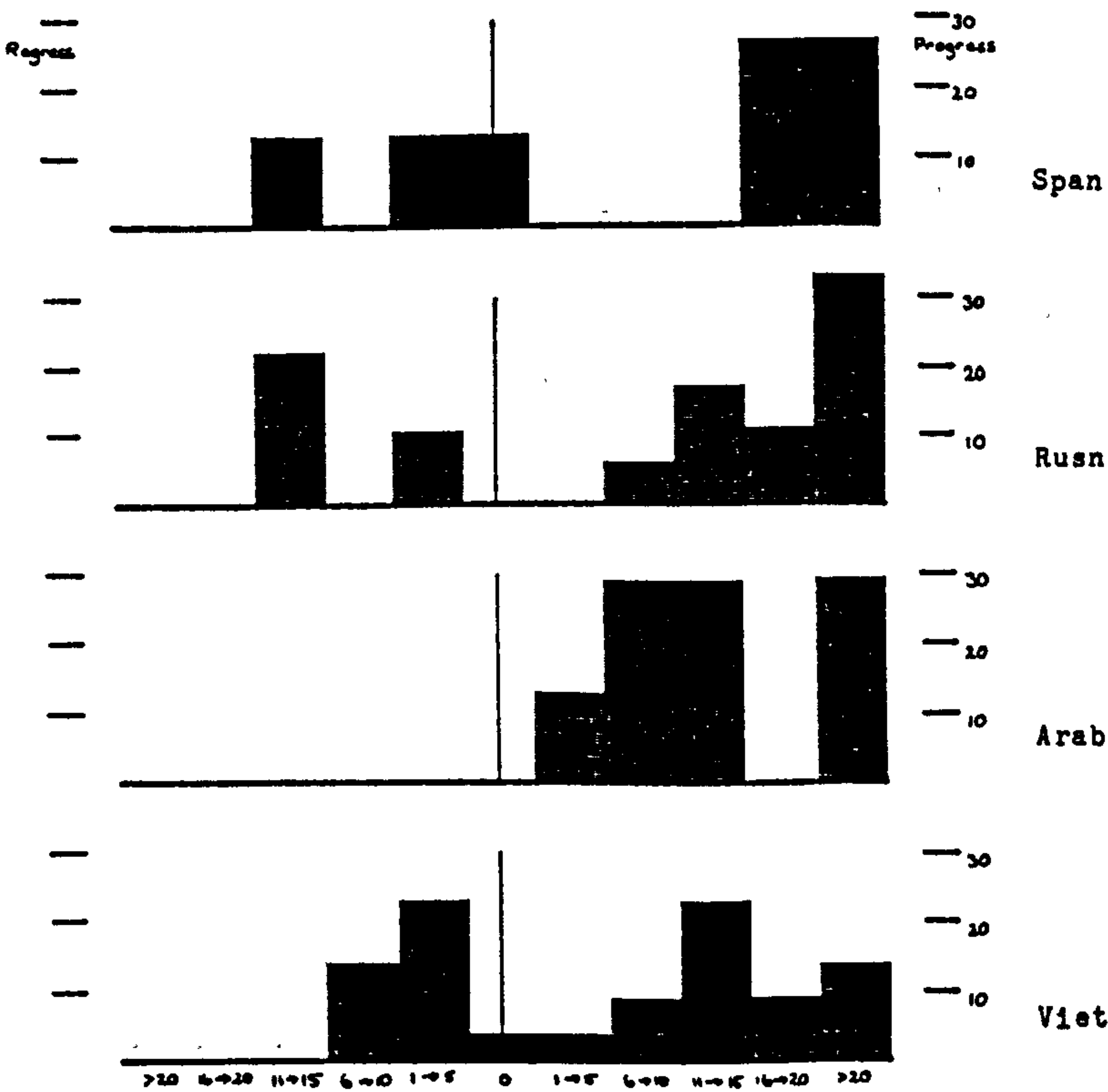
D: Vietnamese

T1	1.0000 (0) P=*****	0.9673 (22) P=0.000	0.9147 (22) P=0.000	0.9006 (22) P=0.000
T2	0.9673 (22) P=0.000	1.0000 (0) P=*****	0.9462 (22) P=0.000	0.9338 (22) P=0.000
T3	0.9147 (22) P=0.000	0.9462 (22) P=0.000	1.0000 (0) P=*****	0.9467 (22) P=0.000
T4	0.9006 (22) P=0.000	0.9338 (22) P=0.000	0.9467 (22) P=0.000	1.0000 (3) P=*****

Table 5.2.10: Percentage of Subjects in each core Group Progressing, Regressing, and not changing over time

GROUP	MOVEMENT	Times			
		1-2	2-3	3-4	1-4
Spanish (16)	Progressing	63	56	62	63
Russian (18)	Progressing	56	39	78	67
Arabic (7)	Progressing	100	14	14	100
Vietnamese (22)	Progressing	32	50	68	59
Spanish	Not Changing	12	13	19	12
Russian	Not Changing	5	28	5	0
Arabic	Not Changing	0	72	72	0
Vietnamese	Not Changing	0	23	23	0
Spanish	Regressing	25	31	19	25
Russian	Regressing	39	33	17	33
Arabic	Regressing	0	14	14	0
Vietnamese	Regressing	68	27	9	36

Fig.5.2.8: Percentage of Subjects in Each of Ranges of Change for Predicate Complementation, Time 1 to Time 4.



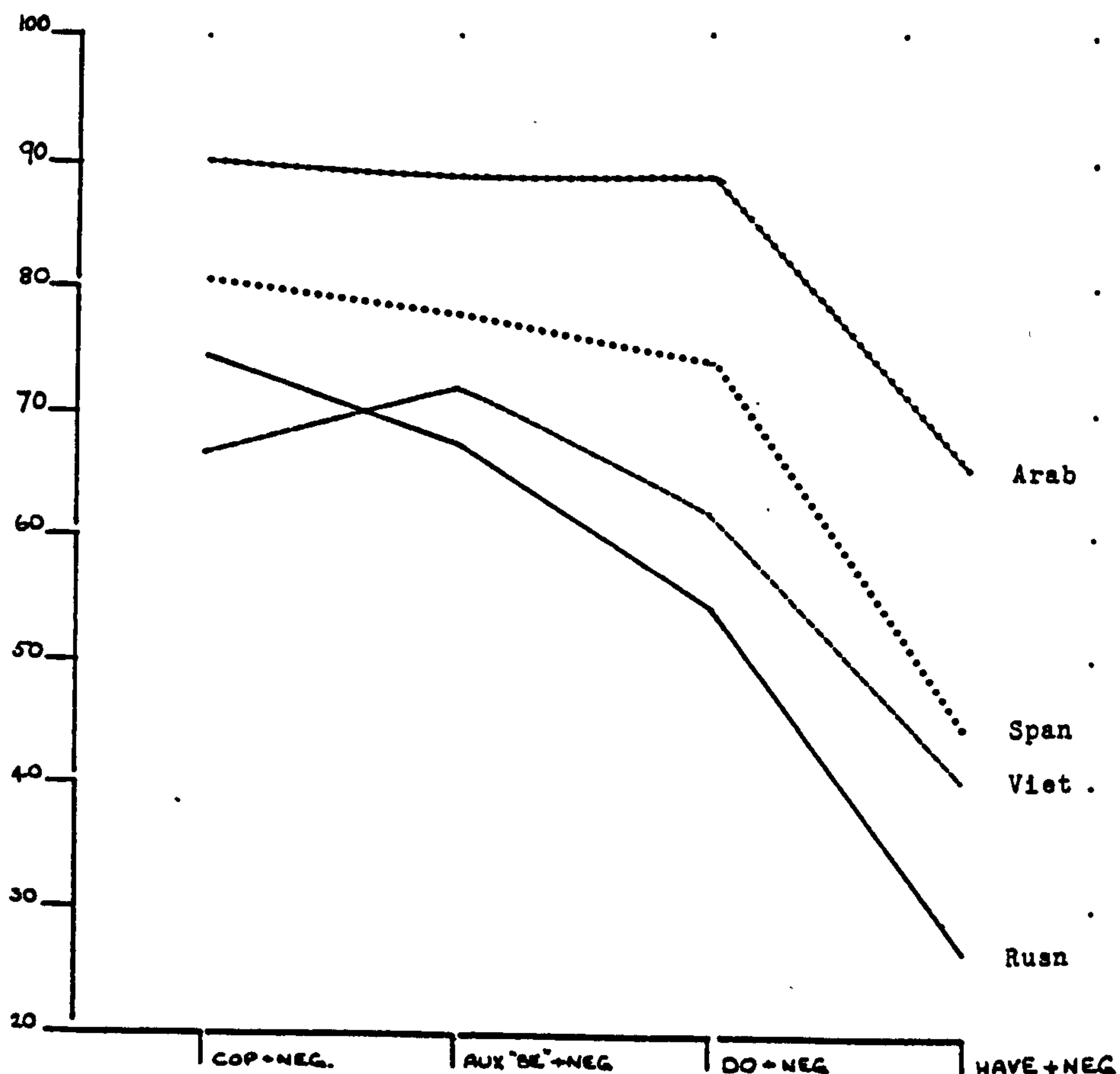
5.3 NEGATION

5.3.1 Variability by AUX + NEG Type

5.3.1.1 Group Trends

To determine if variability exists in the correct formation of the negative dependent on the form of the auxiliary (AUX) which was required and which the negative particle (NEG), "not" or "n't", had to follow the mean score for each group for each AUX + NEG type was calculated (Appendix B, Table 5.4). The means for each type for the times combined are in Figure 5.3.1. Variability according to the AUX type is clearly evident in most cases. For all groups, but the Vietnamese, the Copula (COP) + NEG type is the most favoured followed by AUX 'BE' + NEG. For all groups the HAVE + NEG (followed by past participle of the verb) is the least often correctly realised form.

Fig. 5.3.1: Mean Scores for AUX + NEG Types, Times Combined.



Values of t were calculated for the difference in means for each pair of negative types using the same data as in Fig. 5.3.1. The results of the t -tests are given in Table 5.3.1. For all groups the differences between the three highest means, COP, AUX 'BE' and DO, and the lowest mean, for HAVE, are all highly significant. All differences for the Russian group are highly significant, as is the case for the Vietnamese group with the exception of the difference between COP + NEG and DO + NEG. For the Spanish group the difference between AUX 'BE' + NEG and the means above and below it (COP and DO) are not significant, although in both cases the significance level is just below 5%. The difference between DO and COP is significant. The results of the Arabic group show no significant difference between means for the 3 highest scoring negative types, COP, AUX 'BE' and DO. This is no doubt influenced by the high means for these types (all near or above 90%.)

Table 5.3.1: t Values for Difference in Means for AUX and NEG Types, Times Combined

AUX + NEG TYPES	Spanish t	Russian t	Arabic t	Vietnamese t
AUX 'BE' DO	1.75	3.84 ⁺	- 0.01	2.69 ⁺
AUX 'BE' HAVE	11.65 ⁺	14.80 ⁺	5.26 ⁺	10.96 ⁺
AUX 'BE' COP	- 1.94	- 4.29 ⁺	- 1.24	2.30*
DO HAVE	10.36 ⁺	10.33 ⁺	6.43 ⁺	8.62 ⁺
DO COP	- 3.03 ⁺	- 6.49 ⁺	- 0.47	- 1.60
HAVE COP	-12.68 ⁺	-20.64 ⁺	- 5.96 ⁺	-11.13 ⁺

+ $P = 0.01$ level of significance }
 * $p = 0.05$ level of significance } 2 tail significance

To further investigate group trends for variability according to AUX type, an analysis of each group's distribution of scores for the four types was made (Table 5.3.2 a to d). From this the percentage of subjects scoring $\geq 80\%$ for each type was calculated and is displayed in Figure 5.3.2. These results reveal variability and a clear order among the AUX types for each group which incidentally, is the same regardless of the cumulative percentage level chosen (eg. $\geq 70\%$, $\geq 80\%$, $\geq 90\%$) in all groups but the Vietnamese. In the Vietnamese group at the $\geq 70\%$ level COP and AUX 'BE' are equal with DO less favoured than either. At this level the Vietnamese order more closely resembles the order found in the other groups (COP $\geq$ AUX 'BE' $\geq$ DO $\geq$ HAVE) than at the 80% or 90% level, where COP is less favoured than AUX 'BE' or DO. The clearest separation in the scores for the four AUX + NEG types is evident in the overall lowest scoring Russian group.

The trends emerging from the analysis of means and of group range suggest a clear ordering in the correct formation of negative dependent on the form of auxiliary required. For the Arabic, Spanish and Russian groups the order appears to be, from most to least favoured, COP + NEG $\geq$ AUX 'BE' + NEG $\geq$ DO + NEG $\geq$ HAVE + NEG. Comparative to these groups the Vietnamese score lower than would be expected on COP + NEG. Group trends for this group suggest this order:

$$\text{AUX 'BE' + NEG} \geq \left\{ \begin{array}{l} \text{COP + NEG} \\ \text{DO + NEG} \end{array} \right\} > \text{HAVE + NEG}$$

As in the two preceding sections approximation curves were drawn for each group for the scatter of scores for each AUX + NEG type (y-axis) against the total score for negative (x-axis). The curves obtained are in Fig 5.3.3 a to d. The approximation curves support the trends which have emerged in the analyses of means and ranges. For all groups they show the development of correct formation of COP, AUX 'BE', and DO being fairly close together. For the Arabic group for the part of the curve for which there is sufficient data, COP and

AUX 'BE' seem to be developing simultaneously in an identical way in relation to the total score. The order of COP, AUX 'BE' and DO in the Spanish, Russian and Arabic groups is maintained over the duration of the curves able to be approximated from the data, except in the Russian group where AUX 'BE' crosses over COP when the score for both is almost 90%. As earlier analyses suggested, for the Vietnamese group there is considerable reordering of the COP, AUX 'BE' and DO types in the course of development. Initially, COP seems to be more favoured, but once AUX 'BE' + NEG begins to be used the development in this form appears to be more rapid than that for COP. Similarly, DO is the last of the three to gain momentum in its development, but once development has progressed it becomes more favoured than COP at about 80% level for both. The crossover of COP with the other two types for this group suggests overgeneralisation of DO + NEG type negation to environments in which either COP, or to a lesser extent AUX 'BE' is required. In addition in the early stages 'BE' + NEG appears to have been overgeneralised to simple tense environments. For all groups correct HAVE + NEG is clearly the last of the four negative types to develop.

Table 5.3.2: Modified Group Range for Negative Types, Times Combined

A: SPANISH

Range	AUX COP	+ NEG Type AUX 'BE'	DO	HAVE
0	0	0	2	8
1-19	0	2	6	10
20-39	9	10	4	20
40-59	6	5	7	7
60-69	2	4	6	2
70-79	1	3	2	6
80-89	13	9	16	12
90-99	32	9	0	1
100	9	30	29	5
	72	72	72	71
% > 80%	75.0	66.7	62.5	25.4

Table 5.3.2 (continued): Modified Group Range for Negative Types

B: RUSSIAN

Range	AUX COP	+ NEG Type AUX 'BE'	DO	HAVE
0	0	0	0	12
1-19	0	1	5	11
20-39	6	11	18	38
40-59	12	18	23	8
60-69	1	12	7	2
70-79	9	3	5	3
80-89	17	9	12	2
90-99	22	5	0	0
100	2	17	6	0
	76	76	76	76
% $\geq$ 80%	54.0	40.8	23.7	2.6

C: ARABIC

Range	AUX COP	+ NEG Type AUX 'BE'	DO	HAVE
0	0	1	0	0
1-19	1	1	0	1
20-39	2	1	1	6
40-59	0	0	0	6
60-69	0	0	3	4
70-79	0	0	3	3
80-89	0	3	7	4
90-99	19	8	0	0
100	11	19	19	8
	33	33	33	32
% $>$ 80%	90.9	90.9	78.8	36.4

Fig. 5.3.2: Percentage of Subjects Scoring $\geq 80\%$ for Each AUX + NEG Type, Times Combined.

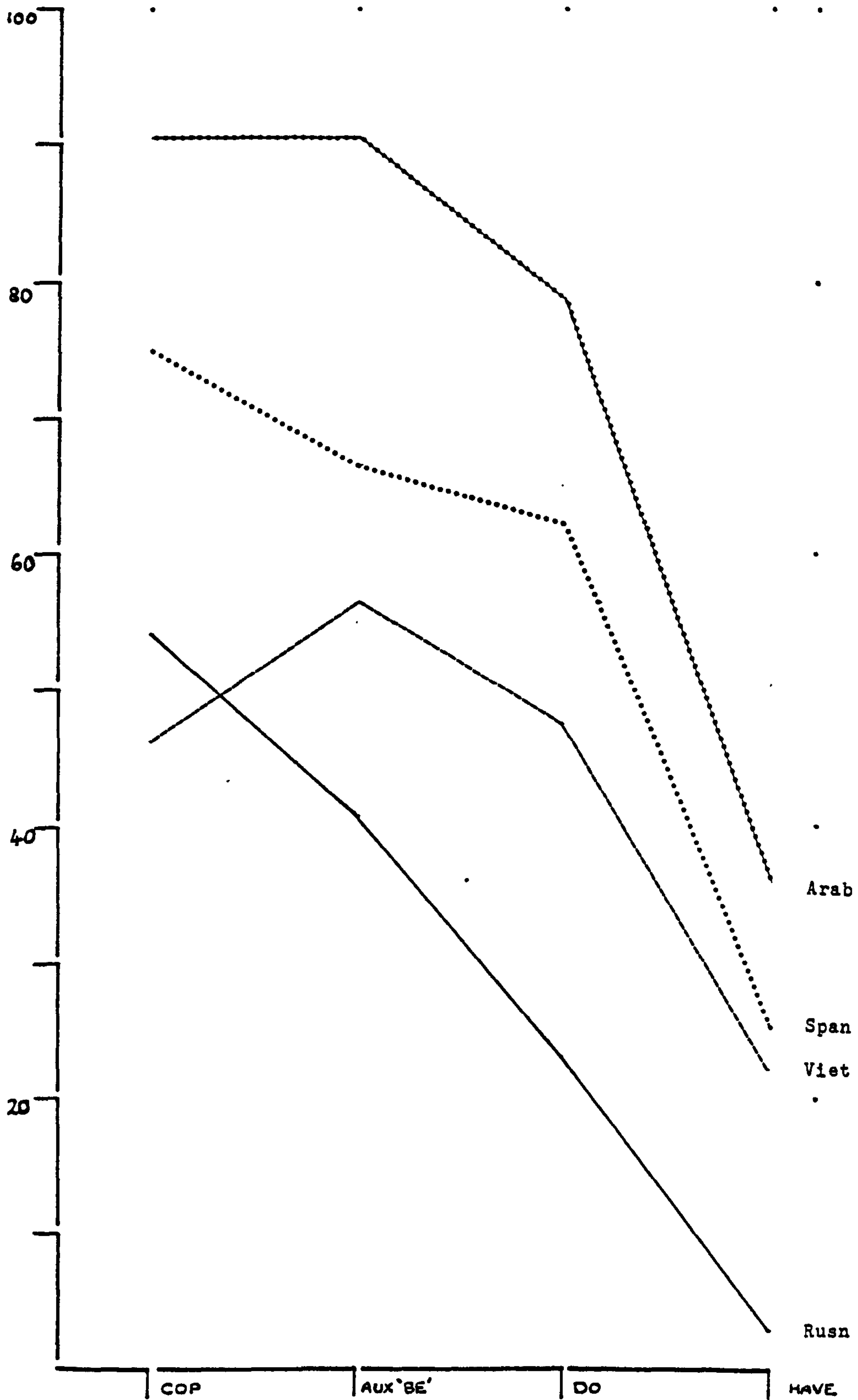


Table 5.3.2 (continued): Modified Group Range for Negative Types

D: VIETNAMESE

Range	AUX COP	+ NEG Type AUX 'BE'	DO	HAVE
0	1	2	4	15
1-19	5	6	9	16
20-39	19	15	22	22
40-59	11	8	8	12
60-69	3	8	4	2
70-79	12	2	3	7
80-89	10	15	9	18
90-99	21	6	0	0
100	13	33	36	3
	95	95	95	95
% > 80%	46.3	56.8	47.4	22.1

5.3.1.2 Individual Behaviour

Implicational Analysis

Bimodal Scaling

The scores for the subjects for each AUX + NEG type were scaled to determine the degree of individual fit to the group pattern. The scales for the best order for each group with all times combined using a division point of approximately 80% are given in Table 5.3.3. Scores for the HAVE and DO Types (which were out of a total of 9) equivalent to 78% were rounded up to 80%. All the scales obtained are significant. As expected from the analysis of group trends, very few deviations in the pattern involve the least favoured type HAVE + NEG. Most deviations in individuals from the pattern of the group as a whole and from the majority of individuals in the group involve the ordering of DO, AUX 'BE' and COP. The coefficients obtained

Fig.5.3.3: Approximation Curves for AUX + NEG Types (y-axis) and Total Negation (x-axis)

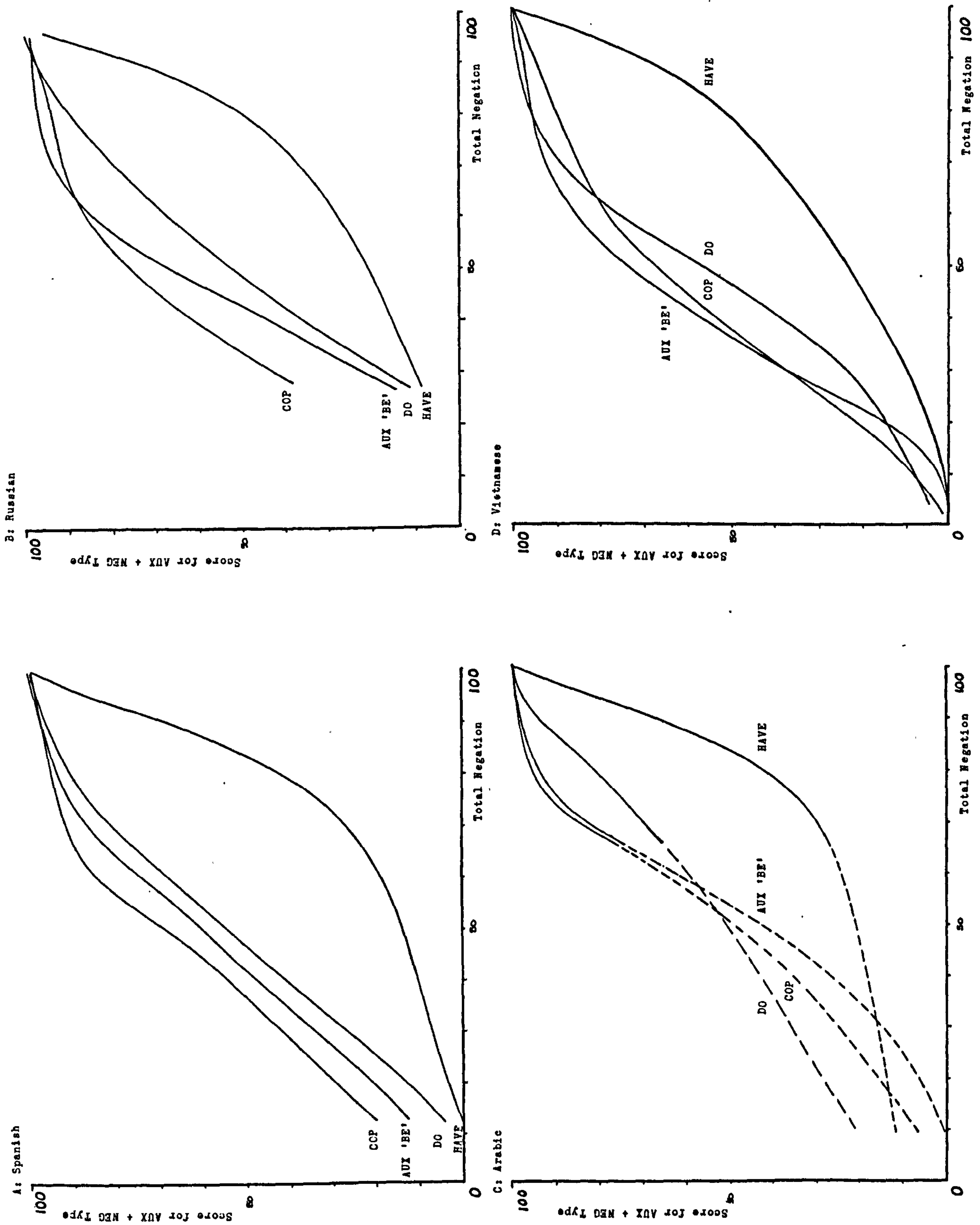


Table 5.3.3: Bimodal Scales for AUX + NEG Types, Times Combined.

A: SPANISH

ITEM..	HAVE		DO		AUX*BE*		COP		TOTAL	
JRESP..	0	1	0	1	0	1	0	1		
A	I		I		I		I		I	
U	4	0	18	0	18	0	18	0	18	18
X	I	ERR			I		I		I	
N	I		I		I		I		I	
E	3	24	0	0	24	0	24	0	24	24
G	I		I	ERR			I		I	
	I		I		I		I		I	
	2	7	0	5	2	5	0	7		7
	I		I		I	ERR			I	
	I		I		I		I		I	
	1	5	0	5	0	4	1	4		5
	I		I		I		I	ERR		
	I		I		I		I		I	
	0	17	0	17	0	17	0	17	0	17
	I		I		I		I		I	
SUMS	53	16	27	44	23	48	18	53		71
PCTS	73	25	38	62	32	68	25	73		
ERRORS	0	0	0	2	2	1	1	0		6

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.98
 MINIMUM MARGINAL REPRODUCIBILITY = 0.70
 PERCENT IMPROVEMENT = 0.28
 COEFFICIENT OF SCALABILITY = 0.93

B: RUSSIAN

CITEM.. HAVE		DO		AUX*BE*				COP		TOTAL
JRESP..	0	1	0	1	0	1	0	1		
	I	ERR	I	ERR	I	ERR	I	ERR	I	
A	I		I		I		I		I	
U	4	0	1	0	1	0	1	0	1	
X	I	ERR	I		I		I		I	
N	I		I		I		I		I	
E	3	13	1	13	0	14	0	14	14	
G	I		I	ERR	I		I		I	
	I		I		I		I		I	
	2	17	0	16	1	16	0	17	17	
	I		I		I	ERR	I		I	
	I		I		I		I		I	
	1	11	0	3	19	1	4	7	11	
	I		I		I		I	ERR	I	
	I		I		I		I		I	
	0	33	0	33	0	33	0	33	33	
	I		I		I		I		I	
SUMS	74	2	58	18	44	32	37	39	76	
PCTS	97	3	76	24	58	42	49	51		
ERRORS	0	1	1	4	1	1	4	0	12	

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.96
 MINIMUM MARGINAL REPRODUCIBILITY = 0.71
 PERCENT IMPROVEMENT = 0.25
 COEFFICIENT OF SCALABILITY = 0.87

C: ARABIC

ITEM..	HAVE		DO		AUX*BE*				COP		TOTAL
JRESP..	0	1	0	1	0	1	0	1			
	-----I	ERR-----	-----I	ERR-----	-----I	ERR-----	-----I	ERR-----	-----I		
A	I		I		I		I		I		
U	4	I	0	12	I	0	12	I	0	12	12
X	I	-----ERR	I		I		I		I		
N	I		I		I		I		I		
E	3	I	13	0	I	0	13	I	0	13	13
G	I		I	-----ERR	I		I		I		
	I		I		I		I		I		
	2	I	4	0	I	4	0	4	I	0	4
	I		I		I	-----ERR	I		I		
	I		I		I		I		I		
	1	I	0	0	I	0	0	I	0	0	0
	I		I		I		I	-----ERR	I		
	I		I		I		I		I		
	0	I	3	0	I	3	0	I	3	0	3
	I	-----	I	-----	I	-----	I	-----	I	-----	
SUMS		20	12	7	25	3	29	3	29		32
PCTS		63	38	22	78	9	91	9	91		
ERRORS		0	0	0	0	0	0	0	0		0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 1.00
 MINIMUM MARGINAL REPRODUCIBILITY = 0.81
 PERCENT IMPROVEMENT = 0.20
 COEFFICIENT OF SCALABILITY = 1.00

D: VIETNAMESE

ITEM..	HAVE		COP		DO		AUX*BE*		TOTAL	
RESP..	0	1	0	1	0	1	0	1		
	I-ERR		I-ERR		I-ERR		I-ERR		I	
A	I		I		I		I		I	
U	4	0	21	0	21	0	21	0	21	21
X	I	ERR			I		I		I	
M	I		I		I		I		I	
E	3	16	0	0	16	0	16	0	16	16
G	I		I-ERR		I		I		I	
	I		I		I		I		I	
	2	9	0	3	6	6	3	0	9	9
	I		I		I-ERR		I		I	
	I		I		I		I		I	
	1	14	0	14	0	9	5	5	9	14
	I		I		I		I-ERR		I	
	I		I		I		I		I	
	0	35	0	35	0	35	0	35	0	35
	I-ERR		I-ERR		I-ERR		I-ERR		I	
SUMS	74	21	52	43	50	45	40	55		95
PCTS	79	22	55	45	53	47	42	58		
ERRORS	0	0	0	6	6	5	5	0		22

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.94
 MINIMUM MARGINAL REPRODUCIBILITY = 0.61
 PERCENT IMPROVEMENT = 0.33
 COEFFICIENT OF SCALABILITY = 0.85

for the best order for each group at each time, and, in addition, for the Vietnamese group for the order favoured by the other 3 groups are in Appendix B Table 4.4. Results from the Vietnamese group seem to indicate a change in the position of DO in the order in comparison to the COP, AUX 'BE' types. This is noticeable in the change in best orders from time to time. The Spanish group shows a similar change at Time 3.

Multi-Valued Scaling

Having established significant bimodal scales, the more sensitive multi-valued scaling was applied to the sets of scores manually. As in previous structures analysed only discrepancies greater than one item difference in score were counted as deviations from the pattern. Since for HAVE and DO there were only 9 occurrences, only discrepancies > 12% were considered to constitute deviations. The scales obtained can be found in Appendix B Tables 3.3. The coefficients of reproducibility obtained for the best order for each group when all times are combined are given below (Table 5.3.4). (The results for each time separately are in Appendix B Table 4.5.)

Table 5.3.4: Best Order for each Group using Multi-Valued Scaling, times combined

GROUP	BEST ORDER	R
SPANISH	COP > AUX > DO > HAVE	.97
RUSSIAN	COP > AUX > DO > HAVE	.93
ARABIC	{COP AUX} > DO > HAVE	.98
VIETNAMESE	AUX > COP > DO > HAVE	.94

Clearly for all groups the COP + NEG and AUX 'BE' + NEG types are the most favoured. The Arabic group's scales are not conclusive regarding the order between COP and AUX 'BE', mainly because for most subjects the scores for both is exceedingly high (91% are > 80%). The Vietnamese group appears to favour AUX 'BE' + NEG

(followed by V-ing) for correct formation of the negative over COP + NEG. The Spanish and Russian groups clearly find COP easier than AUX 'BE'.

There are more deviations from the implicational pattern in the Vietnamese and Russian groups than in the Spanish and Arabic. Most deviations involve the favouring of DO for correct formation of negative over AUX 'BE' and/or COP. This suggests a small number of subjects are overgeneralising the DO + NEG form of negation to environments where another AUX form is required. Such a strategy leads to a high percentage of correct DO + NEG and low percentage correct for the other AUX + NEG types.

5.3.2 Variability by Environments Within COP + NEG Type

5.3.2.1 Group Trends

In the items dealing with Negation preceded by Copula, the same four environments as were in the affirmative; __ADJ, __NP, __PP and __PART, were included. To determine if variability exists dependent on the environment of COP + NEG, group trends in terms of mean scores and the spread of range of scores (group range) were analysed.

Fig 5.3.4 shows diagrammatically the mean scores for each group for each environment with data from the four test times combined. Table 5.3.5 gives the values and significance of t obtained for the differences in means for each group. Appendix B, Table 5.5 contains the means obtained.

These results show variability by environment, although in the three most favoured environments __ADJ, __NP and __PP the differences are often not large enough to be significant. For the Spanish group the difference between __ADJ and __PP is not significant as is the case for the Russian group between __ADJ and __NP. None of the differences between the three most favoured environments are significant for the

Fig. 5.3.4: Mean Scores for COP + NEG Environments,
Times Combined.

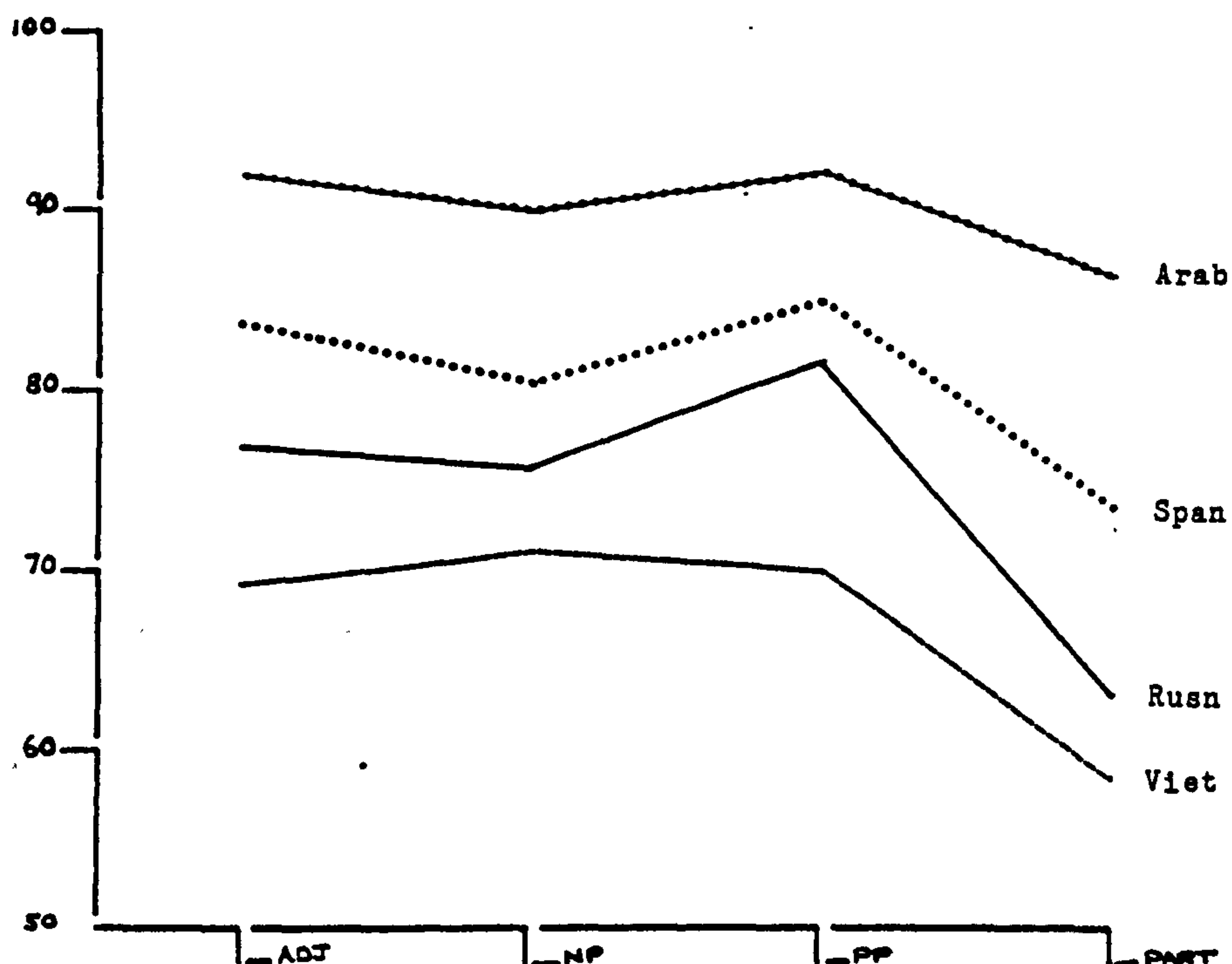


Table 5.3.5: t Values for Difference in Means for COP + NEG
Environments, times combined

COP + NEG Environments	Spanish t	Russian t	Arabic t	Vietnamese t
ADJ NP	2.89 ⁺	0.77	1.68	- 1.57
ADJ PP	- 1.17	- 3.25 ⁺	- 0.19	- 0.48
NP PP	- 3.43 ⁺	- 3.62 ⁺	- 1.80	0.96
ADJ PART	6.68 ⁺	6.61 ⁺	3.89 ⁺	6.61 ⁺
NP PART	4.77 ⁺	5.75 ⁺	3.02 ⁺	6.64 ⁺
PP PART	7.30 ⁺	8.67 ⁺	4.07 ⁺	6.69 ⁺

+ p = 0.01 level of significance - two tail test of significance

Arabic or Vietnamese groups. Compared to the results for Copula in the negative form PP is more favoured relative to the ADJ and NP environments.

The group ranges for the scores in the four environments are presented in Table 5.3.6. Figure 5.3.5 shows graphically the percentage of subjects scoring $> 80\%$ and $> 90\%$ in each environment. The graph showing the percentage of subjects in each group obtaining scores $> 90\%$ in each environment (Figure 5.3.5b) indicates a clear favouring of the PP environment at this level of performance in all groups. At the $> 80\%$ level only the Russian group shows the same clear preference. Together with the results concerning the order of means, these results suggest an ordering of the realisation of Copula in the four negative environments for each group as in Table 5.3.7.

Table 5.3.7: Suggested Ordering of Environments from analysis of Group Trends, times combined

GROUP	ORDER
SPANISH } ARABIC }	$\left\{ \begin{array}{c} \text{PP} \\ \text{ADJ} \end{array} \right\} \geq \text{NP} > \text{PART}$
RUSSIAN	$\text{PP} > \left\{ \begin{array}{c} \text{ADJ} \\ \text{NP} \end{array} \right\} \geq \text{PART}$
VIETNAMESE	$\left\{ \begin{array}{c} \text{PP} \\ \text{NP} \end{array} \right\} > \text{ADJ} \geq \text{PART}$

Table 5.3.6: Modified Group Range for COP + NEG Environments,
Times Combined

A: SPANISH

Range	Environment			
	ADJ	NP	PP	PART
0	0	0	0	0
1-19	1	1	1	2
20-39	6	9	5	7
40-59	4	6	8	9
60-79	5	4	3	12
80-89	10	10	3	18
90-99	14	9	15	13
100	32	33	37	11
	72	72	72	72
% ≥ 80%	77.8	72.2	76.4	58.3
% ≥ 90%	63.9	58.3	72.2	33.3

B: RUSSIAN

Range	Environment			
	ADJ	NP	PP	PART
0	0	0	0	0
1-19	0	1	0	2
20-39	6	5	2	11
40-59	10	8	9	17
60-79	13	17	15	23
80-89	21	19	13	7
90-99	9	11	13	9
100	17	15	24	7
	76	76	76	76
% ≥ 80%	61.8	59.2	65.8	30.3
% ≥ 90%	34.2	34.2	48.7	21.1

Table 5.3.6 (continued): Modified Group Range for COP + NEG
Environments, times combined

C: ARABIC

Range	Environment			
	<u>ADJ</u>	<u>NP</u>	<u>PP</u>	<u>PART</u>
0	0	0	1	1
1-19	1	1	0	0
20-39	1	2	2	2
40-59	1	0	0	0
60-79	0	0	0	1
80-89	1	5	0	6
90-99	4	3	3	9
100	25	22	27	14
	<u>33</u>	<u>33</u>	<u>33</u>	<u>33</u>
% > 80%	90.9	90.9	90.9	87.9
% > 90%	87.9	75.8	90.9	69.7

D: VIETNAMESE

Range	Environment			
	<u>ADJ</u>	<u>NP</u>	<u>PP</u>	<u>PART</u>
0	3	2	3	3
1-19	1	4	2	11
20-39	13	12	16	14
40-59	17	14	11	17
60-79	14	9	12	17
80-89	9	13	8	8
90-99	15	7	11	7
100	23	34	32	18
	<u>95</u>	<u>95</u>	<u>95</u>	<u>95</u>
% ≥ 80%	49.5	56.8	53.7	34.7
% ≥ 90%	40.0	43.2	45.3	26.3

Fig. 5.3.5a: Percentage of Subjects Scoring $> 80\%$ for COP + NEG in each of Four Environments, Times Combined.

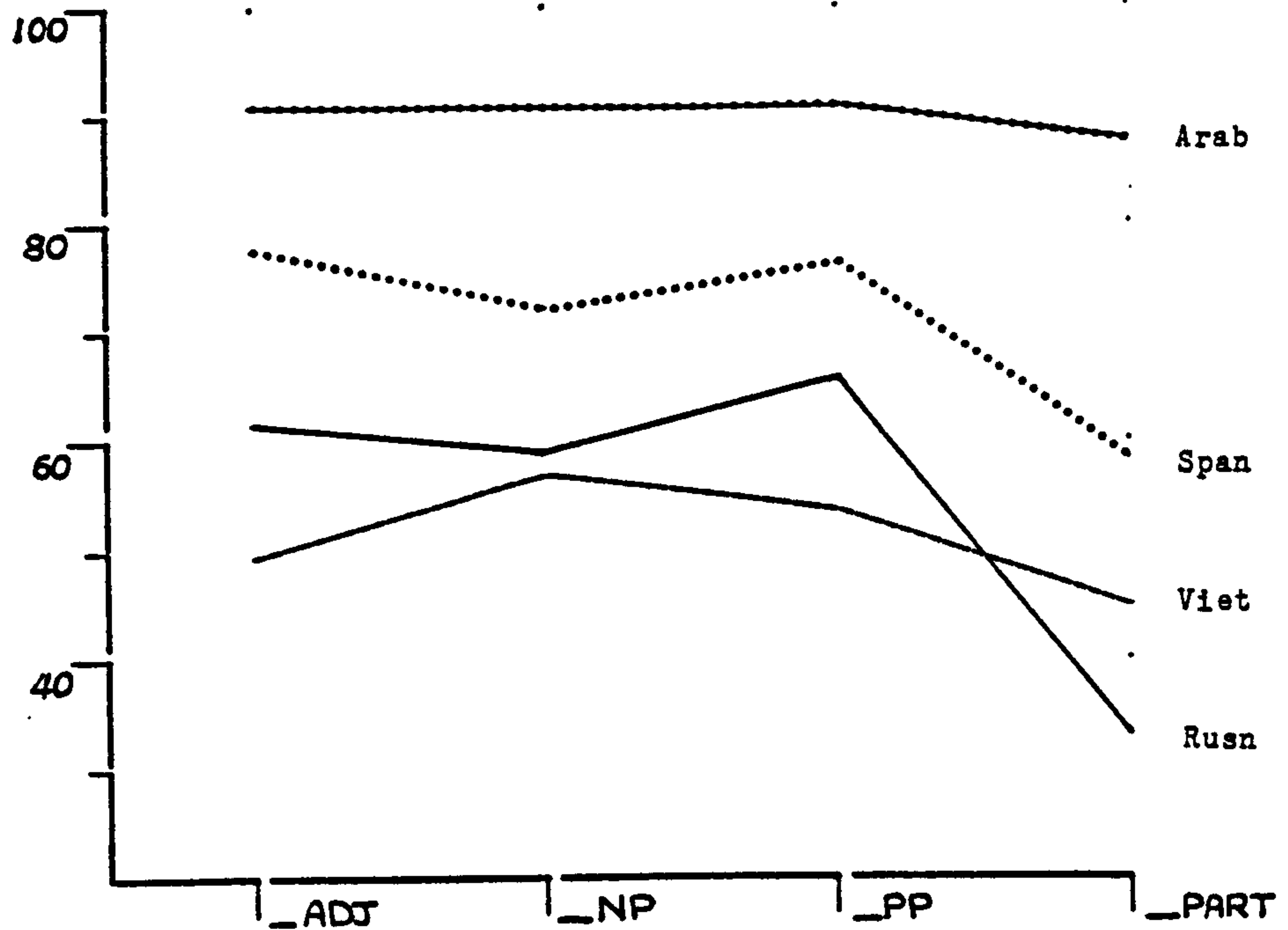
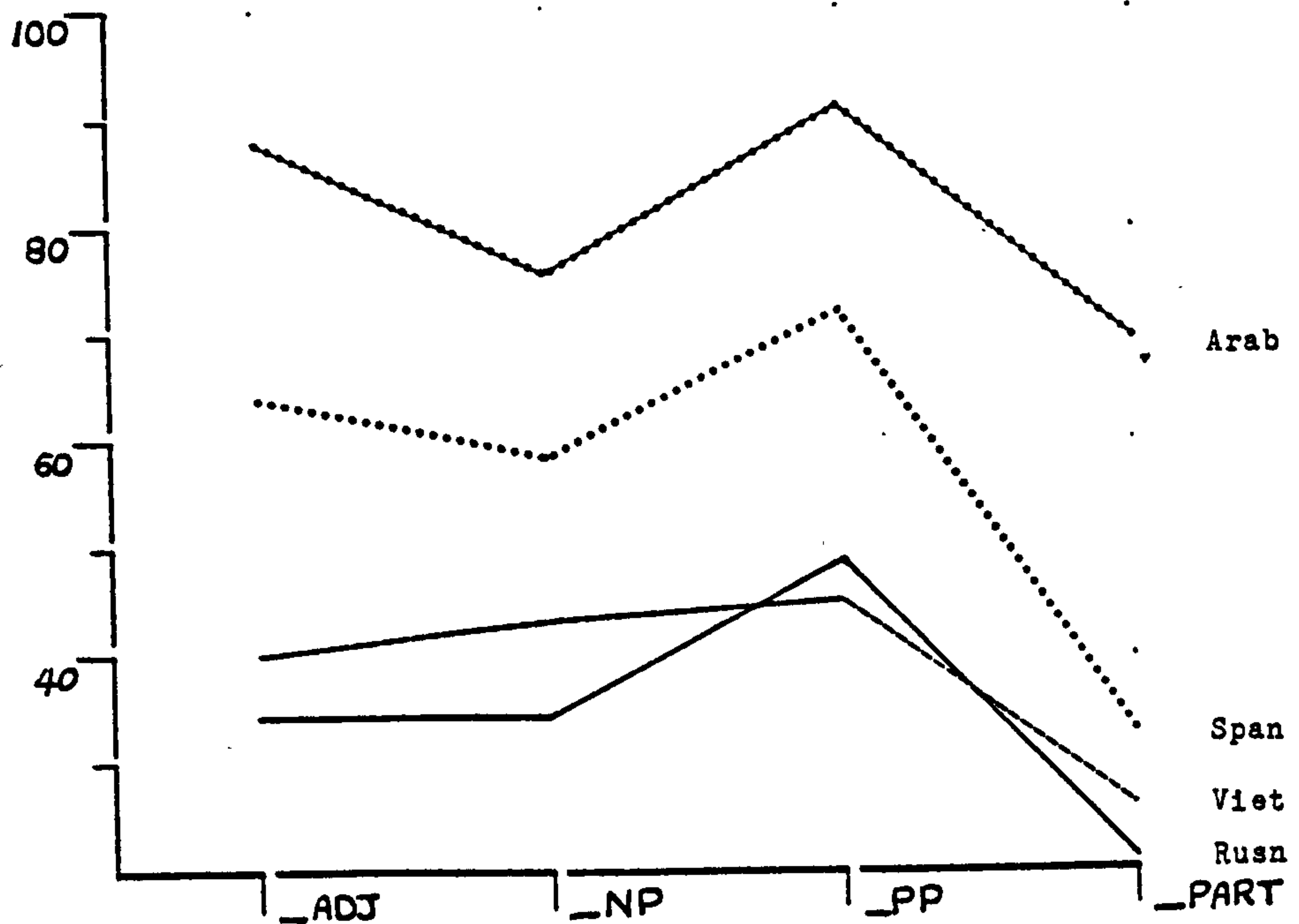


Fig. 5.3.5b: Percentage of Subjects Scoring $> 90\%$ for COP + NEG in each of Four Environments, Times Combined.



Approximation Curves were drawn for each group for each environment as a function of the total score obtained for COP + NEG. Figure 5.3.6 shows the curves obtained for the four environments for each group. In all groups scores for the environments in particular the three most favoured ones, __ADJ, __NP, and __PP, appear to be very close to each other and there is considerable reordering in the course of development even within the crucial 20%-80% section of the curve for the score for each environment. This is in marked contrast to the curves obtained for Copula realisation in the positive, where there is generally a much clearer separation of scores in the four environments and the relationship between environments is invariant in the 20%-80% segment of the curves.

5.3.2.2 Individual Behaviour

Implicational Analysis

Bimodal Scaling

The scores for the individual subjects in each group at the four times were scaled, initially bimodally, to determine the degree of individual fit to the group pattern. The scales obtained for the best order for each group using an approximate point of 80% with data from all times combined, are given in Table 5.3.8. All the scales obtained are highly significant. From the scales we can see that for the Arabic group there are no sets of scores in either of the 2 scale patterns (1 and 2) which determine the relative order of the three most favoured environments, __ADJ, __NP, __PP. Similarly in the Spanish group only 3 sets of scores fall into these 2 patterns and thus determine the order of these 3 environments. In the Russian and Vietnamese groups more sets of scores fall into these 2 types, but these are also where most of the errors in the patterns occur. It is clear particularly for the Arabic and Spanish group that there is little clear differentiation in the realisation of COP + NEG in these 3 environments using this bimodal division point. As such

Fig.5.3.6: Approximation Curves for COP + NEG Environments (y-axis) And Total COP + NEG (x-axis).

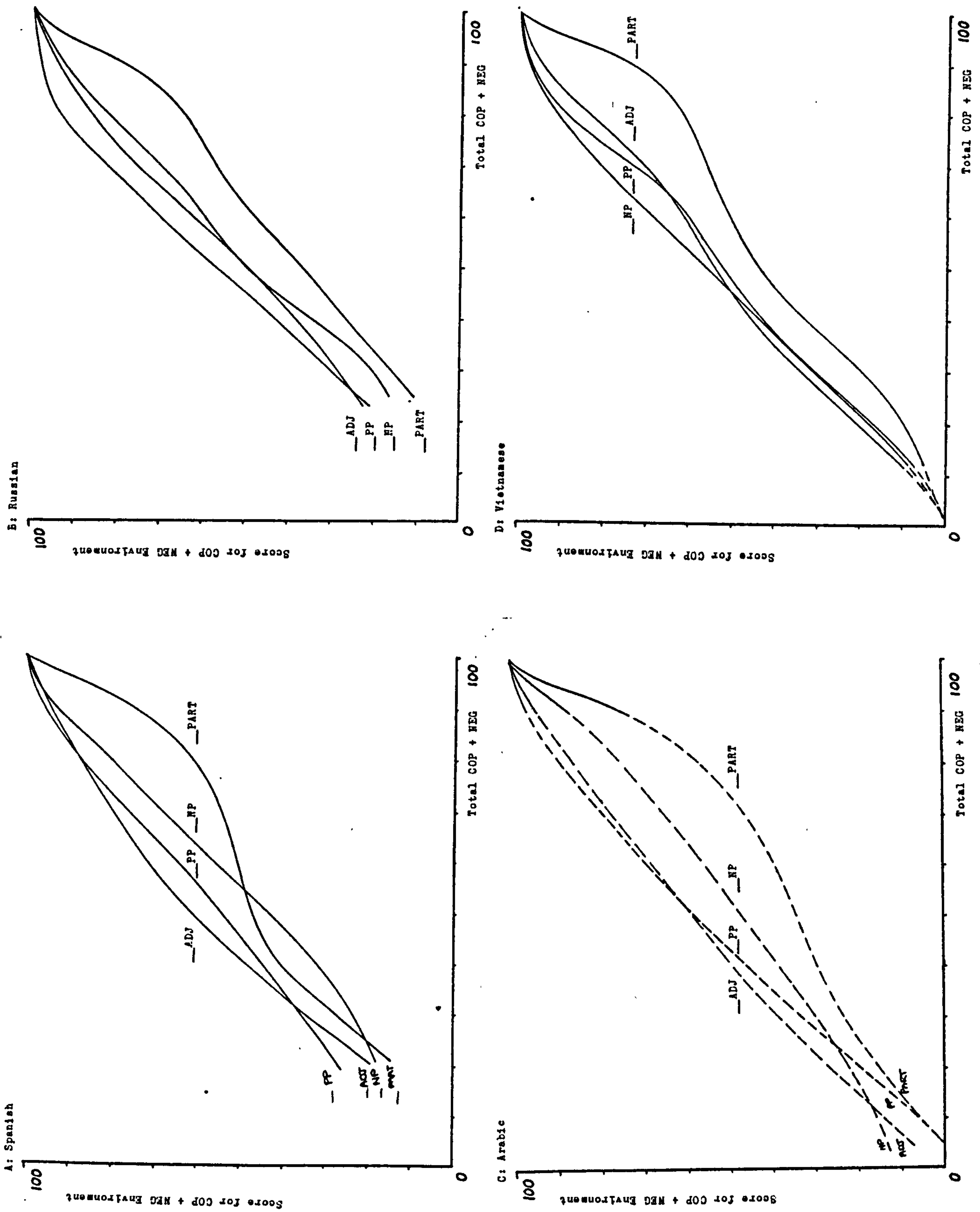


Table 5.3.8: Bimodal Scales for COP + NEG Environments.
using 80% division point, Times Combined.

A: SPANISH

ITEM..	PART	NP		PP		ADJ		TOTAL
ORESP..	0	1	0	1	0	1	0	1
C	I	I	I	I	I	I	I	I
O	4	I	0	42	I	0	42	I
P	I	I	I	I	I	I	I	I
N	I	I	I	I	I	I	I	I
E	3	I	11	0	I	0	11	I
G	I	I	I	I	I	I	I	I
	2	I	2	0	I	0	2	I
	I	I	I	I	I	I	I	I
	1	I	1	0	I	0	1	I
	I	I	I	I	I	I	I	I
	0	I	16	0	I	16	0	I
SUMS	30	42	19	53	17	55	16	56
PCTS	42	58	26	74	24	76	22	78
ERRORS	0	0	0	0	0	0	0	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 1.00
MINIMUM MARGINAL REPRODUCIBILITY = 0.72
PERCENT IMPROVEMENT = 0.29
COEFFICIENT OF SCALABILITY = 1.00

B: RUSSIAN

ITEM..	PART	NP		ADJ		PP		TOTAL
ORESP..	0	1	0	1	0	1	0	1
C	I	I	I	I	I	I	I	I
O	4	I	0	22	I	0	22	I
P	I	I	I	I	I	I	I	I
N	I	I	I	I	I	I	I	I
E	3	I	17	1	I	0	17	I
G	I	I	I	I	I	I	I	I
	2	I	9	1	I	6	4	I
	I	I	I	I	I	I	I	I
	1	I	5	0	I	4	1	I
	I	I	I	I	I	I	I	I
	0	I	21	0	I	21	0	I
SUMS	52	24	31	45	28	48	26	50
PCTS	58	32	41	59	37	63	34	66
ERRORS	0	2	0	5	3	1	5	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.95
MINIMUM MARGINAL REPRODUCIBILITY = 0.64
PERCENT IMPROVEMENT = 0.31
COEFFICIENT OF SCALABILITY = 0.85

C: ARABIC

ITEM..	PART	PP		NP		ADJ		TOTAL
ORESP..	0	1	0	1	0	1	0	1
C	I	I	I	I	I	I	I	I
O	4	I	0	29	I	0	29	I
P	I	I	I	I	I	I	I	I
N	I	I	I	I	I	I	I	I
E	3	I	1	0	I	0	1	I
G	I	I	I	I	I	I	I	I
	2	I	0	0	I	0	0	I
	I	I	I	I	I	I	I	I
	1	I	0	0	I	0	0	I
	I	I	I	I	I	I	I	I
	0	I	3	0	I	3	0	I
SUMS	4	29	3	30	3	30	3	30
PCTS	12	88	9	91	9	91	9	91
ERRORS	0	0	0	0	0	0	0	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 1.00
MINIMUM MARGINAL REPRODUCIBILITY = 0.90
PERCENT IMPROVEMENT = 0.10
COEFFICIENT OF SCALABILITY = 1.00

D: VIETNAMESE

ITEM..	PART	ADJ		PP		NP		TOTAL
ORESP..	0	1	0	1	0	1	0	1
C	I	I	I	I	I	I	I	I
O	4	I	0	31	I	0	31	I
P	I	I	I	I	I	I	I	I
N	I	I	I	I	I	I	I	I
E	3	I	15	0	I	0	15	I
G	I	I	I	I	I	I	I	I
	2	I	5	0	I	5	0	I
	I	I	I	I	I	I	I	I
	1	I	4	2	I	5	1	I
	I	I	I	I	I	I	I	I
	0	I	38	0	I	38	0	I
SUMS	62	33	48	47	44	51	41	54
PCTS	65	35	51	49	46	54	43	57
ERRORS	0	2	0	1	0	0	3	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.98
MINIMUM MARGINAL REPRODUCIBILITY = 0.57
PERCENT IMPROVEMENT = 0.42
COEFFICIENT OF SCALABILITY = 0.96

Table 5.3.9: Bimodal Scales for Four COP + NEG Environments.
Using 90% Division Point. Times Combined.

A: SPANISH

OITEM.	PART	NP		ADJ		PP		TOTAL
ORESP.	0	1	0	1	0	1	0	1
C	I	I	I	I	I	I	I	I
O	4	0	23	0	23	0	23	23
P	I	ERR	I	I	I	I	I	I
N	I	I	I	I	I	I	I	I
E	3	16	11	0	17	1	16	17
O	I	I	ERR	I	I	I	I	I
9	I	I	I	I	I	I	I	I
O	2	7	0	9	2	1	6	7
I	I	I	I	I	ERR	I	I	I
I	I	I	I	I	I	I	I	I
I	1	7	0	7	0	6	1	6
I	I	I	I	I	I	ERR	I	I
O	I	18	0	18	0	18	0	18
SUMS	48	24	30	42	26	46	30	52
PCTS	67	33	42	38	36	44	28	72
ERRORS	0	1	0	2	2	1	2	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.97
MINIMUM MARGINAL REPRODUCIBILITY = 0.63
PERCENT IMPROVEMENT = 0.32
COEFFICIENT OF SCALABILITY = 0.92

B: RUSSIAN

OITEM.	PART	NP		ADJ		PP		TOTAL
ORESP.	0	1	0	1	0	1	0	1
C	I	I	I	I	I	I	I	I
O	4	0	8	0	8	0	8	8
P	I	ERR	I	I	I	I	I	I
N	I	I	I	I	I	I	I	I
E	3	12	6	4	14	2	16	18
O	I	I	ERR	I	I	I	I	I
9	I	I	I	I	I	I	I	I
O	2	4	1	3	2	3	0	9
I	I	I	I	I	ERR	I	I	I
I	I	I	I	I	I	I	I	I
I	1	8	1	8	1	8	3	9
I	I	I	I	I	I	ERR	I	I
O	I	36	0	36	0	36	0	36
SUMS	60	16	31	25	49	27	39	76
PCTS	79	21	67	33	64	36	51	76
ERRORS	0	8	4	3	3	1	3	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.92
MINIMUM MARGINAL REPRODUCIBILITY = 0.67
PERCENT IMPROVEMENT = 0.27
COEFFICIENT OF SCALABILITY = 0.77

C: ARABIC

OITEM.	PART	NP		ADJ		PP		TOTAL
ORESP.	0	1	0	1	0	1	0	1
C	I	I	I	I	I	I	I	I
O	4	0	20	0	20	0	20	20
P	I	ERR	I	I	I	I	I	I
N	I	I	I	I	I	I	I	I
E	3	4	3	2	3	1	6	7
O	I	I	ERR	I	I	I	I	I
9	I	I	I	I	I	I	I	I
O	2	3	0	3	0	3	0	3
I	I	I	I	I	ERR	I	I	I
I	I	I	I	I	I	I	I	I
I	1	0	0	0	0	0	0	0
I	I	I	I	I	I	ERR	I	I
O	I	3	0	3	0	3	0	3
SUMS	10	23	8	29	4	29	3	30
PCTS	30	70	24	76	12	88	9	91
ERRORS	0	3	2	0	1	0	0	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.96
MINIMUM MARGINAL REPRODUCIBILITY = 0.81
PERCENT IMPROVEMENT = 0.14
COEFFICIENT OF SCALABILITY = 0.76

D: VIETNAMESE

OITEM.	PART	NP		ADJ		PP		TOTAL
ORESP.	0	1	0	1	0	1	0	1
C	I	I	I	I	I	I	I	I
O	4	0	23	0	23	0	23	23
P	I	ERR	I	I	I	I	I	I
N	I	I	I	I	I	I	I	I
E	3	12	0	0	12	0	12	12
O	I	I	ERR	I	I	I	I	I
9	I	I	I	I	I	I	I	I
O	2	3	1	6	0	1	5	6
I	I	I	I	I	ERR	I	I	I
I	I	I	I	I	I	I	I	I
I	1	6	1	4	3	6	1	7
I	I	I	I	I	I	ERR	I	I
O	I	47	0	47	0	47	0	47
SUMS	70	25	37	38	54	41	52	99
PCTS	74	26	60	40	57	43	59	99
ERRORS	0	2	0	3	1	1	3	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.97
MINIMUM MARGINAL REPRODUCIBILITY = 0.61
PERCENT IMPROVEMENT = 0.36
COEFFICIENT OF SCALABILITY = 0.92

the results also highlight the lack of sensitivity of bimodal scaling.

To further elucidate the possible implicational ordering of environments, bimodal scaling was also undertaken using the higher 90% division point. The results for each group with data from all test times combined are given in Table 5.3.9. The results for each time separately for each of the two division points are in Appendix B, Table 4.6. As predicted the scales with this higher division point show ordering of environments more clearly with more sets of scores in the relevant patterns, although the coefficients of reproducibility are generally lower but, nevertheless are significant. As in the analysis of group trends the ___PP environment is more favoured at this level, although for the Arabic group there are no cases which determine which of ___ADJ and ___PP is more favoured. In the Russian group only 5 cases differentiate the ordering of ___ADJ and ___NP and with the ___NP order being more favoured there are two cases with errors.

Multi-Valued Scaling

Having established significant bimodal scales but with the ordering in a small number of cases not having been conclusively determined, multi-valued scaling was performed. Only discrepancies greater than 1 item score in the implicational pattern were considered to constitute deviations in the pattern (i.e. > 11%). The full scales obtained can be found in Appendix B, Table 3.4. The coefficients of reproducibility obtained for the best order for each group when data from all times are combined are presented below in Table 5.3.10. The results for each time separately are in Appendix B, Table 4.7. All the scales are significant and in the cases where orders were not clearly established in the bimodal scales (eg. Russian - order of ___ADJ and ___NP) the best order is clear in the more sensitive multi-valued scales.

It is worth noting that for the two groups with the greater number of lower scores, Russian and Vietnamese, the values of R are not as high and therefore there are comparatively more deviations. These groups also show some slight differences in the best order at different

Table 5.3.10: Values of R for each Group, times combined for
Best Order of COP + NEG Environments

Group	Best Order	R
SPANISH	__PP > __ADJ > __NP > __PART	.96
RUSSIAN	__PP > __ADJ > __NP > __PART	.92
ARABIC	__PP > __ADJ > __NP > __PART	.98
VIETNAMESE	__NP > __PP > __ADJ > __PART	.93

times. Some of the Russian group favour an order in which
__PP > __NP > __ADJ and some of the Vietnamese group an order in
which __PP > __NP > __ADJ.

5.3.3 Development Over Time

5.3.3.1 Group Trends

To investigate the development in each group over time, the mean score for Negation for each core group, at each time was calculated (Appendix B, Table 5.4). The total score for Negation was obtained by averaging the scores for the four AUX + NEG types. The means obtained are presented graphically in Fig 5.3.7. For all groups there is an increase in the mean from Time 1 to Time 4. To determine whether these differences in means were significant t-tests were conducted. The resulting t values can be found in Table 5.3.11. None of the differences for the Vietnamese group are significant. The difference between Time 1 and Time 4 is significant for the other 3 groups, although only at $p = .04$ level for the Spanish group. For the Spanish and Russian groups the differences between Times 2 and 3 and Time 4 are also significant.

Since it appeared that the relatively little improvement in the mean score for Negation over time may mask greater or lesser improvement

Fig. 5.3.7: Mean Scores for Negation, Time 1 to Time 4.

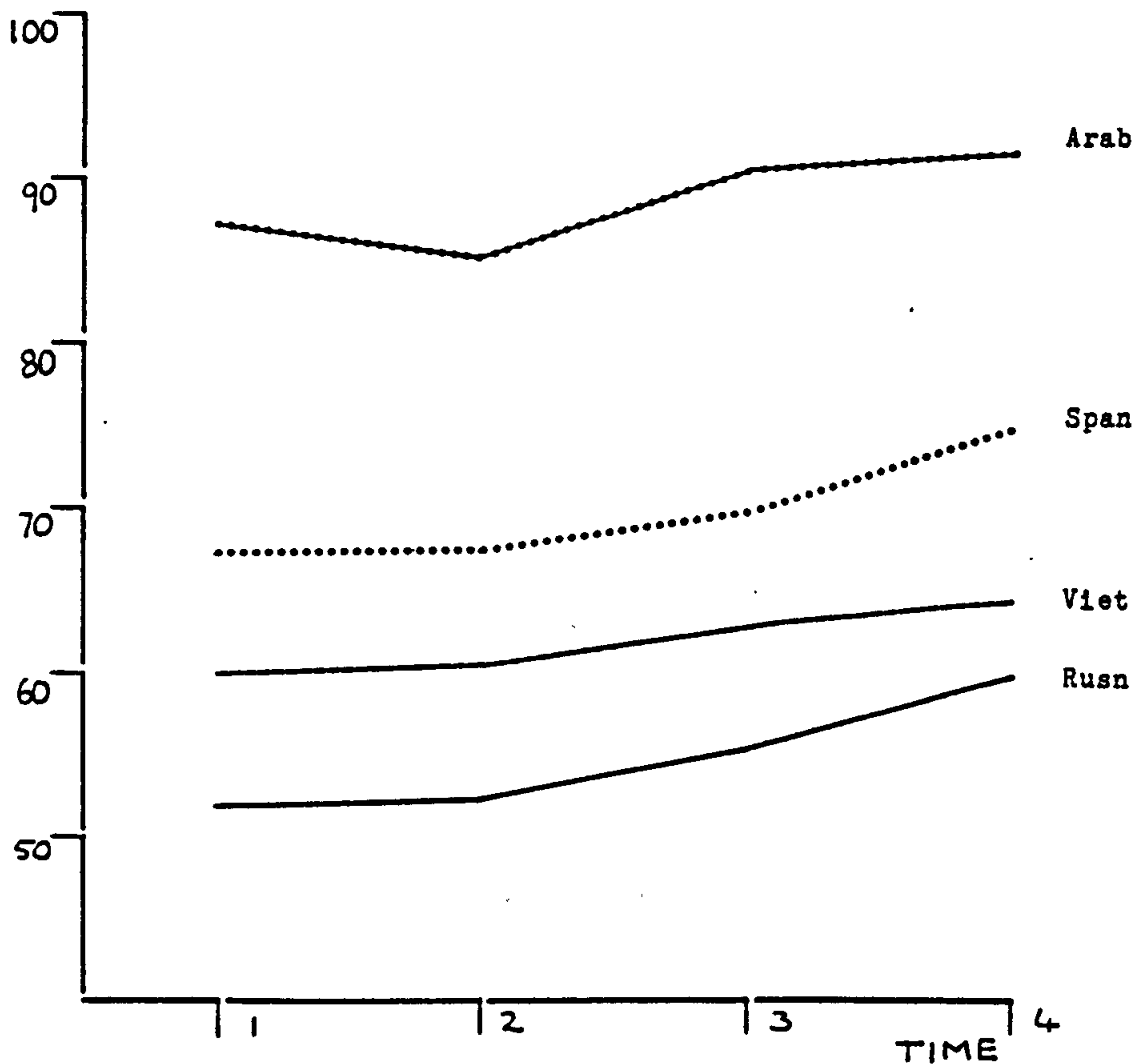


Table 5.3.11: t Values for Difference in Means at each Time for Negation

Times	Group Spanish t	Russian t	Arabic t	Vietnamese t
1-4	- 1.96*	- 2.65 ⁺	- 3.54 ⁺	- 1.16
1-3	- 0.16	- 1.68	- 1.25	- 0.88
1-2	0.44	- 0.57	0.41	- 0.29
2-4	- 3.10 ⁺	- 3.06 ⁺	- 2.87*	- 1.25
2-3	- 1.39	- 1.88*	- 1.30	- 0.87
3-4	- 2.50 ⁺	- 2.01*	- 1.31	- 1.13

+ p = 0.01 level of significance
 * p = 0.05 level of significance } one tail test of significance

within each AUX + NEG type, t was also computed for the differences between means at Time 1 and Time 4 for each AUX + NEG type taken separately. The results are presented in Table 5.3.12.

Table 5.3.12: t Values for Differences in Means, Time 1 to Time 4

AUX + NEG Type	Spanish t	Russian t	Arabic t	Vietnamese t
COP	- 2.36*	- 1.53	- 0.55	- 1.97
AUX	0.28	- 1.48	2.60*	- 1.32
DO	- 1.34	- 0.77	- 2.01	- 1.12
HAVE	- 2.49*	- 4.00 ⁺	- 4.02 ⁺	- 3.53 ⁺

+ $p = 0.01$ level of significance } two tail test of significance
 * $p = 0.05$ level of significance }

For all groups the difference in means from Time 1 to Time 4 for the lowest of the four AUX + NEG means, that for HAVE + NEG, is significant beyond the .05 level of significance. Most of the other differences are not significant.

To determine the relationship between the scores of the subjects in each group from time to time, Pearson's r was computed. The results are presented in Table 5.3.13. All but one of the correlations (for Arabic Time 2 to Time 3) are significant at .05 level and all but 2 of these beyond the .01 level. The non-significant and .05 level significance values of r are all in the very small Arabic group. The Spanish and Vietnamese groups show a very strong correlation between scores at the four test times (most are $> .9$). As with other structures there is a trend to lower correlations the further the correlated times are from each other. The Russian groups correlations from time to time are also strong, particularly between times 2, 3 and 4. The correlations between Time 1 and Times 3 and 4 are weaker than the others, indicating considerable differences in the amount of change in the subjects'

Table 5.3.13: Pearson Correlations for Scores for Negation at the Four Times.

A: Spanish

	T1	T2	T3	T4
T1	1.0000 (0) P=*****	0.9571 (15) P=0.000	0.9172 (15) P=0.000	0.8854 (15) P=0.000
T2	0.9571 (15) P=0.000	1.0000 (0) P=*****	0.9806 (16) P=0.000	0.9578 (16) P=0.000
T3	0.9172 (15) P=0.000	0.9806 (16) P=0.000	1.0000 (0) P=*****	0.9677 (16) P=0.000
T4	0.8854 (15) P=0.000	0.9578 (16) P=0.000	0.9677 (16) P=0.000	1.0000 (0) P=*****

B: Russian

T1	1.0000 (0) P=*****	0.8237 (17) P=0.000	0.6944 (17) P=0.001	0.7085 (17) P=0.001
T2	0.8237 (17) P=0.000	1.0000 (0) P=*****	0.8966 (18) P=0.000	0.9069 (18) P=0.000
T3	0.6944 (17) P=0.001	0.8966 (18) P=0.000	1.0000 (0) P=*****	0.9328 (18) P=0.000
T4	0.7085 (17) P=0.001	0.9069 (18) P=0.000	0.9328 (18) P=0.000	1.0000 (0) P=*****

C: Arabic

T1	1.0000 (3) P=*****	0.8658 (6) P=0.013	0.8279 (7) P=0.011	0.9619 (7) P=0.000
T2	0.8658 (6) P=0.013	1.0000 (0) P=*****	0.6359 (6) P=0.087	0.7702 (6) P=0.037
T3	0.8279 (7) P=0.011	0.6359 (6) P=0.087	1.0000 (0) P=*****	0.6954 (7) P=0.041
T4	0.9619 (7) P=0.000	0.7702 (6) P=0.037	0.6954 (7) P=0.041	1.0000 (0) P=*****

D: Vietnamese

T1	1.0000 (3) P=*****	0.9163 (22) P=0.000	0.8692 (22) P=0.000	0.8365 (22) P=0.000
T2	0.9163 (22) P=0.000	1.0000 (0) P=*****	0.9264 (22) P=0.000	0.9041 (22) P=0.000
T3	0.8692 (22) P=0.000	0.9264 (22) P=0.000	1.0000 (0) P=*****	0.9798 (22) P=0.000
T4	0.8365 (22) P=0.000	0.9041 (22) P=0.000	0.9798 (22) P=0.000	1.0000 (0) P=*****

scores from Time 1 and to these later times. For the Arabic group Time 1 scores correlate strongly with Times 2, 3 and 4, but Times 2, 3 and 4 are correlated relatively weakly with each other.

5.3.3.2 Individual Behaviour

As for Copula and Predicate Complementation each group was analysed to determine the percentage of subjects in the group progressing and regressing from one test time to the next and from Time 1 to Time 4 (Table 5.3.14).

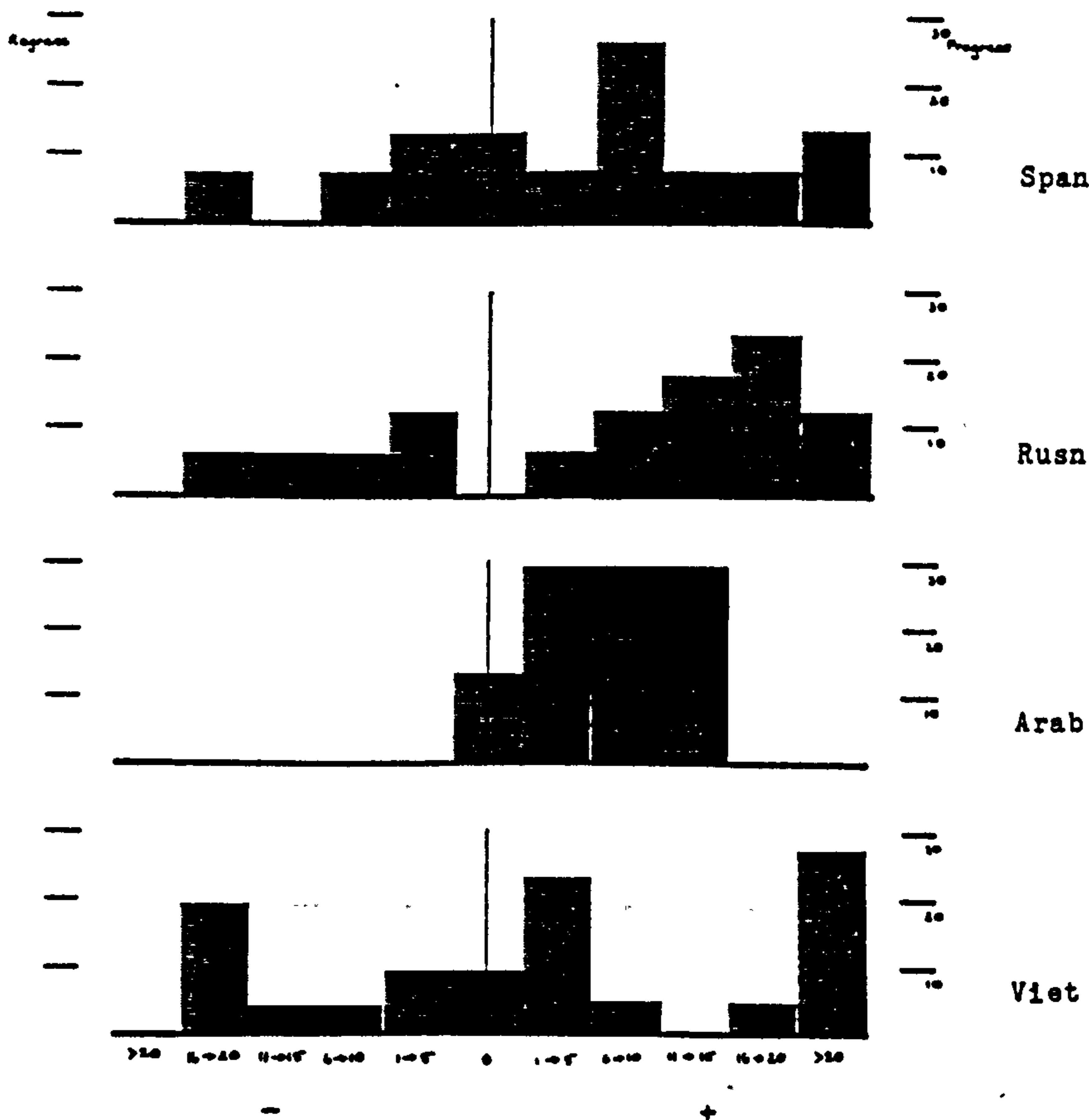
Table 5.3.14: Percentage of Subjects Progressing and Regressing over Time

Group	Movement	Times			
		1-2	2-3	3-4	1-4
Spanish (15-16)	Progressing	20	56	69	60
Russian (17-18)		47	61	56	71
Arabic (6-7)		50	83	71	86
Vietnamese (22)		50	50	45	59
Spanish	Not Changing	33	6	0	13
Russian		6	0	0	0
Arabic		17	0	0	14
Vietnamese		14	0	14	9
Spanish	Regressing	47	38	31	27
Russian		47	39	44	29
Arabic		33	17	29	0
Vietnamese		36	50	41	32

At least 50% of subjects in each group either improve or maintain their level of performance from one time to the next. From Time 1 to Time 4 a substantial proportion (about 30%) regress in the Spanish, Russian and Vietnamese groups. In the Arabic group all

but one improve from Time 1 to Time 4. The range of progression and regression was calculated for the subjects from Time 1 to Time 4. The results are presented in Figure 5.3.6. For all groups, but the highest scoring Arabic group, at least 50% of the progressers improve more than 10% points from Time 1 to Time 4. In the Vietnamese group, which shows the greatest disparity in the change in performance with time of individuals in the group 46% of the progressers progress more than 20% points from Time 1 to Time 4. Whilst there is correspondingly large percentage in the range of change + 5% to - 5% (41% of all subjects in the group). Almost half of the Vietnamese regressers (43%) regress more than 20%. There are no regressers in the Arabic group. In the Spanish and Russian groups more than 60% of the regressers regress by less than 10% from Time 1 to Time 4.

Fig.5.3.6: Percentage of Subjects in Each of Ranges of Change for Negation, Time 1 to Time 4.



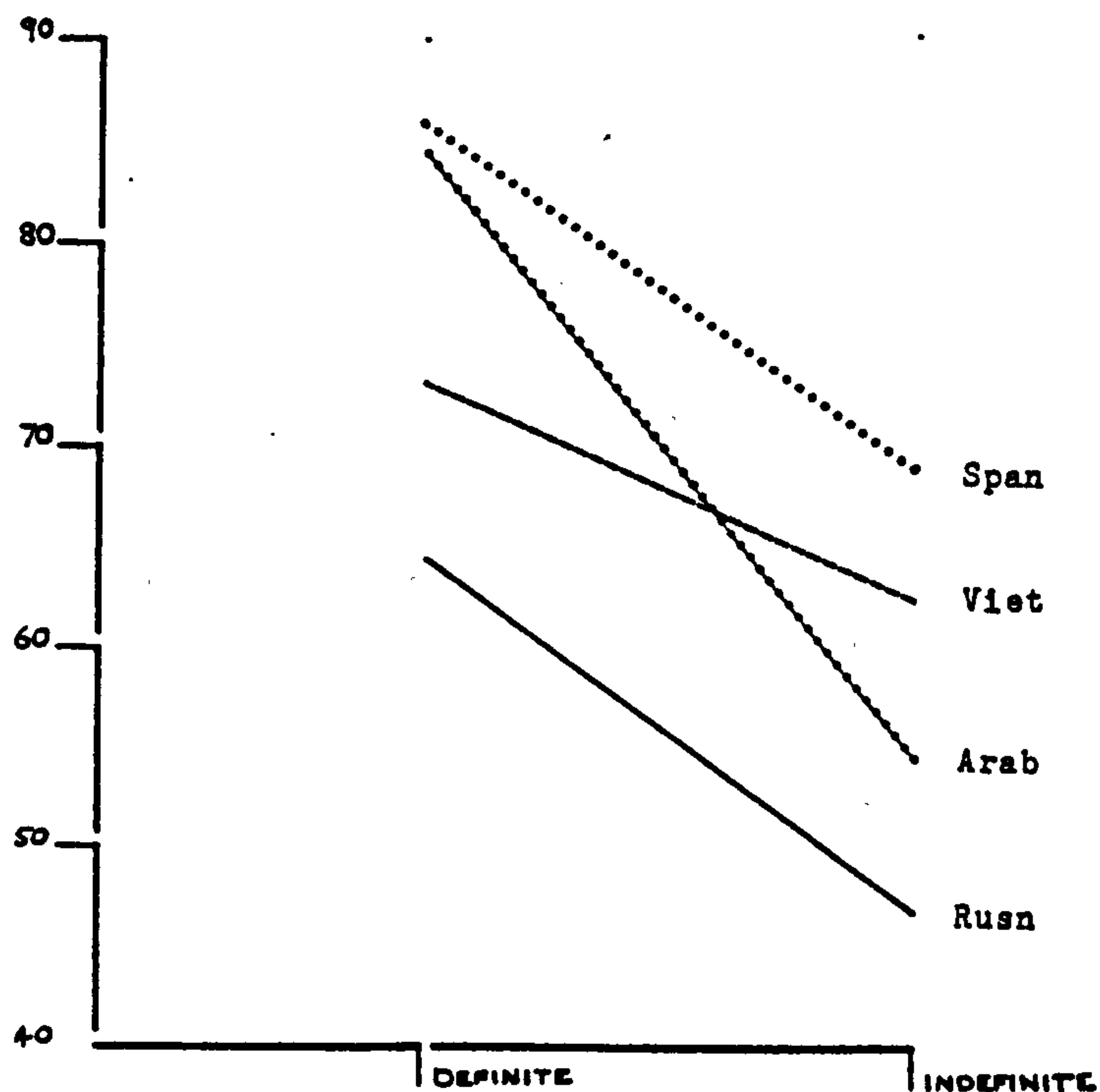
5.4 ARTICLES

5.4.1 Variability according to Article Type

5.4.1.1 Group Trends

The first aspect of variability in the area of Articles to be examined was the variability in the learners' realisation of Articles dependent on the type of article required, i.e. definite or indefinite. First the mean scores for each group for the two article types was examined. Figure 5.4.1 shows the mean scores for each group with data from all times combined (Appendix B, Table 5.6 gives the means for each time separately). From the

Fig. 5.4.1: Mean Scores for Article Types, Times Combined.



graph it appears that all groups perform better on the Definite article than the Indefinite article. T-tests were performed to determine if the differences in means were large enough to be statistically significant. The results are in Table 5.4.1.

Table 5.4.1: Values of t obtained for the Difference in Means for Definite and Indefinite Articles, times combined

Types	Group Spanish	Russian	Arabic	Vietnamese
DEFINITE	6.04 ⁺	5.46 ⁺	4.50 ⁺	3.56 ⁺
INDEFINITE				

+ significant at $p = 0.01$ level (one tail test)

All values of t are significant beyond .001 level of significance, thus it appears that the difference in mean scores for the two article types is large enough to be statistically significant. From this analysis it appears that in each group the Definite Article is realised correctly more often than the Indefinite.

A second analysis of group trends was made in which the number of subjects in each of 6 score ranges for each Article type was calculated (Table 5.4.2). In determining the score ranges allowance was made for the fact that with only 9 items for Indefinite the closest percentage to 80% was 78% (or 7/9). From Table 5.4.2 the percentage of subjects in each group scoring $\geq 78\%$ (i.e. approximately 80%) for each type was able to be calculated and is shown graphically in Figure 5.4.2. On this analysis too the greater number of subjects in the higher score ranges for the Definite Article in all the groups is apparent. The Arabic group shows a particularly great disparity between their scores for the two types.

Table 5.4.2: Modified Group Range for Scores for Definite and Indefinite Article, times combined

A: SPANISH

Range	Article Definite	Indefinite
0-19	1	4
20-39	0	5
40-59	5	18
60-77	15	
78-99	26	29
100	25	11
	72	72
% $\geq$ 78	70.8	55.6

B: RUSSIAN

Range	Article Definite	Indefinite
0-19	2	9
20-39	5	20
40-59	32	26
60-77	16	10
78-99	16	11
100	6	1
	77	77
% $\geq$ 78	28.6	15.6

Table 5.4.2 (continued): Modified Group Range for Scores for
Definite and Indefinite Article, times combined

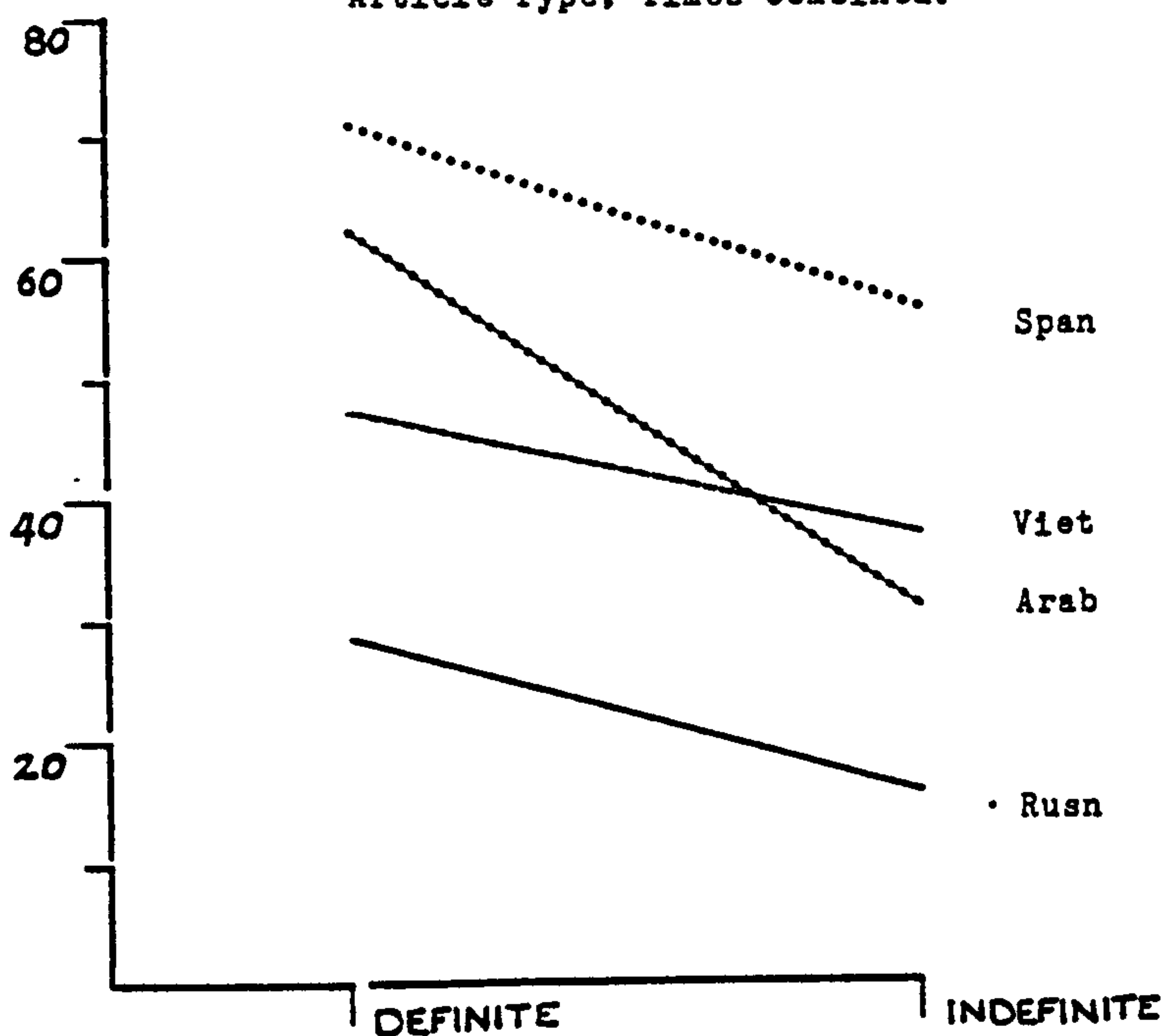
C: ARABIC

Range	Article Definite	Indefinite
0-19	0	3
20-39	0	9
40-59	4	1
60-77	7	7
78-99	2	7
100	16	2
	29	29
% $\geq$ 78	62.1	31.0

D: VIETNAMESE

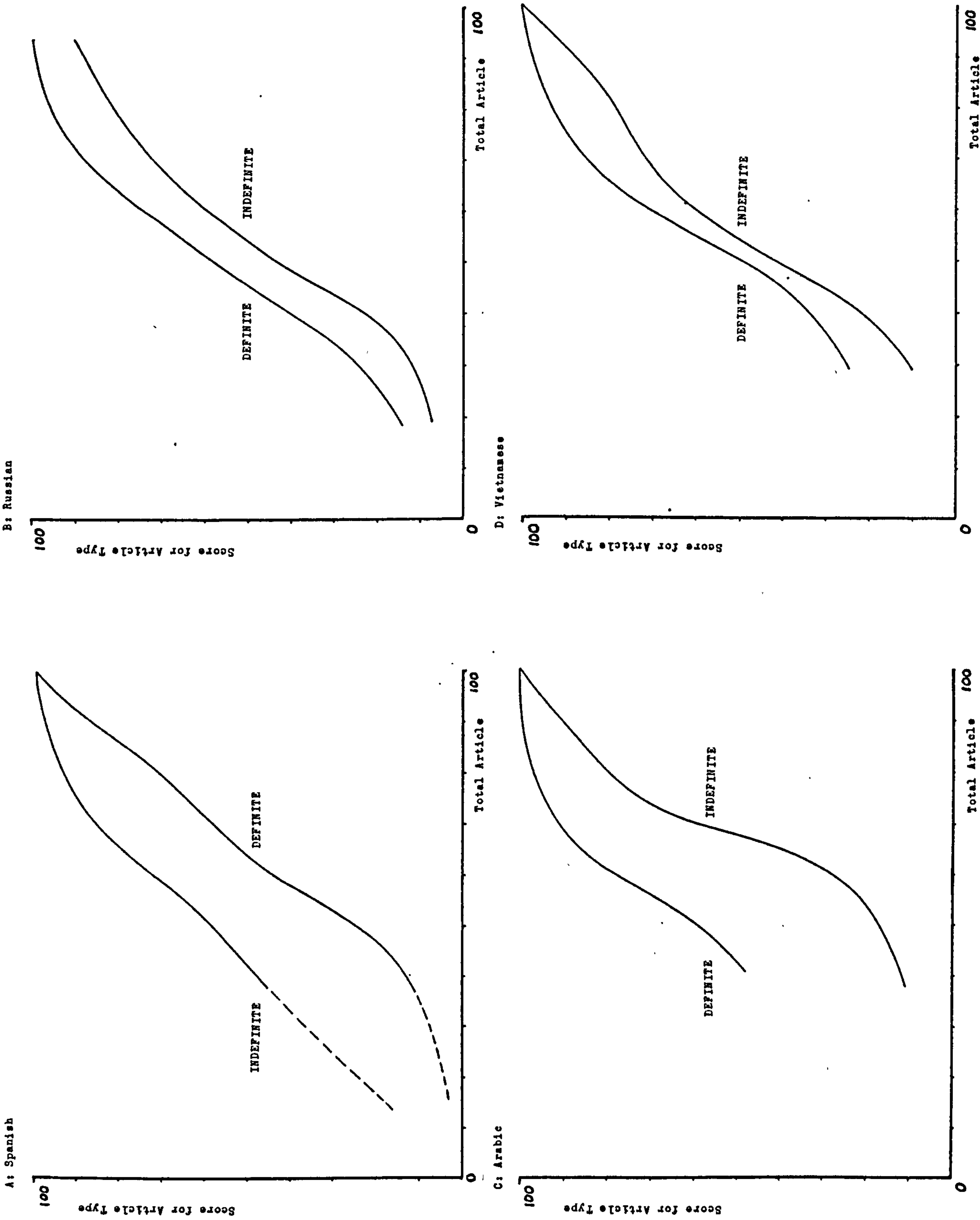
Range	Article Definite	Indefinite
0-19	0	5
20-39	9	13
40-59	26	31
60-77	15	11
78-99	20	20
100	25	15
	95	95
% $\geq$ 78	47.4	36.8

Fig. 5.4.2: Percentage of Subjects Scoring c.75% for Each Article Type, Times Combined.



By producing scattergrams for subjects' scores for each type (y-axis) against their total score for Article (x-axis), approximation curves were able to be drawn which show the average relationship for each group for the learning of the types in relation to each other. The curves obtained are shown in Figure 5.4.3. They show that over the full range of the scores the definite curve is ahead of the one for indefinite.

Fig.5.4.3: Approximation Curves for Article Types (y-axis) and Total Article (x-axis).



5.4.1.2 Individual Behaviour

Implicational Analysis

Bimodal Scaling

To determine the degree of fit of the scores of individuals to the clear group trend of favouring Definite over Indefinite for the correct realisation of the Article scores for the two Article types were scaled bimodally using division points of 7/9 (Indefinite) and 9/12 (Definite) (i.e. the closest to 80% for the number of items) with data from all times combined. The scale patterns obtained are presented in Table 5.4.3. The values of R and S for each time separately are in Appendix B, Table 4.8.

All scales but that for the Arabic group are significant. If manual bimodal scaling had been used the Arabic group's scale would also have been significant ($R = .93$). In the Arabic group there were 4 cases out of 20 where the subjects favoured Indefinite over Definite article. Of the group as a whole 14% did not conform to the pattern. In the other groups < 8% of the sets of scores did not conform to the expected pattern. In all groups a large number of subjects are in the part of the scale in which one type, usually the Definite, has been acquired and the other not (pattern 1, '0 1').

Multi-Valued Scaling

The scores of the subjects for the two Article types were scaled using the more sensitive multi-valued scaling technique. As in the previous sections because of the small number of items only discrepancies in the implicational pattern > 11% were considered to constitute deviations from the pattern. The scales obtained are in Appendix B, Table 3.5. The values of R for the best implicational order for each group with data from all times combined are given in Table 5.4.4. The values for each time separately are in Appendix B, Table 4.9. From Table 5.4.4 it is

Table 5.4.3: Bimodal Scales for Article Types using a division point of 75%, Times Combined.

A: SPANISH

ITEM..	INDEF		DEF		TOTAL
RESP..	0	1	0	1	
	I-ERR		I-ERR		
A	I		I		
R	2	I	37	I	37
T	I		ERR	I	
T	I		I		
Y	1	I	3	I	24
P	I		ERR	I	
	I		I		
	0	I	11	0	11
	I-ERR		I-ERR		
SUMS	32	40	14	58	72
PCTS	44	56	19	81	
ERRORS	0	3	3	0	6

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.96
 COEFFICIENT OF SCALABILITY = 0.87

B: RUSSIAN

ITEM..	INDEF		DEF		TOTAL
RESP..	0	1	0	1	
	I-ERR		I-ERR		
A	I		I		
R	2	I	8	I	8
T	I		ERR	I	
T	I		I		
Y	1	I	4	I	27
P	I		ERR	I	
	I		I		
	0	I	42	0	42
	I-ERR		I-ERR		
SUMS	65	12	46	31	77
PCTS	84	16	60	40	
ERRORS	0	4	4	0	8

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.95
 COEFFICIENT OF SCALABILITY = 0.81

C: ARABIC

ITEM..	INDEF		DEF		TOTAL
RESP..	0	1	0	1	
	I-ERR		I-ERR		
A	I		I		
R	2	I	5	I	5
T	I		ERR	I	
T	I		I		
Y	1	I	4	I	20
P	I		ERR	I	
	I		I		
	0	I	4	0	4
	I-ERR		I-ERR		
SUMS	20	9	8	21	29
PCTS	67	31	28	72	
ERRORS	0	4	4	0	8

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.86
 COEFFICIENT OF SCALABILITY = 0.53

D: VIETNAMESE

ITEM..	INDEF		DEF		TOTAL
RESP..	0	1	0	1	
	I-ERR		I-ERR		
A	I		I		
R	2	I	29	I	29
T	I		ERR	I	
T	I		I		
Y	1	I	6	I	29
P	I		ERR	I	
	I		I		
	0	I	37	0	37
	I-ERR		I-ERR		
SUMS	60	35	43	52	95
PCTS	63	37	45	55	
ERRORS	0	6	6	0	12

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.94
 COEFFICIENT OF SCALABILITY = 0.85

Table 5.4.4: Values of R for the Best Order for each Group for Multi-Valued Scaling of the two Article Types

Group	Best Order	R
SPANISH	DEFINITE $\succ$ INDEFINITE	.97
RUSSIAN	DEFINITE $\succcurlyeq$ INDEFINITE	.96
ARABIC	DEFINITE $\succcurlyeq$ INDEFINITE	.91
VIETNAMESE	DEFINITE $\succcurlyeq$ INDEFINITE	.91

apparent that in both the Arabic and Vietnamese groups there are a greater number of subjects deviating from the implicational pattern than in the Russian and Spanish groups. Nevertheless, all the scales are significant indicating a high degree of conformance to the hierarchy among learners at different points in their development in using the two types of Article.

5.4.2 Variability according to the Position of NP in the Sentence

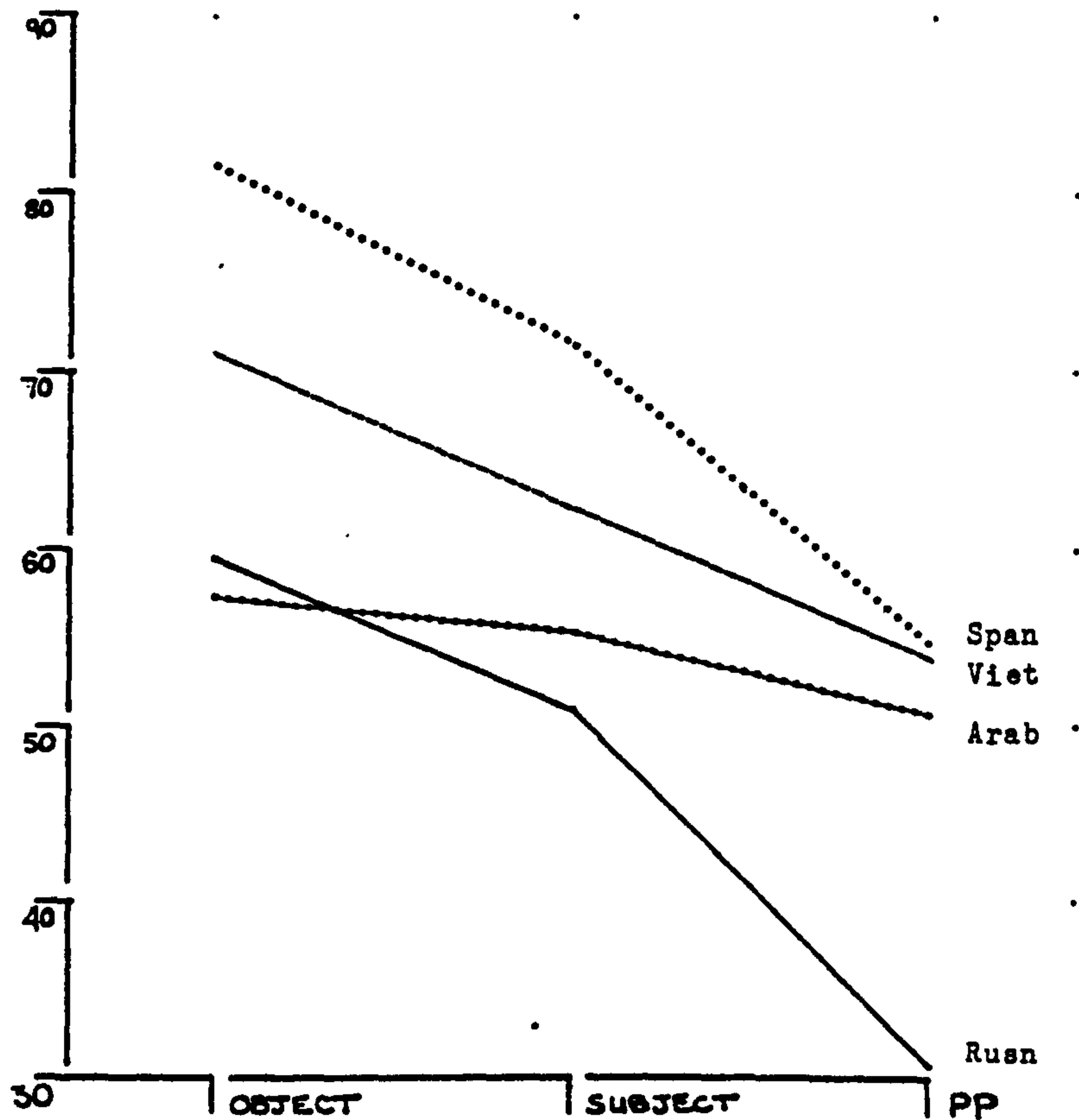
The second aspect of variability in the learners' correct realisation of Article to be studied was that which may be constrained by the linguistic environment; specifically, by the position in the sentence of the NP of which the Article is part. The effect of position, Subject (Subj), Object (Obj) and Prepositional Phrase (PP), was investigated for each Article type.

5.4.2.1 The Indefinite Article

5.4.2.1.1 Group Trends

In order to establish group trends the means for each group for correct realisation of the Indefinite Article in the three environments (with data from all times combined) are plotted in Figure 5.4.4. (The mean values for each time are given in Appendix B, Table 5.7). It appears from this graph that at the level of group means

Fig. 5.4.4: Mean Scores for Indefinite Article in Three Environments, Times Combined.



variability exists in the correct use of the Indefinite article dependent upon the position of NP in the sentence, although it is less marked in the Arabic group. All groups, moreover, show the same ordering of environments, with Object position being the most favoured and PP position the least favoured. Values of t were computed to determine if the differences in means were large enough to be statistically significant. The values obtained are given in Table 5.4.5. For the Spanish group all are significant although between Subject and Object only at the $p = 0.05$ level. The

Table 5.4.5: t Values for Difference in Means for Position of NP
in Sentence, Indefinite Article

Position of NP	Group Spanish t	Russian t	Arabic t	Vietnamese t
Subject Object	- 2.18*	- 1.74	- 0.34	- 1.71
Subject PP	4.16 ⁺	4.15 ⁺	0.46	1.67
Object PP	7.49 ⁺	5.97 ⁺	1.00	4.74 ⁺

+ p = 0.01 level of significance

* p = 0.05 level of significance

differences between Subject and Object are not significant for the other 3 groups. The Russian and Vietnamese groups show highly significant differences between the means for Object and PP. The Russian group's difference between Subject and PP is also highly significant. None of the differences for the Arabic group are statistically significant.

It is worth noting that compared to performance on the other structures the performance of the Arabic group for Indefinite Article is lower than may have been expected.

To further investigate variability according to the position of NP, the number of subjects in each group obtaining each of the four possible scores in each position was calculated. Table 5.4.6 gives the distribution across the possible scores and Figure 5.4.5 shows graphically the percentage of subjects obtaining scores ≥ 2 for the Indefinite Article in each position of the NP.

At the ≥ 2 level for the Spanish, Russian and Vietnamese groups the Object is clearly the most favoured environment and the PP position the least favoured. The Spanish and Russian groups favour the same

Table 5.4.6: Modified Group Range Indefinite Article in three Positions, times combined

A: SPANISH

Score	Position of NP		
	Subj	Obj	PP
0	11	4	10
1	8	8	22
2	13	14	25
3	40	46	15
	72	72	72
% = 3	55.6	63.9	20.8
% ≥ 2	73.6	83.3	55.6

B: RUSSIAN

Score	Position of NP		
	Subj	Obj	PP
0	22	12	25
1	17	21	36
2	14	20	14
3	24	24	2
	77	77	77
% = 3	31.2	31.2	2.6
% ≥ 2	49.4	57.1	20.8

Table 5.4.6 (continued): Modified Group Range Indefinite Article in three positions, times combined.

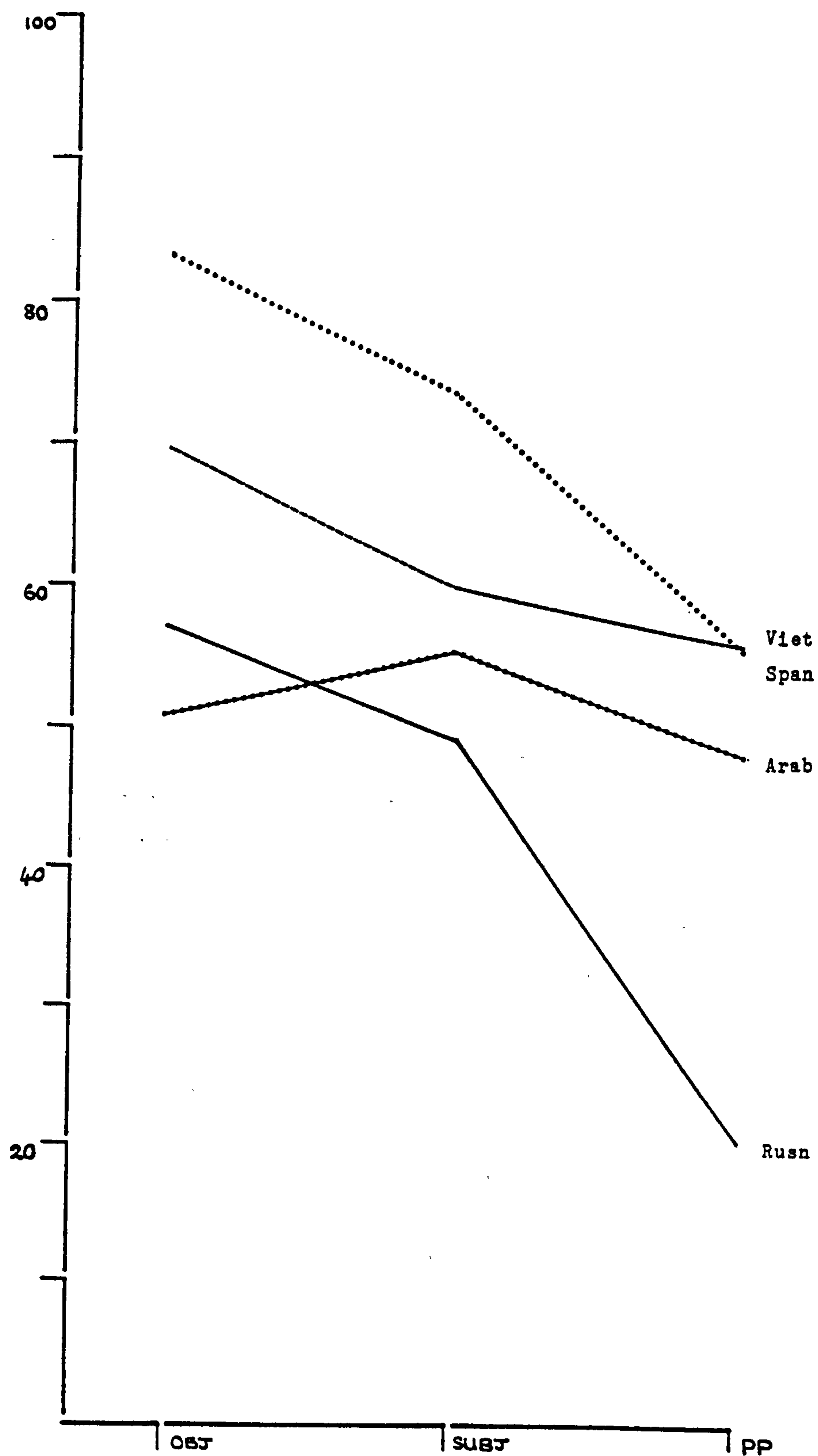
C: ARABIC

Score	Position of NP		
	Subj	Obj	PP
0	8	5	5
1	5	9	10
2	5	6	8
3	11	9	6
	29	29	29
% = 3	37.9	31.0	20.7
% > 2	55.2	51.7	48.3

D: VIETNAMESE

Score	Position of NP		
	Subj	Obj	PP
0	25	10	14
1-1.5	13	19	28
2	7	18	34
3	50	48	19
	95	95	95
% = 3	52.6	50.5	20.0
% > 2	60.0	69.5	55.8

Fig. 5.4.5: Percentage of Subjects Scoring ≥ 2 for Indefinite Article in Each Environment.



order at the ≥ 3 score level, but the Vietnamese group marginally favours the Subject position over the Object one. The Arabic group favours the order Subj $>$ Obj $>$ PP at both division points, but in both cases the difference in the number of subjects using the correct Indefinite Article in the three environments is small, generally only one or two subjects.

Approximation curves were not able to be drawn for the inter-relationship of the environments because of the small number of items for each environment (3) and thus of possible scores.

5.4.2.1.2 Individual Behaviour

Implicational Analysis

Bimodal Scaling

As in previous sections, to determine the concordance of individual subjects' sets of scores to the overall pattern of group variability implicational-scaling was carried out. Initially the sets of scores were scaled bimodally. Since there were only 3 occurrences of the Indefinite Article in each environment a division point of 2 was chosen. This meant that all scores ≥ 2 were assigned a '1' and scores of 0 and 1, a '0'. The scales obtained for the best order overall for each group are in Table 5.4.7. The values of the coefficients for each time taken separately are given in Appendix B, Table 4.10. In addition to the scales for the three environments, scales were also constructed for the two contrasting environments, Subj and Obj, which according to most theories, were expected to show the greatest variability in the realisation of Article. As the statistics for the scales in Table 5.4.7 show, using the computer scaling method only the Spanish scales and the Arabic scale for the two environments reach the required level of significance. It should however be pointed out that using manual scaling techniques

Table 5.4.7: Bimodal Scales for Indefinite Article in Three and Two Environments, using a division point of 2, Times Combined.

A: SPANISH

ITEM..	PP	SUBJ		OBJ		TOTAL
RESP..	0	1	0	1	0	1
I	I	I	I	I	I	I
D	3	0	35	0	35	35
F	I	ERR	I	I	I	I
E	I	I	I	I	I	I
N	2	12	4	3	13	15
V	I	I	ERR	I	I	I
I	I	I	I	I	I	I
R	1	15	1	11	5	10
I	I	I	I	I	I	I
I	I	I	I	I	I	I
0	I	5	0	5	0	5
SUMS	32	40	19	53	12	60
PCTS	44	56	26	74	17	83
ERRORS	0	5	3	5	7	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.91
COEFFICIENT OF SCALABILITY = 0.68

A: SPANISH

ITEM..	SUBJ		OBJ		TOTAL
RESP..	0	1	0	1	0
I	I	I	I	I	I
D	2	0	47	0	47
F	I	ERR	I	I	I
E	I	I	I	I	I
N	1	13	6	6	13
V	I	I	ERR	I	I
I	I	I	I	I	I
R	0	6	0	6	0
I	I	I	I	I	I
SUMS	19	33	12	60	72
PCTS	26	74	17	83	
ERRORS	0	6	6	0	12

STATISTICS.

COEFFICIENT OF REPRODUCIBILITY = 0.92
COEFFICIENT OF SCALABILITY = 0.61

B: RUSSIAN

ITEM..	PP	SUBJ		OBJ		TOTAL
RESP..	0	1	0	1	0	1
I	I	I	I	I	I	I
D	3	0	8	0	8	8
F	I	ERR	I	I	I	I
E	I	I	I	I	I	I
N	2	18	3	0	21	18
V	I	I	ERR	I	I	I
I	I	I	I	I	I	I
R	1	27	5	23	9	14
I	I	I	I	I	I	I
I	I	I	I	I	I	I
0	I	16	0	16	0	16
SUMS	61	16	39	38	33	44
PCTS	79	21	51	49	43	57
ERRORS	0	8	0	9	17	0

STATISTICS.

COEFFICIENT OF REPRODUCIBILITY = 0.85
COEFFICIENT OF SCALABILITY = 0.61

B: RUSSIAN

ITEM..	OBJ		SUBJ		TOTAL
RESP..	0	1	0	1	0
I	I	I	I	I	I
D	2	0	26	0	26
F	I	ERR	I	I	I
E	I	I	I	I	I
N	1	18	12	12	18
V	I	I	ERR	I	I
I	I	I	I	I	I
R	0	21	0	21	0
I	I	I	I	I	I
SUMS	39	38	33	44	77
PCTS	51	49	43	57	
ERRORS	0	12	12	0	24

STATISTICS.

COEFFICIENT OF REPRODUCIBILITY = 0.84
COEFFICIENT OF SCALABILITY = 0.66

Table 5.4.7 (cont.)

C: ARABIC

ITEM..	PP			OBJ			SUBJ				TOTAL
RESP..	0	1	I	0	1	I	0	1	I		
			I-ERR			I-ERR			I-ERR		
I	I			I			I				
D	3	I	0	7	I	0	7	I	0	7	7
F	I		I-ERR	I			I				
E	I			I			I				
V	2	I	5	3	I	1	7	I	2	6	8
V	I			I-ERR			I				
I	I			I			I				
R	1	I	4	4	I	7	1	I	5	3	8
	I			I			I-ERR				
	I			I			I				
	0	I	6	0	I	6	0	I	6	0	6
SUMS	15	14	14	15	13	16					29
PCTS	52	48	48	52	45	55					
ERRORS	0	7	1	1	7	0					16

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.82
 COEFFICIENT OF SCALABILITY = 0.61

C: ARABIC

ITEM..	OBJ			SUBJ			TOTAL
RESP..	0	1	I	0	1	I	
			I-ERR			I-ERR	
I	I			I			
D	2	I	0	12	I	0	12
F	I		I-ERR	I			
E	I			I			
N	1	I	4	3	I	3	7
V	I			I-ERR			
I	I			I			
R	0	I	10	0	I	10	10
	I			I			
SUMS	14	13	13	16			29
PCTS	48	52	45	55			
ERRORS	0	3	3	0			6

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.91
 COEFFICIENT OF SCALABILITY = 0.78

O: VIETNAMESE

ITEM..	PP			SUBJ			OBJ				TOTAL
RESP..	0	1	I	0	1	I	0	1	I		
			I-ERR			I-ERR			I-ERR		
I	I			I			I				
D	3	I	0	29	I	0	29	I	0	29	29
F	I		I-ERR	I			I				
E	I			I			I				
V	2	I	14	19	I	14	19	I	5	28	33
V	I			I-ERR			I				
I	I			I			I				
R	1	I	18	5	I	14	9	I	14	9	23
	I			I			I-ERR				
	I			I			I				
	0	I	10	0	I	10	0	I	10	0	10
SUMS	42	53	38	57	29	66					95
PCTS	44	56	40	60	31	69					
ERRORS	0	24	14	9	19	0					66

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.77
 COEFFICIENT OF SCALABILITY = 0.40

D: VIETNAMESE

ITEM..	SUBJ			OBJ			TOTAL
RESP..	0	1	I	0	1	I	
			I-ERR			I-ERR	
I	I			I			
D	2	I	0	43	I	0	43
F	I		I-ERR	I			
E	I			I			
N	1	I	23	14	I	14	37
V	I			I-ERR			
I	I			I			
R	0	I	13	0	I	13	13
	I			I			
SUMS	38	57	29	64			95
PCTS	40	60	31	69			
ERRORS	0	14	14	0			28

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.85
 COEFFICIENT OF SCALABILITY = 0.58

as discussed in Section 5.1.2, all scales but that for the 3 environments for the Vietnamese would be considered significant. The manual coefficients are given below in Table 5.4.8. Nevertheless there are obviously a considerable number of discrepancies from the pattern and a lesser degree of individual fit to the group pattern than in the structures already analysed. For all groups

Table 5.4.8: Manually Calculated Bimodal Scales and Resulting Coefficients

Group	Order of 3 Environments	R	Order of 2 Environments	R
SPANISH	Obj $\gg$ Subj $\gg$ PP	.95	Obj $\gg$ Subj	.96
RUSSIAN	Obj $\gg$ Subj $\gg$ PP	.93	Obj $\gg$ Subj	.92
ARABIC	Subj $\gg$ Obj $\gg$ PP	.91	Subj $\gg$ Obj	.95
VIETNAMESE	Obj $\gg$ Subj $\gg$ PP	.88	Obj $\gg$ Subj	.93

however the best order shows the PP environment to be the least favoured for the correct realisation of the Indefinite Article at the division point of 2. For the Spanish, Russian and Vietnamese groups the Obj position is more favoured than the Subj position. In all groups a considerable number of errors in the pattern arose from the ordering of subject and object positions. The Arabic group's best order of Subj $\gg$ Obj is determined by only 7 cases, of which 3 favoured Obj $\gg$ Subj and 4 the reverse, giving Subj $\gg$ Obj a marginal superiority. In this case it is not possible to say that any clear ordering of environments in terms of the learners' variable realisation of the Indefinite Article is possible. In the other three groups a smaller, but still considerable proportion favoured Subj over Obj in the crucial differentiating scale pattern (pattern 1, '0 1'). In fact 6 out of 19 cases in the Spanish group (32%), 12 out of 30 (40%) in the Russian group and 14 out of 37 (38%) in the Vietnamese group favour the Subj $\gg$ Obj order.

Multi-Valued Scaling

Multi-valued scaling was performed on the data. As in the previous sections only discrepancies of more than 1 item in the score for each environment were considered to constitute deviations from the implicational pattern. The scales obtained are in Appendix B, Table 3.6. The best orders and coefficients obtained for each time separately are given in Appendix B, Table 4.11. Table 5.4.9 below gives the best order and values of R for all the data from the four test times combined. All the scales are significant, although, particularly in the case of the Vietnamese group R is not high. Only the Spanish and Russian groups show a clear preference of Obj over Subj in the patterning of their variable realisation of the Indefinite Article.

Table 5.4.9: Best Order for 3 Indefinite Article Environments
using Multi-Valued Scaling, times combined

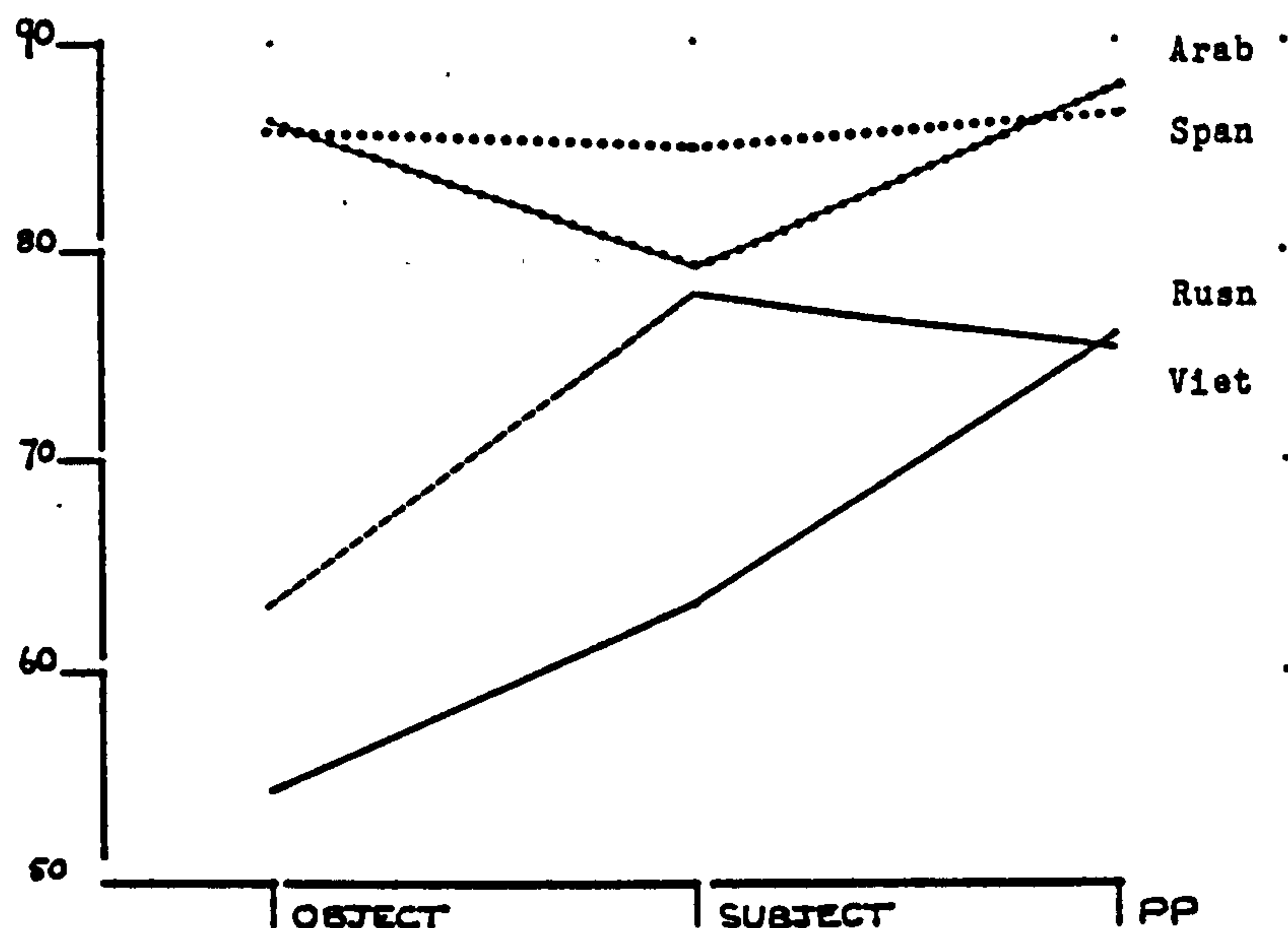
Group	Best Order	R
SPANISH	Obj $\gg$ Subj $\gg$ PP	.97
RUSSIAN	Obj $\gg$ Subj $\gg$ PP	.94
ARABIC	{ Subj $\gg$ Obj $\gg$ PP } { PP $\gg$ Obj $\gg$ Subj }	.94
VIETNAMESE	{ Obj } $\gg$ PP { Subj }	.92

5.4.2.2 The Definite Article

5.4.2.2.1 Group Trends

As with the Indefinite Article, to determine the existence of variability constrained by the position in the sentence of the NP to which the determiner belongs group trends were analysed. Firstly the mean score for each position for each group with data from all the test times combined was plotted (Figure 5.4.6). The mean scores obtained for each time and overall are given in Appendix B, Table 5.8. The means suggest a certain amount of variability dependent on the position of the NP in which the second mention definite article was

Fig. 5.4.6: Mean Scores for Definite Article in Three Environments, Times Combined.



required. The greatest environmental variability is evident in the Russian and Vietnamese groups. Both of these appear to favour the Subject position (Subj) over the Object position (Obj). In the Russian group PP is the most favoured. In the Vietnamese group Subj is slightly more favoured than PP. If anything the Spanish and Arabic groups appear to favour Obj over Subj, with PP being the most favoured, but for both groups there appears to be relatively little difference in the means for the three environments. To determine the significance of the apparent differences in the means for the three environments t-tests were carried out and the results are presented in Table 5.4.10. As predicted none of the differences for the Spanish group are large enough to be statistically

Table 5.4.10: t Values for Difference in Means for 3 Positions
of NP containing Definite Article, times combined

Position of NP	Group Spanish t	Russian t	Arabic t	Vietnamese t
Subj Obj	- 0.23	2.21*	- 2.29*	3.76 ⁺
Subj PP	- 0.48	- 3.28 ⁺	- 2.77 ⁺	0.87
Obj PP	- 0.30	- 6.58 ⁺	- 0.57	- 3.29 ⁺

+ p = 0.01 level of significance

* p = 0.05 level of significance

significant. All differences for the Russian group are significant although that between Subj and Obj only at .05 level of significance. The Arabic group's Subj-Obj difference is also only significant at .05 level, but the difference between Subj and PP is significant at the higher .01 level. The Vietnamese group's differences between Obj and Subj and Obj and PP are both highly significant. The difference between Subj and PP is not significant.

To further elucidate the apparent variability dependent on the position of NP in the sentence the group range was compiled (Table 5.4.11) and from this the percentage of subjects scoring 4, ≥ 3 and ≥ 2 calculated (i.e. cumulative frequency) (the maximum score was 4). The percentage of subjects scoring ≥ 3 is plotted on Fig 5.4.7. At this score level we see that for all groups but the Vietnamese PP is the most favoured position. For the Vietnamese and Russian groups Subj is clearly more favoured than Obj, whereas for the Arabic the order is reversed. The Spanish group shows equal correct realisation in both Subject and Object positions. At the ≥ 2 level Object is slightly favoured (a difference of 2 subjects). Approximation curves were not able to be drawn for the interrelationship of the environments because of the small number of items and thus of possible scores in each environment.

Table 5.4.11: Modified Group Range for Definite Article, times combined

A: SPANISH

Score	Subj	Obj	PP
0	0	0	0
1	4	1	1
2	7	9	3
3	15	15	25
4	45	45	41
	71	71	71
% = 4	63.4	63.4	57.8
% $\geq$ 3	84.5	84.5	93.0
% $\geq$ 2	94.4	97.2	97.2

B: RUSSIAN

Score	Subj	Obj	PP
0	6	4	1
1	13	16	4
2	16	32	17
3	18	12	24
4	24	13	31
	77	77	77
% = 4	31.2	16.9	40.3
% $\geq$ 3	54.6	32.5	71.4
% $\geq$ 2	75.3	74.0	93.5

Table 5.4.11 (continued): Modified Group Range for Definite
Article, times combined

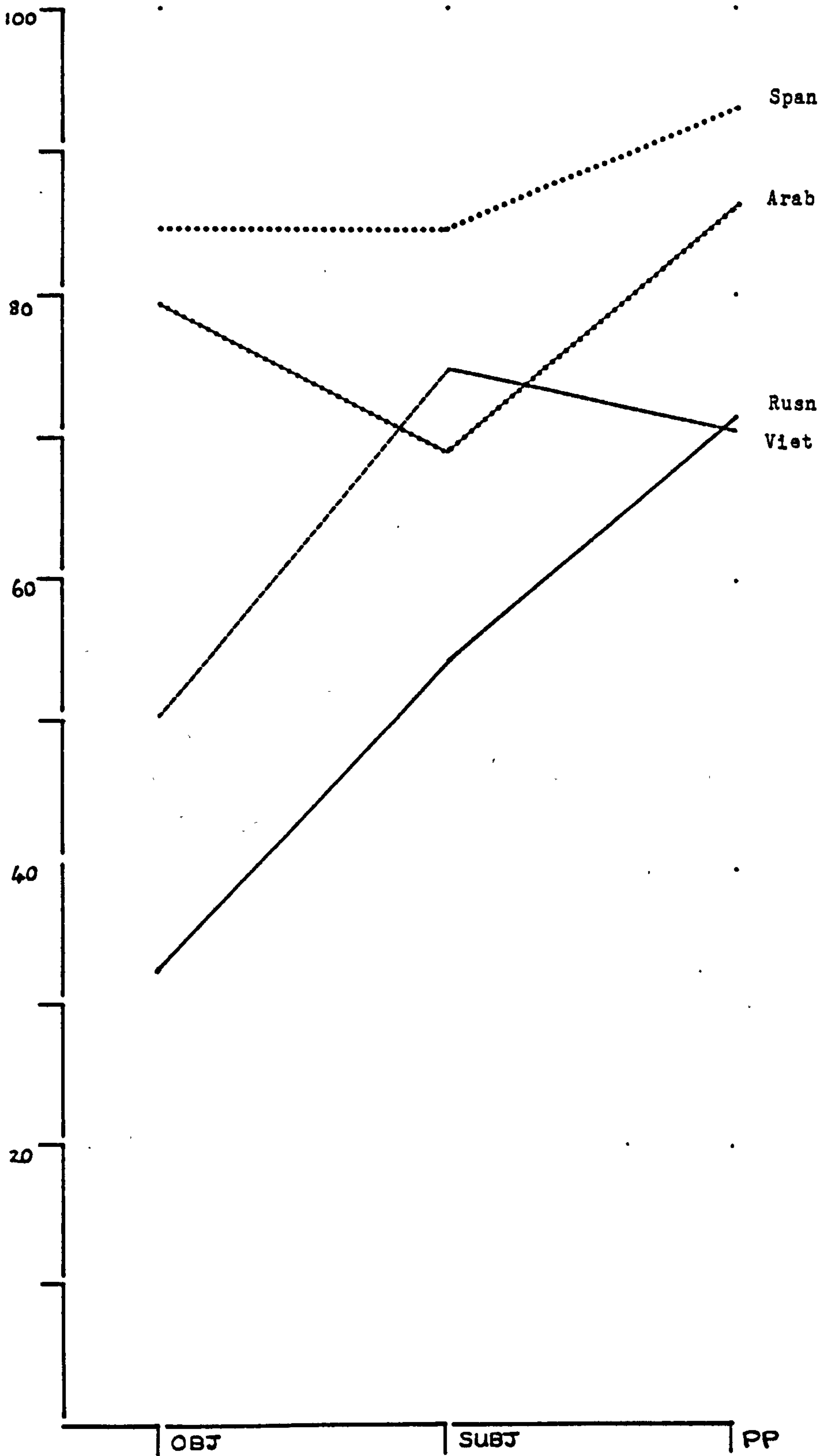
C: ARABIC

Score	Subj	Obj	PP
0	0	0	0
1	2	0	0
2	7	6	4
3	4	4	6
4	16	19	19
	29	29	29
% = 4	55.2	65.5	65.5
% ≥ 3	69.0	79.3	86.2
% ≥ 2	93.1	100.0	100.0

D: VIETNAMESE

Score	Subj	Obj	PP
0	2	4	0
1	12	12	12
2	10	31	16
3	20	14	25
4	51	34	42
	95	95	95
% = 4	53.7	35.8	44.2
% ≥ 3	74.7	50.5	70.5
% ≥ 2	85.3	83.2	87.4

Fig. 5.4.7:Percentage of Subjects Scoring > 3 for Definite Article in Three Environments, Times Combined.



5.4.2.2.2 Individual Behaviour

Implicational Analysis

Bimodal Scaling

To determine the conformity of the scores of individuals within each group to the group pattern the data for each group was scaled bimodally using the SPSS Guttman Scale Program. The scales obtained for the best order for each group with data from the 4 times combined are presented in Table 5.4.11. The coefficients for each time separately are given in Appendix B, Table 4.12. In addition to the orders for the 3 environments for each group the order for the two crucial environments, Subj and Obj, were scaled separately. For all scales a division point of ≥ 3 was used to denote acquisition (i.e. '1'). As for the Indefinite Article, the three-environment scales for the Russian and Vietnamese groups are not significant, although they would be if the manual scaling procedure had been used ($R = .94$ and $R = .95$ respectively). All the scales for the two environments, Subj and Obj, have significant values of R . However, for the Spanish group the low value of S makes the scale obtained non-significant. Only 15 cases for this group are in the pattern ('0 1') which differentiates the Subj and Obj positions and of these 8 favoured Obj and 7 Subj.

The Arabic group favours Obj over Subj, although there are only 5 cases in this pattern. In the two groups with a considerable number of cases in the crucial pattern, the Russian and the Vietnamese, Subj is favoured over Obj for the correct realisation of the anaphoric Definite Article.

For all groups but the Vietnamese the PP position is the most favoured. In the Vietnamese group Subj is more favoured than PP, but there are a large number of non-scale patterns in this part of the scale.

Table 5.4.11: Bimodal Scales for Definite Article in Three and Two Environments using a division point of 3, Times Combined.

A: SPANISH

ITEM..	SUBJ		OBJ		PP		TOTAL
RESP..	0	1	0	1	0	1	
-----I-ERR-----I-ERR-----I-ERR-----I							
D	I		I		I		I
E	3	I	0	51	I	0	51
F	I		-----ERR	I	I		I
E	I		I		I		I
N	2	I	7	8	I	2	13
V	I		I	-----ERR	I		I
I	I		I		I		I
R	1	I	4	1	I	2	3
	I		I		I	-----ERR	I
	I		I		I		I
	0	I	1	0	I	1	0
-----I-ERR-----I-ERR-----I-ERR-----I							
SUMS	12	60	11	61	5	67	72
PCTS	17	83	15	85	7	93	
ERRORS	0	9	6	1	4	0	20

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.91
COEFFICIENT OF SCALABILITY = 0.29

A: SPANISH

ITEM..	SUBJ		OBJ		
RESP..	0	1	0	1	TOTAL
-----I-ERR-----I-ERR-----I					
D	I		I		I
E	2	0	53	0	53
F	I	-----ERR		I	I
E	I		I		I
N	1	8	7	8	15
V	I		I	ERR	I
I	I		I		I
R	0	4	0	4	4
I-----I-----I					
SUMS	12	60	11	61	72
PCTS	17	83	15	85	
ERRORS	0	7	7	0	14

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.96
COEFFICIENT OF SCALABILITY = 0.39

B: RUSSIAN

ITEM..	OBJ		SUBJ		PP		TOTAL
RESP..	0	1	0	1	0	1	
-----I-ERR-----I-ERR-----I-ERR-----I							
D	I		I		I		I
E	3	I	0	19	I	0	19
F	I		-----ERR	I	I		I
E	I		I		I		I
N	2	I	14	6	I	2	18
V	I		I	-----ERR	I		I
I	I		I		I		I
R	1	I	25	0	I	7	18
	I		I		I	-----ERR	I
	I		I		I		I
	0	I	13	0	I	13	8
-----I-ERR-----I-ERR-----I-ERR-----I							
SUMS	52	25	35	42	22	55	77
PCTS	68	32	45	55	29	71	
ERRORS	0	6	4	7	9	0	26

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.89
COEFFICIENT OF SCALABILITY = 0.68

B: RUSSIAN

ITEM..		OBJ		SUBJ		TOTAL	
RESP..	0	1	I	0	1		I
-----I-ERR-----I-ERR-----I							
D	I			I		I	
E	2	I	0	21	I	0	21
F	I	--	--	ERR	I		
E	I			I		I	
N	1	I	21	4	I	4	21
V	I			I	--	--	ERR
I	I			I		I	
R	0	I	31	0	I	31	0
I-----I-----I							
SUMS		52	25	35	42		77
PCTS		68	32	45	55		
ERRORS		0	4	4	0		8

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.95
COEFFICIENT OF SCALABILITY = 0.87

Table 5.4.11 (cont.)

C: ARABIC

ITEM..	SUBJ	OBJ		PP				TOTAL	
RESP..	0	1	I	0	1	I	0	1	I
	I	ERR	I	ERR	I	ERR	I	I	
D	I		I		I		I	I	
E	3	I	0	18	I	0	18	I	18
F	I	ERR	I		I		I	I	
E	I		I		I		I	I	
N	2	I	4	2	I	1	5	I	6
V	I		I	ERR	I		I	I	
I	I		I		I		I	I	
R	1	I	2	0	I	2	0	2	2
	I		I		I	ERR	I	I	
	I		I		I		I	I	
	0	I	3	0	I	3	0	3	3
	I	ERR	I	ERR	I	ERR	I	I	
SUMS	9	20	6	23	4	25		29	
PCTS	31	69	21	79	14	26			
ERRORS	0	2	1	0	1	0		4	

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.95
 COEFFICIENT OF SCALABILITY = 0.79

C: ARABIC

OITEM..		SUBJ		OBJ			
ORESP..	0	1	I	0	1	I	TOTAL
	----	I-ERR	----	I-ERR	----	I	
D	I		I		I		
E	2	I	0	19	I	0	19
F	I	--	--ERR	I		I	
E	I		I		I		
N	1	I	4	1	I	1	4
V	I		I	--	--	ERR	I
I	I		I		I		
R	0	I	5	0	I	5	0
	I	-----	--I	----	----	I	
SUMS		9	20	6	23		29
PCTS		31	69	21	79		
ERRORS		0	1	1	0		2

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.97
 COEFFICIENT OF SCALABILITY = 0.87

D: VIETNAMESE

ITEM..	OBJ	PP		SUBJ				TOTAL	
RESP..	0	1	I	0	1	I	0	1	I
	I	ERR	I	ERR	I	ERR	I		
D	I		I		I		I		
E	3	I	0	41	I	0	41	I	41
F	I	ERR	I		I		I		
E	I		I		I		I		
N	2	I	16	5	I	3	18	I	21
V	I		I	ERR	I		I		
I	I		I		I		I		
R	1	I	19	2	I	13	8	I	21
	I		I		I	ERR	I		
	I		I		I		I		
	0	I	12	0	I	12	0	I	12
	I	ERR	I	ERR	I	ERR	I		
SUMS	47	48	28	67	24	71			95
FCTS	49	51	29	71	25	75			
ERRORS	0	7	3	9	12	0			30

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.90
 COEFFICIENT OF SCALABILITY = 0.70

D: VIETNAMESE

ITEM..	OBJ	SUBJ				TOTAL	
ORESP..	0	1	1	0	1	1	
-----	I-ERR	--	----	I-ERR	--	----	
D	I		I		I		
E	2	I	0	44	I	0	44
F	I	-----	ERR	I			
E	I		I		I		
N	1	I	27	4	I	4	27
V	I		I	-----	ERR	I	
I	I		I		I		
R	0	I	20	0	I	20	0
	I	-----	----	I	-----	----	
SUMS	47	49	24	71			
PCTS	49	51	25	75			
ERRORS	0	4	4	0			

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.96
 COEFFICIENT OF SCALABILITY = 0.89

Multi-Valued Scaling

Multi-valued scaling was also carried out on the sets of scores. Only discrepancies > 1 item difference, as in previous analyses, were considered deviations from the implicational pattern. The best order and resulting coefficient of reproducibility obtained for each group at each time is given in Appendix B, Table 4.13. Table 5.4.12 gives the overall best order and value of R for each group. The scales obtained are in Appendix B, Table 3.7.

Table 5.4.12: Overall Best Order for 3 Definite Article Environments, times combined

Group	Best Order	R
SPANISH	PP $\geq$ Obj $\geq$ Subj	.99
RUSSIAN	PP $\geq$ Subj $\geq$ Obj	.94
ARABIC	PP $\geq$ Obj $\geq$ Subj	1.00
VIETNAMESE	Subj $\geq$ PP $\geq$ Obj	.97

The orders obtained correspond precisely to those obtained in the bimodal analysis. All coefficients are exceedingly high, although noticeably lower for the Russian group than for the other groups. At Time 3 the Russian group clearly prefers the PP $\geq$ Obj $\geq$ Subj order favoured by the Spanish and Arabic groups.

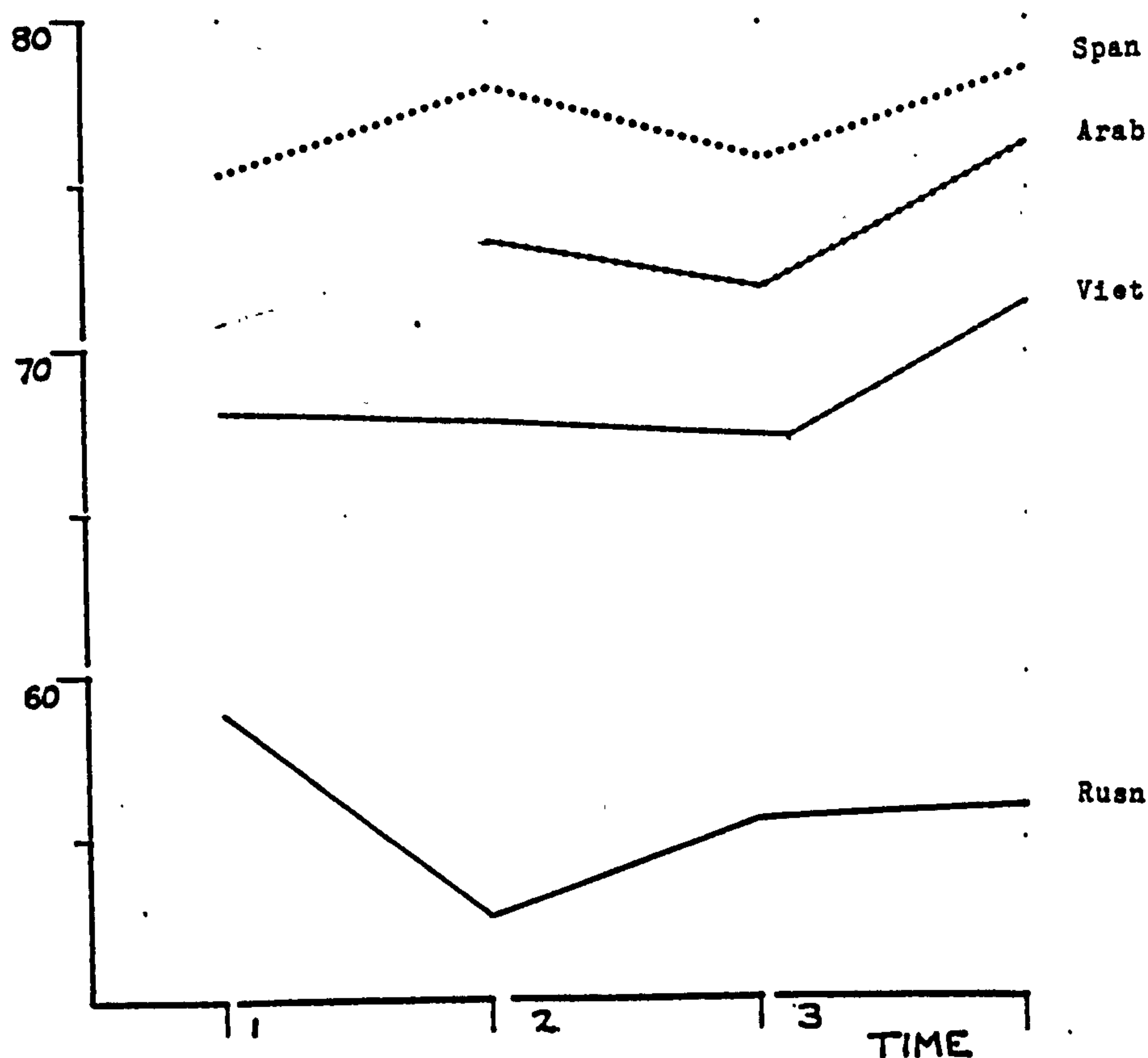
5.4.3 Development over Time

5.4.3.1 Group Trends

In studying the change in the learners' performance over the four test times most emphasis was placed on the changes in the learners' realisation of Articles, considered as an area as a whole. The development for each type separately was only considered when it added an extra dimension to the overall picture. Thus, most of the presentation of results centres on the learners' score for Articles, obtained by adding the two scores for Definite and Indefinite together.

The means for each core group for Articles at each test time was calculated and plotted on Figure 5.4.8. The values obtained are in Appendix B, Table 5.6. All groups but the Russian show a slight

Fig. 5.4.8: Mean Scores for Article, Time 1 to Time 4.



increase in mean from Time 1 to Time 4. The Russian group shows a slight decrease. Values of t were computed to determine whether the differences in means from time to time were large enough to be statistically significant. The results are in Table 5.4.13.

Table 5.4.13: t Values for Difference in Means for Article, Times 1 to 4

Times	Spanish t	Russian t	Arabic t	Vietnamese t
1-4	- 0.67	0.76	- 1.98	- 0.77
1-3	- 0.12	0.90	- 0.54	0.17
1-2	- 0.76	1.30	0.38	0.07
2-4	- 0.25	- 0.72	- 0.45	- 1.12
2-3	0.77	- 0.82	0.42	0.21
3-4	- 1.36	- 0.09	- 0.91	- 1.53

None of the values of t obtained are significant. Thus it appears that we cannot say there is any significant development or change from time to time in the realisation of Articles.

To determine whether this apparent lack of development in Articles as a whole masks significant change in the two Article types, Definite and Indefinite. The means for each type

over the four times were calculated (Appendix B, Table 5.6).

Figures 5.4.9 and 5.4.10 show the means at each time for the Indefinite and Definite Articles considered separately.

Considerably more change in the means over time is evident when the two types are separated. One trend emerges; an increase in the mean score for one type appears to be matched by a decrease for the other. This reflects the nature of the task, in that a correct response could be obtained by a subject by chance.

From Time 1 to Time 4 all groups show an increase in the mean the Indefinite Article and all but the Spanish group a decrease in that for the Definite Article.

Fig. 5.4.9: Mean Scores for Indefinite Article, Time 1 to Time 4.

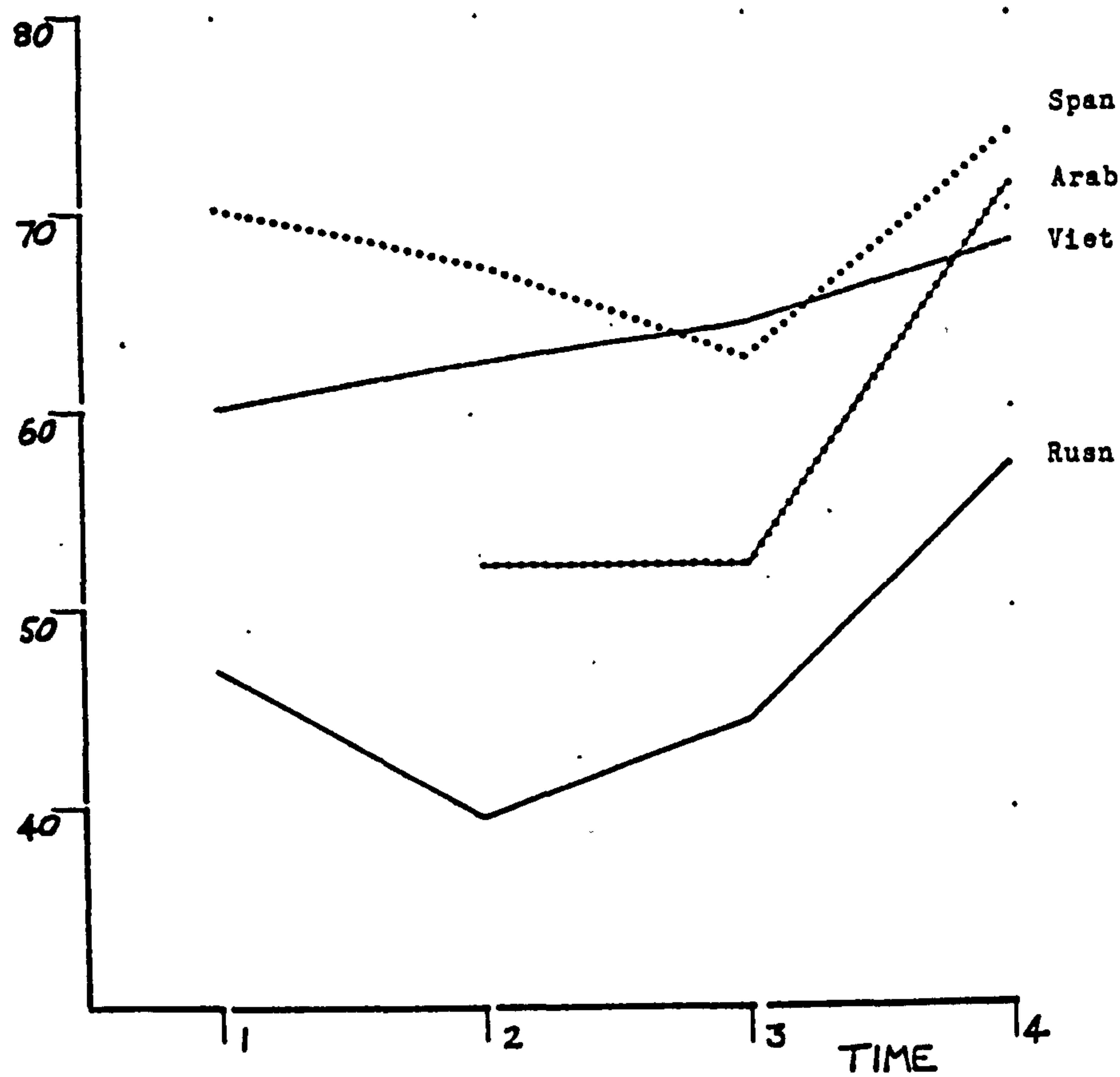
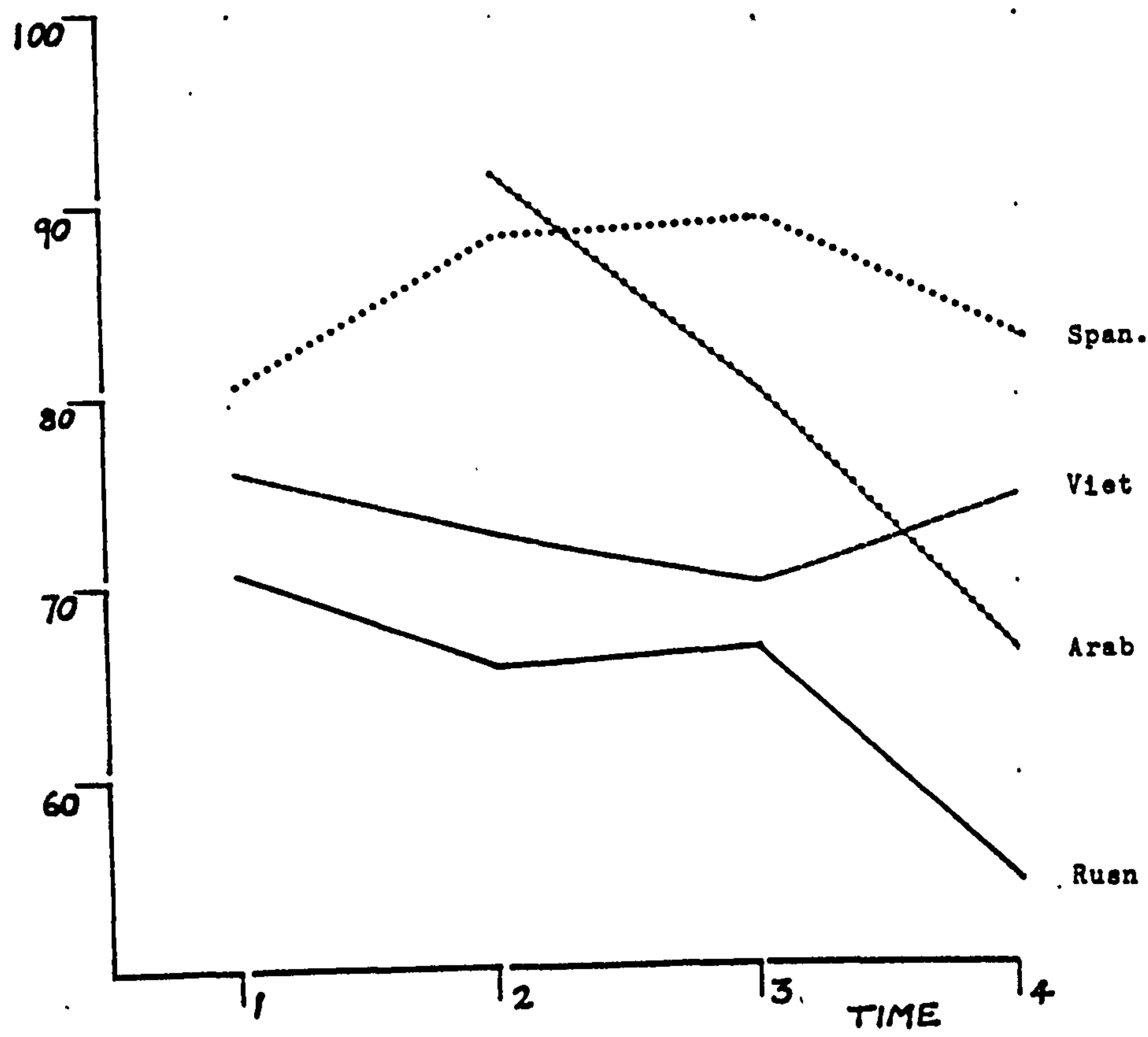


Fig. 5.4.10 : Mean Scores for Definite Article, Time 1 to Time 4.



Values of t were computed to determine if the differences in means from time to time were large enough to be significant. The values obtained are in Table 5.4.14 and 5.4.15. Very few of the differences reach the required level of significance. Only one, that for the Russian group for the Definite Article, shows a significant change from Time 1 to Time 4, and this was in a negative direction.

Table 5.4.14: t Values for Difference in Means at the four Test Times, Indefinite Article

Times	Spanish t	Russian t	Arabic t	Vietnamese t
1-4	- 0.58	- 1.55	- 1.89	- 1.37
1-3	1.15	0.45	0.23	- 0.81
1-2	0.70	0.87	3.02	- 0.72
2-4	- 1.11	- 2.60*	- 1.89	- 1.19
2-3	0.98	- 0.76	0.00	- 0.52
3-4	- 2.57*	- 3.28 ⁺	- 2.46*	- 1.02

Table 5.4.15: t Values for Difference in Means at the four Test Times, Definite Article

Times	Spanish t	Russian t	Arabic t	Vietnamese t
1-4	- 0.44	3.39 ⁺	- 1.00	0.28
1-3	- 1.64	0.78	- 2.00	1.00
1-2	- 1.68	1.02	- 1.89	0.55
2-4	1.50	2.27*	2.10	- 0.41
2-3	- 0.44	- 0.26	1.33	0.76
3-4	2.16*	2.69*	2.00	- 1.06

+ $p = 0.01$ level of significance }
 * $p = 0.05$ level of significance } two tail test

Returning to the learners' overall scores for Articles, these scores for the subjects in each group at the four test times were correlated with each other using Pearson's Product-Moment correlation. The coefficients obtained are presented in Table 5.4.16. Although most of the coefficients are significant they show in general only a moderate correlation between the sets of scores at the various test times. For the Spanish and Vietnamese groups the strongest correlations are between Times 2, 3 and 4. The relatively weak correlations indicate a lack of uniformity in the changes in the performance of the individual subjects in each group over the test times.

5.4.3.2 Individual Behaviour

The investigation of the behaviour of individuals within the groups involved the calculation of the percentage of subjects improving, maintaining the same level of performance and regressing from one time to the next and from Time 1 to Time 4, in terms of each subject's score for the realisation of Articles. The results are in Table 5.4.17. In all groups, but the Russian, more than 50% of subjects progress or maintain the same level of performance from Time 1 to Time 4. For all groups, but the Arabic group (in which there was only data for 3 subjects at Time 1), a relatively large proportion of subjects regress from time to time and overall from Time 1 to Time 4.

To further investigate the behaviour of subjects within the groups the range of progress and regression of the subjects was examined. Figure 5.4.11 gives the percentage of progressers and regressers in each range of change from Time 1 to Time 4. This analysis reveals particularly for the Vietnamese and Russian groups an enormous diversity in individual behaviour. In the Vietnamese group 50% (5) of the progressers made the very considerable development of more than 20% points from Time 1 to Time 4. Over the same time 45% (4) of the regressers regressed by more than 20%. Clearly it is not the case for this group that regressers

Table 5.4.16: Pearson Correlations for Scores for Article at the Four Times.

A: Spanish

	T1	T2	T3	T4
T1	1.0000 (0) P=*****	0.8150 (16) P=0.000	0.5346 (16) P=0.016	0.5960 (16) P=0.007
T2	0.8150 (16) P=0.000	1.0000 (0) P=*****	0.8388 (16) P=0.000	0.8221 (16) P=0.000
T3	0.5346 (16) P=0.016	0.8388 (16) P=0.000	1.0000 (0) P=*****	0.9132 (16) P=0.000
T4	0.5960 (16) P=0.007	0.8221 (16) P=0.000	0.9132 (16) P=0.000	1.0000 (0) P=*****

B: Russian

T1	1.0000 (0) P=*****	0.3327 (18) P=0.089	0.5660 (18) P=0.007	0.5455 (18) P=0.010
T2	0.3327 (18) P=0.089	1.0000 (0) P=*****	0.6144 (18) P=0.003	0.4448 (18) P=0.032
T3	0.5660 (18) P=0.007	0.6144 (18) P=0.003	1.0000 (0) P=*****	0.6709 (18) P=0.001
T4	0.5455 (18) P=0.010	0.4448 (18) P=0.032	0.6709 (18) P=0.001	1.0000 (0) P=*****

C: Arabic

T1	1.0000 (3) P=*****	0.9968 (3) P=0.025	0.7838 (3) P=0.213	0.9985 (3) P=0.018
T2	0.9968 (3) P=0.025	1.0000 (0) P=*****	0.4131 (7) P=0.178	0.7480 (7) P=0.027
T3	0.7838 (3) P=0.213	0.4131 (7) P=0.178	1.0000 (0) P=*****	0.4145 (7) P=0.178
T4	0.9985 (3) P=0.018	0.7480 (7) P=0.027	0.4145 (7) P=0.178	1.0000 (0) P=*****

D: Vietnamese

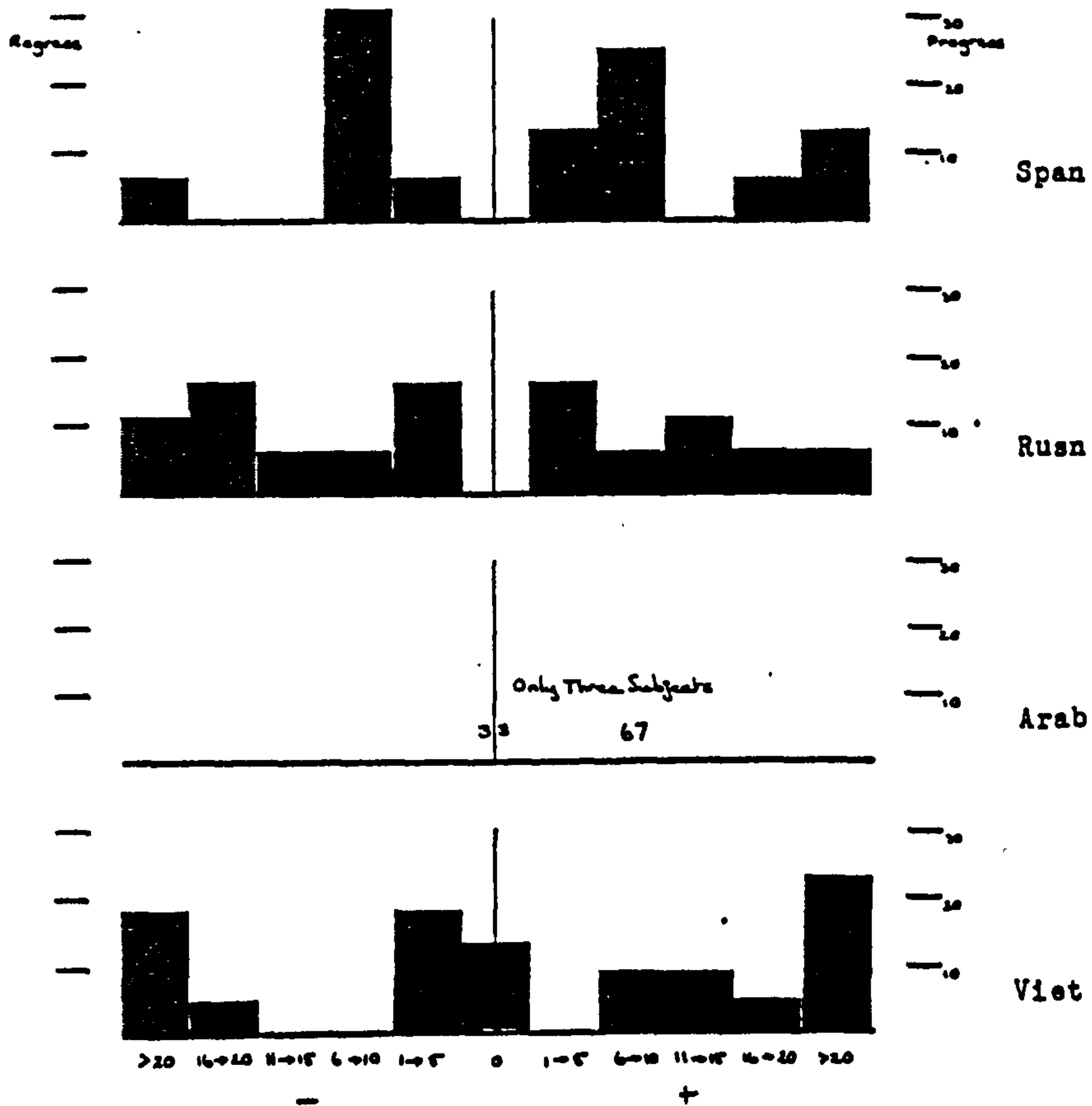
T1	1.0000 (0) P=*****	0.6536 (22) P=0.000	0.4637 (22) P=0.015	0.4930 (22) P=0.010
T2	0.6536 (22) P=0.000	1.0000 (0) P=*****	0.8489 (22) P=0.000	0.7220 (22) P=0.000
T3	0.4637 (22) P=0.015	0.8489 (22) P=0.000	1.0000 (0) P=*****	0.8265 (22) P=0.000
T4	0.4930 (22) P=0.010	0.7220 (22) P=0.000	0.8265 (22) P=0.000	1.0000 (0) P=*****

Table 5.4.17: Percentage of Subjects Progressing and Regressing in each Group for Articles over time

Group	Change	Times			
		1-2	2-3	3-4	1-4
Spanish (16)	Progressing	56	25	50	56
Russian (18)		44	67	39	44
Arabic (3-7)		33	71	57	67
Vietnamese (22)		45	50	59	45
Spanish	Not Changing	0	13	13	0
Russian		0	0	6	0
Arabic		33	0	0	33
Vietnamese		14	5	9	14
Spanish	Regressing	44	62	37	44
Russian		56	33	55	56
Arabic		33	29	43	0
Vietnamese		41	45	32	41

only performed marginally less well at Time 4 than Time 1. A similar diversity is apparent in the Russian group. 50% of the progressers in this group improved $\leq 10\%$ and most $\leq 5\%$ while 50% of the regressers regress more than 15% from Time 1 to Time 4. Most development and regression in the Spanish group is in the -10% to +10% range.

Fig.5.4.11: Percentage of Subjects in Each of Ranges of Change for Article, Time 1 to Time 4.



5.5 Relationship Between the Learning of Syntactic Features in the Four Structural Areas

Having examined the learning of the four structural areas independently it was possible to study the relationship between the learning of the four areas. This was done on two levels, the second being more detailed than the first. On the first, more general level the relationship within each group between the total score for each of the four areas, Copula, Complementation, Negation and Article, was examined in terms of both group trends and of the individual fit to the group pattern, as indicated by Implicational Analysis. Secondly, a more detailed subdivision of each area according to its types was made yielding ten categories. Further subdivision of these categories according to environmental constraints was not made.

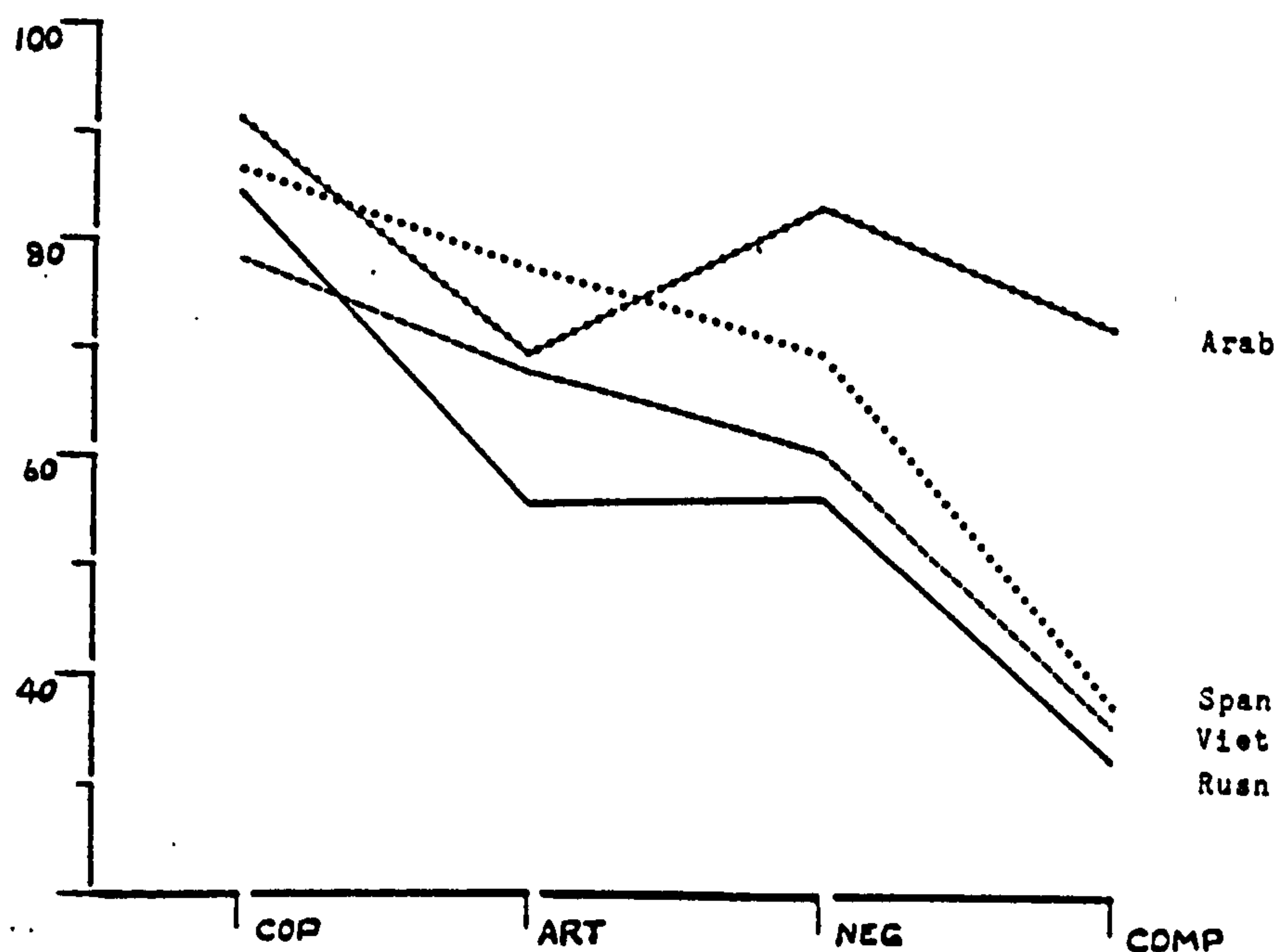
In addition to these two classifications of structures, the same classifications without the NP-related Article results, i.e. the three verb-related areas and their associated subdivision in 8 categories, which were all elicited using the sentence correction task, were able to be examined.

In the analysis of the interrelationship of learning of the structural areas the group trends were analysed in terms of the mean scores for each group for each structure with data from the four times combined and at each test time. After this, Approximation curves for the main structural areas were drawn and examined. Having established group trends implicational analysis was carried out to determine the conformance and thus the scalability of the sets of scores of the individuals in each group. Finally to highlight the similarities and differences between the trends and implicational hierarchies in the four groups, the performance of the groups and their ordering of structures were analysed in terms of correlations between mean scores and the implicational ordering of structural types.

5.5.1 Group Trends

To establish group trends for the relationship between the learning of the four structural areas the ordering of the areas in relation to each other was studied in terms of the mean scores for each area. The mean scores for each group for the four areas with data from all the test times combined are shown graphically in Figure 5.5.1. (The values obtained are given in Appendix B, Tables 5.1-5.6.). T-tests

Fig.5.5.1: Mean Scores for Each Structural Area,
Times Combined.



were undertaken to determine if the difference in means for the four structural areas were large enough to be statistically significant. The values of t obtained are given in Table 5.5.1.

Table 5.5.1: Values of t for Difference in Means for Four Structures, times combined

Structures	Spanish	Russian	Arabic	Vietnamese
Copula Article	5.97 ⁺	13.19 ⁺	7.24 ⁺	5.13 ⁺
Copula Negation	9.17 ⁺	14.17 ⁺	5.67 ⁺	10.79 ⁺
Copula Complementation	19.78 ⁺	22.27 ⁺	6.09 ⁺	19.36 ⁺
Article Negation	3.61 ⁺	- 0.20	- 4.73 ⁺	3.29 ⁺
Article Complementation	14.42 ⁺	8.33 ⁺	- 0.60	13.35 ⁺
Negation Complementation	15.47 ⁺	13.57 ⁺	4.15 ⁺	12.68 ⁺

+ = significant at $p = .01$ level

Virtually all values of t are significant well beyond $p = 0.01$ level of significance. Two non-significant differences were obtained, both involve the Article. The Russian group's means for Article and Negation are not significantly different. Similarly for the Arabic group the means for Article and Complementation are not significantly different.

From this preliminary analysis of the ordering between structural areas a trend appears to be emerging. For all groups the ordering according to means for the 3 Verb-based areas is identical, with Copula being the highest and complement the lowest. The discrepancies between the groups arise from the position of the mean for Article in relation to the three verb-based means. For the Spanish and Vietnamese groups Article is the second highest mean. In the

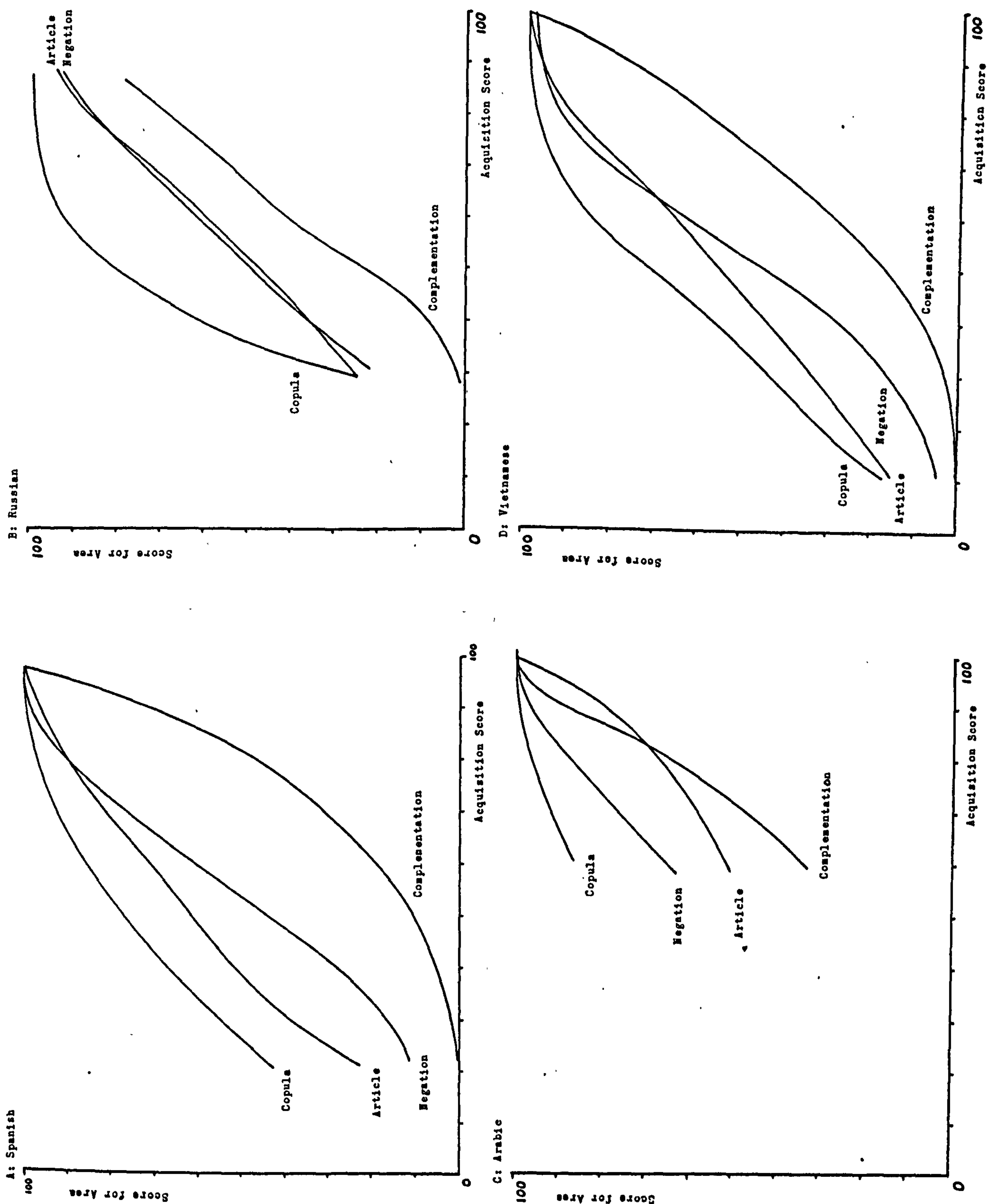
Russian group Article and Negation share the same position between Copula and Complementation. In the Arabic group the mean for Negation is clearly the second highest with Article and Complementation sharing the lowest position.

For each group the score for each subject for each structural area (y-axis) as plotted against that subject's acquisition score (x-axis). From the scattergrams produced curves were approximated which show the line of best fit for the relationship between the learning of a particular structural area and acquisition as a whole as measured by the Acquisition Score. By combining curves for each structural area on the same graph it is possible to gain a visual representation of the interrelationship of the learning of the structural areas.

Following this procedure approximation curves were drawn for each of the four structural areas for each group with data from all test times combined. These are presented in Figure 5.5.2. In all groups there appears to be a clear relationship between Copula, Negation and Complementation with the realisation of Copula beginning first and maintaining its advantage throughout the period of acquisition. Target Negative formation appears to start later than Copula and maintains its position relative to Copula and Complementation throughout the period of acquisition. Complementation is comparatively later in the commencement and progress of its acquisition. Furthermore, over the full course of acquisition there is no crossing of the curves which would result if significantly different rates of acquisition were present in the different areas.

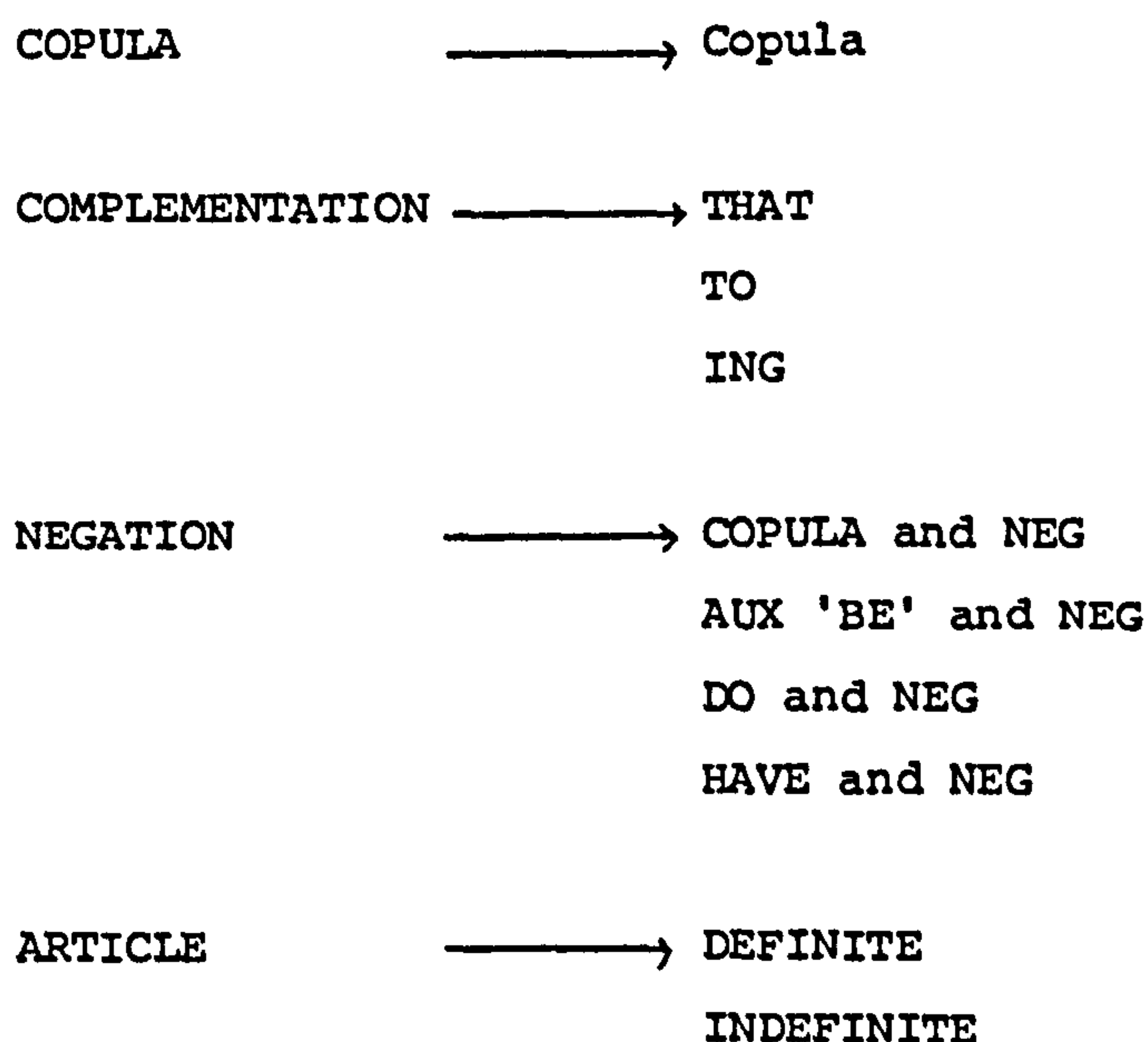
Such a crossover effect is clearly evident in the learning of Article in relation to the other three areas in all four language groups, but particularly the Arabic and Vietnamese. The curves also show the differences between the groups in the extent of learning of Article in relation to the other structural areas. For most of the duration of acquisition for the Spanish group Article is clearly more advanced than Negation. For the Vietnamese group Article is initially more advanced than Negation but the greater apparent comparative

Fig.5.5.2: Approximation Curves for Scores for Each Structural Area (y-axis) against the Acquisition Score (x-axis).



rate of acquisition of Negation once acquisition starts means that by the time the score for each structure is about 70% Negation becomes more advanced than Article. For the Russian group the curves for Negation and Article are intertwined and the rates for each appear to be very similar. For the section of curves for which data is available, the Arabic group clearly favours Negation over Article. Although at Acquisition Score 60% Article is more advanced than Complementation, the rate of acquisition in Complementation is greater and by Acquisition Score 80% the Complementation curve has crossed over the curve for Article.

For more detailed analysis of group trends and of the ordering of structures in each language group the structural areas were subdivided into their constituent structures according to the division below:



yielding 10 syntactic features in all. Of these ten, the first eight are related to the verb. The mean scores for each group for each syntactic feature are presented in Fig 5.5.3. Table 5.5.2 gives the order of features for each group and Table 5.5.3 the correlations in the orders in the groups obtained by computing Spearman's rank order correlation coefficient using the formula:

$$\rho = 1 - \frac{6 \sum_{i=1}^N d_i^2}{N^3 - N}$$

where

d_i = difference in ranks of the two groups for feature i

N = Number of features

Table 5.5.2: Rank Order of Means for 10 Syntactic Features in the Four Language Groups

Syntactic Feature	Group Spanish	Russian	Arabic	Vietnamese
COPULA	1	1	1	1
COP + NEG	3	2	2	4
DEFINITE	2	4	5	2
AUX 'BE' + NEG	4	3	3	3
DO + NEG	5	5	4	6
INDEFINITE	6	7	9	5
THAT	7	6	7	7
TO	8	8	6	8
HAVE + NEG	9	9	8	9
ING	10	10	10	10

Table 5.5.3: Values of rho for Order of Means in the four Groups

	Spanish	Russian	Arabic	Vietnamese
Spanish		.95	.84	.98
Russian			.93	.93
Arabic				.77

all significant at $p = 0.01$ level

Tables 5.5.2 and 5.5.3 clearly show that the order of types in the four groups overall using the mean scores are very similar. The greatest differences in order are between the Arabic group and the Spanish and Vietnamese groups. A look at the orders in Table 5.5.2 reveals that most of the differences in the order at the level of the mean scores arise from differences in the means for the two articles in relation to the other means. Table 5.5.4 gives the rank order correlations for the order of means in the four groups when only the eight verb-related syntactic features from the correction task are included.

Table 5.5.4: Values of rho for Order of Means for eight
Verb-related Syntactic Features

	Spanish	Russian	Arabic	Vietnamese
Spanish		1.00	.98	.98
Russian			.98	.98
Arabic				.95

all significant at $p = 0.01$ level

The exceedingly high values of rho obtained indicate the strength of correlation of the ordering of the 8 verb-related structural types in the four language groups. The order in the Russian and Spanish groups is identical.

5.5.2 Individual Behaviour

Implicational Analysis

Having established the group trends for the interrelationship of the learning of structures in the four areas of syntax investigated in the study, implicational analysis was undertaken to determine the consistency of the behaviour of the individuals within each group in conforming to the apparent overall pattern.

Bimodal Scaling

The scores for the areas were scaled bimodally. In all cases a division point of 80% or its nearest equivalent where the scores were not in percentage form (7/9 for the Complementation types and the indefinite article and 9/12 for the definite article) were used.

Firstly the total scores for each of the structural areas were scaled. The scales obtained for each group with data from all times combined are in Table 5.5.5. All the scales obtained are clearly significant indicating a high degree of individual fit to the group pattern. For all groups but the Vietnamese the best implicational order is the same as the order obtained from the mean scores. In the Vietnamese group implicationally Negation is favoured over Article. In the crucial part of the scale (pattern 2) we can see that 33% of subjects favoured Article over Negation and 67% vice versa.

Table 5.5.6 shows the scale details obtained for the three verb-related structures (ie with the score for Article excluded.) With the exception of the Arabic group, the coefficients for these scales are clearly considerably higher than with Article included. In the Spanish and Vietnamese groups 100% of the sets of scores conformed to the implicational pattern. In the Russian group 99% of the scores fitted the implicational pattern. This indicates that for these three groups all or virtually all deviations from the pattern arise from individual differences in the position of Article in relation to the other three structures. The Arabic group shows only a marginal improvement in the value of R(.93 to .94). From the scale details (Table 5.5.6c) we can see the many errors arose from the ordering of Negation and Complementation. For all groups the best order for the three verb-related structures corresponds to the order of means, namely Copula is the most favoured followed by Negation and Complementation.

Table 5.5.5: Bimodal Scales for the Four Structural Areas using a division point of c. 80%.

A: SPANISH

OITEM.	COMP	NEGATION				ARTICLE				COPULA				TOTAL
ORESP.	0	1	I	0	1	I	0	1	I	0	1	I	0	1
	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	
T	I	I	I	I	I	I	I	I	I	I	I	I	I	
O	4	I	0	4	I	0	4	I	0	4	I	0	4	4
T	I	I-ERR	I-ERR	I	I	I	I	I	I	I	I	I	I	
A	I	I	I	I	I	I	I	I	I	I	I	I	I	
L	3	I	21	2	I	0	23	I	2	21	I	0	23	23
B	I	I	I-ERR	I-ERR	I	I	I	I	I	I	I	I	I	
O	I	I	I	I	I	I	I	I	I	I	I	I	I	
	2	I	13	0	I	9	5	I	3	8	I	0	13	13
	I	I	I	I	I	I-ERR	I-ERR	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	
	1	I	13	0	I	13	0	I	11	2	I	2	11	13
	I	I	I	I	I	I	I	I	I-ERR	I-ERR	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	
	0	I	18	0	I	13	0	I	18	0	I	18	0	18
	I	I	I	I	I	I	I	I	I	I	I	I	I	
SUMS	65	6	39	32	36	35	20	51						
PCTS	92	8	55	49	51	49	28	72						
ERRORS	0	2	0	5	7	2	2	0						

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.94
 COEFFICIENT OF SCALABILITY = 0.81

B: RUSSIAN

OITEM.	COMP	ARTICLE				NEGATION				COPULA				TOTAL
ORESP.	0	1	I	0	1	I	0	1	I	0	1	I	0	1
	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	
T	I	I	I	I	I	I	I	I	I	I	I	I	I	
O	4	I	0	0	I	0	0	I	0	0	I	0	0	0
T	I	I-ERR	I-ERR	I	I	I	I	I	I	I	I	I	I	
A	I	I	I	I	I	I	I	I	I	I	I	I	I	
L	3	I	4	2	I	2	4	I	0	6	I	0	6	6
B	I	I	I-ERR	I-ERR	I	I	I	I	I	I	I	I	I	
O	I	I	I	I	I	I	I	I	I	I	I	I	I	
	2	I	7	0	I	3	4	I	4	3	I	0	7	7
	I	I	I	I	I	I-ERR	I-ERR	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	
	1	I	41	0	I	41	0	I	40	1	I	1	40	41
	I	I	I	I	I	I	I	I	I-ERR	I-ERR	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	
	0	I	22	0	I	22	0	I	22	0	I	22	0	22
	I	I	I	I	I	I	I	I	I	I	I	I	I	
SUMS	74	2	69	8	66	10	23	53						
PCTS	97	3	87	11	97	13	30	70						
ERRORS	0	2	2	4	4	1	1	0						

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.96
 COEFFICIENT OF SCALABILITY = 0.67

C: ARABIC

OITEM.	ARTICLE	COMP	NEGATION				COPULA				TOTAL
ORESP.	0	1	I	0	1	I	0	1	I	0	1
	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	
T	I	I	I	I	I	I	I	I	I	I	
O	4	I	0	7	I	0	7	I	0	7	7
T	I	I-ERR	I-ERR	I	I	I	I	I	I	I	
A	I	I	I	I	I	I	I	I	I	I	
L	3	I	3	1	I	5	0	6	I	0	6
B	I	I	I-ERR	I-ERR	I	I	I	I	I	I	
O	I	I	I	I	I	I	I	I	I	I	
	2	I	9	0	I	6	3	6	I	0	9
	I	I	I	I	I	I-ERR	I-ERR	I	I	I	
	I	I	I	I	I	I	I	I	I	I	
	1	I	3	0	I	3	0	3	I	0	3
	I	I	I	I	I	I	I	I-ERR	I-ERR	I	
	I	I	I	I	I	I	I	I	I	I	
	0	I	3	0	I	3	0	3	I	3	3
	I	I	I	I	I	I	I	I	I	I	
SUMS	20	8	13	15	9	19	3	25			
PCTS	71	29	49	54	32	65	11	89			
ERRORS	0	1	1	3	3	0	0	0			

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.93
 COEFFICIENT OF SCALABILITY = 0.76

D: VIETNAMESE

OITEM.	COMP	ARTICLE				NEGATION				COPULA				TOTAL
ORESP.	0	1	I	0	1	I	0	1	I	0	1	I	0	1
	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	
T	I	I	I	I	I	I	I	I	I	I	I	I	I	
O	4	I	0	10	I	0	10	I	0	10	I	0	10	10
T	I	I-ERR	I-ERR	I	I	I	I	I	I	I	I	I	I	
A	I	I	I	I	I	I	I	I	I	I	I	I	I	
L	3	I	11	3	I	11	0	14	I	0	14	I	0	14
B	I	I	I-ERR	I-ERR	I	I	I	I	I	I	I	I	I	
O	I	I	I	I	I	I	I	I	I	I	I	I	I	
	2	I	12	0	I	8	4	8	I	0	12	I	0	12
	I	I	I	I	I	I-ERR	I-ERR	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	
	1	I	24	0	I	19	5	24	0	5	19	I	0	24
	I	I	I	I	I	I	I	I-ERR	I-ERR	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	
	0	I	35	0	I	35	0	35	0	35	0	35	0	35
	I	I	I	I	I	I	I	I	I	I	I	I	I	
SUMS	82	13	65	30	63	32	40	55						
PCTS	86	14	68	32	66	34	42	58						
ERRORS	0	3	3	9	4	0	5	0						

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.94
 COEFFICIENT OF SCALABILITY = 0.79

Table 5.5.6: Bimodal Scales for the Three VP-related Areas using a division point of c.80%

A: SPANISH

OITEM.	COMP	NEGATION				COPULA				TOTAL
O RESP.	0	1	1	0	1	1	0	1	1	
	I	I	I	I	I	I	I	I	I	
T	I	I	I	I	I	I	I	I	I	
O	3	I	0	4	I	0	4	I	0	4
T	I	I	ERR	I	I	I	I	I	I	
A	I	I	I	I	I	I	I	I	I	
L	2	I	28	0	I	0	23	I	0	23
S	I	I	I	I	I	ERR	I	I	I	
O	I	I	I	I	I	I	I	I	I	
	1	I	19	0	I	19	0	I	0	19
	I	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	
	0	I	20	0	I	20	0	I	20	0
	I	I	I	I	I	I	I	I	I	
SUMS	67	4	37	32	20	51				71
PCTS	94	6	55	45	28	72				
ERRORS	0	0	0	0	0	0				0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 1.00
COEFFICIENT OF SCALABILITY = 1.00

B: RUSSIAN

OITEM.	COMP	NEGATION				COPULA				TOTAL
O RESP.	0	1	1	0	1	1	0	1	1	
	I	I	I	I	I	I	I	I	I	
T	I	I	I	I	I	I	I	I	I	
O	3	I	0	2	I	0	2	I	0	2
T	I	I	ERR	I	I	I	I	I	I	
A	I	I	I	I	I	I	I	I	I	
L	2	I	7	0	I	0	7	I	0	7
S	I	I	I	I	I	ERR	I	I	I	
O	I	I	I	I	I	I	I	I	I	
	1	I	45	0	I	44	1	I	44	45
	I	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	
	0	I	22	0	I	22	0	I	22	0
	I	I	I	I	I	I	I	I	I	
SUMS	74	2	66	10	23	53				76
PCTS	97	3	87	13	30	70				
ERRORS	0	0	0	1	1	0				2

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.99
COEFFICIENT OF SCALABILITY = 0.94

C: ARABIC

OITEM.	COMP	NEGATION				COPULA				TOTAL
O RESP.	0	1	1	0	1	1	0	1	1	
	I	I	I	I	I	I	I	I	I	
T	I	I	I	I	I	I	I	I	I	
O	3	I	0	10	I	0	10	I	0	10
T	I	I	ERR	I	I	I	I	I	I	
A	I	I	I	I	I	I	I	I	I	
L	2	I	12	2	I	12	0	I	14	14
S	I	I	I	I	I	ERR	I	I	I	
O	I	I	I	I	I	I	I	I	I	
	1	I	9	0	I	5	0	I	3	3
	I	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	
	0	I	3	0	I	3	0	I	3	3
	I	I	I	I	I	I	I	I	I	
SUMS	20	12	10	22	3	29				32
PCTS	63	38	31	67	9	91				
ERRORS	0	2	2	0	0	0				4

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.96
COEFFICIENT OF SCALABILITY = 0.84

D: VIETNAMESE

OITEM.	COMP	NEGATION				COPULA				TOTAL
O RESP.	0	1	1	0	1	1	0	1	1	
	I	I	I	I	I	I	I	I	I	
T	I	I	I	I	I	I	I	I	I	
O	3	I	0	8	I	0	8	I	0	8
T	I	I	ERR	I	I	I	I	I	I	
A	I	I	I	I	I	I	I	I	I	
L	2	I	24	0	I	0	24	I	0	24
S	I	I	I	I	I	ERR	I	I	I	
O	I	I	I	I	I	I	I	I	I	
	1	I	23	0	I	23	0	I	23	23
	I	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	
	0	I	40	0	I	40	0	I	40	40
	I	I	I	I	I	I	I	I	I	
SUMS	87	8	63	32	40	55				95
PCTS	92	8	66	34	42	53				
ERRORS	0	0	0	0	0	0				0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 1.00
COEFFICIENT OF SCALABILITY = 1.00

Bimodal scaling was also performed on the 10 syntactic features obtained by sub dividing the four structural areas. The scale details obtained are presented in Table 5.5.7. Table 5.5.8 shows the details for the 8 verb-related features. Whilst only the Spanish and Arabic scales for the 10 features are significant using the computer scaling method, all of the scales for the eight verb-related structures are significant. If manual bimodal scaling had been undertaken all scales would have yielded significant coefficients of reproducibility, the lowest being for the 10 structures in the Vietnamese group ($R = .93$). The same pattern between the values of R for the 8 verb-related correction task structures and the full 10 structures is clearly evident, all the R s obtained for the 8 structures are considerably higher than for 10 (an improvement on average of .05 using the machine scaling method and .02 using the manual scaling method). A considerable number of errors in all groups arise as a result of the lack of uniformity among subjects in their ordering of the 2 articles in relation to the other 8 structures.

Order of Structures

Tables 5.5.9 and 5.5.10 give the order of the 10 and 8 features using the orders obtained from the bimodal scales using the 80% division point. Tables 5.5.11 and 5.5.12 give the resulting values of Spearman's rho for the correlation of the orders for the 10 features and the 8 verb-related features obtained for each group.

In most cases the correlations between the groups for the order of the 8 verb-related features are higher than those for the 10 features. One increase in the strength of the correlation, that between the Arabic and Spanish groups, is considerable (.3). These increases reflect the relative disparity in the groups in the ordering of the Definite and Indefinite Article in relation to the other features. All coefficients for the order of the 8 features indicate a strong relationship between the orders in the groups, particularly for the orders in the Spanish, Russian and Arabic groups.

Table 5.5.7: Bimodal Scales for 10 Features from the Four Areas
using a division point of c.80%.

A: SPANISH

OITEM..	ING	HAVE	THAT	TO	INDEF	DO	AUX	COPULA	COPNEG	DEF	TOTAL
ORSP..	0	1	1	1	1	1	1	1	1	1	1
-----I-ERR	-----I-ERR	-----I-ERR	-----I-ERR	-----I-ERR	-----I-ERR	-----I-ERR	-----I-ERR	-----I-ERR	-----I-ERR	-----I-ERR	-----I-ERR
B	I	I	I	I	I	I	I	I	I	I	I
I 10	I 0	2I 0	2I 0	2I 0	2I 0	2I 0	2I 0	2I 0	2I 0	2I 0	2
M	I	-----ERRI	I	I	I	I	I	I	I	I	I
O	I	I	I	I	I	I	I	I	I	I	I
D 9	I 4	3I 0	7I 0	1	6I 2	5I 0	7I 0	7I 0	7I 0	7I 0	7
1	I	I	I	I	I	I	I	I	I	I	I
0	I	I	I	I	I	I	I	I	I	I	I
8	I 9	0I 3	6I 1	3	6I 2	7I 0	9I 0	9I 0	9I 0	9I 0	9
I	I	I	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
7	I 10	0I 7	3I 7	3	3I 0	10I 0	10I 0	10I 0	10I 0	10I 1	10
I	I	I	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
6	I 13	0I 13	1I 12	10	3I 4	9I 0	13I 0	13I 0	13I 0	13I 0	13
I	I	I	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
5	I 4	0I 4	4	3	1I 2	2I 2	3I 1	4I 0	4I 0	4I 0	4
I	I	I	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
4	I 3	0I 3	3	1	2I 2	1I 3	3I 0	3I 0	3I 0	3I 1	3
I	I	I	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
3	I 4	0I 4	4	4	0I 3	1I 4	0I 0	2I 2	1	3I 2	4
I	I	I	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
2	I 3	0I 3	3	3	0I 2	1I 3	0I 3	1I 2	2	1I 0	3
I	I	I	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
1	I 8	0I 8	8	8	0I 7	1I 8	0I 8	0I 8	7	1I 2	8
I	I	I	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
0	I 8	0I 8	8	8	0I 8	8	0I 8	0I 8	8	0I 8	8
I	I	I	I	I	I	I	I	I	I	I	I
SUMS	66	5	53	19	50	21	45	25	32	39	27
PCTS	93	7	75	25	70	30	65	35	43	55	38
ERRORS	0	3	0	9	1	4	9	6	8	6	2

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.90
MINIMUM MARGINAL REPRODUCIBILITY = 0.71
PERCENT IMPROVEMENT = 0.19
COEFFICIENT OF SCALABILITY = 0.66

Table 5.5.7 (cont.)

B: RUSSIAN

OITEM.	HAVE	INC	INDEF	THAT	DO	TO	DEF	AUX	COPNEG	COPULA	TOTAL
OITEM.	HAVE	INC	INDEF	THAT	DO	TO	DEF	AUX	COPNEG	COPULA	TOTAL
0	1	0	1	0	1	0	1	0	1	0	1
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0
SUMS	74	2	74	2	64	12	62	14	58	18	53
PCTS	97	3	97	3	84	15	82	18	76	24	70
ERRORS	0	2	0	1	2	10	1	8	5	7	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.87
 MINIMUM MARGINAL REPRODUCIBILITY = 0.75
 PERCENT IMPROVEMENT = 0.13
 COEFFICIENT OF SCALABILITY = 0.50

C: ARABIC Table 5.5.7 (cont.)

OITEM..	INDEF	HAVE	ING	THAT	DEF	DO	TO	COPNEG	COPULA	AUX	TOTAL
ORSP..	0	1	1	1	1	1	1	1	1	1	1
ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
B	I	I	I	I	I	I	I	I	I	I	I
I	10	I	0	3I	0	3I	0	3I	0	3I	0
M	I	I	I	I	I	I	I	I	I	I	I
D	9	I	0	6I	1	3I	0	6I	0	6I	0
1	I	I	ERRI	I	I	I	I	I	I	I	I
0	I	I	I	I	I	I	I	I	I	I	I
8	I	3	2I	4	1I	4I	0	3I	0	5I	0
I	I	I	I	I	I	I	I	I	I	I	I
7	I	3	1I	4	1	3I	0	4I	0	4I	0
I	I	I	I	I	I	I	I	I	I	I	I
6	I	4	1I	5	0I	4I	0	5I	0	5I	0
I	I	I	I	I	I	I	I	I	I	I	I
5	I	0	0I	0	0I	0	0I	0	0I	0	0
I	I	I	I	I	I	I	I	I	I	I	I
4	I	1	0I	1	0I	0	1I	0	1I	0	1
I	I	I	I	I	I	I	I	I	I	I	I
3	I	1	0I	1	0I	1	0I	0	1I	0	1
I	I	I	I	I	I	I	I	I	I	I	I
2	I	0	0I	0	0I	0	0I	0	0I	0	0
I	I	I	I	I	I	I	I	I	I	I	I
1	I	1	0I	1	0I	1	0I	1	0I	1	1
I	I	I	I	I	I	I	I	I	I	I	I
0	I	2	0I	2	0I	2	0I	2	0I	2	2
I	I	I	I	I	I	I	I	I	I	I	I
SUMS	20	8	10	14	18	20	22	23	23	23	28
PCTS	71	29	61	35	50	71	79	82	89	89	89
ERRORS	0	3	0	1	1	2	1	0	0	1	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.93
 MINIMUM MARGINAL REPRODUCIBILITY = 0.75
 PERCENT IMPROVEMENT = 0.18
 COEFFICIENT OF SCALABILITY = 0.71

D: VIETNAMESE

Table 5.5.7 (cont.)

OITEM..	ING	HAVE	THAT	TO	INDEF	COPNEG	DO	DEF	COPULA	AUX	TOTAL
ORSP..	0	1	1	1	1	1	1	1	1	1	1
----	----	----	----	----	----	----	----	----	----	----	----
B	I	I	I	I	I	I	I	I	I	I	I
I	10	I	0	0	0	0	0	0	0	0	8
M	I	-----ERRI	I	I	I	I	I	I	I	I	I
O	I	I	I	I	I	I	I	I	I	I	I
D	9	I	3	0	0	0	0	0	0	0	5
I	I	-----ERRI	I	I	I	I	I	I	I	I	I
O	I	I	I	I	I	I	I	I	I	I	I
8	I	4	1	6	3	4	0	7	0	0	7
I	I	-----ERRI	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
7	I	3	1	2	1	3	0	4	0	0	4
I	I	-----ERRI	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
6	I	7	0	5	2	1	6	7	3	0	7
I	I	I	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
5	I	6	0	6	3	1	1	5	4	0	6
I	I	-----ERRI	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
4	I	8	0	8	0	3	2	6	4	1	8
I	I	-----ERRI	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
3	I	4	0	4	2	4	4	0	2	2	4
I	I	-----ERRI	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
2	I	16	0	15	14	15	11	5	7	8	16
I	I	-----ERRI	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
1	I	14	0	14	13	14	14	6	10	13	14
I	I	-----ERRI	I	I	I	I	I	I	I	I	I
I	I	I	I	I	I	I	I	I	I	I	I
0	I	16	0	15	16	16	16	16	16	16	16
I	I	-----ERRI	I	I	I	I	I	I	I	I	I
SUMS	80	19	74	23	68	35	52	43	52	40	55
PCTS	84	16	70	22	72	37	55	45	55	42	58
ERRORS	0	7	2	10	3	9	0	6	5	4	0

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.89

MINIMUM MARGINAL REPRODUCIBILITY = 0.65

PERCENT IMPROVEMENT = 0.20

COEFFICIENT OF SCALABILITY = 0.57

Table 5.5.8: Bimodal Scales for 8 VP-related Features,
using a division point of c.80%.

A: Spanish

OITEM.	ING	HAVE+NEG		THAT		TO		DO+NEG		AUX+NEG		COP-		COPNEG				TOTAL	
ORESP.	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	
	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	
0	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
U	8	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4
T	I	ERR	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
S	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
0	7	6	1	0	7	0	7	1	6	0	7	0	7	0	7	0	7	0	7
	I	I	ERR	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	6	8	0	4	4	1	7	3	9	0	8	0	8	0	8	0	8	0	8
	I	I	I	I	ERR	I	I	I	I	I	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	3	13	0	10	3	10	3	6	7	0	13	0	13	0	13	0	13	0	13
	I	I	I	I	I	I	ERR	I	I	I	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	4	11	0	11	0	11	0	10	1	0	11	1	10	0	11	0	11	0	11
	I	I	I	I	I	I	I	I	ERR	I	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	3	7	0	7	0	7	0	5	2	6	1	3	4	0	7	0	7	0	7
	I	I	I	I	I	I	I	I	I	I	ERR	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	2	1	0	1	0	1	0	1	0	1	0	1	1	0	1	0	1	0	1
	I	I	I	I	I	I	I	I	I	I	I	I	ERR	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	1	4	0	4	0	4	0	4	0	4	0	3	1	3	1	2	2	2	4
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	ERR	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16	16
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
SUMS	66	5	53	18	50	21	46	25	27	44	23	48	20	51	18	53			71
PCTS	93	7	73	25	70	30	63	35	38	62	32	68	28	72	25	73			
ERRORS	0	1	0	7	1	3	10	3	0	1	4	2	1	1	2	0			36

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.94
 MINIMUM MARGINAL REPRODUCIBILITY = 0.72
 PERCENT IMPROVEMENT = 0.21
 COEFFICIENT OF SCALABILITY = 0.77

B: Russian

OITEM.	ING	HAVE+NEG			THAT			DO+NEG			TO			AUX+NEG			COPNEG			COP.			TOTAL
ORESP.	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1		
	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR	I-ERR		
0	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
U	8	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	
T	I	ERR	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
S	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
0	7	0	1	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	
	I	I	ERR	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
	6	6	0	5	1	0	6	1	5	0	6	0	6	0	6	0	6	0	6	0	6	6	
	I	I	I	I	I	ERR	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
	8	6	0	6	0	3	3	3	3	0	6	0	6	0	6	0	6	0	6	0	6	6	
	I	I	I	I	I	I	I	ERR	I	I	I	I	I	I	I	I	I	I	I	I	I		
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
	4	10	0	10	0	10	0	6	4	3	7	0	10	0	10	1	9	1	9	1	9	10	
	I	I	I	I	I	I	I	I	I	ERR	I	I	I	I	I	I	I	I	I	I	I		
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
	3	8	0	8	0	6	2	7	1	7	1	4	4	0	8	0	8	0	8	0	8	8	
	I	I	I	I	I	I	I	I	I	I	I	ERR	I	I	I	I	I	I	I	I	I		
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
	2	11	0	11	0	11	0	9	2	10	1	7	4	7	3	8	1	8	1	8	1	11	
	I	I	I	I	I	I	I	I	I	I	I	I	ERR	I	I	I	I	I	I	I	I		
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
	1	16	0	16	0	13	1	13	1	16	0	16	0	16	0	2	14	1	14	1	14	16	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	ERR	I	I	I	I	I		
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	0	17	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I		
SUMS	74	2	74	2	62	14	58	18	53	23	44	32	37	39	23	53						76	
PCTS	97	3	97	3	82	18	76	24	70	30	58	42	49	51	30	70							
ERRORS	0	1	1	1	0	6	4	8	3	2	4	4	4	0	6	0						44	

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.93
 MINIMUM MARGINAL REPRODUCIBILITY = 0.79
 PERCENT IMPROVEMENT = 0.18
 COEFFICIENT OF SCALABILITY = 0.71

Table 5.5.8 (cont.)

C: Arabic

OITEM	HAVE+NEG	ING	THAT	DO+NEG	TO	COP	COP+NEG	AUX+NEG	TOTAL										
ORSP..	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	TOTAL
0	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
U	8	I	0	10	I	0	10	I	0	10	I	0	10	I	0	10	I	0	10
T	I	ERR	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
8	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
0	7	I	3	2	I	3	0	3	I	0	3	I	0	3	I	0	3	I	3
	I	I	I	ERR	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
6	I	6	0	I	4	2	I	3	I	1	3	I	0	4	I	0	4	I	4
	I	I	I	I	I	ERR	I	I	I	I	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
5	I	9	0	I	5	0	I	4	I	1	4	I	0	3	I	0	3	I	3
	I	I	I	I	I	I	ERR	I	I	I	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
4	I	1	0	I	1	0	I	0	I	1	0	I	0	1	I	0	1	I	1
	I	I	I	I	I	I	I	I	I	ERR	I	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
3	I	2	0	I	2	0	I	2	0	I	2	0	I	0	2	I	0	2	2
	I	I	I	I	I	I	I	I	I	I	ERR	I	I	I	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
2	I	0	0	I	0	0	I	0	0	I	0	0	I	0	0	I	0	0	0
	I	I	I	I	I	I	I	I	I	I	I	I	I	ERR	I	I	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
1	I	0	0	I	0	0	I	0	0	I	0	0	I	0	0	I	0	0	0
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	ERR	I	I	
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
0	I	3	0	I	3	0	I	3	0	I	3	0	I	3	0	I	3	0	3
	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
SUMS	20	12	17	15	11	21	7	25	6	26	3	29	3	29	3	29	3	29	32
PCTS	63	38	33	47	34	66	22	78	19	81	9	91	9	91	9	91	9	91	
ERRORS	0	2	2	2	1	1	2	1	1	0	0	0	0	0	0	0	0	0	12

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.99
 MINIMUM MARGINAL REPRODUCIBILITY = 0.77
 PERCENT IMPROVEMENT = 0.19
 COEFFICIENT OF SCALABILITY = 0.80

D: Vietnamese

OITEM..	ING	HAVE+NEG				THAT				TO				COP+NEG				DO+NEG				COP				AUX+NEG				TOTAL	
ORSP..	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	1	1				
	ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR				
0	I		I		I		I		I		I		I		I		I		I		I		I		I		I				
U	8	I	0	10	I	0	10	I	0	10	I	0	10	I	0	10	I	0	10	I	0	10	I	0	10	I	0				
T	I	ERR					I		I		I		I		I		I		I		I		I		I		I				
8	I		I		I		I		I		I		I		I		I		I		I		I		I		I				
0	7	I	3	4	I	2	3	I	0	7	I	2	3	I	0	7	I	0	7	I	0	7	I	0	7	I	0				
	I		I	ERR					I		I		I		I		I		I		I		I		I		I				
	I		I		I		I		I		I		I		I		I		I		I		I		I		I				
4	I	3	1	I	3	I	4	0	I	4	I	0	4	I	0	4	I	0	4	I	0	4	I	0	4	I	0				
	I		I		I	ERR					I		I		I		I		I		I		I		I		I				
5	I	11	0	I	8	3	I	7	4	I	3	4	I	0	11	I	2	9	I	0	11	I	0	11	I	0	11				
	I		I		I		I	ERR					I		I		I		I		I		I		I		I				
4	I	7	0	I	7	0	I	7	0	I	7	0	I	0	7	I	0	7	I	0	7	I	0	7	I	0	7				
	I		I		I		I		I		I	ERR					I		I		I		I		I		I		I		
3	I	4	0	I	4	0	I	4	0	I	4	0	I	1	3	I	3	1	I	0	4	I	0	4	I	0	4				
	I		I		I		I		I		I		I		I	ERR					I		I		I		I				
2	I	10	0	I	10	0	I	9	1	I	10	0	I	9	1	I	5	3	I	3	7	I	4	6	I		10				
	I		I		I		I		I		I		I		I		I	ERR					I		I		I		I		
1	I	16	0	I	16	0	I	15	1	I	14	2	I	14	0	I	14	2	I	11	3	I	10	6	I		16				
	I		I		I		I		I		I		I		I		I		I		I	ERR					I		I		
0	I	26	0	I	26	0	I	26	0	I	26	0	I	26	0	I	26	0	I	26	0	I	26	0	I		26				
	I	ERR					I	ERR					I	ERR					I	ERR					I	ERR					I
SUMS	80	15	74	21	72	23	68	27	52	43	50	45	40	55	40	55	40	55	40	55	40	55	40	55	40	55	95				
PCTS	84	16	78	22	76	24	72	28	55	48	53	47	42	58	42	58	42	58	42	58	42	58	42	58	42	58					
ERRORS	0	5	2	6	4	6	7	2	0	4	5	7	3	5	14	0											70				

STATISTICS..

COEFFICIENT OF REPRODUCIBILITY = 0.91
 MINIMUM MARGINAL REPRODUCIBILITY = 0.67
 PERCENT IMPROVEMENT = 0.24
 COEFFICIENT OF SCALABILITY = 0.72

Table 5.5.9: Rank Order of 10 Features in each Group using
Bimodal Scaling order with 80% division point

Feature	Spanish	Russian	Arabic	Vietnamese
COPULA	3	1	2.5	2
AUX + NEG	4	3	1	1
DEFINITE	1	4	5.5	3
COP + NEG	2	2	2.5	5
DO + NEG	5	6	10	4
INDEFINITE	6	8	4	6
TO	7	5	7	7
THAT	8	7	9	8
HAVE + NEG	9	9	8	9
ING	10	10	10	10

Table 5.5.10: Rank Order of 8 Verb-related in each Group, using
Bimodal Scaling Order with 80% division point

Feature	Spanish	Russian	Arabic	Vietnamese
COPULA	2	1	2	2
AUX + NEG	3	3	2	1
COP + NEG	1	2	2	4
DO + NEG	4	5	5	3
TO	5	4	4	5
THAT	6	6	6	6
HAVE + NEG	7	7	8	7
ING	8	8	7	8

Table 5.5.11: Values of rho for the Correlation of the Order of 10 Features in the 4 Groups, using Bimodal Scaling Order

	Spanish	Russian	Arabic	Vietnamese
Spanish		.86 ⁺	.63* p = 0.02	.86 ⁺
Russian			.89 ⁺	.83 ⁺
Arabic				.73 ⁺

+ significant at p = 0.01 level
* significant at p = 0.05 level

Table 5.5.12: Values of rho for the Correlation of the Order Features in the 4 Groups, using the Bimodal Scaling Order

	Spanish	Russian	Arabic	Vietnamese
Spanish		.95	.93	.83
Russian			.95	.83
Arabic				.85

all significant at p = 0.01 level

Table 5.5.13 and 5.5.14 give the correlation between the two Orders obtained from the analysis of group trends and the bimodal implicational scaling..

Table 5.5.13: Correlation of Mean and Implicational Orders for 10 Features, within each Group

Group	rho
SPANISH	.95
RUSSIAN	.93
ARABIC	.88
VIETNAMESE	.92

Table 5.5.14: Correlation of Mean and Implicational Orders for 8 Verb-related Features, within each Group

Group	rho
SPANISH	.95
RUSSIAN	.93
ARABIC	.93
VIETNAMESE	.93

Although in no cases are the orders obtained in the two analyses identical all the correlations are exceedingly high indicating a strong relationship between the orders obtained for each group using the two methods of analysis.

5.6 The Effect of the Independent Variables

5.6.1 Partial Correlations for AOA and LOR

Data on two independent variables, Age on Arrival (AOA) and Length of Residence (LOR) were collected from subjects in the study (details are given in Appendix B, Table 1). To assess the correlation of each of these variables with the subjects' Acquisition Scores and rate of change in Acquisition Score first degree partial correlations were calculated, using the SPSS Partial Correlation Program. Partial correlation allows the measurement of the relationship between two variables while adjusting for the effect of one or more additional variables. In the calculation the following formula is used:

$$r_{ij.k} = \frac{r_{ij} - (r_{ik})(r_{jk})}{\sqrt{1 - r_{ik}^2} \sqrt{1 - r_{jk}^2}}$$

where k = control variable

i = independent variable

j = dependent variable

r = correlation coefficient.

To determine the correlations between these 2 independent variables and the learners' performance on the tasks results from the core groups were used. Two dependent measures were correlated with the independent variables. The first, the Acquisition Score (ACQSCORE) at Time 1 is a measure of each subject's overall performance. The second measure used was designed to measure the rate of acquisition in each subject in terms of the change in the Acquisition Score over the time of the study, calculated as:

Change in

Acquisition = Acquisition Score T4 - Acquisition Score T1

(hereafter, CHACQ1-4)

5.6.1.1 Age on Arrival

Correlation coefficients were computed for AOA with the two dependent variables, controlling for the effect of LOR. The values of r obtained are presented in Table 5.6.1.

Table 5.6.1: Correlations of AOA with dependent variables, controlling for LOR

GROUP	ACQSCORE Time 1	CHACQ1-4
	r	r
SPANISH	.18	- .41
RUSSIAN	.54 ⁺	- .69 ⁺
ARABIC	.70*	- .40
VIETNAMESE	.50 ⁺	- .20
GROUPS COMBINED (56 cases)	.37 ⁺	- .29* p = 0.02

* significant at $p = 0.05$ level

+ significant at $p = 0.01$ level

For both the Vietnamese and the Russian group there is a highly significant but relatively modest correlation between AOA and the overall score at Time 1. In the Arabic group the correlation is only significant at $p = 0.025$ level, but the correlation indicates a stronger relationship than that in the other 2 groups. The correlation obtained for the Spanish group is not significant. All correlations between AOA and score at Time 1 are positive indicating that on average the older the learner on arrival the greater his acquisition for a given LOR.

All coefficients for the correlation of rate of acquisition and AOA are negative but only one, for the Russian group, is significant.

For the Russian group there appears to be a substantial negative relationship between AOA and rate of acquisition.

When data from all groups is combined there appears overall to be significant, but low correlations between AOA and ACQSCORE at Time 1 (positive) and rate of acquisition as measured by CHACQ1-4 (negative).

5.6.1.2 Length of Residence

Controlling for the effect of AOA, correlations were computed between LOR and the two dependent variables. The resulting values of r are given in Table 5.6.2.

For all groups but the Arabic there is a significant, but modest positive correlation between LOR and overall score at Time 1. For the Spanish and Vietnamese groups there is a significant, but modest, negative correlation between LOR and rate of acquisition.

Table 5.6.2: Correlations of LOR with dependent variables, controlling for AOA

GROUP	ACQSCORE Time 1	CHACQ1-4
	r	r
SPANISH	.40*	- .66 ⁺
RUSSIAN	.48*	- .25
ARABIC	.55	- .50
VIETNAMESE	.41*	- .40*
GROUPS COMBINED	.45 ⁺	- .32 ⁺ p = .01

When data from all the groups is combined the correlations between LOR and the two dependent variables are both highly significant. The relationship between level of performance at Time 1 and LOR is modest, but substantial. Between rate of acquisition and LOR the relationship although present is slight.

5.6.2 The Relative Effects of the Four Independent Variables

Four independent variables which had been hypothesized to affect the level of performance of subjects in the groups were included in the study. The influence of two of these, the metric variables, AOA and LOR, were studied by means of partial correlations in the preceding section. The other two are the non-metric variables, called factors, according to which the subjects' scores were divided into groups, namely Time and native language (Language).

5.6.2.1 Analysis of Covariance

To assess the effect these factors and the covariates, AOA and LOR, have on the subjects' performance an Analysis of Covariance was undertaken. In Analysis of Covariance designs the effects of metric covariates, in this case AOA and LOR, can be assessed along with the effects of non-metric categorical independent variables, more commonly included in Analyses of Variance. Analysis of Variance allows the decomposition of variation in scores for a dependent variable to determine the effect which independent variables have on the dependent variable. The statistic produced by Analysis of Variance is the F ratio, a significant value of F indicating that the factor or covariate under consideration has made a considerable contribution to the variation which is evident.

The particular model chosen for the analysis in this study is one in which the effects of covariates and factors are assumed to be of equal interest and where there is not assumed to be any causal priority between the two types of independent variables. This model, which is available through the SPSS ANOVA programme Option 9, provides a regression approach in which "all the effects are assessed simultaneously, with each effect being adjusted for all the other effects" (Kim and Kohout 1975:409). The values of F obtained for each of the effects for each of the dependent variables, the Acquisition Score and the scores for each of the structural areas taken separately, are given in Table 5.6.3.

Table 5.6.3: Values of F obtained from Analysis of Covariance
using the Regression Model

	DEPENDENT VARIABLES				
	ACQUISITION SCORE	COPULA	COMPLEMEN- TATION	NEGATION	ARTICLE
TOTAL COVARIATES	13.3 ⁺	10.1 ⁺	19.4 ⁺	5.8 ⁺	10.6 ⁺
AOA	17.9 ⁺	18.6 ⁺	14.1 ⁺	7.1 ⁺	20.0 ⁺
LOR	18.4 ⁺	7.4 ⁺	36.0 ⁺	8.6 ⁺	7.2 [±]
TOTAL FACTORS	5.7 ⁺	3.2 ⁺	10.1 ⁺	5.2 ⁺	6.5 ⁺
LANGUAGE	8.8 ⁺	5.1 ⁺	17.3 ⁺	9.6 ⁺	12.6 ⁺
TIME	1.1	1.2	2.9*	0.8	0.3

+ p = 0.01 level of significance

* p = 0.05 level of significance

The F ratios obtained show clearly that the two independent covariates, AOA and LOR, contribute more to the variance than the two factors, Language and Time. Of these two factors, only the F values for Language are consistently significant. The Time factor only contributes significantly to the variance for the lowest scoring area, Complementation, and then only at the p = 0.05 level of significance.

From the analysis we can conclude that the two independent variables, AOA and LOR, contribute most to the variance in the learners' scores in all areas but Negation where Language produces a slightly higher F ratio than either of the covariates. For Negation and Acquisition Score AOA and LOR have similar F values and thus appear to have about the same effect on the scores. For Copula and Article the effect of AOA is considerably greater than that of LOR. For Article, Language also has a greater effect than LOR. In the area of Complementation the effect of AOA appears to be less, the effect of LOR being more than twice that of AOA. In this area the effect of Language is also more apparent.

The analysis shows no significant Time effect in the data. It does however show a significant Language effect when the covariate effects have been adjusted for. This Language effect is most marked in the lowest scoring of the four structural areas, Complementation and the least marked in the highest scoring area, Copula. The analysis further shows there to be no significant interaction between the two factors.

5.6.2.2 Multiple Classification Analysis

To further assess the effect of the Language factor, and to a lesser extent of the non-significant Time factor, a Multiple Classification Analysis (MCA) was undertaken using SPSS ANOVA with Options 3 and 8. Multiple Classification Analysis provides a method of displaying the results of an Analysis of Variance, so that the net effects of factors can be seen when other independent factors and covariates are controlled for. In particular, it enables the determination of which categories within the factors (in this case, language groups) deviate most from the grand mean and thus contribute most to the significance of the F ratio. In addition, from MCA a value of Multiple R for the factors is obtained which, through calculation of R^2 , can show how much of the variation is explained by these factors. Table 5.6.4 shows the MCA obtained for Language and Time for each of the 5 dependent variables.

Table 5.6.4: Results of the Multiple Classification Analysis for Acquisition Score and for Each Structural Area.

Acquisition Score

GRAND MEAN = 64.40

VARIABLE + CATEGORY	N	UNADJUSTED		ADJUSTED FOR INDEPENDENTS		ADJUSTED FOR INDEPENDENTS + COVARIATES	
		DEV'N	ETA	DEV'N	BETA	DEV'N	BETA
LANG *							
1	84	-1.56		-1.48		0.12	
2	23	20.01		19.54		17.47	
3	71	-8.02		-7.99		-6.50	
4	63	3.81		3.85		0.79	
			0.39		0.39		0.32
TIME							
1	36	-3.81		-2.91		-2.75	
2	61	-1.45		-1.51		-1.37	
3	62	0.78		0.40		0.26	
4	62	4.09		3.71		3.57	
			0.14		0.12		0.12
MULTIPLE R SQUARED					0.169		0.258
MULTIPLE R					0.411		0.508

- *1 = Vietnamese
 2 = Arabic
 3 = Russian
 4 = Spanish

Copula

Table 5.6.4 (cont.): Results of MCA.

284

GRAND MEAN = 50.85

GRAND MEAN =		30.85						ADJUSTED FOR INDEPENDENTS + COVARIATES	
VARIABLE + CATEGORY		N	UNADJUSTED DEV'N	ETA	ADJUSTED FOR INDEPENDENTS DEV'N	BETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	BETA	
LANG									
1		84	-2.75		-2.75		-2.23		
2		28	7.07		7.07		6.26		
3		72	-0.47		-0.47		-0.10		
4		64	1.05		1.05		0.31		
				0.29		0.29			0.25
TIME									
1		62	-1.89		-1.89		-1.89		
2		62	0.10		0.10		0.10		
3		62	0.54		0.54		0.54		
4		62	1.25		1.25		1.25		
				0.12		0.12			0.12
MULTIPLE R SQUARED						0.097			0.169
MULTIPLE R						0.312			0.411

Complementation

GRAND MEAN = 11.18

GRAND MEAN =		11.18						
VARIABLE + CATEGORY		N	UNADJUSTED		ADJUSTED FOR		ADJUSTED FOR	
LANG			DEV'N	ETA	DEV'N	BETA	INDEPENDENTS	+ COVARIATES
							DEV'N	BETA
1		84	-0.63		-0.63		0.30	
2		28	10.01		10.01		8.29	
3		72	-2.86		-2.86		-1.91	
4		64	-0.34		-0.34		-1.87	
				0.46		0.46		0.39
TIME								
1		62	-1.50		-1.50		-1.50	
2		62	-0.63		-0.63		-0.63	
3		62	0.29		0.29		0.29	
4		62	1.84		1.84		1.84	
				0.15		0.15		0.15
MULTIPLE R SQUARED						0.237		0.347
MULTIPLE R						0.487		0.589

Negation

GRAND MEAN = 65.35

GRAND MEAN =		65.35				ADJUSTED FOR INDEPENDENTS + COVARIATES	
VARIABLE + CATEGORY		N	UNADJUSTED DEV'N	ETA	ADJUSTED FOR INDEPENDENTS DEV'N	BETA	BETA
LANG							
1		84	-2.27		-2.24		-0.70
2		27	23.89		23.83		21.42
3		71	-10.41		-10.41		-8.96
4		63	4.51		4.51		1.85
				0.39		0.39	0.33
TIME							
1		60	-2.00		-2.17		-2.25
2		61	-2.67		-2.35		-2.17
3		62	0.55		0.48		0.43
4		62	4.01		3.94		3.89
				0.10		0.10	0.10
MULTIPLE R SQUARED						0.161	0.201
MULTIPLE R						0.401	0.449

Article

GRAND MEAN = 67.67

GRAND MEAN =		67.67							
VARIABLE + CATEGORY		N	UNADJUSTED		ADJUSTED FOR		ADJUSTED FOR		
LANG			DEV'N	ETA	DEV'N	BETA	INDEPENDENTS	+ COVARIATES	
							DEV'N	BETA	
1		84	1.37		1.37		2.30		
2		24	6.11		6.17		5.00		
3		72	-11.94		-11.95		-11.32		
4		64	9.34		9.34		7.84		
				0.41		0.41		0.38	
TIME									
1		58	0.07		0.39		0.55		
2		62	-0.92		-1.02		-1.07		
3		62	-0.99		-1.08		-1.13		
4		62	1.84		1.74		1.69		
				0.06		0.06		0.06	
MULTIPLE R SQUARED						0.172		0.243	
MULTIPLE R						0.415		0.493	

From the MCA we see that overall, in terms of the Acquisition Score (Table 5.6.3a) 26% of the variation in scores is explained by the two factors, Language and Time. From the Analysis of Covariance we can conclude that most of this 26% arises from the Language Factor, since the effect of Time is not significant. In the four areas taken separately, the contribution of the factors to the variation in scores varies from 17% for the Copula to 35% for Complementation.

When the effect of Language is adjusted for the effect of Time and the two covariates, AOA and LOR, most of the Language effect is revealed as being due to deviation from the expected mean by the Arabic and Russian groups. The Arabic group performs better than average in all areas and the Russian group worse although only to a marked extent in Negation and Article. Finally turning to the MCA results in respect of the Time factor, it is apparent that for all independent variables except Article the deviations from the grand mean at the four times show a trend in which they move in the positive direction as the time moves forward. This indicates that although the Time factor taken overall is not significant statistically, there is nevertheless a steady increase in the mean with time when the means are adjusted for the effect of the other factor, Language, and the two covariates. Both these aspects of the MCA results will be discussed in greater detail in the next chapter.

CHAPTER SIX

Interpretation and Discussion of Results

6.0 Introduction

In Chapter 6 the results of the analysis will be interpreted and discussed in the framework of the hypotheses. There were five groups of hypotheses outlined in Section 2.6. Those in each group address a particular aspect of SLA of syntax of concern in this study. The Group 1 hypotheses deal with the systematicity underlying learners' often variable realisation of features. Three General Hypotheses were presented which are to be tested indirectly using the seven specific hypotheses formulated in Chapter 3 (sections 3.1.7, 3.2.7, 3.3.7 and 3.4.7). The two hypotheses in Group 2 deal with the interrelationship of the learning of the four discrete areas of syntax. Those of Group 3 deal with the extent and nature of the influence of the mother tongue on the learners' second language production. The one hypothesis in Group 4 deals with the relationship between group cross-sectional and individual longitudinal patterns of development. The Group 5 hypotheses address the question of the relationship between SLA and two non-linguistic variables, AOA and LOR.

The interpretation and discussion of results will centre on the hypotheses. Each hypothesis will be considered and evidence for and against it assessed. Following this the findings will be discussed. In Chapter Seven the main findings will be summarised and the broader implications will be briefly suggested and commented upon.

6.1 The Systematicity Underlying the Learners' Second Language Production

6.1.0 Introduction

In order to interpret and discuss the results in relation to the Group 1 hypotheses it is necessary to consider what constitutes

evidence of systematicity in the learners' production. The results indicate that all subjects show non-categorical performance in at least one of the structural areas and most in all of them. The majority of subjects show variable realisation of the features of syntax designated for study. Since this is the case systematicity has to encompass the possibility of non-categorical, and thus variable production of features. The essence of systematicity must be defined as the existence of non-random patterns in the learners' second language production such that an underlying rule system can be described which governs the learners' production and thus determines in some structured way the course of their development in the learning of a feature of syntax or of a particular area of syntax. The existence of such a rule system implies that acquisition is sequential, that it is possible to write rules which describe the system and sequence and enable the specification of a continuum of development. It is these important characteristics of the learners' second language production which the three General Hypotheses of Group 1 address.

The three General Hypotheses concerning the systematicity underlying the learners' production can only be tested indirectly through the specific hypotheses presented in Chapter 3, each of which proposes specific environments and features which constrain the learners' variable use of second language syntactic features. In the following sections the results relating to each of these specific hypotheses will be evaluated. If the null hypothesis in each case is able to be rejected then this provides support for General Hypothesis 1. When this is so the environments can be used to define an implicational pattern for that aspect of the development of second language syntax as proposed by General Hypothesis 2. Finally, in such cases, in accordance with the proposition of General Hypothesis 3, a variable rule can be formulated and a continuum of development defined.

Implicational Analysis (discussed in section 2.5 and 5.1) is an important technique which enables the analysis of variable production and the representation of the patterns which underlie the variability. As such it is clearly a crucial tool in the study of the possible

systematicity of variable language use. Systematicity can exist on a number of levels of generality. On the broadest level all learners, as evidenced by conformance of all individuals, can be shown to be using the same rule system and thus to exhibit the same patterns in their production. In the context of SLA, on a less general level, all learners sharing the same native language may share the same system, which is different from that of learners speaking other native languages. On a yet less general level, within a group of learners sharing the same first language one could envisage the possibility of subgroups each with its own system, which differs from the others. Such differences could be attributable to factors such as teaching method or learning environment. On the narrowest level it is possible to envisage a situation where each individual has his own idiosyncratic system to which he can be shown to adhere, but which differs from that of every other learner. Research to the present indicates this not to be the case in SLA. Since the purpose of SLA studies and of studies of human learning in general is to establish the existence of common strategies and processes random performance or non-random but idiosyncratic performance would mean that no generalizations could be drawn from the system of one learner about the systems of others and thus any purpose and importance in studying and understanding the system would not exist. In assessing the results in relation to the Group 1 hypotheses we are attempting to determine the systematicity underlying the learners' language at the highest of these levels of generality possible. If system cannot be determined on at least the level of the NL group then the definition of that systematicity becomes irrelevant.

6.1.1 COPULA

Specific Hypothesis 1 deals with the possible constraining of the learners' variable realisation of copula by the four following syntactic environments __ADJ, __NP, __PP and __PART. The highly significant scales obtained using both the bimodal scaling technique and the more sensitive multi-valued scaling indicate a high degree of conformance to a pattern among the individuals in each of the four language groups.

Despite the slight differences in ordering obtained using the various scaling methods, particularly in the bimodal scales for the 80% and 90% division points, it is possible to define a clear implicational hierarchy for each of the language groups. The results presented in Tables 5.1.6 to 5.1.8 indicate that the implicational hierarchy is not identical in the four groups. In the case of the Arabic group (Table 5.1.4c and Appendix B, Table 3.1c) the extremely high and very close scores obtained for all but 2 subjects for the ordering of the three more favoured environments (___ADJ; ___NP; ___PP) mean that it would be unwise to draw any firm conclusions as to the ordering of these environments in relation to each other from the data collected. In fact, the sets of scores which can be considered to provide evidence of the ordering of these environments, show no overwhelming preference for any particular order for the Arabic group.

For the Spanish, Russian and Vietnamese groups the implicational analysis provides clear evidence which enables the null hypothesis to be rejected. For these groups of learners' variability in the realisation of copula is constrained by which of the four possible complements follows the position where the copula is required. For the Arabic insufficient variable subjects were present to enable the hypothesis to be tested.

In terms of the ordering of the environments differences are evident among the groups. Combining the results of the bimodal and more sensitive multi-valued scaling it is apparent that the Spanish and Russian groups both favour ___ADJ over ___NP, the Spanish group to a larger extent than the Russian. In contrast the Vietnamese group clearly favour ___NP over ___ADJ. For all three groups these two environments are favoured over ___PP and ___PART in that order for the realisation of copula. The approximation curves (Figure 5.1.4) similarly reveal this ordering of environments.

Given that the null hypothesis for these three groups has been able to be rejected and for each group, in accordance with General Hypothesis 2, implicational hierarchies have been defined, it is possible to formulate variable rules and define the developmental continuum in

accordance with General Hypothesis 3. Two separate variable rules need to be formulated, one for the Vietnamese group, the other for the Russian and Spanish groups:

Vietnamese

Copula $\longrightarrow$ $\langle BE \rangle$

α	NP
β	ADJ
γ	PP
Δ	PART

Russian/Spanish

Copula $\longrightarrow$ $\langle BE \rangle$

α	ADJ
β	NP
γ	PP
Δ	PART

such that $\alpha \geq \beta \geq \gamma \geq \Delta$

Using the sets of scores of the learners in the groups it is possible to define the stages of development, and thus a developmental continuum, on which learners can be placed according to the level of their development. The full multi-valued scales (Appendix B, Table 3.1) show that among the subjects in this study there is no evidence of the initial stages of development, in which the copula is absent in all or some of the environments studied. The theoretical model for defining the stages of the copula (derived from trimodal scaling (section 2.5) is as follows:

Environments		α	β	γ	Δ
Stages	1	0	0	0	0
	2	v	0	0	0
	3	v	v	0	0
	4	v	v	v	0
	5	v	v	v	v
	6	+	v	v	v
	7	+	+	v	v
	8	+	+	+	v
	9	+	+	+	+

Few of the subjects' scores in any of the three groups conform to a stage lower than stage 5 in the theoretical model. The data in this study does not provide evidence of the earliest stages in the development of the realization of COPULA in these four environments. From this we can conclude that in adolescent ESL learners of English the initial stages of development where COPULA is absent in some or all of these environments are either by-passed altogether or, more probably, moved through extremely quickly and thus not captured in this study on the task used.

For all groups there are subjects whose scores fit into each of the stages from stage 5 to stage 9. Figure 6.1.1 outlines the developmental continuum for each group and gives examples of subjects at the various stages of the continuum.

Comparison with Other Studies

The ordering of environmental constraints which have been established in this study for the realisation of copula correspond to those reported in other SLA studies for the three environments which they dealt with; __ADJ, __NP, and __PP. Rashid (1980) reported an order of __ADJ > __NP > __PP and Al-Jumaily (1982) reported this order in his correction task, with __NP being favoured over __ADJ in translation and elicited imitation. In addition the order obtained for the Vietnamese corresponds with that of Platt and Weber's (1980) Malaysian English

Figure 6.1.1: Continuum of Development for Copula in Four Environments

STAGE	DESCRIPTION	EXAMPLES OF SUBJECTS
1	Zero realisation of copula in all four environments.	Span no subjects in stage Rusn no subjects in stage Arab 03 (T1) Viet no subjects in stage
2	Copula starts to be realised variably in environment α , absent in other three environments.	Span no subjects in stage Rusn no subjects in stage Arab no subjects in stage Viet no subjects in stage
3	Copula variably realised in both α and β environments, absent in remaining two.	Span no subjects in stage Rusn no subjects in stage Arab no subjects in stage Viet 07 (T3)
4	Copula variably realised in α , β and γ environments, absent in environment Δ .	Span no subjects in stage Rusn no subjects in stage Arab no subjects in stage Viet 25 (T4)
5	Copula variably realised in all four environments	Span 01 (Ts 1 - 3) Rusn 04 (Ts 1 - 3) Arab 03 (Ts 2 & 3) Viet 25 (Ts 1 & 3)
6	Realisation of copula reaches the criterion* defined as denoting acquisition in environment α , variable in remaining three environments.	Span 15 (Ts 2 & 4) Rusn 07 (T1), 11 (T3) Arab 01, 07 (T1) Viet 16 (Ts 2 & 4)
7	Copula reaches the criterion level in β environment, in addition to environment α .	Span 19 (T1), 12 (T4) Rusn 08 (Ts 1 & 3) Arab 02 (T1) Viet 09 (T2), 01 (T4)
8	Realisation of copula reaches the criterion level in environment γ , in addition to environments α and β .	Span 02 (Ts 1 - 4) Rusn 18 (Ts 1, 3 & 4) Arab 02 (Ts 2 - 4) Viet 14 (Ts 1 - 4)
9	Copula realised at the criterion level for acquisition in all four environments.	Span 10 (Ts 1, 2 & 4) Rusn 15 (Ts 1 - 4) Arab 06 (Ts 1 - 4) Viet 02 (Ts 1 - 4)

* the level used to denote acquisition for copula realisation was 90%.

speakers. The Vietnamese order also corresponds to those reported in Black Vernacular English (Labov 1969 and Wolfram 1969). In fact with the exception of one case, that of Singapore English reported by Platt¹, there seems to be a large measure of agreement in the general ordering of constraints regardless of the language variety considered.

Discussion

No obvious or straightforward explanation for the implicational hierarchies established in this study or in similar SLA studies immediately presents itself.

Environmental constraints on language acquisition and phenomena of language change in phonology have been able to be explained in terms of markedness theory, specifically feature marking. Such a concept is not easily and possibly not at all able to be transferred to syntax, where the environments which appear to be ordered and which need to be compared involve elements from different syntactic classes (noun, adjective, locative phrase, verbal participle acting as an adjective). Unlike phonology where environments can be described and categorised employing the same criteria (features, eg. ⁺ voice) syntactic environments are quite distinct from each other.

One attempt to evolve a theory of markedness in syntax centres on the study of language typology (Comrie 1981 gives a good summary of this approach). It is hypothesised that a more typologically common way of expressing a feature of syntax can be considered to constitute the less marked case. For example, the use of an invariant preverbal negator is the most typologically common way of realising negation in world languages (Dahl 1979) and would be considered less marked than other ways of realising negation.

¹Reservations about this study were discussed in Chapter 3

The typological approach has generally been applied to the determination of the degree of markedness of realisations of particular aspects of syntax rather than to the determination of relative markedness of syntactic environments for the realisation of an element of syntax. However Ferguson's (1971) short analysis of languages of the world in terms of the realisation of copula in neutral equational sentences preceding either NP or Adj, suggests that although non-differentiation between environments is very common in the languages of the world, copula in some languages is realised in __NP environment, but not in __ADJ. This typological evidence would suggest that __NP is less marked than __ADJ and would thus be expected to be acquired first. Clearly not all learners studied, amongst them the Spanish and Russian learners in this study, follow such a typologically predicted pattern.

Another typological trend which may feasibly have some bearing on the ordering of environments in the copula is that between predicative copulas, i.e. preceding NP and ADJ, and locative copulas, i.e. preceding locative PP or adverb. Lyons (1968) discusses this distinction which is often made among the languages of the world. When a separate locative copula is realised, as is the case in Vietnamese, it is usually derived from a full locational verb, although it no longer functions as such. Further detailed typological study of copula realisation may reveal some sort of markedness hierarchy based on these and possibly other distinctions which could provide us with at least a partial explanation of environmental constraints.

Another factor which may contribute to the ordering of constraints and of particular applicability in the realisation of copula in the __PART environment is that of derivational complexity. Although in the sense used here the participle is taking the place of an adjective, it is clearly derived from the verb through the passive transformation from which the agent (subject of active sentence) has been deleted. Compared to the other environments for COP its derivation is more complex. From the learner's point of view he may have to have reached the stage in his acquisition where he is learning and using passive constructions before he can realise copula in this environment.

A final factor which is worth considering is the possible influence of the learners' NL. Of the three NLs of the groups being considered only Vietnamese differentiates between environments in the realisation of copula, with copula being realised NP and a locative copula PP whereas no copula is realised ADJ. Given the Vietnamese group's comparatively lower scores for ADJ it is tempting to suggest that the lack of marking of copula in this environment results from NL transfer.

In reality it seems that the differences in ordering obtained in this and other studies can only be fully investigated and explained using a multifactorial framework including in it the distinctions and factors discussed above. Although certain universal trends emerge from studies of the ordering of constraints in different language varieties (eg. NP and ADJ before PP and these three before PART), no one invariant universal hierarchy is indicated by the studies to the present. Wolfram (1973) distinguishes "two aspects to the question of constraint variability" (1973:9). He calls the first "effect predictability" and the second "order predictability". He concludes that whilst "effect predictability" is probably universal (eg. non-realisation of copula in certain language varieties is constrained by certain syntactic environments), "order predictability", ie. the precise ordering of "constraint hierarchies", is language specific. The results of this study for SLA and of SLA studies in general and of other studies of non-standard language varieties certainly suggest this is the case for copula realisation.

6.1.2 Complementation

6.1.2.1 Complement Types

Specific Hypothesis 2 addresses the proposal that the learners' correct use of predicate complement constructions is constrained by which of the three complementisers, THAT, TO or ING, is required. In order to be able to reject the null hypothesis it is necessary to establish conclusively that a pattern in the learners' correct responses exists which is related to the complementiser required. Both the group trend

and variability analysis presented in section 5.2.1 reveals a clear pattern in all groups. This similarity in the pattern for the ordering of the types in the four groups is demonstrated by the approximation curves (Figure 5.2.3). In the lower score levels (eg. < 4) the bimodal scaling shows significant scales for all groups with an order THAT > TO > ING. At higher levels all groups show significant scales for the order TO >> THAT > ING. Thus evidence from both these analyses indicate a crossover effect in the ordering of these two types. Wolfram (1973) and Fasold (1973) have both discussed the existence of such phenomena.

The existence of this clear pattern in all groups enables us to reject the null hypothesis for Specific Hypothesis 2. Learners' variability in the use of predicate complement constructions is constrained by the complementiser required. This finding means that there is indirect support for General Hypothesis 1. The implicational hierarchy in this case in accordance with General Hypothesis 2 is THAT > TO > ING to a level of about 50% after which the first two constraints are reordered so TO > THAT > ING.

Turning to General Hypothesis 3 in relation to this aspect of syntax, it is not appropriate to construct a variable rule for this pattern. What has been studied in this case is not the realisation of a single feature in a number of environments (for which variable rules can be properly formulated) except in the broadest sense where that feature would be defined as COMP. It is possible however from the cross-sectional results for each group to define the stages of development in the course of acquisition of appropriate means of expressing predicate complementation and thus of the developmental continuum on which learners can be placed depending on their level of development. The continuum is given in Figure 6.1.2.

In the Vietnamese and Spanish groups there are examples of subjects' scores at all stages in this continuum. In the Arabic group there are no cases of learners in stage 1. In the Russian group no learners at any of the four test times fit into either the first or the last stage (1 or 7) of the continuum.

Figure 6.1.2: Continuum for the Development of Complementatation

STAGE	DESCRIPTION	EGS. OF SUBJECTS IN STAGE
1	All formal means of appropriate formation of complementation absent	Span 07 (Ts 1 - 4) Rusn Arab no subjects in this stage Viet 17 (Ts 2 & 3)
2	THAT complementation starts to be used variably where appropriate. Other types still absent.	Span 10 (Ts 1 & 2) Rusn 04 (Ts 1 - 4) Arab 03 (Ts 2 & 3) Viet 25 (Ts 1 - 4)
3	In addition to THAT, TO starts to be used variably where appropriate. ing still absent.	Span 16 (Ts 1 - 3) Rusn 10 (Ts 1 - 4) Arab 02 (Ts 1 & 2) Viet 23 (Ts 1 - 4)
4	In addition to the THAT and TO, ING starts to be realised variably	Span 21 (T1), 02 (T3) Rusn 12 (T2), 06 (T3) Arab 07 (T1), 02 (T3) Viet 14 (T1), 13 (T2)
5	TO is realised correctly at the specified acquisition level* in all contexts where required. Other types variable (or in a small number of cases categorically absent) ²	Span 05 (Ts 2 - 4) Rusn 15 (Ts 2 - 4) Arab 07 (Ts 2 & 4) Viet 22 (Ts 2 - 4)
6	In addition, THAT complementation becomes categorically target-like ²	Span 11 (Ts 1 & 2) Rusn 19 (Ts 1 & 2) Arab 05, 08, 06, 09 (T1) Viet 02, 11, 22 (T1)
7	Finally the ING type becomes categorically target-like in their realisation	Span 17 (T3), 11 (T4) Rusn no subjects in this stage Arab 06, 09 (Ts 2 - 4) Viet 20 (Ts 1 - 4)
*In the case of our analysis a criterion of 8/9 was used to define categorical target-like performance on each complement type.		

² Whether stage 4 precedes or follows stage 5 or stage 6 depends on the rate of acquisition of the types in relation to each other in the individual learner. The proper numerical order of stages is the more common.

The multi-valued scales (Appendix B, Table 3.2.1) in particular show that there are differences between groups and within each group between individuals concerning two aspects of the relative acquisition of the three types. The first concerns the point at which the crossover, or reordering of the two more favoured complement types takes place. For some subjects it appears to happen quite early in the course of development of the two types (eg. Span 03(T2) or Rusn 18), whereas for others it happens much later or in a small number of cases not at all (eg. Viet 24 and 18). The phenomenon of reordering is well established as a trend in each of the groups, but it appears that the precise point of the reordering, or in an insignificant minority of cases its failure to occur, is determined by the individual's rate of acquisition of the two types. The second aspect concerns the onset of correct use of the ING type relative to the other two types which appears to be quite variable from individual to individual. There are several examples of scores which conform to the patterns + + O and + V O. These do not represent deviations from the absolute implicational pattern, but they deviate from the model, suggested by Bailey in which all rules/environs become variable before the 'earliest' becomes categorical. Bailey (1974) does however add that this is not always the case depending on the rate of change. In our case rate of change can be interpreted as the rate of acquisition.

Comparison with Other Studies

The results of two previous studies of the ordering of these types (Anderson 1978 and Simukoko 1981) are broadly comparable to those reported here. Unfortunately neither studied the orders in the detail of this study. Using an 80% criterion for acquisition Anderson reports an acquisition hierarchy in which the TO is ahead of the THAT which in turn is ahead of ING. At the 80% level the results reported here are in complete agreement with those of Anderson. Studying Non-Equi predicate complement constructions Simukoko reports an order THAT > TO > ING. In his analysis bimodal scaling using 66% division point was used. A close look at his scales (Simukoko 1981:334-335) reveals a number of discrepancies from the implicational pattern he claims to have found both above and below the chosen division point. As in this study the

scores for the THAT and TO types indicate that at the higher levels of scoring there is not the same clear favouring of THAT which is evident in the earlier stages of the acquisition of these two types. In addition, there appears to be a large measure of variability on the part of individual learners as to the precise level when the reordering of the types takes place. The reanalysis of Simukoko's results using all the data provided by his scales rather than merely the crude binary distinction which Guttman scaling allows reveals much greater detail and important trends in the acquisition of these types, similar to those found in the present study, which his analysis was not able to show.

Discussion

Varionists such as Wolfram (1973), Fasold (1973) and Bailey (1974) have discussed the phenomenon of reordering of constraints. They consider it "a function of regular language change" (Wolfram 1973:7). According to their analyses reordering is only possible if constraints are not in their unmarked order, thus the reordering consists of a change from a marked to a less marked, or unmarked order.

There seems little doubt that the acceleration of the learning of one rule or environment over another, which is initially more favoured, is observed in some aspects of the SLA of syntax. We have a clear example of this phenomenon in all the four language groups in the present study. The acquisition of the three means of complementation and their distribution is a mammoth task, and clearly from the relatively poorer scores of the learners one that is more difficult than the acquisition of either Copula or Negation.

Predicate complement constructions are necessary syntactically in the language of even quite elementary learners. Without some way of expressing such complements it is impossible to express basic needs and desires. Proto-forms of these complement constructions exist in the language of learners in early stages of learning. They are basically of two types, which roughly correspond to the two target types

in English, THAT and TO. These two forms in English correspond to the two most basic means of predicate complementation exhibited in world languages, one being a finite sentential complement and the other an infinitival complement. In the early stages of a learner's language the proto-THAT complement is formed by conjoining two sentences. Because the learner's grammar at this stage is also very primitive the form of the verb in both main and embedded clause is likely to be the uninflected base verb form (eg. She want she come). Similarly the proto-TO type also contains the uninflected base verb form (eg. He want buy bicycle). It may be that of these two proto-types, one is actually the precursor of the other, or indeed that initially one is used in all Equi sentences (eg. proto-TO) and the other in all Non-Equi (eg. proto-THAT). This study could not provide the data necessary to trace the precise characteristics of these early stages of development.

Thinking about the structure of these proto-types and of the initial pattern evident in our results for the ordering of these two types it is possible to suggest a tentative explanation for the initial favouring of THAT over TO for the correct and appropriate use of that means of predicate complementation. To produce correct THAT complementation it is not required of the learner to learn any new element of grammar. In English the word 'that' which can mark the complement is not obligatory and indeed would be inappropriate in informal language. Thus to produce a correct THAT complement the learner merely needs to produce a clause which is identical in form to those in main clauses. In contrast to produce a correct TO complement from the sentences given for correction, not only had the learner to decide that this form of complement was the appropriate one, but also to insert the infinitive marker 'to' in the appropriate position. In essence, to form a correct TO complement the learner needed some new knowledge, whereas to form a correct THAT complement no new learning of linguistic forms was required. From the cross-sectional data provided in the study it is clear in all the groups that once learners have learnt the use of the infinitive marker 'to' they progress very rapidly in extending its use, and thus the rate of acquisition of the correct form of this complement type, once started, is comparatively rapid (see for example the approxi-

ation curves). The slower progress in the THAT type in the later stages of development of the two types indicates a tendency to overgeneralise the use of the probably less marked TO type to contexts in which TO is unacceptable and THAT is obligatory. The tendency to overgeneralise the THAT type to TO contexts is much less common. These tendencies which are observable in our subjects have also been remarked on by Anderson (1978:101) and possibly reflect the inherent centrality of infinitival complementation in the grammar of language.

The ING-type complement is a second non-finite complement available in English. It possesses an extra feature comparative to the other two types, that of aspect. To form the ING non-finite complement correctly it is necessary for the learner to isolate contexts in which its use is appropriate and then add the complementiser '-ing' to the base verb form. Given the rather late acquisition of the ING complement and the early appearance of progressive -ing in the continuous tense it seems reasonable to suggest that in the case of ING complementation the formation of the complement does not pose any problem. Its late appearance probably reflects its lesser generality, which in turn is related to its additional aspectual meaning. In addition, since the number of verbs which obligatorily require an ING complement is quite small, the problem the learner faces when he is aware of the form centres on its distribution.

6.1.2.2 Subject Identity Type

Specific Hypothesis 3 proposes that the SI relationship between the main and subordinate clauses constrains the learners' variable realisation of predicate complement constructions. In order to be able to reject the null hypothesis it is necessary to establish the existence of significant implicational scales for the two types. The coefficients obtained are presented in Tables 5.2.6 and 5.2.7. All the scales for all groups are significant for both bimodal and multi-valued analyses. This means that there is sufficient evidence to reject the null hypothesis. It is apparent that the SI relationship constrains the learners' variability in forming predicate complement constructions. This provides support for General Hypothesis 1.

In accordance with General Hypothesis 2 it is possible to define an implicational hierarchy for the two SI types. In all groups the pattern is the same, EQUI $\succ$ NON-EQUI. Using the order it is possible to formulate a variable rule in accordance with General Hypothesis 3:

$$\text{Complementiser} \longrightarrow \langle \text{COMP} \rangle \left| \begin{array}{l} \alpha \text{ NP}_1 \text{ V X } \left[\begin{array}{cc} \text{NP}_1 & \text{VP} \\ \text{S} & \text{S} \end{array} \right] \\ \beta \text{ NP}_1 \text{ V X } \left[\begin{array}{cc} \text{NP}_2 & \text{VP} \\ \text{S} & \text{S} \end{array} \right] \end{array} \right.$$

where $\alpha \succ \beta$

Similarly a continuum of development can be defined and the learners placed on it according to the pattern in their scores (Figure 6.1.3). For all but the Arabic group there are instances of subjects in all 5 stages.

Comparison with Other Studies

Anderson (1978) reports a similar favouring of EQUI over NON-EQUI type SI relationship for the correct realisation of predicate complement constructions.

Discussion

The ordering obtained in this study, together with that of Anderson, for the two types of SI relationship means that any explanation of learning difficulty of the two types based on derivational complexity cannot be accepted. Derivationally the EQUI-type is more complex, since it requires the deletion of the identical subject in TO and ING complements. Yet from the learners' point of view this EQUI-type is correctly realised more frequently and earlier than the NON-EQUI type.

Another interesting finding to emerge from this study is that the same hierarchy appears to exist in all groups regardless of the NL background of the learners. It seems the formation and distribution of

Figure 6.1.3: Continuum of Development for Subject Identity Relationship

STAGE	DESCRIPTION	EGS. OF SUBJECTS
1	target predicate complement constructions categorically absent for both SI types	Span 07 (Ts1-4) Rusn 05 (T1) Arab none in stage Viet 17 (Ts2 & 4)
2	Complements start to be realised variably where EQUI relationship exists	Span 14 (Ts1 & 2) Rusn 01 (T1) Arab 03 (T2) Viet 12 (T1)
3	In addition realised variably where NON-EQUI relationship exists	Span 05 (Ts1 & 2) Rusn 12 (Ts2-4) Arab 01 (Ts1-3) Viet 21 (Ts1-4)
4	Complements start to be realised in a categorically* target-like way where SI relationship is EQUI	Span 17 (T1) Rusn 17 (T3) Arab none in stage Viet 02 (Ts1-3)
5	Complements also realised correctly* where NON-EQUI SI relationship exists	Span 17 (Ts2-4) Rusn 19 (Ts1 & 2) Arab 06 (Ts1-4) Viet 20 (Ts1-4)
*criterion used was 8/9		

predicate complement constructions in the learners' various native languages have little effect on the patterns evident in their use of these constructions in their second language. No obvious reason presents itself for why the favouring of EQUI should be more marked in the vietnamese group.

6.1.3 NEGATION

6.1.3.1 AUX + NEG Types

Specific Hypothesis 4 deals with the order of acquisition of the AUX + NEG types. It proposes that learners' variable realisation of AUX + NEG is constrained by which of the four forms of AUX, COP, AUX 'BE', DO and HAVE, is required. In order to be able to reject the null hypothesis it is necessary to show that significant implicational scales were obtained for the ordering of the learners' sets of scores for these four types.

All the bimodal scales using the 80% division point (Table 5.3.3) are well over the required level of R of .90. They all show significant scales for the order of environments. Similarly all the more sensitive multi-valued scales (Table 5.3.4 and Appendix B, Table 3.3) reach the required level of significance. These results indicate that the null hypothesis for Specific Hypothesis 4 can be rejected. It appears that for all the groups, as predicted by General Hypothesis 1, the form of AUX required constrains the order of the four AUX + NEG types.

Turning to General Hypothesis 2, it is possible to define the orders obtained and then, in accordance with General Hypothesis 3, to formulate variable rules and define the stages of a continuum of development. The order of AUX + NEG types is not the same in all groups. The differences between them arise from the ordering of the two uses of BE, COP and AUX 'BE'. The Spanish and Russian groups favour COP > AUX 'BE' > DO > HAVE. Whilst the Vietnamese group favours AUX 'BE' > COP > DO > HAVE. The Arabic group's scores for these two types are extremely high. At the 90% division point using bimodal scaling COP is favoured over AUX. The other analyses show no preference between these two orders. On the basis of the 90% Bimodal Scaling they will be considered along with the Spanish and Russian groups, but it should be noted that the small size and high scores mean their patterns are less confidently stated.

Two variable rules can be formed, one for the Vietnamese group and one for the other three groups:

Spanish, Russian and ArabicNEG $\longrightarrow$ <AUX + NEG> α ___ Non-Verbal Comp β ___ V-ing γ ___ V_{main} Δ ___ V-enwhere $\alpha \geq \beta \geq \gamma \geq \Delta$ VietnameseNEG $\longrightarrow$ <AUX + NEG> α ___ V-ing β ___ Non-Verbal Comp γ ___ V_{main} Δ ___ V-enwhere $\alpha > \beta > \gamma > \Delta$

Using the variability data provided for each of the groups it is possible to define stages in development of the correct formation of AUX + NEG and place the learners from each group at the stages on the continuum of development. The stages and examples of learners in each of the stages for each group are given in Figure 6.1.4. In all groups with the exception of the Vietnamese there is not evidence of the earliest stages when one or both of two most favoured types are absent. Even for the Vietnamese group most subjects in these first two stages contain deviations, generally because they have realised DO variably. These instances are most likely examples of the use of unanalysed 'don't' as a negator similar to the earlier use of 'no' and 'not'. These are thus not genuine cases of DO + NEG V_{main} negation. For the Russian and Arabic groups there is only evidence of the continuum of development from stage 4 and for the Spanish group from stage 3. For the Russian group there are no subjects over the four test times who have achieved the criterion level of acquisition which we have defined (approx. 90% - not more than one item incorrect) in the HAVE + NEG type in addition to the other three types (i.e. Stage 9).

Figure 6.1.4 : Continuum of Development for AUX + NEG Types.

STAGE	DESCRIPTION	EXAMPLE OF SUBJECTS
1	Target AUX + NEG is absent in all environments.	Span no subjects in stage Rusn Arab 03 (T1) Viet 02 (T1)
2	AUX + NEG starts to be realised variably target-like in environment α , absent in other three environments.	Span 07 (T1) Rusn Arab no subjects in stage Viet
3	In addition to environment α , AUX + NEG variably target-like in environment β .	Span 07 (T1) Rusn 06 (T4) Arab no subjects in stage Viet 25 (T3)
4	AUX + NEG realised variably in environment γ , in addition to environments α and β .	Span Rusn Arab no subjects in stage Viet
5	AUX + NEG variably target-like in all four environments.	Span 15 (Ts 3 & 4) Rusn 18 (Ts 1, 2 & 4) Arab 03 (Ts 2 & 3) Viet 23 (Ts 1, 2 & 4)
6	Target-like AUX + NEG reaches the designated criterion* level for acquisition in environment α , variable in the remaining three environments.	Span 04 (Ts 1 & 2) Rusn 17 (Ts 1 & 3) Arab 01 (Ts 2 & 4) Viet 01 (T1)
7	In addition AUX + NEG reaches the criterion level in environment β , still variable in γ and δ .	Span 10 (T2), 08 (T4) Rusn 12 (Ts 1 & 2) Arab 07 (Ts 1 & 2) Viet 04 (Ts 1 & 2)
8	AUX + NEG reaches the criterion level in environment γ , in addition to environments α and β .	Span 10 (Ts 1, 3 & 4) Rusn 10 (Ts 3 & 4) Arab 02 (Ts 1, 2 & 4) Viet 22 (Ts 2 - 4)
9	AUX + NEG reaches the criterion level in environment δ .	Span 11 (Ts 1, 2 & 4) Rusn no subjects in stage Arab 06 (Ts 1 - 4) Viet 24 (Ts 1, 2 & 4)
* criterion level for acquisition in this case was 88%.		

Comparison with Other Studies

As was discussed in detail in Chapter 3, the majority of studies of negation in both first and second language acquisition have concentrated on the developmental forms used by learners in the course of the development of the fully analysed form of DO + NEG V_{main} type of negation. Nevertheless, from these studies it was possible to infer the order of acquisition of the four AUX + NEG types. This order presented in Chapter 3 is COP > AUX 'BE' > DO > HAVE.

This comparison indicates that the findings of this study concerning the ordering of the formation of the various forms of AUX + NEG are in agreement with those of observational studies. The only discrepancy in the ordering was that found in the Vietnamese group, where although both forms of BE + NEG precede the other AUX forms, DO and HAVE, AUX 'BE' + NEG V-ing was clearly more favoured for acquisition than the environments requiring COP 'BE' + NEG.

Discussion

In studying the development of negation in English in the various following environments included in this study we are basically studying the interaction of two separate aspects of acquisition; AUX development and NEG development. By AUX development we mean the development in the learners' language of the English auxiliary system which enables the expression of tense, number, modality and aspect. By NEG development we mean the development of the correct form of the negative particle and its placement in the appropriate position in relation to the auxiliary and the predicate. Since the form of the negative particle and its placement is the same for all the AUX forms it is not unexpected that the order of formation of the four AUX + NEG types included in the study reflect the process of AUX development. It is apparent that the negative is formed correctly first in those cases where the auxiliary to which it is attached, or which it follows, has already been acquired by the learner in affirmative sentences. DO + NEG is clearly a more difficult case for the learner, since the auxiliary is

not present in affirmative sentences and thus the learner needs to acquire the additional rule of DO-insertion in order to produce target-like forms of negative sentences.

The HAVE auxiliary carries the extra feature of aspect, [+perfect] and this aspectual meaning appears to be a later acquisition in all second language learners. The lateness of the acquisition of HAVE + NEG is related to the relative lateness of the acquisition of perfect aspect by learners.

6.1.3.2 COP + NEG Environments

Specific Hypothesis 5 proposes that learners' variability in the realisation of COP + NEG is constrained by which of the four environments, __ADJ, __NP, __PP or __PART, follows it. In order to be able to reject the null hypothesis it is necessary to establish the existence of significant implicational scales for the environments. Tables 5.3.8 to 5.3.10 show that for each group significant scales were obtained on both bimodal scalings and the multi-valued scaling. Thus it appears that the null hypothesis can be conclusively rejected. The learners' variability is constrained by these four following linguistic environments. This finding supports the contention of General Hypothesis 1.

Since significant scales exist for the ordering of the environments in terms of the relative realisation of COP + NEG an implicational hierarchy can be defined for each group in accordance with General Hypothesis 2. For all groups slight differences were apparent using the three scalings as to the positioning of __PP in relation to __ADJ and __NP. The more sensitive multi-valued scaling (Table 5.3.10) revealed for each group one definitive order. For the Spanish, Russian and Arabic groups this is __PP > __ADJ > __NP > __PART and for the Vietnamese group __NP > __PP > __ADJ > __PART.

As proposed by General Hypothesis 3, using the data obtained from the implicational analyses variable rules can be formulated for the

realisation of COP + NEG dependent on the following syntactic environment:

<u>Spanish, Russian and Arabic</u>	
NEG $\longrightarrow$ $\langle \text{BE} + \text{NEG} \rangle$	α <u>PP</u> β <u>ADJ</u> γ <u>NP</u> Δ <u>PART</u>

<u>Vietnamese</u>	
NEG $\longrightarrow$ $\langle \text{BE} + \text{NEG} \rangle$	α <u>NP</u> β <u>PP</u> γ <u>ADJ</u> Δ <u>PART</u>

where $\alpha \geq \beta \geq \gamma \geq \Delta$

Similarly a developmental continuum can be outlined on which the learners in each group can be placed according to the stage they are in their development of COP + NEG in the four environments (Figure 6.1.5).

Discussion

Two aspects of the results for the ordering of the COP + NEG environments warrant discussion. Firstly the relative closeness of the subjects' scores on the four environments comparative to those for the same environments in the affirmative sentences (Section 6.1.1). This trend is particularly evident from the comparison of the approximation curves for the environments in the two sentence types (Figures 5.1.4 and 5.3.6).

One obvious explanation for this lessening of the environmental constraint on variability in the negative is the presence of the negative particle between the copula and the following syntactic environment. The extent of difference in copula realisation in the four environments is much less when the negative particle mediates between the two elements.

Figure 6.1.5 : Continuum of Development for COP + NEG in Four Environments

STAGE	DESCRIPTION	EXAMPLES OF SUBJECTS	
1	Categorical non-realisation of COP + NEG in all four environments.	Span Rusn Arab Viet	no subjects in stage 03 (T1) 16 (T3)
2	COP + NEG variably realised in environment α , absent environments β , γ and Δ .	Span Rusn Arab Viet	no subjects in stage 17 (T3)
3	COP + NEG variably realised in environments α and β , absent in environments γ and Δ .	Span Rusn Arab Viet	no subjects in stage
4	COP + NEG variably realised in all environments, except environment Δ .	Span Rusn Arab Viet	no subjects in stage 23 (T4) no subjects in stage 15 (T4)
5	COP + NEG variably realised in all four environments.	Span Rusn Arab Viet	15 (Ts 1 & 2) 18 (Ts 1 & 2) 03 (Ts 2 & 3) 23 (Ts 1 - 4)
6	COP + NEG realised at criterion level for acquisition* in environment α , still variable in environments β , γ and Δ .	Span Rusn Arab Viet	14 (Ts 1 & 2) 08 (Ts 1 & 2) no subjects in stage 14 (T2)
7	COP + NEG realised at criterion level in environment β , in addition to environment α , still variable in environments γ and Δ .	Span Rusn Arab Viet	12 (Ts 3 & 4) 01, 14 (T3) 01 (T1), 07 (T2) 14 (T1), 21 (T3)
8	COP + NEG realised at criterion level in all environments, except Δ .	Span Rusn Arab Viet	13 (T2), 04 (T4) 12 (Ts 1 - 4) 02 (Ts 2 & 3) 13 (Ts 1 & 3)
9	COP + NEG realised at criterion level in all environments.	Span Rusn Arab Viet	11 (Ts 1 - 4) 19 (Ts 1 & 2) 09 (Ts 1 - 4) 24 (Ts 1 - 4)

* the criterion level for acquisition was 89%

The second aspect which warrants discussion is the difference in the ordering of environments compared to that found for realisation in affirmative sentences. If it were not for the fact of the clear trend towards the __PP environment being comparatively more favoured in negative sentences being evident in all three groups for which sufficient relevant data is available (ie except the Arabic group) it could be speculated that this apparent trend is merely a by-product of the lessening of the environmental constraint as discussed above. However, when the trend is so clear and universal such speculation does not provide an adequate explanation of the apparent phenomenon. The presence of such a trend has been noted in the other study which has included different COP + NEG environments, that of Al-Jumaily (1982). Although he does not provide a detailed analysis of the realisation of COP in the three negative environments studied Al-Jumaily (personal communication) reports that the __PP environment was comparatively more favoured in the negative than in the affirmative.

It is difficult enough to find any plausible explanation for the implicational ordering of these environments for copula realisation. Considerable discussion of some of the factors which may be relevant in arriving at such an explanation was presented in section 6.1.1. In that discussion the difficulty of isolating a priori criteria for the comparison of entirely different syntactic classes (eg. NP, ADJ, PP) was highlighted. The same problems pertain to any explanation of the order of environments for COP + NEG with the added complication of there being a difference in that order. No reason why PP should be more favoured in the negative comparative to the other two environments is obvious, indeed it is difficult to envisage what type of explanation could underlie this phenomenon, since there is no qualitative difference between the environments in the two sentence types.

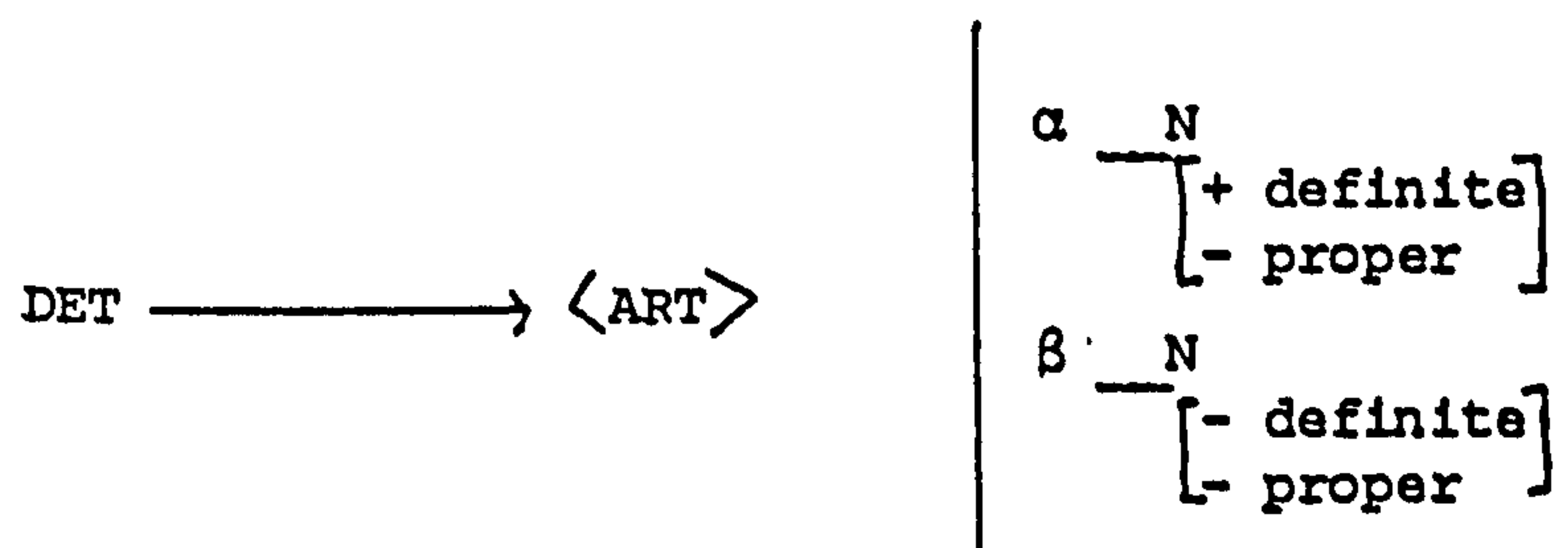
6.1.4 ARTICLES

6.1.4.1 Article Types

Specific Hypothesis 6 proposes that variability in the realisation of Article is constrained by which of the two articles, definite or indefinite is required. For the null hypothesis to be rejected it is necessary to establish that the learners' realisation is significantly constrained by the type required using the implicational analysis techniques which enable such patterns to be established in variable data.

Both the bimodal and multi-valued scales for these two types (Table 5.4.3 and 5.4.4) indicate significant scales for all the groups. However, for the Arabic group the bimodal scales were only significant using the more common manual method of calculating R. These significant values of R enable us to reject the null hypothesis. The type of article required does constrain the variable realisation of the category, Article. This is in accordance with General Hypothesis 1.

Since the specific hypothesis has been validated it is possible to define the implicational hierarchy for these two types in accordance with General Hypothesis 2. For all groups the order of types which was found was DEFINITE $\succ$ INDEFINITE. A variable rule can be written which characterises the system underlying the learners' realisation of the two article types:



where $\alpha \succ \beta$

Using as a basis the trimodal implicational model it is possible using the cross-sectional results obtained to define the stages of a developmental continuum on which the learners participating in this study can be placed according to their performance (Figure 6.1.6). No subjects in any of the groups show patterns which conform to the hypothesised stage 1. Similarly, no Arabic subjects fall into stage 2. Evidence of stages 3 to 5 is present in all the four groups.

Figure 6.1.6: Continuum for the Development of the Correct Use of the Definite and Indefinite Article

STAGE	DESCRIPTION	EGS. OF SUBJECTS
1	Both definite and indefinite articles not realised correctly by the learner in any contexts where required	no subjects in this stage in any group
2	Definite article variably correct in contexts where required, indefinite still categorically absent.	Span 15 (T3) Rusn 12 (T2) Arab no subjects Viet 17 (T3)
3	In addition, indefinite article starts to be realised correctly variably in contexts in which it is required	Span 06 (Ts 1 - 3) Rusn 09 (Ts 1 - 3) Arab 03 (Ts 1 & 3) Viet 07 (Ts 1 - 4)
4	Whilst indefinite remains variably correct, definite starts to be categorically* realised correctly in the contexts where it is required	Span 17 (Ts 3 & 4) Rusn 17 (Ts 1 - 3) Arab 09 (Ts 2 - 4) Viet 23 (Ts 1 & 3)
5	In addition indefinite is categorically realised correctly	Span 11 (Ts 1 - 4) Rusn 10 (T1) Arab 06 (Ts 1,2 & 4) Viet 20 (Ts 1 - 4)
*in this case a score > 89% was considered to show categorically correct use of article		

Comparison with Other Studies

The implicational hierarchy found in this study for these two types accord with those found in other analyses of the relative correct realisation of definite and indefinite, which were discussed in detail in Chapter 3, (eg. Andersen 1978, Huebner 1979 and Yamada and Matsuura 1982).

Discussion

No one explanation for this favouring of DEFINITE over INDEFINITE immediately presents itself, but a couple of factors which may be relevant to any explanation will be tentatively proposed in this discussion.

Givón (1979) analysed the frequency of definite and indefinite NPs in a variety of written texts. From his analysis he considers that in terms of discourse markedness definite is the less-marked of the two, even though presuppositionally it is more marked. If this argument is accepted, then the order can be explained in terms of discourse markedness, since less marked forms and environments have a tendency to be acquired before more marked ones (Bailey 1974).

The second explanation draws on evidence of the frequency of the types. In general textual usage it seems to be agreed that definite articles are more frequent than indefinite. This is related to the function of the two types. Indefinite articles are used in a fairly restricted range of meanings to introduce information which is not known to the hearer as a result of shared information about the world or more specific shared understanding of a given situation. The definite article in anaphoric reference is used ~~with~~ any noun previously mentioned when it is referred back to in the course of the discourse. In the course of a text the same nouns may be referred to many times often, if the need to disambiguate demands, in its full DET + N form rather than pronominalised. The situation in the text used in this study was such that it was generally necessary for the full noun phrase to be repeated (i.e. with definite article) to make the meaning of the text clear. So the same noun, introduced with an indefinite article, was then referred back to, generally several times with a definite article.

Such factors cannot be considered to provide a satisfactory explanation of this order without any consideration of the meaning of the two article types. Intuitively it seems probable that the concept of definiteness is the crucial, central one. From the learner's point of view if he marks

those nouns which are definite as a result of anaphora, then the specific marking of indefiniteness is redundant. Either way it is not necessary for meaning to mark both. The question is why should one, say definite, be marked rather than its antithesis, indefinite. One piece of evidence which supports the intuition of the centrality of the definite article comes from language typology. Although languages commonly have either both or neither of the two articles, some languages possess the means of marking definiteness, but not indefiniteness. Arabic is one such language. No evidence can be found of the opposite being the case, ie an indefinite article, but no definite one. This typological evidence supports the conceptual centrality of the definite article for the composition of cohesive discourse which seems to be one possible factor underlying the hierarchy obtained.

6.1.4.2 Article Environments

Specific Hypothesis 7 deals with the proposition that the learners' variable realisation of each of the articles is constrained by the position in the sentence, either Subj, Obj or PP, of the NP to which it is attached. In order to be able to reject the null hypothesis for this hypothesis it is necessary to establish the existence of significant implicational scales for each article type.

In considering the evidence from the results in relation to the hypothesis, the patterns for the indefinite article will be taken first. The bimodal scaling produced significant coefficients (Tables 5.4.7 and 5.4.8) for all but the Vietnamese group for the three environments, but only using the manual calculation method (with the exception of the Spanish group). All the multi-valued scales (Table 5.4.8) are significant, although for the Arabic and Vietnamese groups no one particular order is clearly preferred. The Spanish and Russian groups show the same order on both implicational analyses.

Turning to evidence from the analysis of the definite article, the bimodal scaling (Table 5.4.11) produced significant values of R, although for the Russian and Vietnamese groups only using the manual calculation

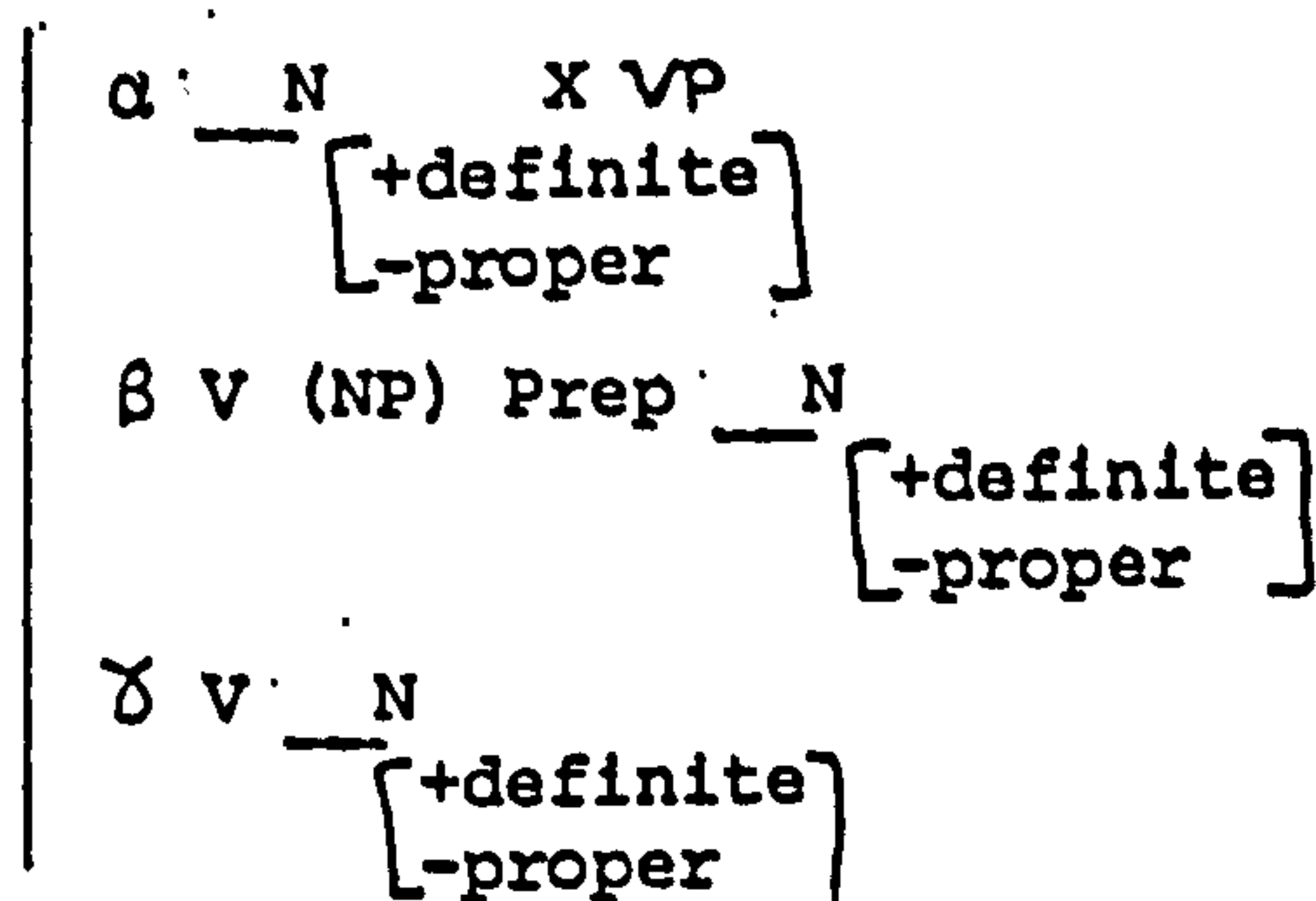
method. More importantly for all groups, but the Spanish, the scales for the two most important environments, Obj and Subj are significant even using the more rigorous machine calculation method. For all groups the more sensitive multi-valued scales are significant and each indicates preference for one particular order.

The evidence from the results suggests that it is justifiable to reject the null hypothesis. Although some bimodal scales are only significant using the less stringent manual calculation procedure, this is generally accepted as a valid criterion and has been the one employed in previous studies (eg. Andersen 1978, Platt 1976). Nevertheless it needs to be stated that the patterns obtained for the ordering of environments are not as unequivocal in this area as in the other areas. This is probably partly the result of the smaller number of items in each environment for articles (3 and 4). Since the null hypothesis has been able to be rejected the results provide further support for General Hypothesis 1.

As proposed by General Hypothesis 2, it is possible to define the implicational hierarchies of environments which have been observed. For the indefinite article all groups but the Arabic showed the same hierarchy in which $\text{Obj} \gg \text{Subj} > \text{PP}$. In the Arabic group the order preferred has the Subj and Obj positions reversed with PP still least favoured. For the definite article in the same three environments there is less correspondence in the patterns obtained in the various groups. The Spanish and Arabic learners, whose native languages incidentally contain definite articles, favour $\text{PP} \gg \text{Obj} \gg \text{Subj}$. In the Russian group PP is also the most favoured environment but then $\text{Subj} \gg \text{Obj}$. For the Vietnamese group the order favoured is $\text{Subj} \gg \text{PP} \gg \text{Obj}$.

For each article for each group, in accordance with General Hypothesis 3 variable rules can be written:

Indefinite ArticleSpanish, Russian and VietnameseDET $\longrightarrow$ <A>
$$\begin{array}{l} \alpha \text{ V } \text{---} \text{N} \\ \quad \quad \quad [-\text{definite}] \\ \beta \text{ ---} \text{N} \quad \quad \text{X VP} \\ \quad \quad \quad [-\text{definite}] \\ \gamma \text{ V (NP) Prep ---} \text{N} \\ \quad \quad \quad \quad \quad [-\text{definite}] \end{array}$$
ArabicDET $\longrightarrow$ <A>
$$\begin{array}{l} \alpha \text{ ---} \text{N} \quad \quad \text{X VP} \\ \quad \quad \quad [-\text{definite}] \\ \beta \text{ V ---} \text{N} \\ \quad \quad \quad [-\text{definite}] \\ \gamma \text{ V (NP) Prep ---} \text{N} \\ \quad \quad \quad \quad \quad [-\text{definite}] \end{array}$$
Definite ArticleSpanish and ArabicDET $\longrightarrow$ <THE>
$$\begin{array}{l} \alpha \text{ V (NP) Prep ---} \text{N} \\ \quad \quad \quad \quad \quad [+ \text{definite}] \\ \quad \quad \quad \quad \quad [- \text{proper}] \\ \beta \text{ V ---} \text{N} \\ \quad \quad \quad [+ \text{definite}] \\ \quad \quad \quad [- \text{proper}] \\ \gamma \text{ ---} \text{N} \quad \quad \text{X VP} \\ \quad \quad \quad [+ \text{definite}] \\ \quad \quad \quad [- \text{proper}] \end{array}$$
RussianDET $\longrightarrow$ <THE>
$$\begin{array}{l} \alpha \text{ V (NP) Prep ---} \text{N} \\ \quad \quad \quad \quad \quad [+ \text{definite}] \\ \quad \quad \quad \quad \quad [- \text{proper}] \\ \beta \text{ ---} \text{N} \quad \quad \text{X VP} \\ \quad \quad \quad [+ \text{definite}] \\ \quad \quad \quad [- \text{proper}] \\ \gamma \text{ V ---} \text{N} \\ \quad \quad \quad [+ \text{definite}] \\ \quad \quad \quad [- \text{proper}] \end{array}$$

VietnameseDET $\longrightarrow$ <THE>where $\alpha \geq \beta \geq \gamma$

For each article type a continuum of development was able to be defined using the patterns obtained. These are presented in Figures 6.1.7 and 6.1.8.

Comparison with Other Studies

An examination of the results of previous SLA studies for the ordering of environments for the realisation of the definite article, reviewed in Chapter 3, reveals a similar lack of concordance to that shown among the groups in this study. The orders obtained in this study all agree with one or other of the SLA studies which were discussed in Chapter 3 which found significant environmental constraining of the realisation of the definite article. In this respect the results reported here support these earlier findings in indicating that although the position in the sentence of the noun to which the article is attached constrains the learners' variable use of the article there is no common ordering constraint for even two of the environments in relation to each other which is evident in all learners regardless of NL or other factors.

Discussion

Given the differences remarked on above between orders obtained in learners from different NL backgrounds, one obvious candidate in accounting for the ordering of environments is the NL. It may be that

Fig. 6.1.7: Continuum of Development for the Indefinite Article in Three Environments.

STAGE	DESCRIPTION	EXAMPLES OF SUBJECTS
1	Indefinite Article absent or variably realised in all three environments.	Span 07 (T1), 15 (T3) Rusn 12 (Ts 1 & 2) Arab 03 (Ts 1 - 3) Viet 17, 25 (Ts 1 - 3)
2	Indefinite Article reaches the criterion level chosen to denote acquisition* in environment α . Still below this level in environments β and γ .	Span 14 (Ts 1, 2 & 4) Rusn 15 (Ts 1 & 2) Arab 01 (Ts 2 & 4) Viet 24 (Ts 1 & 2)
3	Indefinite Article is realised at criterion level in β environment, in addition to environment α .	Span 01 (Ts 1 - 3) Rusn 17 (Ts 1 & 3) Arab 01 (T1), 04 (T2) Viet 13 (Ts 1 & 2)
4	Indefinite Article is realised at criterion level in all three environments.	Span 11 (Ts 1 - 4) Rusn 17 (Ts 2 & 4) Arab 06 (Ts 1, 2 & 4) Viet 20, (Ts 1 - 4)

* criterion level chosen to denote acquisition was 2/3

+ because of the small number of items in each environment the bimodal theoretical model was used.

Fig. 6.1.8: Continuum of Development for the Definite Article in Three Environments.

STAGE	DESCRIPTION	EXAMPLES OF SUBJECTS
1	Definite Article absent or variably realised in all three environments.	Span 07 (T1) Rusn 05, 14 (T1) Arab 02, 01 (T1) Viet 04 (Ts 2 - 4)
2	Definite Article reaches the criterion level chosen to denote acquisition* in environment α . Still below this level in environments β and γ .	Span 01 (Ts 2 & 3) Rusn 09 (Ts 1 - 4) Arab 05, 02 (T4) Viet 19 (Ts 1 - 3)
3	Definite Article is realised at criterion level in environment β , in addition to environment α .	Span 17, 14 (T1) Rusn 19 (Ts 1 & 2) Arab 01, 02 (T3) Viet 08 (Ts 2 - 4)
4	Definite Article realised at criterion level in all three environments.	Span 11 (Ts 1 - 4) Rusn 17 (Ts 1 - 3) Arab 06 (Ts 1 - 4) Viet 20 (Ts 1 - 4)

* criterion level chosen to denote acquisition was 3/4.

this is an area of syntax which is particularly predisposed to NL influence. Such a proposal is supported by the fact that the ordering is identical in the Spanish and Arabic groups, whose NLs are the only ones out of the four to use the definite article in a similar way to English.

Such an explanation is clearly not sufficient on its own though since the Russian and Vietnamese groups do not show the same order despite the fact that both NLs have no equivalent of the English articles. However their definite orders do share a common feature, Subj > Obj.

One possible factor for the differences in the orders in different studies is the method of data collection used, and particularly the style of discourse the learner was required to use in the task. Once again such a factor on its own cannot be sufficient since all the learners in this study carried out the same task.

All studies of SLA of articles in various environments have come up against a methodological problem, that of ensuring, or in free production obtaining, sufficient occurrences in all environments. From the point of view of an experimental study such as this it is difficult to create environments for a large number of occurrences of each article type in all the necessary positions. Certain positions in the sentence (eg. Subj) are more likely to be definite than others (eg. Obj) because of the information structure of English. Any passage with a large number of obligatory contexts for each article type, especially in the less frequent positions must either be extremely long or extremely contrived. A similar problem of frequency in environments has been encountered in spontaneous writing and speaking tasks. Clearly at the stage we are now at in the investigation of variability in article realisation dependent on NP environment it is essential to obtain support for the tendencies discovered when a large number of environments for each position are used.

Huebner's (1979) proposal, discussed in section 3.4.6 that Non-subject position is favoured over Subj because of the greater need in this position for the disambiguation of meaning whilst seeming logically

plausible is not supported by the existence of an unambiguous trend in the results in favour of such a universal ordering of constraints.

The results available to the present, including those of this study, indicate that in the case of the variability of article realisation Wolfram's (1973) distinction between "effect predictability" and "order predictability" is applicable.

6.2 The Interrelationship of the Learning of the Four Areas of Syntax

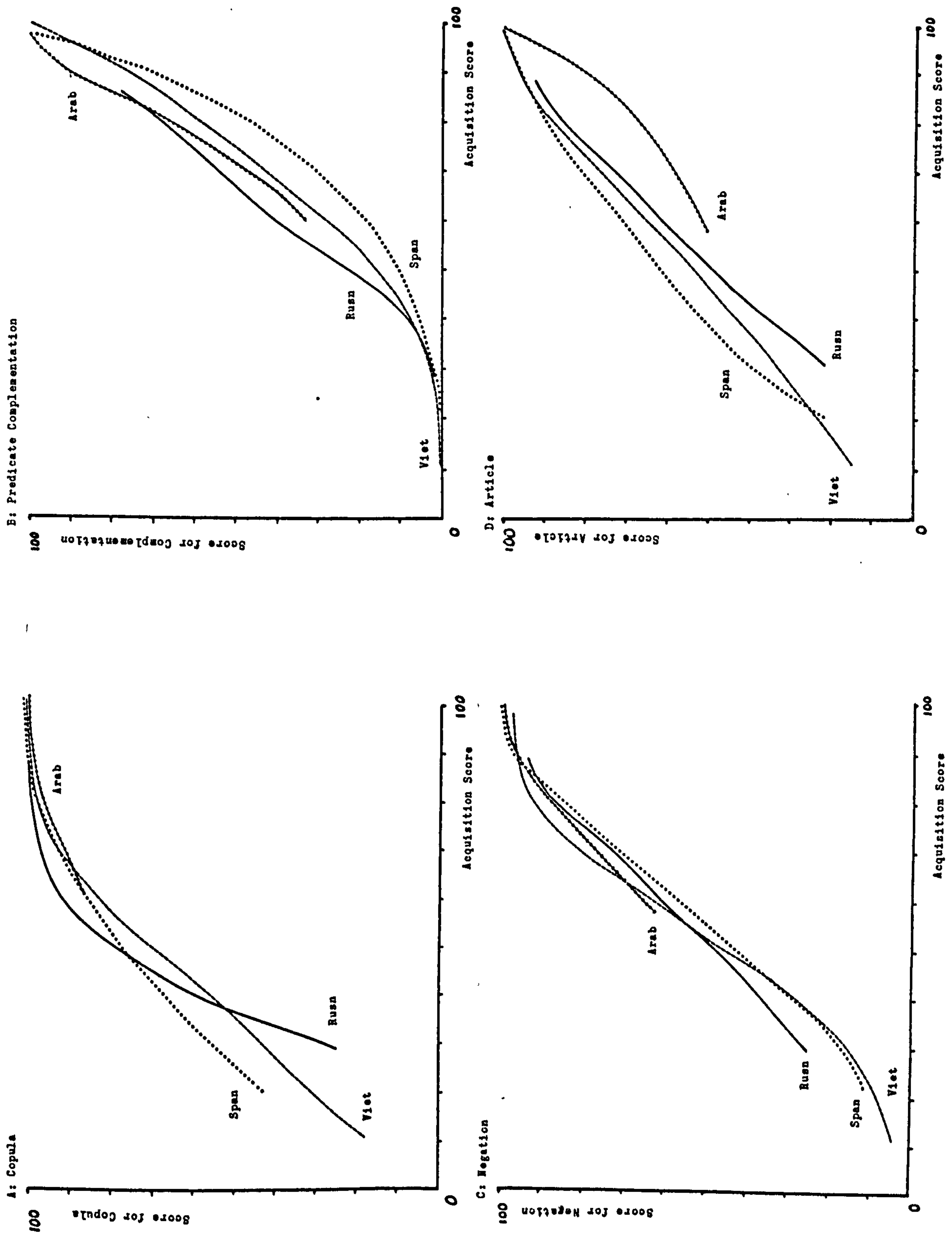
The two hypotheses in group 2 deal with the interrelationship between the learning of the four structural areas in two dimensions, between groups and within groups.

Hypothesis 2.1 introduces the proposition that a significant correlation exists for the learning of these four structural areas. Before turning to a consideration of whether the results obtained enable the rejection of the null hypothesis, it is worth discussing the results obtained in the initial broad analysis in which the four areas were considered as a whole. Since only four scores were obtained for each individual and four mean scores for each group statistical correlation of ordering was not possible in this broad analysis. Nevertheless the findings will be outlined and interpreted for the tendencies they show.

On the level of this broad analysis the existence of a relationship between the learning of the four areas between the groups is clearly apparent. The order of means for the four areas (Figure 5.5.1) is quite similar, the similarity being greatest between the Spanish and Vietnamese groups. Differences between the groups in the order of means all arise from differences in the level of acquisition of Article in relation to the other three areas, Copula, Negation and Complementation. The approximation curves for the four groups for each area, displayed in Figure 6.2.1, show a high degree of similarity in the shape of the curve for each area and its relative position in relation to the Acquisition Score. Once again the differences which emerge all relate to the shape of the curve for the Article (Fig 6.2.1d) and its relationship to the curves for the learning of the other three areas. Within groups the significant coefficients of reproducibility and scalability for the bimodal scaling (Table 5.5.5) indicate the high degree of conformance of the individual learners within each group to the overall group pattern.

The results of the broad analysis of the interrelationship of the learning of the four structural areas indicate that a relationship appears to exist on both dimensions, among the individuals within each group and

Fig.6.2.1: Approximation Curves for Each Group for Each Area (y-axis) against Acquisition Score (x-axis).



between the groups. For all groups the learning of the copula is more advanced than the learning of negation which in turn is more advanced than the learning of predicate complementation. The learning of the article is somewhere between the copula and complementation in all but the Arabic group, for whom it is less advanced than complementation. At this level of analysis the main differences both between the groups and within each group relate to the learning of the article in relation to the other three structural areas.

To enable statistical evaluation of the results in relation to Hypothesis 2.1 the four structural areas were broken down into 10 grammatical features and the learning of these features was studied along the two dimensions specified; between groups and within groups. The rank order correlations obtained for the order of means for the 10 features in the four groups (Table 6.2.1) show a significant and very strong relationship between the orders in the groups, particularly

Table 6.2.1: Correlation of order of means for 10 features in the four language groups

10 Features

	Spanish	Russian	Arabic	Vietnamese
Spanish		.95	.84	.98
Russian	.95		.93	.93
Arabic	.84	.93		.77 ^x
Vietnamese	.98	.93	.77 ^x	

x significant at $p = 0.02$ level

all others significant beyond $p = 0.01$ level

among the Spanish, Russian and Vietnamese groups (for which all the correlation coefficients were well over .9). The correlation between the orders obtained for the groups as a result of the bimodal scaling (Table 6.2.2) similarly show a significant and generally strong relationship between the orders in the four language groups, although not as high as that found for the order of means. The significant bimodal

Table 6.2.2: Correlation of Orders of 10 features Obtained from Bimodal Scaling in the four Language Groups

	Spanish	Russian	Arabic	Vietnamese
Spanish		.86	.63*	.86
Russian	.86		.89	.83
Arabic	.63*	.89		.73*
Vietnamese	.86	.83	.73*	

*significant at $p = 0.05$ level

all others significant at $p = 0.01$ level

Guttman scales obtained for the scaling of these ten features within each group indicates that the relationship between the learning of these discrete features of syntax is reflected also on the level of the performance of individual learners within each of the groups (Table 5.5.7). All the scales obtained were significant using the manual calculation method, although those for the Russian and Vietnamese groups failed to reach the required level of significance according to the machine method of calculation.

The results discussed in the preceding paragraphs which have established significant correlations both between groups, as measured by group mean and implicational rank orders, and within groups, as measured by implicational scales, mean that there is sufficient evidence to allow the rejection of the null hypothesis. The results support the alternative hypothesis, namely that there are significant correlations for the interrelationship of the learning of the four discrete areas of syntax both between language groups and within each group.

Hypothesis 2.2 addresses the question of whether the correlations obtained under Hypothesis 2.1 are higher when the features correlated relate solely to one of the main sentence constituents. Once again considering the broad analysis in terms of the scores for each of the four areas first, it is apparent that between groups there is a perfect correlation between the order of the 3 VP-related areas (copula, complementation and negation) (Figure 5.5.1). Similarly, within each

group the values of R obtained for the bimodal scaling (Table 5.5.6) are all higher than those when Article is also included. For the Spanish, Russian and Vietnamese groups R is either .99 or 1.00, indicating perfect or near perfect scales.

Detailed statistical evaluation of the results in relation to Hypothesis 2.2 was possible using the 10 syntactic features derived from the four areas. Of these 8 relate to the verb phrase and 2 (definite and indefinite) to the noun phrase. The rank order correlations obtained for the orders of means and implicational orders in the four groups for the 8 verb-related features are given in Table 6.2.3. These correlations are all clearly considerably higher than those for all 10 features combined (Table 6.2.1 and 6.2.2).

Table 6.2.3: Correlations of Means and Implicational Rank Orders for 8 VP-related features

	Order of Means			
	Spanish	Russian	Arabic	Vietnamese
Spanish		1.00	.98	.98
Russian	1.00		.98	.98
Arabic	.98	.98		.95
Vietnamese	.98	.98	.95	
	Implicational Order			
	Spanish	Russian	Arabic	Vietnamese
Spanish		.95	.93	.83
Russian	.95		.95	.85
Arabic	.93	.95		.85
Vietnamese	.83	.85	.85	

all significant beyond $p = 0.01$ level

All but one of the coefficients (that between Spanish and Vietnamese which was already exceedingly high for the 10 features at $r = .98$) increase when only the eight VP-related features are ordered. The average increase in r is .08.

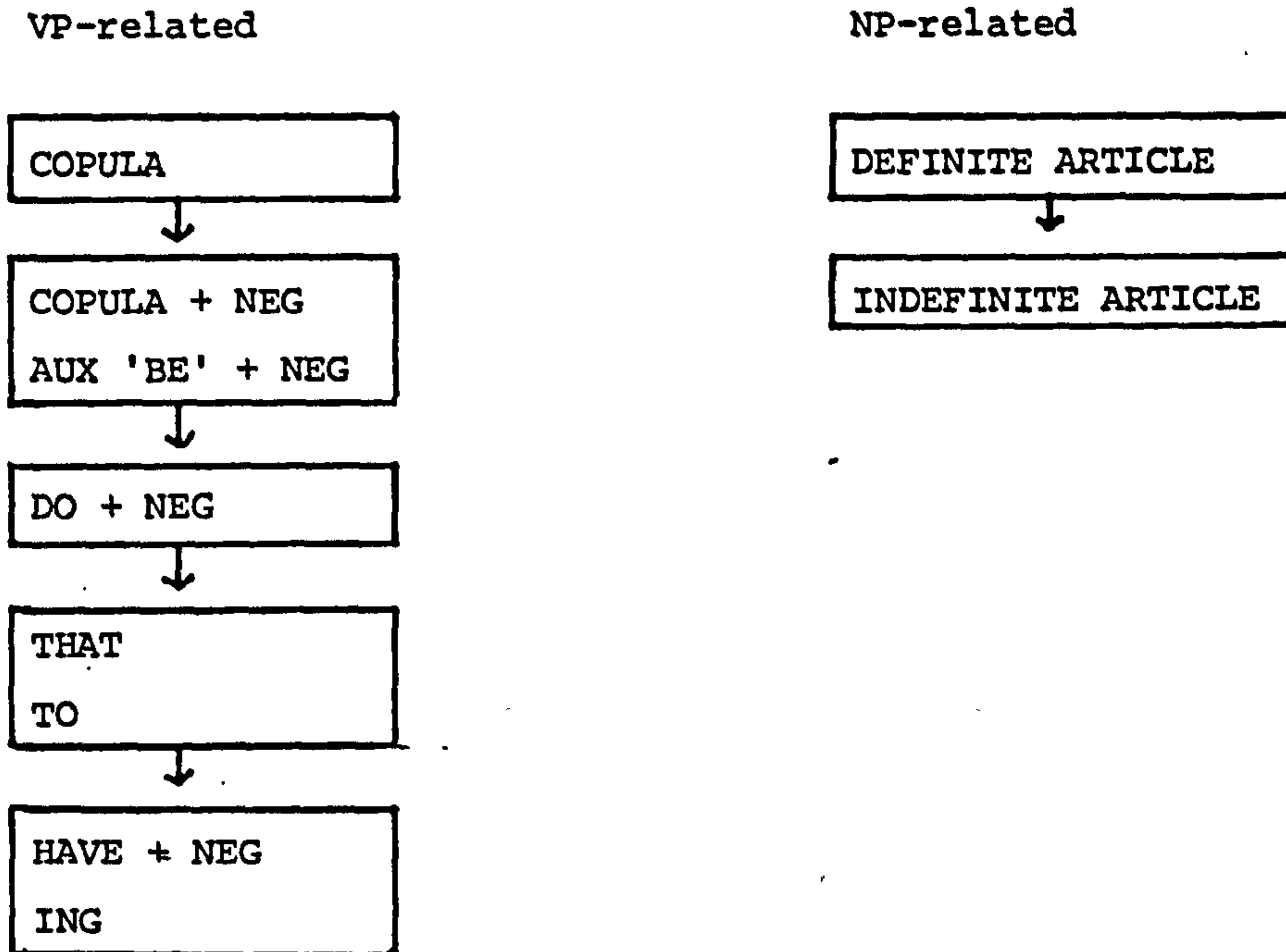
All groups show the same order of both means and bimodal implicational scaling for the two article types, definite and indefinite. Thus all the correlations between the groups for the order of these two NP-related features considered separately from the other 8 VP-related ones are perfect.

Within each group the bimodal scales for the eight features (Table 5.5.8) and the two article types (Table 5.4.3) are all significant. The values of R overall are higher than those obtained when the 10 features are scaled together. The increase in R is .02 when the manual calculation method is used and even greater, .05, when the machine method is used.

For the two article types the multi-valued scales are significant. The bimodal scales when R is manually calculated are significant for all groups. For the Arabic group the machine calculated R is not significant and is lower than that for the 10 combined features. Once again the small sample size makes this result unreliable. For the remaining 3 groups the improvement over the machine calculated R for the 10 features, for these 2 taken separately averages a very substantial .06.

The results of the analysis indicate that the correlations obtained are higher where features related solely to one of the main sentence constituents are correlated. The results therefore enable the rejection of the null hypothesis and confirm Andersen's (1978) findings. Both between and within groups a very strong interrelationship has been noted between the learning of features associated with each of the main sentence constituents, NP or VP. For the 8 VP-related features there is an almost exact correspondence in the order in the four groups. For the 2 NP-related features there is exact congruence. These results enable the definition of acquisition hierarchies for each of these two sets of features (Table 6.2.4).

Table 6.2.4: Acquisition Hierarchies for the VP and NP-Related Sets of Features



Features occurring in the same box are not considered to^{be} ordered in relation to each other, but only in relation to the boxes above and below.

From our results a picture emerges of the relationship between the learning of discrete areas of syntax where sets of features relating to one or other of the two main sentence constituents (either NP or VP) are developing in a systematic way, not only within each discrete structural area, but also in relation to the other structural areas related to that same main sentence constituent. In contrast, the two sets of features each associated with one of these two distinct constituents are developing to some degree independently of each other. This independence is manifested by differences in both dimensions, between and within groups, in the extent of learning of the two sets of features in relation to each other.

It is necessary to express a degree of caution in extrapolating this finding. The features which were able to be included are fairly restricted. Furthermore, the two articles were elicited using a different task from the VP-related features. It is possible that the

greater individual and group variation in the scores for articles and in their relationship to scores for the other features is a product of the task. However, similar diversity reported in numerous other studies (eg. Hakuta 1976, Al-Kary 1976, Sajavaara 1978, Wilkinson 1982) suggests that this is probably not the case.

6.3 The Effect of the Native Language

The discussion already presented regarding the hypotheses in Group 2 has pointed in passing to there being a certain degree of similarity between the performance of the four language groups in the four structural areas. The various hypotheses of Group 3 address the question of the influence of native language and particularly of the nature and extent of any effect of the learners' first language on patterns in the learners' acquisition of aspects of these four areas.

Hypothesis 3.1 deals with the similarity in the implicational patterns and the group mean rank orders in the four groups of learners from different native language backgrounds. Some of the results discussed in Section 6.2 provide support for Hypothesis 3.1. Not only is there a similarity between the groups when the four areas are taken as a whole, but when the areas are broken down into 10 syntactic features there has also been shown to be a striking degree of similarity in the ordering of the features in the four groups of learners' speaking quite different native languages (Table 6.2.1 and 6.2.2), as shown by the significant and generally high correlations in both group mean and bimodal implicational rank orders. These findings allow the rejection of the null hypothesis and acceptance of the alternative hypothesis.

Hypothesis 3.2 deals with the possibility of there being higher correlations between the groups for the ordering of environments and forms within some structural areas than in others. In order to discuss the results in relation to Hypothesis 3.2 it is necessary to examine and compare in detail the performance of the groups within each of the areas. Since four of the 10 features discussed in Section 6.2 were drawn from negation (AUX + NEG forms) and three from complementation

(THAT, TO and ING) the fact there is such a high degree of similarity between the groups in the ordering of the eight VP-related features, of which these are seven, points to there being a very high degree of correlation within these structural areas in the ordering of these features in the four groups.

In Complementation it was found that there was an identical pattern in the learning of the three complement types (section 5.2.1) in the four groups, with THAT being favoured over TO in the early stages of learning and ING being the least favoured. In the later stages there is a crossover apparent in all the groups with TO becoming more favoured than THAT. The main difference between the groups and the learners within those groups is in the precise point at which this crossover takes place. The overall pattern however is identical in all the groups regardless of native language. Identical patterns in all four groups also emerge for the relationship between the two Subject Identity types (EQUI and NON-EQUI) (Section 5.2.2). Similarly the four groups show very similar patterns of production in the realisation of the four AUX + NEG types (section 5.3.1).

Table 6.3.1 summarises the orders found in each of the groups for the realisation of the types and environments in Copula, Negation and Article. From the Table it is apparent all four groups show the same ordering of the two article types. Three of the groups, Spanish, Russian and Arabic, show identical orders for the two aspects of negation which were considered, AUX + NEG types and COP + NEG environments. In both cases the Vietnamese ordering differs. In the case of AUX + NEG types this difference is only in the ordering of the two most favoured types, both involving BE. The difference in the order of environments for COP + NEG is more marked and will be discussed in the next paragraph after the copula orders have been considered.

The Spanish and Russian groups show identical orders for the four Copula environments. The Vietnamese group differs in the ordering of the two most favoured environments, showing a clear preference for NP over ADJ. For reasons discussed in section 6.1 the results for the Arabic

Table 6.3.1: Order of Types/Environments in Three of the Areas

<u>COPULA</u>									
LANGUAGE GROUP	COPULA ENVIRONMENTS								
	__ ADJ __	__ NP __	__ PP __	__ PART __					
Spanish	1	2	3	4					
Russian	1	2	3	4					
Arabic	-	-	-	-					
Vietnamese	2	1	3	4					

<u>NEGATION</u>									
LANGUAGE GROUP	NEGATIVE TYPES				COP + NEG ENVIRONMENTS				
	COP	AUX 'BE'	DO	HAVE	__ ADJ __	__ NP __	__ PP __	__ PART __	
Spanish	1	2	3	4	2	3	1	4	
Russian	1	2	3	4	2	3	1	4	
Arabic	1	2	3	4	2	3	1	4	
Vietnamese	2	1	3	4	3	1	2	4	

<u>ARTICLE</u>									
LANGUAGE GROUP	ARTICLE TYPE		ARTICLE ENVIRONMENTS						
			DEFINITE			INDEFINITE			
	DEFINITE	INDEFINITE	SUBJ	OBJ	PP	SUBJ	OBJ	PP	
Spanish	1	2	3	2	1	2	1	3	
Russian	1	2	2	3	1	2	1	3	
Arabic	1	2	3	2	1	1	2	3	
Vietnamese	1	2	1	3	2	2	1	3	

group were not considered to provide evidence of the favouring of any one particular order for the three most favoured environment (__ADJ, __NP and __PP). Comparison of the results for the copula realisation in both the affirmative and the negative reveals that all groups show the same trend of the comparative favouring of the __PP environment in the negative compared to in the affirmative, thus revealing another similarity between the groups. The combination of the approximation curves for each

environment of the Copula in the negative and affirmative enables us to see even more clearly the similarities and differences between the groups (Figure 6.3.1 and Figure 6.3.2). These graphs show that in the affirmative the groups are virtually identical in the realisation of Copula in the ADJ and PART environments in relation to their overall learning of the copula, the curves being identical in both shape and positioning. On this detailed level there is quite a degree of disparity between the groups in the positioning of the curves for the realisation of Copula in NP and PP environments. A similar disparity between the positioning of the curve for the learning of copula realisation in the NP environment is also apparent in the negative.

It has already been noted in Section 6.2 that on the level of the interrelationship of the learning of the four areas the greatest differences between the groups appears to be in their realisation of the category of Article. This provides further support for the contention of Hypothesis 3.2 that there is less similarity between the patterns in different native language groups in some areas than in others. Within articles these differences between the groups are reflected by differences in the ordering of the NP environments for the correct realisation of each article type in the four groups. The greatest differences between the groups are in the ordering of the 3 NP environments for the definite article. There was not enough data for each environment to enable approximation curves to be drawn but the implicational analysis produced orders which were different in each of the groups except the Arabic and Spanish. No clear trend emerged among the groups, even in terms of the ordering of the Subj and Obj environments. For the indefinite article more similarity was evident in the patterns in the groups. For the three groups for which there was sufficient number of cases to have confidence in the patterns found, the order obtained was identical.

From the preceding discussion it is clear that the results of the study enable the rejection of the null hypothesis for Hypothesis 3.2. Greater similarity between the groups is evident in the ordering of

Fig.6.3.1.1: Approximation Curves For Each Group For Each Copula Environment.

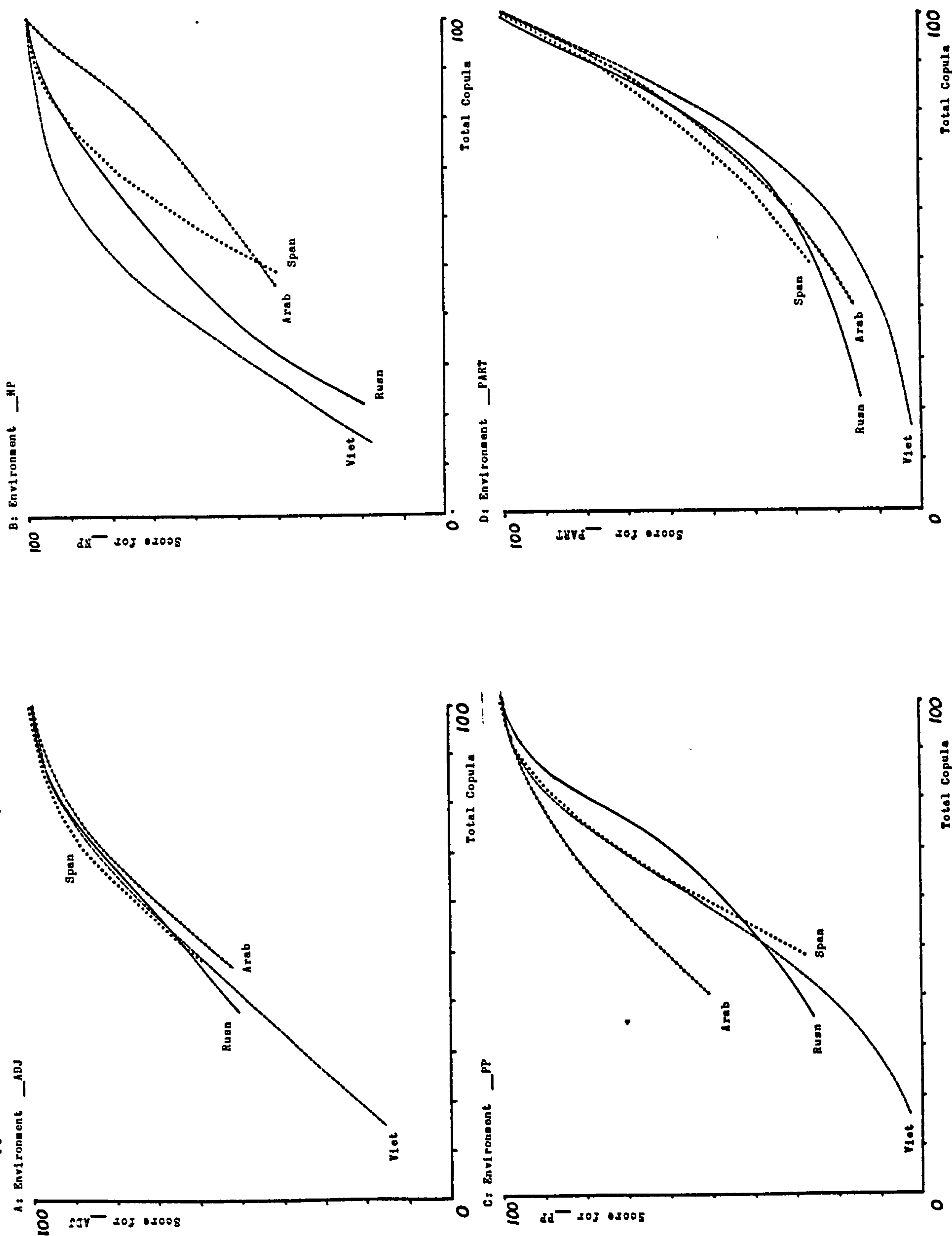
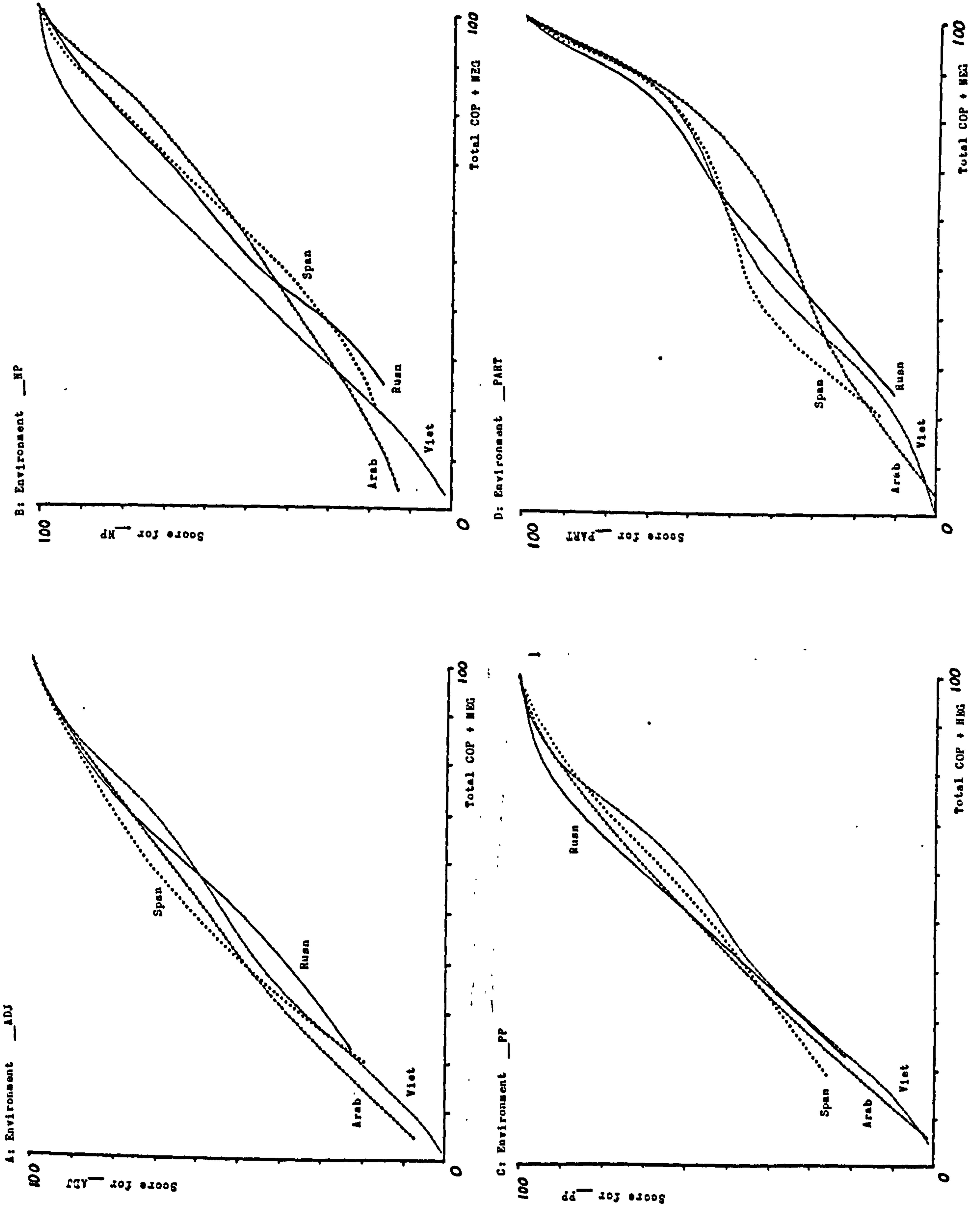


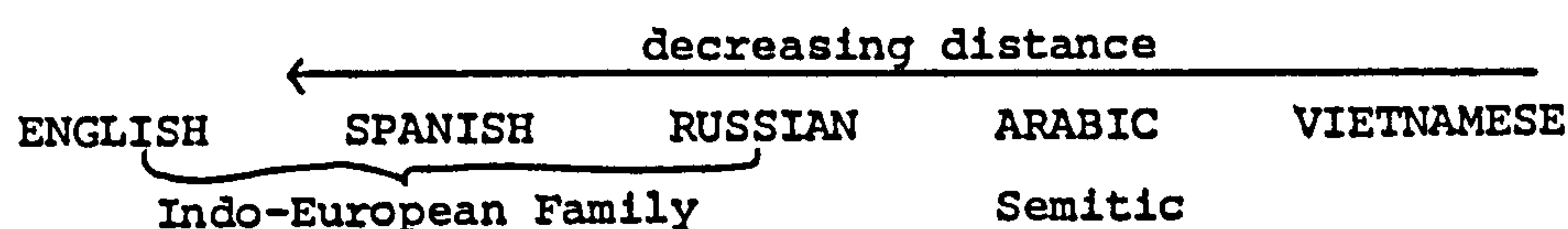
Fig.6.3.2: Approximation Curves for Each Group for Each COP + NEG Environment.



AUX + NEG types, of the two aspects of predicate complementation which were studied and of the two article types. The greatest disparities between the four groups are evident in the ordering of environmental constraints, especially for copula, COP + NEG and the definite article. These results suggest the possibility that the native language may have more influence on the ordering of environmental constraints in learners' second language production than in the actual forms used or their overall scoring in the areas. Such a possibility is supported by the fact that the Vietnamese group, which shows a clear favouring of NP over ADJ for realisation of the copula in both affirmative and negative (in contrast to the other groups), have a NL which differentiates between these two environments in realising the copula. Vietnamese requires a copula verb when it is followed by an NP, but has no copula when the complement is adjectival. This result supports Eckman's (1977) proposal that where the NL form is unmarked, as is the case of zero copula in ADJ in Vietnamese, and the TL form is marked (English realisation of copula), the presence of an unmarked category in NL may retard the learning of the marked TL category.

In other areas (eg. definite article) NL-based explanations of differences in the ordering of environments do not present themselves as readily. It is the case that the two groups who have the same ordering of environments for the definite article, Spanish and Arabic, are precisely those in which the NLs of the learners have a definite article which is more or less equivalent to that in English. However, the other two groups, Russian and Vietnamese, whose NL do not have articles, do not share similar orders. Even more importantly the order for the Vietnamese, who speak a topic-prominent language, does not correspond with that reported by Huebner (1979) for his topic-prominent speaking learner.

Hypothesis 3.3 proposes that the similarity in the learning of these structural areas will be greater between those groups, whose native languages can be considered to be closest to each other in terms of language distance. The native languages of the four groups of learners can be ordered in relation to their distance from English and from each other. This classification is restated below:



Given the small size of the Arabic group, most of the discussion of Hypothesis 3.3 must centre primarily on the patterns and thus the similarities and differences between the Spanish, Russian and Vietnamese groups. As a general rule if the results are to allow the rejection of the null hypothesis the correlations of the orders between the groups must be assessed relative to each other and must be found to indicate the following pattern:

$$\begin{array}{l}
 \text{Spanish with Russian} \gg \left\{ \begin{array}{l} \text{Spanish with Vietnamese} \\ \text{Russian with Vietnamese} \end{array} \right. \\
 \\
 \text{Russian with Vietnamese} \gg \text{Spanish with Vietnamese}
 \end{array}$$

If the relationship of correlations involving the Arabic group are also considered the following patterns also need to be established:

$$\text{Russian with Arabic} \gg \text{Spanish with Arabic}$$

Since it is impossible to judge the relative respective distances of Vietnamese and Spanish with Arabic, this dimension will not be considered.

Turning first to the correlations obtained for the order of means for the 10 syntactic features drawn from all 4 structural areas (Table 6.2.1),

which have been discussed under Hypotheses 2.1 and 3.1 (sections 6.2 and 6.3), it is apparent that only 50% of the predictions are found to be true. In fact the Spanish group's order correlates more highly with the Vietnamese group's ($r = .98$) than the Russian group's ($r = .95$), and this correlation is also higher than that between the Russian and Vietnamese groups. For the order of the ten features obtained using bimodal scaling (Table 6.2.2) 3 out of the four (75%) of the predicted relationships are confirmed. If we turn to the order of means for the 8 VP-related features all four (100%) of the predictions are confirmed. Using the bimodal scaling order, for which there is a greater difference in the coefficients between the various groups, once again all four predictions are confirmed.

In the discussion of Hypothesis 3.2 the ordering of environments and forms within the four areas was dealt with. For complementation it was noted that the same patterns were found in all the groups and thus the results in this area are not informative in regard to this hypothesis. In the remaining areas the orders were summarised in Table 6.3.1. For Copula, all three predictions which can be tested fit the predicted patterns. Within Negation, for the order of the AUX + NEG types for all cases where differences exist between the groups they are in line with the predictions which need to be confirmed if we are to be able to reject the null hypothesis. For the ordering of the COP + NEG Environments this is likewise the case. In the other area where there are differences in orders among the groups, the ordering of the three article environments for the definite and indefinite article, also provide support for the predictions. For the Indefinite the Spanish and Russian groups share the same order, so it is not unexpected that none of the predictions are not confirmed. In the definite article there are more differences between the groups and 3 out of 4 of the correlations fit the predicted patterns. The one which does not, Russian with Arabic $\geq$ Spanish with Arabic, involves the small Arabic group. Nevertheless it is perhaps not surprising that this prediction is not confirmed since Spanish and Arabic are very similar to each other and to English in the use of a definite article.

Most of the correlations of orders in the four groups conform to the patterns which are predicted by this language distance hypothesis. The few, altogether .4, which do not all involve correlations which are already extremely high (over .9), or the small Arabic group. Since 90% of the predictions conform to the pattern expected if the null hypothesis is to be rejected, it appears that we have sufficient grounds for rejecting it and thus supporting the alternative hypothesis for Hypothesis 3.3.

However the results for the definite article for the ordering of environments, for which Spanish with Arabic > Spanish with Russian, highlight the relative insensitivity of a broad concept of language distance. Whilst overall it may be appropriate to consider a language C to be at a greater distance from language A than language B, within particular areas of the structure of the languages this relationship may not always hold. Arabic and Spanish both use a definite article and thus, for this feature, are clearly closer to each other than either is with Russian.

Hypothesis 3.4 addresses the question of the relationship between rate of acquisition for each NL group as measured by mean score at Time 1, and the distance of the respective native languages from English. To assess this possible NL effect it is necessary to neutralise the effects of other non-linguistic variables which may also affect rate of acquisition. In the study data was collected for two non-linguistic metric variables, AOA and LOR, and for two non-metric factors, Time and Language (NL). It was not feasible to collect and assimilate data for the numerous other non-linguistic variables, such as aptitude, motivation, psychological distance, ego permeability, and sociological factors, which may also affect rate of acquisition. The analysis of results relating to Hypothesis 3.4 is conducted with this in mind.

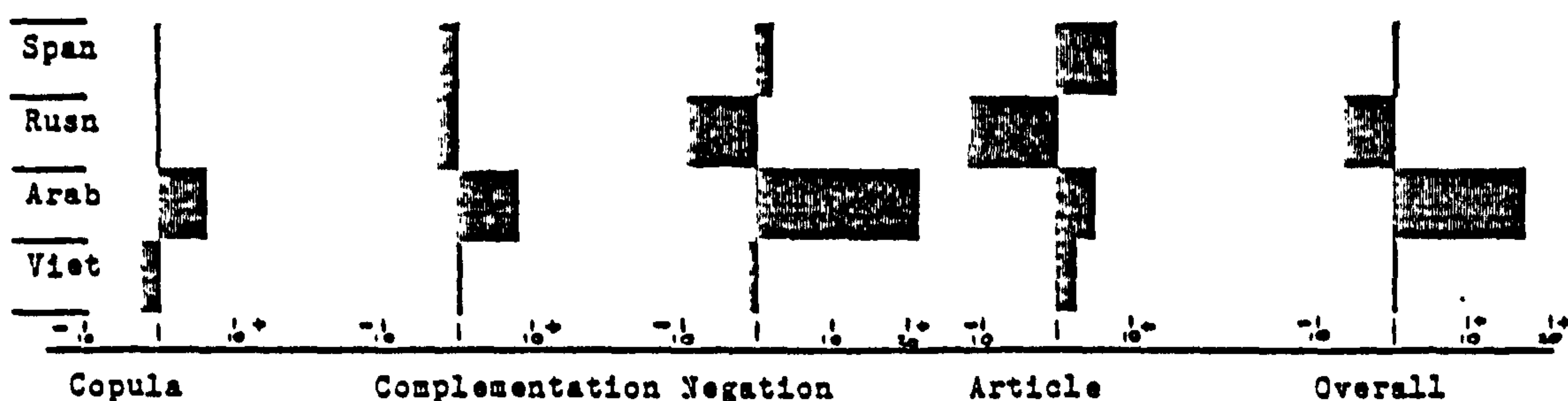
To reject the null hypothesis for Hypothesis 3.4 the results need to show that when the non-linguistic factors which were able to be measured are neutralised the rate of acquisition, as measured by the mean score at Time 1, is greater in groups whose NLs can be considered closer to English in terms of language distance and less when the opposite is

the case. If the effect of language distance is operating as predicted the order of adjusted means would be from highest to lowest Spanish, Russian, Arabic and Vietnamese.

Even the most cursory look at the results shows there is not this type of evidence to reject the null hypothesis. The mean AOA for all four groups is about the same. In terms of mean LOR the groups can be divided into two subgroups, Vietnamese and Russian, and Arabic and Spanish. Each subgroup has approximately equal mean LOR. In order then to reject the null hypothesis we would expect mean scores, the Russian and Spanish groups' scores at Time 1 to be greater respectively than those of the Vietnamese and ^{Arabic} groups. In both cases for all but one area (Russian, Vietnamese - Copula; Spanish, Arabic - Article) precisely the opposite is the case.

The Multiple Classification Analysis (Section 5.6.2.2) provides more precise data relevant to the discussion concerning Hypothesis 3.4. By adjusting the deviation in the mean scores for the groups to compensate for and thus neutralise the effects of time and the two non-linguistic variables, it allows the comparison of the average performance in the four groups by showing how much and in what direction each deviates from the grand mean. Using the MCA results from Table 5.6.4, Figure 6.3.3 shows how much each group's mean deviates from the grand mean in each of the areas and for the overall Acquisition Score. From it we can see that

Figure 6.3.3: Deviation of Means from the Grand Mean



when the other variables are controlled the Spanish group's means are consistently higher than those of the Russian group, and than those of the Vietnamese group on all areas except Complementation, indicating a faster rate of acquisition. However, contrary to Hypothesis 3.4 the adjusted means for the Russian group in all areas but Copula are lower than those for the Vietnamese indicating a slower rate of acquisition. Further evidence in favour of the null hypothesis is the fact that although the Spanish means are higher than those for the Vietnamese, except for in complementation, the overall difference between the two is very small indicating a very similar rate of acquisition in the two groups despite the difference in their NLs in terms of distance from English. Finally the group which deviates most from the expected mean and thus contributes most to the significant F ratio for the effect of Language on the learners' scores is the Arabic group. This small group of learners show consistently higher levels of performance on all the structural areas than the grand mean, and in all cases except for the article considerably higher than all the other groups. This indicates that the Arabic learners appear to be learning at a faster rate than the other learners in the study, which is, of course contrary to Hypothesis 3.4, since Arabic is considered to be at a greater distance from English than the two Indo-European native languages of the Spanish and Russian groups. Only for Articles does the Spanish group show a slightly faster rate of acquisition than the Arabic group, this chiefly because of faster learning and thus higher level of performance for the indefinite article.

Clearly these findings do not allow us to reject the null hypothesis for Hypothesis 3.4. The results do not indicate that the rate of acquisition is higher in groups of learners whose native languages are closer to English in terms of language distance. In Chapter 4 differences between the groups, in terms of a number of socioaffective factors were noted, and the opinion was expressed that the presence of these factors was not evenly distributed among the subjects in the four groups. Differences between the groups in terms of the rate of acquisition seem more likely to have resulted from differences in terms of these non-linguistic variable, which were not measured. Schumann's work

⁶
(1975 and 1978) has highlighted the importance of sociological and psychological factors in influencing the learner's rate of acquisition and eventual level of attainment.

The results of this study do not show a relationship between NL distance from TL and rate of acquisition, but this does not mean that such a relationship does not exist. In order to establish such a link it is obviously necessary to collect data on a large range of psychological and sociological variables so that their effect can be neutralised before the relationship between language distance and rate of acquisition can be accurately assessed.

6.4 The Relationship between Cross-sectional and Longitudinal Patterns

The one hypothesis in Group 4 deals with the relationship between group cross-sectional developmental patterns and the developmental patterns which are evident in individual learners over time. It proposes that the implicational hierarchies and the continua of development derived from these hierarchies obtained by taking a cross-section of a group of learners at different levels in their learning will correspond to the hierarchies and patterns observed in individual learners over time. Before turning to a discussion of the evidence which this study provides pertaining to the hypothesis it is necessary to comment in general terms on the trends apparent in the learners' development over time.

Time was included as one of the two factors in the Analysis of Covariance. The results of this analysis show that once the effect of Language and the two covariates, AOA and LOR, had been allowed for there is no significant Time effect apparent in the performance of the learners on the four separate administrations of the tasks. Only one F ratio is significant, that for the area with the lowest scores, Complementation, however it is only significant at the $p = 0.05$ level. Despite this the MCA reveals that although the Time effect is small and generally fails to reach the required level of significance, the deviation from the grand mean of the adjusted mean for each time shows a general trend of increasing adjusted mean from Time 1 through to Time 4.

In the sections dealing with Development over Time for each structural area and for the Acquisition score t-tests were carried out to determine whether the difference between means for each group at the four times was large enough to be considered significant. These revealed many significant differences, especially between the mean scores over the longest time span, from Time 1 to Time 4. Despite a general upward trend in terms of group mean performance the upward movement is not as great as was expected, and the reasons behind this need to be elaborated.

The results of the analysis of individual behaviour over Time for each structural area indicate a considerable amount of individual variation in change over time. These results suggest that whilst some subjects are improving steadily, others are not changing at all over time whilst still others actually appear to be backsliding or regressing. From Time 1 to Time 4 the majority of subjects progress overall, and with the exception of the Russian and Vietnamese groups for the Article and the Vietnamese group for the Copula, a clear majority of subjects in each group progress within each of the structural areas. Nevertheless, there is still a significant minority who do not.

Whilst it is obviously to be expected that individuals will learn at different rates as a result of numerous factors of psychological, sociological and cognitive origin, it seems necessary to discuss the occurrence of backsliding in the context of these results. Backsliding is a well-documented phenomenon in language learning (see for example Hyltenstam 1977) and over the four test times we would expect a small number of subjects to regress, rather than progress. What is surprising is the number of regressers, particularly over the largest time span, Time 1 to Time 4. While a learner may be expected to show variable performance over a fairly short span of time, such as from one test time to the next (approximately two months) with change which is not always in the direction of progress, over longer periods of time we would expect the vast majority of learners to show some progress. It seems likely that some of these regressers are not true regressers in the sense that the

term is generally used but rather appears to regress because of variability in their production associated with performance factors. Enormous problems arise in a situation where learners are being retested, especially when this is to be on several occasions. It is impossible for the experimenter to control for confounding factors which can be expected to vary from one individual to another and from one school to the next. Individual learners were observed to fluctuate markedly in their attitude and application to the task on different test occasions. Such fluctuations which differ between individuals are bound to arise and confound the observation of development over time. In addition the retesting on three occasions, using the same test format (although the vocabulary was different) is bound to mean less enthusiasm on the part of the learners particularly by the time of the third and fourth administrations. The fact that the learners were more relaxed and casual on these later administrations may in fact mean that their responses reflect their second language knowledge at a more spontaneous response level. In Tarone's terms their language may have constituted a style which is closer to the vernacular style on the continuum of styles.

Despite instructions to the contrary some learners were observed to spend time pondering over their responses. It appeared that they were attempting to use their formal linguistic knowledge to mediate their responses. Although the possibility of "monitoring" in this way was hoped to be avoided the results suggest that a number of learners may have "monitored" in this way especially in the earlier test times when they were being very careful. This diligence and desire "to get things right" was particularly observed in the Vietnamese group (such an approach to education is an essential element in Vietnamese culture). The fact that the results in this group show overall the least development over time lends support to this possibility.

Although there is more regression among the subjects than was expected, especially in the Russian and Vietnamese groups this does not affect the assessment of the results as they pertain to Hypothesis 4.1 concerning the relationship between cross-sectionally defined developmental

patterns and the developmental patterns observed in individual learners over time. Change in the opposite direction, where it constitutes regression, as opposed to progress, can still be informative as to the correspondence between cross-sectional and longitudinal patterns. In such cases the movement is merely expected to follow the patterns in the opposite direction, that of decreasing, as opposed to increasing, complexity. To enable the null hypothesis of Hypothesis 4.1 to be rejected it is only necessary to establish that changes in the stages of individual learners over time in either direction conform to the cross-sectionally determined stages of development. A preliminary survey of the results certainly suggests that the data provides evidence of this type. In each area studied the scores for the subjects at each test time in virtually all cases produce significant coefficients of reproducibility when arranged according to a particular order. This suggests that there are few subjects deviating from the implicational pattern at any test time.

Using the results a more detailed examination of the longitudinal development of individual subjects can be made. In each area one implicational hierarchy was singled out for this analysis; copula environments, complement, AUX + NEG and Article Types. As a basis for this the stages of the continuum of development for each area, derived from the analysis of the cross-sectional results in which the trimodal theoretical model of variability was used to determine the stages (refer to section 6.1 analysis) were assigned to the scores for each area for each subject at each test time. This meant that each score was assigned to one of the three categories, '+', 'V' or '-' according to its value. In all areas '+' was set at the level where the score was within one item of being perfect, this meant a level of approximately 90% (the exact level was determined by the number of items in each category for each particular structure). At the opposite end of the range of scores a similar criterion was used for assigning the '-' value (ie about 10%, once again the exact level being determined by the number of items in the given category). The category 'V' as assigned to all scores between these two extremes. Tables 6.4.1 to 6.4.4 show the results of this stage allocation over the four times. They show that

Table 6.4.1: Stage in Continuum of Each Subject at Each Time for Copula.

A: Spanish

Subject Number	Time 1	2	3	4
10	9	9	8	9
11	9	9	9*	9
17	9	9	9	9
x09	9	8	8	-
16	8	9	7	9
x21	8	-	-	-
03	8	9	9	9
05	8	9	9	8
13	8*	8	8	8
02	8	8	8	8
x19	7	8	-	-
04	6*	8	9	8
14	6	5*	6*	8
12	6*	8	8	7
01	5	5	5	7
15	5	6	5	6
06	5	5	5	7*
08	5	8	8	9
07	5	5	5	5
x20	5	-	-	-
x22	-	-	-	5*

B: Russian

Subject Number	Time 1	2	3	4
x19	9	9	-	-
13	9	8	9	9
x16	9	-	-	-
15	9	9	9	9
14	9	9	8	8
17	8	9	9	9
09	8	8	8	8
10	8	8	8	8
12	8	8	8	8
18	8	6	8	8
06	7	9	8	7
08	7	8	7	9
02	6	7	8	8
07	6	7	5	7
22	5	5	5	5
11	5*	5*	6	8
5	5	5	5	6*
03	5	5	5*	6
x20	5	-	-	-
05	5	6*	8	8
01	5	5	5	8*
x23	-	-	-	7

C: Arabic

Subject Number	Time 1	2	3	4
05	9*	9	9	9
06	9	9	9	9
08	8	9	9	9
x04	8	9	-	-
09	8	9	9	9
02	7	8	8	8
01	6	9	8	8
07	6	9	9	9
x03	2*	5	5	-

D: Vietnamese

Subject Number	Time 1	2	3	4
02	9	9	9	9
11	9	9	9	9
20	9	9	9	9
24	9	9	9	9
04	9	8	8	8
18	9	8	8	8
22	9	9	8	9
21	8	9	9	8
14	8	8	8	8
13	8	8	8	8
19	8	7*	8	8
x09	6	7	6	-
23	6	6*	8	8*
03	6	6	8*	8*
15	5*	5	5	5
06	5	5	8*	8
12	5*	8	8	8
01	5	5	8	7
16	5	6	5	6
x05	5	-	-	-
10	5	5	5	-
25	5	6	5	5
07	5	5	5	5
08	5	6	6	5*
17	5	5	5	5

Table 6.4.2: Stage in Continuum of Each Subject at Each Time for Complement Types.

A: Spanish					B: Russian				
Subject	Time				Subject	Time			
Number	1	2	3	4	Number	1	2	3	4
11	6	6	7*	7	x19	6	6	-	-
05	6	5	5	5	15	6	5	5	5
17	4*	6	7	6	14	3*	3	2	4
03	4*	4	4	4*	x16	5	-	-	-
x21	4	-	-	-	17	3	5	6	6
04	4	5	5	6	13	3	3*	6	6
12	5	3	5	3	06	3	3	4	3
13	3	4	4	5	12	3	4	5	5
16	3	3	4	6	18	3	5	5	5
02	3	4	4	6	10	3	3	3	3
x09	3	3	2	-	09	3	3	4	3
15	3	3	3	3	22	3	3*	3	2
14	3	3	3	4	02	3	3	2	2
10	2	2	3	4	01	3	3	3	5
06	2	2	2	2	03	3	2	3	3
08	2	3	6	6	04	2	2	2	2
01	2	2	2	1	x20	2	-	-	-
x20	2	-	-	-	11	2	2	2	2
07	1	1	1	1	08	2	2	2	3
x19	1	2	-	-	07	2	2	2	3
x22	-	-	-	2	05	2	2	2	3
					x23	-	-	-	3

C: Arabic					D: Vietnamese				
Subject	Time				Subject	Time			
Number	1	2	3	4	Number	1	2	3	4
05	6	7	6	7	20	7	7	7	7
08	6	5	7	7	02	6	5	5	7
06	6	7	7	7	11	6	7*	7	7
09	6	7	7	7	22	6	5	5	5
x04	5	7	-	-	24	4*	4*	7	7
07	4	5	6	5	18	3*	4*	4	4
02	3	3	4	5	14	4	3	3*	5
01	3	4*	6	7	12	4*	2	2	2
x03	1*	2	2	-	13	3	4	4	4
					04	3	3	4	5
					21	3	3	3	4*
					03	3	3	3	3
					19	3	3	4	5
					23	3	3	3	3
					x09	3	1*	3	-
					08	3	2	3	3
					07	2	3	3	3
					25	2	2	2	2
					x05	2	-	-	-
					15	2	2	2	1
					16	2	2	2	2
					06	2	3	3	5
					01	2	3	3	3
					17	2	1	1	2
					x10	2	3	2	-

Table 6.4.3: Stage in the Continuum for AUX + NEG Types for Each Subject at Each Time.

A: Spanish					B: Russian				
Subject Number	Time 1	2	3	4	Subject Number	Time 1	2	3	4
11	9	9	8	9	x19	8	8	-	-
x21	9	-	-	-	x16	8	-	-	-
17	8	8	9	9	12	7	7	6*	7*
03	8	9	8	9	14	6	5	6	5
02	8	8	8	8	15	6	7	7	8
10	8	7	8	8	17	6	7	6	7
16	8	8	8	9	11	6	4	4	4
x09	8	5*	6*	-	10	5	5	8	8
05	8	8	9	8	13	5	5*	7	8
x19	7	5	-	-	08	5	5	5	5
12	6	5	5	5	09	5	7	7	7
13	6	8	8	8	05	5	5	5	5
04	6	6	8	9	07	5	5	5	5
14	5	5	5*	5	04	5	5	5	5*
15	5	5	5	5	18	5	5	6	5
08	5	8	8	7	03	5	5	5	5
06	5	4	5	5	01	5	7	7	7
01	4	4	4	5	x20	4	-	-	-
x20	4	-	-	-	06	4	4	5	4
07	3	4	3	4	02	4	4	4	4
x22	-	-	-	5	22	-	5	5	5
					x23	-	-	-	5
C: Arabic					D: Vietnamese				
Subject Number	Time 1	2	3	4	Subject Number	Time 1	2	3	4
06	9	9	9	9	24	9	9	8	9
09	8	7	9	9	11	9	9	8	8
05	8	9	8	9	20	9	8	8	9
08	8	8	8	9	02	8	8	8	9
x04	8	8	-	-	18	8	6*	5	9
02	8	8	7	8	22	8	8	8	8
07	7	7	8	8	04	7	7	6	8
01	7	6	8	6	21	7	5	5	5*
x03	5	5	5	-	13	7	8	8	7
					01	6	5	4	5
					x05	6	-	-	-
					14	5*	5*	8	8
					12	5	5*	8	8
					23	5	5	5	5
					19	5	5*	8	8
					x09	5	5	5	-
					07	5	5	5	5
					08	5	5	5	5*
					x10	5	5	5	-
					25	4	4	3	4
					06	4	5	6	5
					03	4	5	5	5
					17	4	4	2*	5
					15	3	4	5	5
					16	3	4	2*	4

Table 6.4.4: Stage in the Continuum for Article Type for Each Subject at Each Time.

A: Spanish

Subject Number	Time 1	2	3	4
11	5	5	5	5
x21	5	-	-	-
03	5	5	4	5
05	5	5	4	5
10	5	5	5	5
08	5	5	5	4
04	4	4	4	4
x09	4	5	4	-
12	4	3	3	3
15	4	3	2	3
16	3*	5	4	5
17	3	5	4	4
14	3	4	4	3
13	3*	5	5	5
02	3	4	3	3*
x20	3	-	-	-
06	3	3	3	3*
x19	3	4	-	-
01	3	3	3	3
07	3	3	4	3
x22	-	-	-	3*

B: Russian

Subject Number	Time 1	2	3	4
08	5	3	3	3
10	5	4	4	4
17	4	4	4	3*
15	4	3	4	3
13	4	3	4	3
x16	3	-	-	-
22	3	3	3	3
02	3	3	3	3
04	3	3	3	3
03	3	3	4	3
x19	3	3	-	-
18	3	3	3	3
07	3	3	3	3
09	3	3	3	3
x20	3	-	-	-
12	3	4	4	3
11	3*	3	3	3
06	3	3	3	3
14	3	3	3	3
01	3	3	3	3
05	3	3	3	3
x23	-	-	-	3

C: Arabic

Subject Number	Time 1	2	3	4
06	5	5	4	5
x04	3	3	-	-
x03	3	3	3	-
02	3	4	3	3
01	3	3	3*	3
08	-	4	4	4
05	-	4	4	3
09	-	4	4	4
07	-	4	4	4

D: Vietnamese

Subject Number	Time 1	2	3	4
20	5	5	5	5
11	5	5	4	5
02	5	5	5	5
22	4	3	4	5
24	4	3	3	3
03	4	3	3	3
23	4	3*	4	3
21	4	3	5	5
x10	4	3	4	-
25	4	4	3	3
01	4	4	4	4
04	3	3	3	3
14	3	4	3*	5
07	3	3	3	3
13	3	3	5	5
18	3	3	3	3
19	3	3	3	3
17	3	3	2	3
x09	3	3	3	-
15	3	3	3	3
12	3	3	3	3*
06	3	4	5	5
08	3	3	3	3
16	3	3	3	3
x05	3*	-	-	-

from time to time most of the learners fit in to one or other of the stages on the continuum. Table 6.4.5 gives the percentage of scores for each group in each area which conform to the designated stages of the continuum. Table 6.4.6 gives the percentage of core subjects in each group who have no deviations from the stages over the four test times, and those who have one deviation. These tables show that longitudinally there is a high degree of conformance to the cross-sectionally determined stages of development. Overall at least 9 out of 10 sets of scores fit each group's cross-sectionally determined stages. For most of the areas for the Spanish, Russian and Arabic groups the level of conformance is well over 90%. Taking the core subjects (Table 6.4.6), a minimum of about two thirds of the subjects conform to the stages at all four test times. Virtually all the subjects who deviate from the stages predicted by the cross-sectional analysis do so only on one occasion. Overall 80% of subjects conform to the predicted stages at all the test times. These results show a very high level of correspondence between the cross-sectionally determined patterns and those observed in individual learners over time and thus enable the rejection of the null hypothesis. The results of this study thus appear to validate cross-sectional methodology as a means of determining stages in the SLA developmental continuum.

Further examination of the changes in the learners' development over learners time in terms of the stages defined cross-sectionally indicates that the can be categorised in terms of the change which they make. The first dichotomy is between those subjects who show movement over time in terms of the stages into which their scores in a particular area fit and those who show no change over the four test times. Among those learners who show change over the four test times two subtypes can be isolated. The first consists of those who show consistent, unidirectional movement, which may be in one of two directions, either forward, constituting progress or backwards, constituting regression or back-sliding. The second subtype consists of those who do not show a uniform movement in one of the two possible directions, but rather fluctuate. Among these learners the change from Time 1 to Time 4 may be in either direction or lastly may result overall in no change. These categories

Table 6.4.5: Percentage of Sets of Scores at 4 Times conforming to
Cross-sectionally Determined Stages

Language Group	Copula Environments	Complementa- tion Types	Negation Types	Article Types
Spanish (21)	89	94	96	93
Russian (22)	93	96	95	97
Arabic (9)	94	94	100	97
Vietnamese (25)	91	91	91	96

Table 6.4.6: Percentage of Subjects with No and One Deviant Set of
Scores over the 4 Times

Language Group	Copula Environments		Complementa- tion Type		Negation Type		Article Type	
	Ø	1	Ø	1	Ø	1	Ø	1
Spanish (16)	63	31	81	13	94	6	75	25
Russian (18)	72	22	83	17	82 (17)	12	89	11
Arabic (7)	86	14	86	14	100	-	67 (3)	33
Vietnamese (22)	68	23	73	18	64	32	86	14

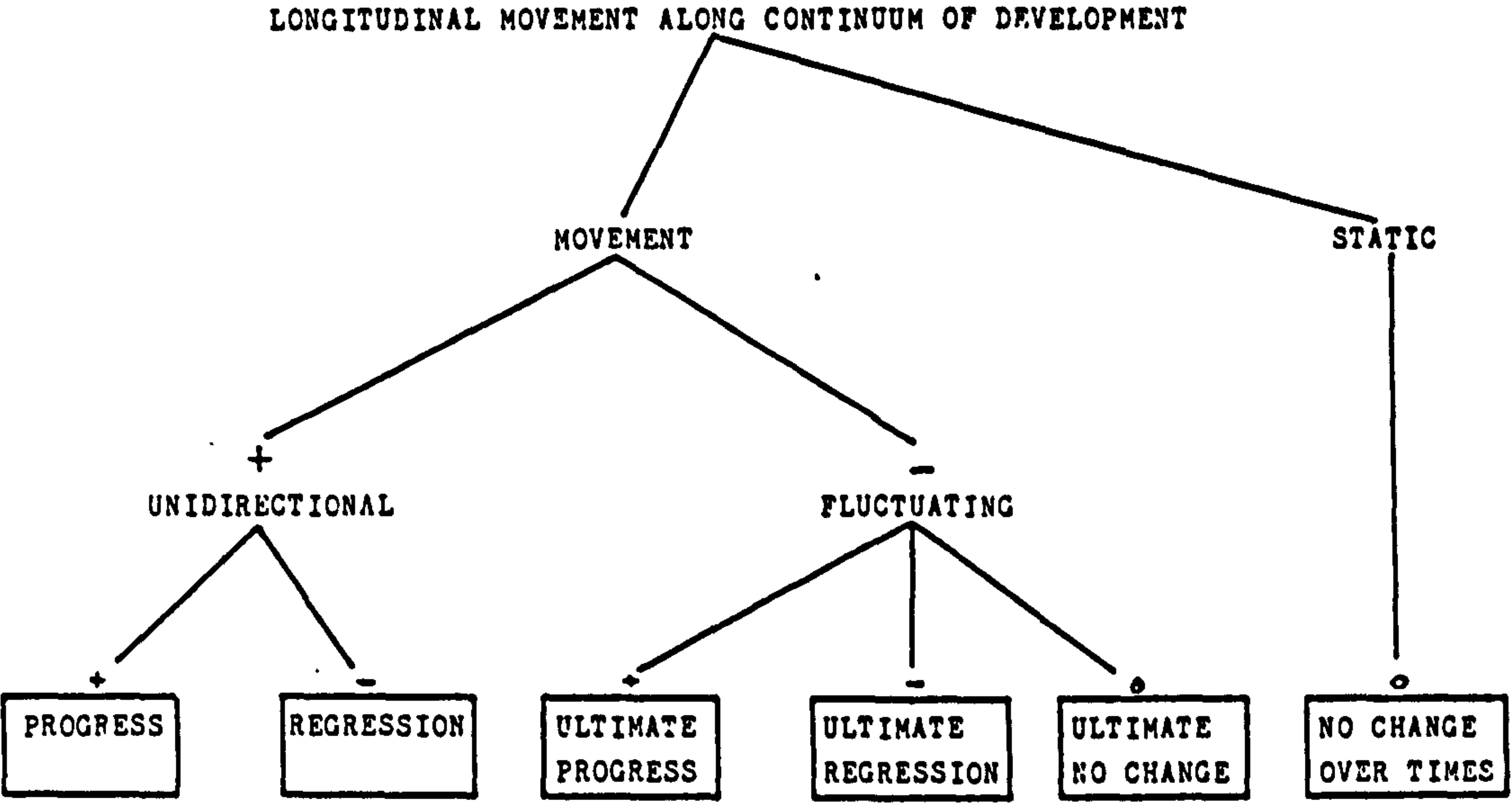
of learners in terms of their development over time are summarised in Table 6.4.7 along with examples of subjects fitting in to each category in terms of their development between Times 1 and 4. Whilst a certain percentage of learners show no development over the four test times in terms of the stages defined, the majority show change in the stage of the continuum they are at each or at least some of the test times. From Table 6.4.8 it is evident that when change does occur the ultimate result in comparison with Time 1 tends to be progress along the continuum towards a more complex and thus target-like grammar of the language. Clearly movement along the continuum in the direction of increasing complexity or development is much more common than in the direction of regression or backsliding, and this despite the confounding factors which arose from retesting.

Table 6.4.8: Percentage of Subjects who Change Stages over Time and Percentage of these in Each Direction

Language Group	Copula			Complement- ation			Negation			Article		
	Movt	+	-	Movt	+	-	Movt	+	-	Movt	+	-
	%	%	%	%	%	%	%	%	%	%	%	%
Spanish	69	82	0	75	75	25	81	62	7	69	27	27
Russian	72	69	8	83	60	13	73	55	13	39	0	71
Arabic	71	100	0	100	100	0	86	67	17	67	0	0
										(4)		
Vietnamese	59	46	15	82	72	17	82	61	17	50	46	36

Turning to the significant minority of subjects in each area in each group who show no change over the four test times, Table 6.4.9 indicates that for all areas, but Complementation, the majority of these apparently "fossilised" learners, to use Selinker's term, are in two stages of the continuum, the all variable stage (VVVV, VVV, or VV) and the all acquired stage (eg. +++, ++ or ++). It is particularly noticeable for the Article and Negation that at least 3/4 of these non-changing subjects are in the all variable stage. This is not surprising since the variable category covers the greatest part of the score range. There

Table 6.4.7: Types of Movement observed in the Subjects



Examples	Examples	Examples	Examples	Examples	Examples
<u>COPULA</u> Span 01, 03 Rusn 02, 11* Arab 08, 09 Viet 06*, 23*	<u>COPULA</u> Span - Rusn 14 Arab - Viet 04, 18	<u>COPULA</u> Span 16,15 Rusn 08, 07 Arab 01 Viet 01, 16	<u>COPULA</u> NONE	<u>COPULA</u> Span 05 Rusn 06 Arab - Viet 25	<u>COPULA</u> Span 17,02 Rusn 15, 10 Arab 06 Viet 02, 07
<u>COMPLEMENT</u> Span 13, 02 Rusn 12, 01 Arab 06, 09 Viet 04, 19	<u>COMPLEMENT</u> Span 05, 01 Rusn 11 Arab - Viet 22, 12*	<u>COMPLEMENT</u> Span 17* Rusn 14* Arab 07 Viet 02, 14*	<u>COMPLEMENT</u> Span 12 Rusn - Arab - Viet -	<u>COMPLEMENT</u> Span - Rusn 06, 09 Arab - Viet 08	<u>COMPLEMENT</u> Span 15 Rusn 04 Arab - Viet 02, 07
<u>NEGATION</u> Span 01, 17 Rusn 15 Arab 08, 07 Viet 02, 03	<u>NEGATION</u> Span 12 Rusn 11 Arab - Viet 11, 21*	<u>NEGATION</u> Span 03 Rusn 17 Arab 05 Viet 06, 04	<u>NEGATION</u> Span - Rusn - Arab 01 Viet 01	<u>NEGATION</u> Span 10, 06 Rusn 18 Arab 02 Viet 25	<u>NEGATION</u> Span 02, 15 Rusn 05, 02 Arab - Viet 23, 07
<u>ARTICLE</u> Span - Rusn - Arab - Viet 06	<u>ARTICLE</u> Span 12, 08 Rusn 08, 10 Arab - Viet 25, 24	<u>ARTICLE</u> Span 17 Rusn - Arab - Viet 21, 22	<u>ARTICLE</u> Span 15 Rusn 13, 15 Arab - Viet 23*	<u>ARTICLE</u> Span 03, 05 Rusn 12 Arab 02 Viet 11	<u>ARTICLE</u> Span 11, 04 Rusn 22, 14 Arab 01* Viet 02, 07

can be considerable variation and development in the subject's score within the variable category without it constituting movement into the next stage of the continuum. Significant coefficients of reproducibility ^{were obtained} for the multi-valued scaling analysis and indicate that even within the variable stage implicational relationships between the types and environments are maintained. The number of those in the all acquired stage for Copula reflects the relatively more advanced level of learners' development in this area. For complementation the majority of learners who do not change are "fossilised" in earlier stages where either ING or both ING and TO type Complements are absent. This reflects the comparative lateness of the acquisition of sentence complementation, especially of the two non-finite Complements.

Table 6.4.9: Percentage of Non-Changing Subjects in all V and all + Stages

Structural Area	% in stage where all V	% in stage where all +	TOTAL
Copula	19	43	62
Complementation	9	9	18
Negation	83	8	91
Article	75	14	89

6.5 The Effect of the Non-Linguistic Variables

The three hypotheses in Group 5 deal with the two independent variables, AOA and LOR, for which data was collected in the course of the study. One aim of the study was to determine the existence and extent of the influence of these two non-linguistic variables on the learners' level of performance in the second language and on their rate of acquisition. Hypothesis 5.1 deals specifically with the effect of AOA and Hypothesis 5.2 and 5.3 with the effect of LOR on these aspects of learners' second language development.

Before considering in detail the implications of the partial correlation analysis for each of these variables, it is worthwhile to put their effect into perspective by considering their effect on the learners' production as shown by the Analysis of Covariance (Section 5.6.2.1).

The F values obtained for these two metric independent variables (covariates) indicate that both contribute significantly to the variation in the learners' scores, in terms of both the Acquisition Score and the score for each of the four areas considered separately. Furthermore, these two covariates produce higher values of F and thus appear to contribute more to the variation in the subjects' scores than either of the two non-metric independent variables, Language and Time. Comparison of the F ratios obtained for the two covariates (Table 5.6.3) shows that the relative effect of the two differs in the different structural areas. In the overall Acquisition Score and Negation the effect of both AOA and LOR appears to be about equal. For Copula and Article AOA appears to have a greater effect on the variation than LOR, whilst in Complementation the contribution of LOR appears to be greater than that of AOA. These differences may relate to the time of onset of the acquisition of Complementation in relation to the other areas. Because Complementation is clearly much later in starting to be acquired it is to be expected that the LOR variable will show a much greater effect on the variability in learners' scores.

In addressing the specific hypotheses in Group 5 the results of the Partial Correlation analysis (Section 5.6.1) are required. Hypothesis 5.1 proposes the existence of positive correlations between both the Acquisition Score and the rate of acquisition, as measured by the change in Acquisition Score from Time 1 to Time 4. The correlations obtained (Table 5.6.1) show overall a significant, but modest correlation between AOA and Acquisition Score at Time 1 ($r = .37$). Within the groups the correlations for these two variables for the Russian, Arabic and Vietnamese are all significant and in fact slightly higher than overall ($r = .50$ to $.70$). For the Spanish group the correlation is not significant. The correlations obtained show overall a significant, but weak negative correlation ($r = -.27$) between AOA and the rate of acquisition as measured by the dependent variable, change in Acquisition Score from Time 1 to Time 4. Within the groups only the Russian correlation between these two variables is significant ($r = -.69$). The results obtained above indicate that although there is evidence against the null hypothesis concerning the relationship between AOA and Acquisition

Score at Time 1, the evidence for the relationship between AOA and rate of acquisition does not allow the rejection of the null hypothesis.

Even in the case of the first set of correlations which enable us to reject the null hypothesis for the non-existence of a relationship between AOA and Acquisition Score at Time 1, the relationship is clearly fairly weak. This indicates that many other non-linguistic variables are also contributing to the learners' level of scores. This has been discussed in detail in section 6.3. Nevertheless it is significant that even in this comparatively restricted age range (10.5-17 years) of the learners in this study a positive correlation is apparent.

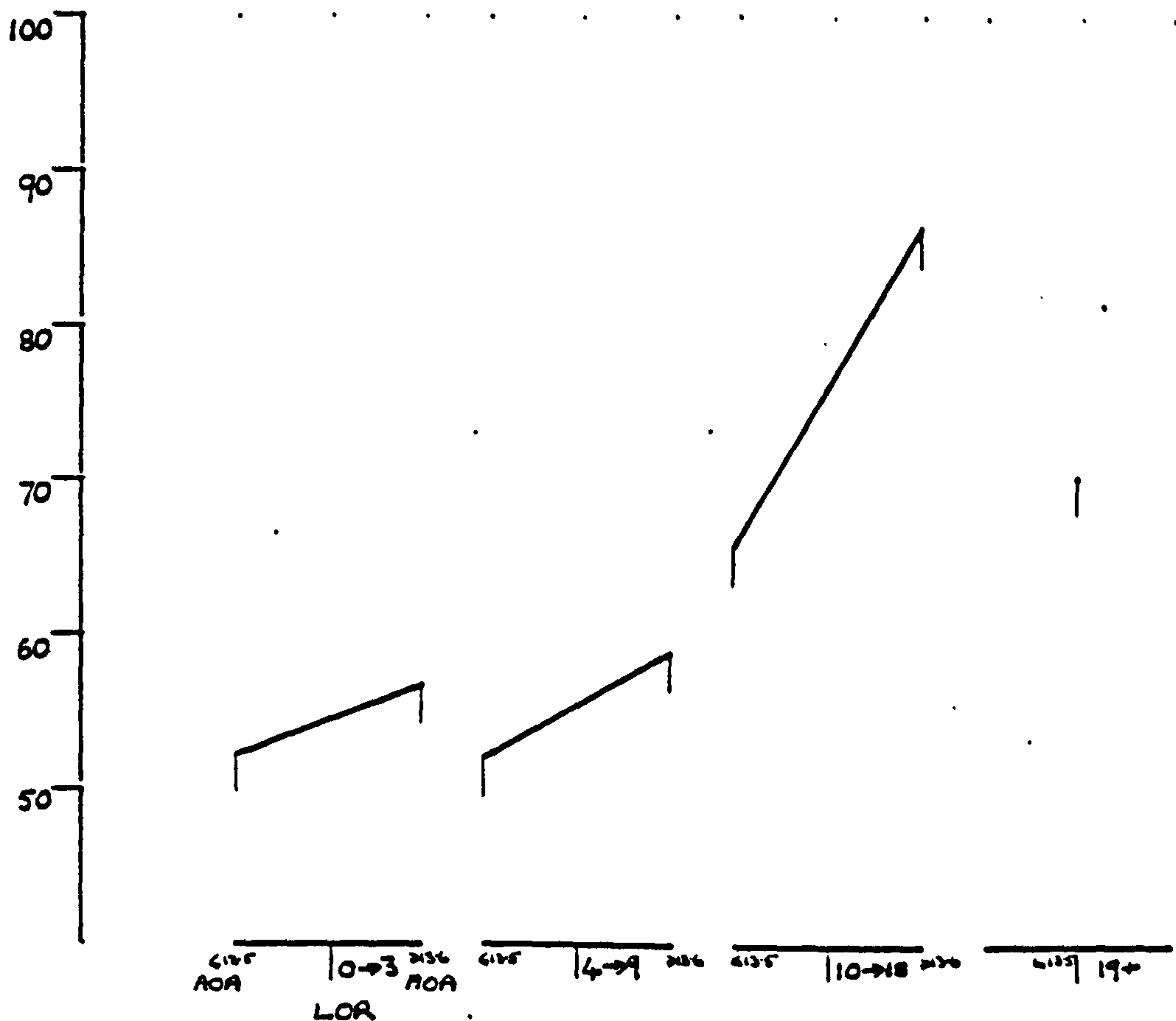
The second set of correlations, which did not enable us to reject the null hypothesis for the relationship between AOA and rate of acquisition may have partly resulted from the unsatisfactoriness of the measurement of rate of acquisition. For whatever reason (some were discussed in section 6.4) the change in scores over time cannot be considered to be a very accurate reflection of the learners' rate of acquisition. Clearly further investigation is necessary before this part of the hypothesis can be completely dismissed.

Hypothesis 5.2 proposes the existence of a significant positive correlation between LOR and Acquisition Score at Time 1. The partial correlation coefficients obtained (Table 5.6.2) indicate overall a significant, although modest correlation between these two variables ($r = .45$). Taking the groups separately, all correlations are significant, except for the Arabic group, which just misses the $p = 0.05$ level of significance. Because of the small number of subjects in this group the results are not as reliable. Overall it appears that the results enable us to reject the null hypothesis and to conclude that a significant positive correlation exists between LOR and the learners' level of performance at Time 1. As with AOA the correlation is clearly relatively weak, indicating that many other non-linguistic variables are contributing to differences in the learners' scores.

Hypothesis 5.3 proposes the existence of a significant negative correlation between LOR and rate of acquisition. When all subjects are considered together the correlation coefficient obtained although low is significant and negative ($r = -.32$). For the groups considered separately only the correlations for the Spanish and Vietnamese groups are significant (both negative). The results appear to provide a small amount of evidence against the null hypothesis. However, given the doubts expressed in a preceding section about the validity of the rate of acquisition measure (Change in Acquisition Score from Time 1 to Time 4), it seems unwise to reject the null hypothesis on the basis of these results. Although the results indicate, in accordance with Hypothesis 5.2, that subjects with longer length of residence tend to score higher at Time 1, but their rate of learning is slower than that of subjects with shorter LOR, the relationship is not very strong. As for AOA, it may well be that the confounding factors associated with retesting have meant that the trends are not as apparent as may have been expected, especially in respect of the association of LOR with rate of learning.

In an attempt to demonstrate graphically the influence of the two independent variables on Acquisition Score at Time 1, the learners were subdivided according to the two variables. Because of the relatively small number of subjects only a limited subdivision was possible. In terms of AOA, the subjects were divided into two groups, one consisted of those whose AOA was < 13.5 years, the other of those whose AOA was > 13.6 years. These two groups were then further subdivided according to LOR into four groups (0-3 months, 4-9 months, 10-18 months, > 19 months). The choice of ranges of LOR was largely dictated by the number of subjects in each LOR category, since it was necessary to try to make the numbers in each of the subgroups as even as possible. The scores for the one reliable dependent variable (ACQSCORE TIME 1) for each subgroup were then averaged and the means plotted on Figure 6.5.1, thus yielding a visual representation of the interaction of the dependent and independent variables. Even with such small numbers in the subgroups clear trends are apparent. The mean for the Acquisition score at Time 1 for the > 13.6 AOA group rises for each longer LOR category.

Fig.6.5.1: Mean Acquisition Score at Time 1 for Each AOA/LOR Group.



A similar trend is apparent in the ≤ 13.5 AOA group, but with a slight drop in LOR 4-9 months group. It is also apparent that for each LOR category the older AOA group scores higher than the younger one.

The analysis of the influence of the two non-linguistic variables, which is peripheral to the main concerns of this study has not produced conclusive results. Although significant positive correlations have been established between both AOA and LOR and Acquisition Score at Time 1, the comparatively small scale of the study means that even these results need further verification. Reliable results, especially when it is desirable to subdivide the learners according to a number of different factors, require investigation in a large scale study, specially designed to elicit data on the effect of these and other non-linguistic variables on the learners' acquisition level.

CHAPTER SEVEN

Conclusions

7.1 Summary of Findings

The findings of this study clearly have broad implications for our understanding of SLA. Before these are briefly discussed, the findings presented in Chapter 6 will be summarised taking each of the five groups of hypotheses separately.

Both the general hypotheses and the seven specific hypotheses by which these General Hypotheses were tested dealt with the systematicity underlying the learners' often variable realisation of features of the second language within the four areas of syntax included in the study. For all seven specific hypotheses the null hypotheses were able to be rejected and thus it was established that for each language group, except when there was insufficient relevant data (as was sometimes the case for the Arabic group), implicational hierarchies were able to be defined. These were shown to govern the variability in the learners' production of second language features in the environments and forms which were proposed. As such, the findings indicate that underlying the learner's second language production, at least in these areas along the parameters investigated, systems exist which guide the realisation of features and thus their development. The existence of such systems was able to be established by the formation of variable rules, in the seven cases where this was appropriate (all except complementation types). As a result continua of increasing complexity were able to be defined in terms of the realisation of syntactic features within each area of second language syntax on which the individual learners could be placed in terms of the stage that they had reached in their development.

Group 2 contained two hypotheses both of which dealt with the interrelationship of the acquisition of the four discrete areas of syntax. Hypothesis 2.1 dealt with the interrelationship between the

learning of features from all four areas. Through group mean and implicational rank order correlations it was established that a relationship exists between the groups in the ordering (ie the difficulty order, or as it is also called the acquisition order) of features from the four areas in the four language groups. Furthermore within each of these groups using implicational scaling it was possible to establish that on the level of the individual learners the same conformance to a general pattern for the ordering of features from the four areas also existed. Hypothesis 2.2 proposed in accordance with Andersen's (1978) findings that correlations and thus relationships which exist between the learning of discrete areas of syntax are higher and thus stronger between groups of features which relate to one or other of the two main sentence constituents, NP and VP. The null hypothesis for this hypothesis was also able to be rejected. It was able to be shown that both between and within groups the correlations were higher when the features from the areas were subdivided into two groups using this parameter. Within each of the two subgroups of features it was possible to define an acquisition hierarchy, in Krashen's (1981) terms "a natural order", for the features relating to each of the main sentence constituents. Because of the presence of only two features in the NP-related group, both of which involved the Article, it was not possible to have the same degree of confidence in this finding in relation to NP-related features as it was for those eight from three areas which were related to the VP.

The four hypotheses in Group 3 addressed various aspects of the influence of the learners' native language on their second language production. In accordance with Hypothesis 3.1 it was established that there is a significant correlation between the ordering of group means and implicational hierarchies for 10 features drawn from different areas of syntax. As such this result agrees with that of the morpheme order studies and shows, at least at this level of detail, there is a high degree of similarity among the groups in their order of acquisition of features of syntax, regardless of their native language. Hypothesis 3.2 dealt with the similarity between the groups at the more

detailed level of the ordering of environments and forms. Once again the null hypothesis was able to be rejected, since in certain areas (eg. Complement, SI and Article Types) virtual concordance among all the groups was observed, whereas in other aspects differences were apparent and the correlations between the groups were not as high. It was observed that the greatest differences between the groups were observed at the level of the ordering of environmental constraints for the realisation of a feature (eg. Copula and Definite Article).

Hypothesis 3.3 and Hypothesis 3.4 dealt with the relationship of the concept of language distance to the differences between the groups both in terms of the rate and the sequence of acquisition. For Hypothesis 3.3 it was established that first languages which could be considered as being closer to each other in terms of this admittedly imprecise concept showed equal or higher correlations with each other in terms of the ordering of features and environments than with those of speakers of languages which are considered to be more distant from each other. In establishing this the most important and reliable evidence concerned the similarities and differences between the Spanish, Russian and Vietnamese groups. Particularly at the level of the ordering of environments there was clearly a much greater similarity between the hierarchies observed in the learners who spoke Indo-European languages than between either of these two groups and the Vietnamese native speakers. Although the results supported the alternative hypothesis it was pointed out that such an imprecise and difficult to quantify concept as language distance needs to be further refined to account for the fact that although in general terms two languages may be considered as a whole to be more distant from each other than two others (eg. English and Arabic compared to English and Russian), this does not take into account the fact that in a particular area of grammar there may be more similarity between the two which are overall more distant from each other (eg. Articles in English and Arabic compared to Article in English and Russian).

Hypothesis 3.4 dealt with the proposal that more differences between the NL and TL in terms of language distance are reflected in differences between learners not in their sequence, but rather in terms of their average rate of acquisition. In the case of Hypothesis 3.4 the null

hypothesis was not able to be rejected. Evidence of the overall rate of acquisition when the two measured non-linguistic variables, AOA and LOR, were neutralised indicated that with the exception of the Article the mean Acquisition Score in the Spanish and Vietnamese groups was virtually the same, with the Arabic group showing a clearly higher rate of learning than average and the Russian group a clearly lower than average rate of acquisition. This pattern in the results for this relationship was attributed to differences between the groups in terms of socio-affective factors which were not able to be dealt with in the course of this study. The hypothesis needs to be tested by large scale study in which some of the other important socio-affective factors which can differ so markedly from individual to individual and from one immigrant group to another can also be measured, and the relative effect of each assessed.

Group 4 contained one hypothesis which addressed the question of the relationship between cross-sectionally determined stages of development for a particular feature and the patterns observed in the individual learners in their development over time. Despite the fact that there was less development over time than expected for the groups considered as a whole largely as a result of confounding factors which were discussed in section 6.4 this apparent lack of change masked a great deal of movement among the individuals within the groups. Whilst the majority of the learners who changed from Time 1 to Time 4 progressed, a significant minority, especially in the Vietnamese and Russian groups, regressed. The null hypothesis was able to be rejected because, irrespective of the direction of that change, high percentages of the learners' changes over time (approximately 90%) conformed to the stages of the developmental continua which were defined cross-sectionally in relation to the Group 1 hypotheses.

The three hypotheses in Group 5 dealt with the relationship between the independent, non-linguistic variables, AOA and LOR, and learners' score levels in terms of the Acquisition score at Time 1 and the rate of acquisition as measured by the change in acquisition from Time 1 to Time 4. Because of the unsatisfactoriness of the measurement within

the study of rate of acquisition (CHACQ1-4) no significant correlation was found between either of the two non-linguistic variables and this measure. The possibility of such a relationship existing clearly needs to be investigated further. Overall significant, but weak positive correlations were found for the relationship between the learners' scores at Time 1 and both of the variables, AOA and LOR¹. For some of the language groups the correlations were not significant. The results highlighted the fact of the complexity of the relationships which these two non-linguistic variables appear to have with learners' performance. Two main problems associated with this complexity were evident and indicate why such hypotheses to provide conclusive findings probably need to be the central concern of a study rather than being peripheral as they were to this investigation. The first is that when relationships exist much of the time it is probable that they are non-linear. To enable the investigation of such relationships very sophisticated models and statistics are necessary. Second, the relatively low values of r which were obtained even when the significance level was reached indicate that many other variables are contributing to the differences between subjects in terms of their scores. A study which was primarily concerned with the interaction of a range of important non-linguistic variables and learners' performance working with large numbers of subjects would probably be able to disentangle the many non-linguistic factors which contribute to varying extents to the learners' acquisition.

7.2 The Nature of the Continuum

Several aspects of the results of the study seem worth considering in terms of their broader implication both for our understanding of the nature of the hypothesised continuum of development, and of the contribution which the native language appears to make to the process of acquisition.

¹This measure can be considered to indicate indirectly a measure of rate of acquisition since the faster the rate of acquisition the higher a learners' comparative score would be at any time.

The evidence shows overwhelmingly that within the areas in terms of the parameters studied the learners' realisation of features of English syntax (eg copula or AUX + NEG forms) is not random despite the fact that it is often variable. This nonrandomness is demonstrated by the ability to write rules which defined the system underlying the learners' production. Such rules have to be variable to encompass the possibility of non-categorical performance in one or all of the environments or forms. Furthermore, they have been shown to be able to characterise the performance of learners who are at different levels in their acquisition of the feature or features because what they define is an implicational hierarchy in which the essential relationships are those of more or less rather than all or nothing. The results of this study have been able to establish that systematicity exists in learners' language within areas of syntax. Although the analysis of their performance within areas was not exhaustive (eg the relative target acquisition of the various BE allomorphs was not studied), it seems quite probable that within each area systematicity exists along a number of dimensions. Where more than one aspect was investigated within a particular area (eg. Complementation, Negation and Articles) systematicity was found to underlie the learners' variable behaviour along all dimensions. A picture emerges of learners' acquisition of second language syntax being an organic, highly ordered process.

The systematicity within areas was found to be mirrored by systematicity among learners in the same NL group in terms of the interrelationship of acquisition of features of syntax from different, seemingly discrete structural areas. The results did however indicate that this interrelationship is particularly strong and constant among syntactic features associated with the same main sentence constituent (either NP or VP).

The main differences between both groups and individuals within each group related to the interrelationship of the learning of these two series of features each associated with either NP or VP.

The findings obtained regarding the Group 1 and Group 2 hypotheses enable an evaluation of their contribution to the validation of the Interlanguage Developmental Continuum model of SLA. Clearly the language of the learners in this study at different stages in their acquisition of English shows evidence of what Corder has proposed, namely, "a dynamic, goal-oriented language system of increasing complexity". The results concerning the systematicity within areas and the interrelationship of the learning of areas enable some speculative refinement of Corder's definition. Since in the acquisitional process different aspects of grammar do not all appear to be rigidly related to each other there is no sense in which we can formulate one rule system or define one continuum which covers all acquisition in all areas for all learners. It seems best to view the overall concept of the Interlanguage Developmental Continuum as that of a macro-continuum, a framework which defines the overall structure and outer limits of the developmental processes. Within this macro-continuum it can be hypothesised that a number of micro-continua are operating, each one of these containing a series of features, which may be drawn from different areas of syntax, but which can be shown to be related to each other in terms of linguistically relevant criteria. Examples of such criteria could be association with the same main sentence constituent (eg. NP. or VP), the nature of the morpheme (eg. bound or free) and the semantic interrelatedness of the features (eg. prepositions). Features of syntax within each of these micro-continua are envisaged as being closely interrelated to the extent that implicational hierarchies can be defined which enable the description of one system underlying their process of development. The relationships between micro-continua are envisaged as being considerably looser, with each functioning to some extent independent of the others. Drawing on the empirical evidence presented in this and other studies it can be speculated that the points of overlap or interaction between these various micro-continua could depend upon a number of factors such as the native language of the learner/s, exposure to the second language, the amount of formal instruction received, the nature of the task being performed and the individual learner's learning style and personality.

Within each micro-continuum it is possible to envisage yet another level of detail, just as an object viewed without magnification can show a pattern on its surface, which is mirrored at each level of increasing magnification by other, previously hidden patterns. At this third level of magnification each feature can be envisaged as having, at least in some cases, another continuum or, possibly, a series of other continua, which can be defined using the rules governing development which are evident at the level of environmental constraints on the realisation of that particular feature.

7.3 The Role of the Native Language

The second aspect of the results of the study which gives rise to broader implications and invites the possibility of speculation concerns the influence of the NL on SLA. As a result of the investigation it has been able to be established that despite an overall similarity between learners from different native language groups in terms of the order of acquisition of features of syntax both within and between structural areas, (findings, which are in accordance with those of both developmental and morpheme order studies), differences exist which at least in some cases appear to be attributable to the native languages of the learners. For example the Vietnamese group showed a different ordering of the __Adj and __NP environments for the realisation of the copula than the other groups. Overall in terms of the relative acquisition of the gross areas of syntax in relation to each other through the course of acquisition (approximation curves Figure 6.3.1) the groups show a high degree of similarity. Generally it is at the level of environmental constraint ordering that differences are apparent. Wolfram's (1973) valuable distinction between 'effect predictability' and 'ordering predictability' seems to be relevant to the results of this study. In all groups the environments were found to significantly constrain variability except where virtually all scores for all environments indicated categorical or near categorical performance. From this we can speculate that the 'effect' is universal and thus predictable among all groups of learners. What, at least in certain cases, appears to be first language specific,

or, less extremely expressed, to be more variable dependent on the influence of the native language is the precise ordering of those environmental constraints.

Taken as a whole the results of this investigation would seem to support Zobl's (1980a, 1980b, 1980c, 1982) ideas about the effect of the first language on the SLA process. The similarities within the groups indicate as Zobl suggests that any first language influence takes place against a background of the superordinate cognitive developmental processes. It is at a detailed level, or to use our analogy, at high levels of magnification, that we can find evidence of first language influence. Thus the Vietnamese learners were seen to be slightly retarded in their realisation of copula in the ADJ environment comparative to the other groups. In Zobl's terms they spent longer in the stage where copula was not realised in this environment than the other learners. However, this retardation appears to be comparatively small since it did not lead to gross changes in the ordering, such as ADJ moving to being implicationaly behind the least favoured PART environment. With a limited number of examples of such phenomena only speculation is possible. It does however appear that if we are to observe the influence of NL in learners' SLA of aspects of syntax it is likely to be at these levels of detail.

In addition this finding lends some support to Eckman's (1977, 1981) attempts to link the notions of markedness and NL influence together into a differential markedness hypothesis. It was able to be established that absence of copula in ADJ is typologically more common and thus less marked than in NP. In this case, in accordance with Eckman's hypothesis, it is precisely when the NL (ie Vietnamese) form is unmarked compared to the TL form that acquisition is more difficult and thus appears to be retarded.

In other cases differences between groups were not able to be so readily explained in terms of any factors relating to the learners' NLs and markedness. The Russian and Vietnamese learners showed differences in the ordering of PP in relation to Subj and Obj for the realisation of the definite article yet their native languages seem, at least superficially, to be very similar in their expression of definiteness.

Although the results seem to support the possibility of NL influence and of greater differences in the ordering of environmental constraints between learners whose native languages can be considered distant from each other the importance of these differences should not be overstated. Whilst some form of Contrastive Analysis may in certain restricted cases help to provide an explanation of differences in orders in learners from different NL groups, in many cases it provides no such help. We see time and again cases where NLs differ from each other in their realisations of features of syntax yet the patterns in all learners appear to be the same (eg. predicate complementation in this study). This being the case Contrastive Analysis has little predictive power. Generally, even when NL may be successfully invoked to explain minor differences in ordering between groups, cognitive and linguistic factors seem to be more pertinent in attempts to explain the overall tendencies in the orders obtained (eg. for the ordering of copula environments or AUX + NEG forms). Such factors include typological markedness and derivational and semantic complexity, and possibly also the nature of the human brain's processing capacity and mechanisms.

7.4 Cross Sectional Methodology

A third aspect worthy of comment concerns the validation of cross-sectionally determined stages of development as being indicative of the stages of development the individual learners over time. From the experimenter's point of view this finding has several important implications. Firstly, by using cross-sectional designs retesting and the confounding factors associated with it (especially when dealing with larger numbers of subjects) can be avoided. Second, from the point of view of the time it takes to collect the data to be analysed cross-sectional designs are clearly to be preferred. The third implication concerns the number of subjects who can be tested. When determining implicational patterns to be confident of the patterns obtained reasonably large numbers of cases are required. This is especially so since it appears that Bailey's (1974) f -curve has validity in describing the rôle of acquisition of features of syntax, meaning that the

intermediate stages are often moved through fairly quickly. A considerable percentage of learners in any representative sample can be expected to be clustered in the upper and, possibly, lower sections of the acquisition curve with fewer in the middle where the clear implicational patterns are apparent. Cross-sectional studies requiring all subjects to be tested on only one occasion enable larger samples to be used.

It is for reasons such as these that in the past decade cross-sectional designs have been preferred. Validation of the accuracy of their findings for understanding the process of SLA in the individual learner means that they can continue to be used with greater confidence.

7.5 Concluding Remarks

Taken as a whole the findings of this study provide support for SLA in adolescent learners being largely a developmental process only indirectly mediated by the NL of the learner. The establishment of continua of development whose validity was able to ^{be} longitudinally verified supports the Interlanguage Developmental Continuum model of the process of SLA.

APPENDIX A

A.1 The Tasks	
A The Sentence Correction Task	367
B The Modified Cloze Task	382
A.2 Instructions for the Tasks	
A For the Sentence Correction Task	383
B For the Modified Cloze Task	384
A.3 Items for Each Structure	385

Appendix A.1: The Tasks

A: The Sentence Correction Task at the Four Times

Time 1

PART A

NOW YOU DO THE SAME

1. Today he at school.
2. I no like oranges.
3. They friends until last year.
4. Mary and John not coming with us.
5. Two years ago we no interested in music.
6. I believe I right.
7. You late again.
8. He no can come tomorrow.
9. Mike no already had his breakfast.
10. We students together in 1968.
11. He gave up smoke.
12. Her parents in town at the moment.
13. My car not dirty now.
14. Now I tired.
15. Last year we not go to beach.
16. Jane expects them arrive today.
17. Now me not bored at school.
18. Mary a teacher.
19. I not in town at the moment.
20. The shops not closed on Saturdays.
21. It wet today.
22. I'm sorry I no see you last week.
23. This week me not working.
24. We neighbours.
25. My parents no angry last night.
26. Yesterday the book not on that shelf.
27. Mary annoyed yesterday.
28. This year I not happy.
29. We don't are friends now.
30. I'm keen on swim.
31. You tired today.
32. She no live there.
33. I not late yesterday.
34. Now me not doctor.
35. Sue and I on the bus together yesterday.
36. Paul not in the kitchen.
37. We no watching TV at 9pm last night.
38. They were angry hear about the fight.
39. I no got car.
40. You unhappy yesterday.
41. Sue no at school tomorrow.
42. Me not a student last year.
43. Teacher not pleased with her students today.
44. She upset this week.
45. By 8pm last night I still not finish . my homework.
46. You not angry anymore.
47. I nurse.
48. Anna no living in Melbourne now.
49. Paul wants buy a bicycle.
50. This year him not my teacher.
51. I on a tram at the moment.
52. Last year Mike and John not pilots.
53. I hope it not rain.
54. My shoes not in the cupboard now.
55. She not sleeping when I rang.
56. Me a secretary until last month.
57. They not at the concert last week.
58. Anna not bored in Maths last Friday.
59. John hates Paul laugh at him.
60. The boys upset after the match yesterday.
61. Yesterday I no eat anything.
62. I cold today.
63. They not frightened yesterday.
64. I at home all last week.
65. Mary no can play tennis.
66. So far this week she not been to school.

34. He no come yesterday.
35. Paul not her friend.
36. We asked go for a walk.
37. At 9am yesterday they still no heard from her.
38. Now I happy.
39. They not businessman.
40. Last night the children frightened of the dark.
41. I not your friend any more.
42. Jim likes ride.
43. Today I no driving anywhere.
44. She at the concert last Friday.
45. Her shoes not clean now.
46. We not interested in discos.
47. John at the movies tonight.
48. Ma no living here in 1975.
49. Anna says she to have a headache.
50. He teacher in 1972.
51. I don't can see him.
52. He not got a flat yet.
53. She is interested in play the guitar.
54. He a doctor.
55. John not mechanic until 1976.
56. My parents no tired after their trip last month.
57. John's sure Paul be away yesterday.
58. We at the Zoo.
59. This week me no sick.
60. I bored at school.
61. Paul no want any ice-cream.
62. You not sleepy yesterday.
63. His mother shocked at him last night.
64. We not neighbours until 1978.
65. The bicycle in the shed.
66. Jane not sad now.

67. She enjoys Mike stay with her.
68. Last night not cold.
69. They schoolfriends.
70. By the time Anna was 9, she not been to Australia.
71. She not interested in Maths this year.
72. Last night me no at home.
73. He knows she be happy.
74. I angry with you.
75. They not visit me tomorrow.
76. I not tired now.
77. Her socks blue.
78. We not seen her yet.
79. Mary a teacher.
80. John and Sue at the beach this afternoon.
81. This year I not student.
82. Anna and me not in the city last Friday.
83. Mrs. Brown and Mrs. Smith neighbours until 2 years ago.
84. Today me no at school.
85. We not going to school this week.
86. Last week he not excited about the trip.
87. I decided have a shower.
88. I at Paul's party now.
89. She not a nurse anymore.
90. The dog not eating at the moment.
91. Last year she a student.
92. Her friends not teenagers now.
93. Jane interested in Maths.
94. Mike not at disco last Saturday.
95. John want Mary come too.
96. Those children frightened of snakes.
97. John and Mary not at home at the moment.
98. Paul not having lunch at 12 o'clock yesterday.
99. Yesterday John and I tired.
100. We not at the movies now.

67. Me her friend.
68. You think to know so much.
69. My parents not upset anymore.
70. Last year she don't was a teacher.
71. I worried now.
72. You not leave at 8am every morning.
73. Me not at home now.
74. Mary enjoys swim.
75. It hot all last week.
76. The tree not in that park.
77. I not going to town today.
78. I surprised at the news last night.
79. John and Mary no go to school now.
80. We thirsty last night.
81. Last Friday me late.
82. You in hospital last month.
83. Today Anna sick.
84. I'm glad see you again.
85. Last year this boy fat.
86. They not doing their homework at 7pm last night.
87. Mike at the football yesterday.

PART 8

NOW YOU DO THE SAME

1. I at the disco right now.
2. Mary don't watch TV anymore.
3. You not nurse there in 1969.
4. John's sure of be early.
5. She my friend.
6. I not hungry today.
7. They not studying when I saw them.
8. We are unhappy our daughter leave school.
9. Your children not on the picnic yesterday.
10. John pleased now.
11. The house not tidy last week.
12. Yesterday their schoolbags heavy.
13. She not at work at the moment.
14. I not pleased with her anymore.
15. Mike and John engineers.
16. I no come with you next week.
17. We no busy today.
18. Her parents told her be good.
19. My friends not visiting me this morning
20. He tall.
21. I not surprised at the news last week.
22. We bored at school today.
23. We think she to be here soon.
24. The children hungry.
25. They no won a match for 4 weeks.
26. John not frightened of snakes now.
27. Mary stopped the baby cry.
28. Him not going to Sydney today.
29. The plates in that cupboard yesterday
30. Last night the buses not late.
31. Jim was happy visit them.
32. He not rich anymore.
33. I a student.

Time 2

PART A

NOW YOU CORRECT THESE SENTENCES

1. Today John at home.
2. I no like apples.
3. They students together in 1970.
4. Anna and Mary not coming with us.
5. Three years ago we no interested in disco music.
6. I think I right.
7. You early again.
8. Peter no can come this week.
9. He not already had his breakfast.
10. Jane and I friends until 1973.
11. She gave up smoke.
12. His parents in town at the moment.
13. Our house not dirty now.
14. I tired now.
15. Paul expects them leave today.
16. We not go to beach last Saturday.
17. Now me don't bored at school.
18. Susan a teacher.
19. He no live there.
20. The shops don't closed on Saturdays.
21. It hot today.
22. I'm sorry to not ring you last week.
23. This week me not working.
24. They neighbours.
25. My parents not late home last night.
26. Yesterday the book don't on that shelf.
27. She annoyed yesterday.
28. This year I don't happy.
29. We don't are friends now.
30. John's keen on sing.
31. We tired today.
32. I not in the city at the moment.
33. You not angry any more.
34. Now me not taxi-driver.
35. We on the bus together last night.
36. Nina not in the kitchen.
37. Sue and I no watching T.V. at 3pm last night.
38. They were pleased hear the good news.
39. I no got car.
40. You unhappy last week.
41. He no at school tomorrow.
42. Me don't student last year.
43. John no bored in Maths last Friday.
44. Mary upset this week.
45. By 11pm last night he still not finish his homework.
46. I don't late yesterday.

47. I nurse.
48. She don't living in Melbourne now.
49. He wants buy a new record.
50. This year Mr. Brown not my teacher.
51. I on a tram at the moment.
52. Four year ago they not pilots.
53. We hope it not rain.
54. My shoes not in my wardrobe now.
55. Sue not sleeping when I rang.
56. I a secretary until last month.
57. John and Mike not at the disco last Saturday.
58. Teacher not pleased with her class today.
59. Anna hates John laugh at her.
60. The players upset after the match last week.
61. I no watch anything on T.V. last night.
62. I cold today.
63. The children not tired last night.
64. Me at home all last week.
65. Mike no can play basketball.
66. So far this week Mary not been to school.
67. Me his friend.
68. John believes to know a lot.
69. My parents don't upset now.
70. He don't was a doctor until last year.
71. I interested in that boy now.
72. You not leave school at 3pm often.
73. I not at work now.
74. Paul enjoys play tennis.
75. It cold all last week.
76. That picture don't in the Art Gallery.
77. I not going to the football today.
78. I worried about the bad news last night.
79. They no go to discos any more.
80. Mary and I hungry yesterday.
81. Last Friday me late.
82. You in hospital last month.
83. Today Kim sick.
84. We're glad see you again.
85. Last year that girl fat.
86. They not doing their homework at 7pm last night.
87. He at the football yesterday.

PART B

NOW YOU CORRECT THESE SENTENCES

1. I at the cinema right now.
2. Paul don't watch T.V. any more.
3. You not secretary there in 1969.
4. John's sure of be late.
5. She my sister.
6. Me not thirsty today.
7. You don't studying last year.
8. They are unhappy their daughter leave school.
9. Your children not at the beach yesterday.
10. Mary pleased now.
11. Her room not tidy last week.
12. Yesterday their schoolbags heavy.
13. Paul not at home at the moment.
14. I don't surprised at the news now.
15. They mechanics.
16. I don't come with you tomorrow.
17. We no busy today.
18. Her parents told her be good.
19. My friends don't visiting me this morning.
20. She thin.
21. I don't worried yesterday.
22. We bored at school today.
23. John and I think she to be here soon.
24. The children hungry.
25. They no lost a match for 3 weeks.
26. Nina not scared of snakes now.
27. She stopped the baby cry.
28. Him don't going to Adelaide today.
29. The spoons in that drawer yesterday.
30. Last night the trains not late.
31. Sue was happy see they again.
32. Jim not rich any more.
33. I a journalist.
34. Sue not come last night.
35. He don't 'her friend.
36. John asked go for swim.
37. At 11am yesterday they don't heard from her.
38. Now I unhappy.
39. They not dentists.
40. Until last year her children scared of the dark.
41. I don't your friend any more.
42. Jane likes ride bicycles.
43. Today I don't driving anywhere.
44. Nina be at the disco last Friday.
45. Her shoes don't clean now.
46. We not interested in disco music.

47. He at a concert tonight.
48. Me no living here in 1975.
49. Paul says him to have a headache.
50. She teacher in 1972.
51. I don't can see him.
52. She don't got a flat yet.
53. Sue's interested in play the guitar.
54. He a doctor.
55. Paul don't a mechanic until 1976.
56. My parents not tired after their trip last month.
57. Jane's sure Mike be at home yesterday.
58. We in the park.
59. This week I no sick.
60. I bored at school.
61. Jenny not want any cake.
62. You no sleepy yesterday.
63. Her mother shocked about it for a long time.
64. We don't neighbours until 1978.
65. The car in the garage.
66. He don't sad now.
67. He enjoys Mike visit him.
68. Last night don't warm.
69. Jenny and Sue schoolgirls.
70. By the time their father got home the children not finished their dinner.
71. He doesn't interested in history this year.
72. Last night me no at the disco.
73. Paul knows her to go to Sydney tomorrow.
74. I angry with you.
75. The children not visit her tomorrow.
76. I not upset now.
77. His shoes brown.
78. Mary and I not seen her yet.
79. They at the beach this afternoon.
80. This year I no student.
81. We not in town last Friday.
82. Mr. James and Mr. Wood. neighbours until 2 years ago.
83. Today me don't at school.
84. Sue and I not going to work this week.
85. Last week she not excited about the party.
86. I decided have a party.
87. I at John's party now.
88. She doesn't a nurse any more.
89. The baby not eating at the moment.
90. Last year John a student.
91. His friends don't teenagers now.
92. He interested in Maths.
93. Jenny don't at the cinema last Saturday.
94. John want Nina come too.
95. Most people scared of snakes.
96. They don't at home at the moment.
97. Paul don't having dinner at 9pm last night.
98. We surprised by the news yesterday.
99. We not at the theatre now.

Time 3

PART A

1. She at school today.
2. I no like bananas.
3. We students together in 1978.
4. We don't coming with you.
5. A year ago we no interested in
classical music.
6. I think I right.
7. We late again.
8. Sue don't can come tomorrow.
9. Sam not already had his lunch.
10. They friends a long time ago.
11. John gave up smoke.
12. Their parents in town at the moment.
13. My shirt not dirty now.
14. Right now I tired.
15. John and Mary not go out last Friday.
16. Jane expects her mother arrive today.
17. Me don't bored at school at the
moment.
18. He a teacher.
19. Paul aren't live there.
20. The shops don't closed on Monday.
21. It fine today.
22. I'm sorry to miss the football match
yesterday.
23. This week I don't working.
24. They neighbours.
25. Last night her parents don't late home.
26. That book didn't on her desk yesterday.
27. Mike annoyed yesterday.
28. This year me don't happy.
29. We don't is friends now.
30. He's keen on play the guitar.
31. They tired today.
32. I not in town at the moment.
33. You not angry any more.
34. Now me not cleaner.
35. We on the bus together yesterday afternoon.
36. She not in the toilet.
37. We no watching T.V. at 10 o'clock last night.
38. Her parents pleased to get her letter.
39. I don't got car.
40. You sad yesterday.
41. She not at work tomorrow.
42. Me don't a student last year.
43. He no bored in Science last year.
44. She upset this week.
homework.
45. By 10pm last night he still not finish his
46. I don't late for tea last night.

47. I a dentist.
48. Anna don't going to school today.
49. He wants buy some new jeans.
50. This year Mrs. White not my teacher.
51. I on a tram at the moment.
52. Two years ago they don't pilots.
53. I hope it not to rain.
54. My shoes not in the wardrobe now.
55. He not sleeping when I rang.
56. Me a secretary until last month.
57. They not at the disco last Friday.
58. The teacher don't pleased with her class today.
59. Sue hates him laugh at her.
60. The footballers upset after last Saturday's match.
61. I no watch that programme last night.
62. I thirsty today.
63. The children not worried about that last night.
64. I at home every day last week.
65. He no can play basketball.
66. So far this week she not been to work.
67. Me his friend.
68. You think to know a lot.
69. His parents not upset now.
70. She don't was a doctor until 1978.
71. I interested in History now.
72. You aren't leave for school at 8am every morning.
73. I don't at home at the moment.
74. Tom enjoys swim.
75. It cold all last week.
76. That plant don't in their garden.
77. I not going to school today.
78. I surprised at her news last night.
79. They not go to discos every Friday.
80. We hungry last night.
81. Yesterday me late.
82. Last week you in hospital.
83. Today Tom sick.
84. She glad see you again.
85. Last year this boy fat.
at 7pm last night.
86. Those students not doing their homework
87. Jane at the football last Saturday.

PART B

1. Me at the cinema right now.
2. He no watch T.V. any more.
3. You not nurse there in 1969.
4. Nina's sure of be on time.
5. Peter my brother.
6. I not hungry today.
7. You don't studying when he rang last night.
8. They are unhappy their daughter leave home.
9. Their children not at the beach yesterday.
10. Gill pleased now.
11. His room not tidy yesterday.
12. Yesterday their schoolbags heavy.
13. Jim not at home at the moment.
14. I don't surprised about it any more.
15. They engineers.
16. I no go with John tomorrow.
17. Gill and I no busy today.
18. His parents told him be quiet.
19. My relatives no visiting me this morning.
20. She tall.
21. I don't worried yesterday.
22. Those children bored at school today.
23. We think she to be here soon.
24. These girls thirsty.
25. They no won a match for 4 weeks.
26. Mary not scared of snakes now.
27. The woman stopped her baby cry.
28. Him not flying to Brisbane today.
29. The bowls in that cupboard yesterday.
30. Yesterday morning the trains not late.
31. Jane was happy meet Jim again.
32. He don't rich now.
33. I librarian.
34. She not stay last night.
35. Him don't her friend.
36. She asked leave the room.
37. At 1pm yesterday they still don't
heard from her.
38. Now I unhappy.
39. They not businessmen.
of the dark.
40. Until last year their children scared
41. I don't your friend any more.
42. He likes sing.
43. I no driving anywhere today.
44. He at the concert last night.
45. His shoes don't clean now.
46. They not interested in disco music.
47. John at the movies tonight.

48. Me no living here in August, 1975.
49. Paul says himself to have a headache.
50. Mr. Smith teacher in 1974.
51. I am don't can see her.
52. He don't got a house yet.
53. Mike's interested in play the piano.
54. She a doctor.
55. Paul don't a mechanic until 1976.
56. They not tired after their trip last month.
57. Jane's sure Mike to be at home today.
58. We at the Zoo.
59. This week I no well.
60. I bored at work.
61. She not want any cake.
62. You no sleepy yesterday.
63. Her mother shocked about it for a long time.
64. We no neighbours until last year.
65. The car in the garage.
66. Jane not unhappy now.
67. Jenny enjoys Karen visit her.
68. Last night don't cold.
69. Mike and Bill schoolboys.
children not finished their tea.
70. By the time their father got home, the
71. He doesn't interested in Maths this year
72. Last night me no at the disco.
73. Bill knows her go to Sydney tomorrow.
74. I angry with him.
75. The children not visit her next week.
76. I not upset now.
77. His shoes black.
78. Mary and I not seen him yet.
79. They at the beach this afternoon.
80. This year I no student.
81. We don't in town last Saturday.
years ago.
82. Mrs. Cook and Mr. Wood neighbours until 3
83. Today me no at school.
this year.
84. You and your sister not having a holiday
85. Yesterday she not excited about the party.
86. I decided have a bath.
87. I at Paul's party at the moment.
88. She doesn't a model any more.
89. The baby no sleeping at the moment.
90. Last year she a student.
91. Her friends don't teenagers now.
92. She interested in History.
93. Jane be at the concert last Friday.
94. She wants Nina come too.
95. A lot of people scared of snakes.
96. We don't at home at the moment.
yesterday morning.
97. Bill don't having breakfast at 9am
98. We surprised at the news yesterday.
99. You not in Myer's now.

Time 4

PART A

1. Her mother at home today.
2. Me no like pears.
3. We students together in 1972.
4. They don't coming with us.
5. A year ago they no interested in disco music.
6. I believe I right.
7. You late again.
8. Sue no can go to school tomorrow.
9. He don't already had his breakfast.
10. They friends many years ago.
11. Paul gave up smoke.
12. His parents in the city at the moment.
13. Her car don't dirty now.
14. Now me exhausted.
15. Last summer we not go to the beach.
16. She expects her boyfriend visit tomorrow.
17. I don't bored at school at the moment.
18. My sister a teacher.
19. John not live there now.
20. In Melbourne the shops don't closed on Saturday mornings.
21. It warm today.
22. He's sorry to not see you last week.
23. This week I don't working.
24. Paul and Sergio neighbours.
home.
25. Last night his parents don't late
26. Yesterday that book don't in the bookcase.
27. He annoyed with me yesterday.
28. This year me not happy.
29. Nina and Hieu don't is friends.
30. Jenny's keen on swim.
31. We tired today.
32. I don't at work at the moment.
33. You don't angry any longer.
34. Now me not cleaner.
35. Sue and I on the bus together yesterday afternoon.
36. He doesn't in the bathroom.
night.
37. They no watching TV at midnight last
38. We were pleased get some news from her.
39. I don't got a bike.
40. You sad all day yesterday.
41. Sue no at school tomorrow.
42. Me not a student last year.
43. She no bored in Science last Wednesday.
44. John upset this week.
finish her homework.
45. By 11pm last night Jane still don't
46. I don't early home yesterday evening.
47. I a dentist.

48. Anna don't living in Sydney now. 72. You not leave for school at 8am.
49. Jenny wants buy some new shoes. 73. Me don't at home right now.
50. This year Mr. Parker not my teacher. 74. She enjoys sing.
51. I on a tram at the moment. 75. It fine all last week.
52. A year ago Paul and Mark don't pilots. 76. The exhibition don't at the National Gallery.
53. I hope it to not rain. 77. I no going to town today.
54. My best shoes not in the wardrobe. 78. I surprised at the news we heard last night.
55. He not sleeping when I rang. 79. Those boys aren't go to college now.
56. Me a typist until last year. 80. We hungry yesterday morning.
Friday night.
57. John and Sue not at the disco last 81. Last Tuesday me late for school.
58. The teacher don't pleased with his 82. You in hospital last month.
class today.
59. Mary hates Paul laugh at her. 83. Robert sick today.
60. The players upset after their loss 84. I'm glad meet you again.
on Saturday.
61. Yesterday I am not eat anything. 85. Last year Nina fat.
last night.
62. Me cold today. 86. The children don't doing their homework at 7pm
63. They not tired last night. 87. Jenny at the football final last Saturday.
64. Every day last week I at school.
65. Jenny don't can play tennis today.
66. So far this week his father don't
been to work.
67. I his friend.
68. She thinks to know a lot.
69. Her parents don't worried now.
70. He don't was an engineer until last
year.
71. I interested in Maths now.

PART 9

1. At the moment me at the disco.
2. Sam don't watch TV any more.
3. You not nurse there in 1972.
4. We're sure of to be late.
5. He my brother.
6. I don't thirsty today.
7. They don't studying when I saw them.
8. That man unhappy his son leave school.
9. They not at the barbeque yesterday.
10. Her mother pleased with her now.
11. The living room not tidy last week.
12. Yesterday their schoolbags heavy.
13. Jim not at home at the moment.
14. I don't surprised about it any more.
15. They mechanics.
16. I don't come with you next week.
17. Bill and I no busy today.
18. They told him be quiet.
19. Her relatives don't visiting her this morning.
20. He skinny.
21. I no worried yesterday.
22. Some children bored at school every day.
23. We think she to arrive soon.
24. The babies hungry, 3 weeks.
25. Those footballers not won a match for
26. Nina don't scared of spiders now.
27. He stopped the baby cry.
28. Her no going to Sydney by train this time.
29. The knives in that drawer yesterday.
30. Yesterday evening the trams don't late.
31. He was happy see them again.
32. Paul don't rich now.
33. Me journalist.
34. She wasn't go to John's party last night.
35. Tom don't his friend.
36. Con asked leave the room.
37. At 8am yesterday they still no hear from her.
38. Now I unhappy.
39. Jim and Paul not businessmen.
40. Until last year her children scared of the dark.
41. I don't your friend any longer.
42. Jim likes eat.
43. Today me don't driving anywhere.
44. Nina be at the film last night.
45. Their shoes don't clean now.
46. They not interested in going , to discos.
47. He at the disco tonight.

48. Jim doesn't living here in 1975.
49. Paul says he to have a headache.
50. Mrs. Brown teacher in 1970.
51. I don't can hear him from here.
52. Jane not got a flat yet.
53. John's interested in play the drums.
54. Sam a doctor.
55. George don't a mechanic until last year.
56. My parents don't tired after their long trip home yesterday.
57. Tom's sure Paul to be at work today.
58. We in the Botanic Gardens.
59. This week me no well.
60. I bored alone at home.
61. He isn't want any tea.
62. You not sleepy yesterday.
63. His father shocked about it for a long time.
64. Joy and I don't be neighbours until a few months ago.
65. Her bicycle in the shed.
66. She not happy about it any more.
67. Anna enjoys Linh come to her place for tea.
68. Last night not cold.
69. Helen and Jane schoolfriends.
70. By the time their father got home the child ~~children~~ still don't gone to bed.
71. Sam doesn't interested in History this year.
72. Last night me not at the concert.
73. The teacher knows her be away tomorrow.
74. I angry about it.
75. My cousins not visit me tomorrow.
76. Me not tired now.
77. Her boots brown.
78. We not seen her yet.
79. The boys at the beach this afternoon.
80. This year I no student.
81. Anna and me don't in town last Saturday.
82. Mrs. Cox and Mr. Wood neighbours until a couple of years ago.
83. Today me no at school.
84. My sister and I not going to school this week.
85. Yesterday Tom don't excited about his new car.
86. I decided have a shower.
87. I at his party at the moment.
88. She doesn't a model any more.
89. The baby doesn't sleeping at the moment.
90. Last year Tom a student.
91. They don't teenagers now.
92. He interested in Geography.
93. Mike doesn't at the party last Friday.
94. He wants George come too..
95. Many people scared of snakes.
96. They don't at home. at the moment.
97. Bill don't having breakfast at 9am yesterday morning.
98. Yesterday they annoyed about it.
99. John and Jane don't in Myers now.

B: The Modified Cloze Task at the Four Times

Time 1 It is Saturday afternoon on warm spring day. boy, ... girl and young man are in park in Melbourne. boy is feeding some ducks. ducks live on pond in park. girl is standing with boy. young man is sitting on bench. He is watching children and ducks. sun is shining and sky is clear and blue. Suddenly they see dog at entrance to park. It is chasing small white cat. cat sees tree and climbs right up to top. dog can't catch cat now, so it runs over to children. young man chases dog with big stick.

Time 2

It is Monday afternoon on fine day in November. boy, ... girl and woman are in Botanic Gardens near city. boy is feeding some swans. swans swim all day on lake in Gardens. girl is standing next to boy and watching him. woman is sitting on grass. She is watching children and swans. sun is not shining and sky is grey.

Suddenly, ... woman sees very small child on path to lake. He is chasing bird. bird sees rock in water and flies right on to top of it. small child can't reach rock from edge of lake, so he can't get to bird now. child runs towards woman. woman catches child by arm. She picks him up and carries him over to seat.

Time 3 It is Sunday morning on warm summer day. girl, ... little boy and young woman are at beach near Melbourne. girl is giving some seagulls some bread. gulls live in cliffs behind beach. boy is standing beside girl. woman is sitting on sand. She is watching children and seagulls. sun is shining and sky is clear and blue. Suddenly, ... girl sees cat on path to beach. It is chasing baby bird. bird sees rock and climbs right up to top. cat can't climb rock, so it can't catch bird now. cat walks over to children. young woman chases cat away with stick.... it

Time 4 It is Saturday morning on warm spring day.

.... boy, ... girl and young man are in Gallery in Melbourne. boy is watching some men in green uniforms. men work in office in Gallery. girl is standing with boy. young man is sitting on seat. He is watching children and men. Outside, ... sun is shining and sky is clear and blue.

Suddenly, they see man with a black stocking over his head at entrance to Gallery. man sees camera on wall and goes over and covers it. Suddenly officer sees man. He tries to chase man in black, but he can't catch him, so he runs over to children and young man. young man speaks to officer. Another officer runs after thief with big black cash.

Appendix A.2: Examples of the Instruction Sheets Used

A: For the Sentence Correction Task

Spanish A continuación hay algunas frases en inglés. Lee cada una rápidamente. Si crees que está correcta, pon una marca de aprobación (✓) al lado. Si crees que está equivocada, escribe la frase nuevamente y en forma correcta en la línea que está a continuación.

No tienes mucho tiempo, de modo que no te detengas demasiado en cada frase, pero por favor, lee cada una. Trabaja rápidamente. Tienes 40 minutos.

Russian Перед Вами ряд предложений на английском языке. Быстро прочтите каждое из них и, если Вы считаете, что в нём нет ошибок, поставьте рядом с ним птичку (✓) и переходите на следующее предложение; если же Вы находите, что оно неправильно, то напишите его на правильном английском языке на той-же строчке.

Времени не много, так что не следует долго задумываться над каждым предложением. Старайтесь работать быстро. Пожалуйста, не пропускайте ни одного предложения. У Вас 40 минут.

Arabic

فيما يلي بعض العبارات الانجليزية. اقرأ كل عبارة بسرعة.
 فاذا كانت العبارة صحيحة ضع هذه العلامة (✓) بجانبها اما اذا كانت
 منطوقة فالتب بجانبها العبارة الصحيحة.

الوقت محدود ولذلك يجب ان تعمل بسرعة. اقرأ كل عبارة

Vietnamese

وשתلي من ابل ذلك ————— ونامت فقط

Đây là một vài câu tiếng Anh. Hãy đọc mỗi câu đó thật nhanh. Nếu anh (hay chị) nghĩ câu đó viết đúng Anh-văn, Anh (hay chị) hãy đánh dấu (✓) bên cạnh. Nếu Anh (hay chị) nghĩ câu đó viết không đúng hãy viết lại theo đúng cách Anh-văn ở hàng bên cạnh.

Vì không có quá nhiều thi-giờ, vậy đừng chú ý vào 1 câu quá lâu. Hãy làm nhanh. Hãy cố đọc từng câu một. Anh (hay chị) có 40 phút để làm.

Sau đây là một vài thí dụ

1. Mary is smoking a cigarette.	✓	
2. I doesn't like chocolats.		...I...don't...like...chocolats...
3. You having breakfast.		...You...are...having...breakfast
4. They are happy.	✓	
5. John dances very well.	✓	

B: For the Modified Cloze Task

Spanish

A continuación hay un fragmento en inglés. Faltan algunas palabras. Lee el fragmento y escribe "the" o "a" donde lo consideres necesario para poner el fragmento en inglés correcto.

No tienes mucho tiempo, por lo tanto trabaja rápidamente.

Ejemplo:

Last night I was in town. I met friend in Swanston Street and we had dinner together. Then we went to film. The film was 'Superman'.

Russian

Перед Вами отрывок на английском языке с пропусками. Прочтите отрывок и поставьте слово "the" или "a" туда, где по-Вашему оно нужно для того, чтобы английский язык отрывка был правильным, хорошим.

Времени не много: работайте быстро!

Вот пример:

Last night I was in town. I met friend in Swanston Street and we had dinner together. Then we went to film. The film was 'Superman'.

Arabic

هذه فقرة انكليزية تحتوي على الفراغات. اقرأ النقطه وضع كلمة THE او A عند الضرورة لتجعل من العبارات عبارات انكليزية صحيحة. عليك ان تملأ بسرعة هذا من ذل.

Last night I was in town. I met friend in Swanston Street and we had dinner together. Then we went to film. The film was 'Superman'.

Vietnamese

Đây là một đoạn văn tiếng Anh. Trong đó có vài chỗ trống. Hãy đọc kỹ, và viết thêm "the" hay "a" vào chỗ trống nào mà "anh (hay chị) nghĩ nó cần. Thiết kế cho đúng Anh. văn.

Hãy làm nhanh vì bạn không có quá nhiều thời gian.

Đây là 1 thí dụ

Last night I was in town. I met friend in Swanston Street and we had dinner together. Then we went to film. The film was 'Superman'.

APPENDIX A. 3: Items for each structure in the Sentence Correction Task

COPULA	Environment	Target form	Items in the Task	Complement Type	Relation to Main Clause	Items in the Task
---Adj		'am'	A62, B38, B74	THAT	Equi	A6, A68, B49
		'is'	A21, A83, B2		Non-Equi	A53, B23, B73
		'are'	A7, B24, B77		Pred.Adj	A22, B8, B57
		'was'	A75, A81, A85	FOR - TO	Equi	A49, B36, B86 (T1, B87)
		'were'	A40, A80, B12		Non-Equi	A16, B18, B94 (T1, B95)
---NP		'am'	A47, A67, B33	POSS - ING	Pred.Adj	A38, A84, B31
		'is'	A18, B5, B54		Equi	A11, A74, B42
		'are'	A24, B15, B69		Non-Equi	A59, B27, B67
		'was'	A56, B50, B90 (T1, B91)		Pred. Adj	A30, B4, B53
		'were'	A3, A10, B82 (T1, B83)			
---PP		'am'	A51, B1, B87 (T1, B88)			
		'is'	A1, B47, B65			
		'are'	A12, B58, B79 (T1, B80)			
		'was'	A64, A87, B44			
		'were'	A35, A82, B29			
---Part		'am'	A14, A71, B60			
		'is'	A44, B10, B92 (T1, B93)			
		'are'	A31, B22, B95 (T1, B96)			
		'was'	A27, A78, B63			
		'were'	A60, B40, B98 (T1, B99)			

NEGATIONAUXILIARY1. COPULAEnvironment

—Adj

Target Form Items in the Task

'am'	A28, B6, B59
'is'	A13, B32, B66
'are'	A33, (T1, A46) B17, B45
'was'	A46, (T1, A83) B11, B68
'were'	A25, B30, B62
'am'	A34, B41, B80 (T1, B81)
'is'	A50, B35, B88 (T1, B89)
'are'	A29, B39, B91 (T1, B92)
'was'	A42, A70, B55
'were'	A52, B3, B64
'am'	A32, (T1, A19), A73, B83 (T1, B84)
'is'	A36, A76, B13
'are'	A54, B96, (T1 B97), B99 (T1, B100)
'was'	A26, B72, B93, (T1, B94)
'were'	A57, B9, B81 (T1, B82)
'am'	A17, B14, B76
'is'	A58, (T1, A43), B26, B71
'are'	A20, A69, B46,
'was'	A43, (T1, A58), B21, B85 (T1, B86)
'were'	A5, A63, B56

—NP

3. HAVE

HAVE + NEG

+ V past participle

'have'	A39, B25, B78
'has'	A9, A66, B52
'had'	A45, B37, B70

4. DO

DO + NEG + Vfinite

'do'	A2, A72, A79
'does'	A19, (T1, A32), B2, B61
'did'	A15, A61, B34

—PP

5. WILL

WILL + NEG + Vinfinitive

'will'	A41, B16, B75

6. CAN

CAN + NEG + Vinfinitive

'can'	A8, A65, B51

—Part

NEGATION (Contd)2. AUX 'be'

BE + NEG

+ V-ing

Target FormItems in the Task

'am'	A23, A77, B43
'is'	A48, B28, B89 (T1, B90)
'are'	A4, B19, B84 (T1, B85)
'was'	A55, B48, B97 (T1, B98)
'were'	A37, A86, B7

TABLE 1 Characteristics of Subjects in each Group and Acquisition Scores at Time 1.

Group	Subject No.	Sex	AOA in years	LOR in months	Acquisition Score, Time 1
A:Spanish	11	F	12.3	17	94
	17	M	12.7	13	86
	16	M	12.5	14	74
	13	F	13.5	14	69
	03	M	16.4	11	87
	05	F	13.6	9	84
	10	F	17.2	9	75
	04	M	11.5	11	62
	12	F	12.3	27	71
	02	F	12.9	11	67
	14	M	11.3	14	54
	01	F	14.1	5	38
	07	M	16.2	7	22
	15	F	10.4	26	54
	08	F	14.3	7	55
	06	F	13.8	7	37
	x09	F	16.1	17	69
	x19	M	15.0	3	52
	x21	F	16.2	11	89
	x20	M	17.1	3	35
	x22	F	17.2	14	-

AOA = Age on Arrival
LOR = Length of Residence
x = non-core subject
na = not available
- = missing
est = estimated since one or more values missing

TABLE 1 Characteristics of Subjects in Each Group

Group	Subject No.	Sex	AOA in years	LOR in months	Acquisition Score, Time 1
B:Russian	17	M	14.2	12	72
	13	F	13.5	1	65
	18	M	14.4	10	53
	15	F	13.3	22	79
	06	F	13.3	6	50
	14	F	13.9	4	60
	02	M	14.3	4	46
	12	M	13.6	2	57
	08	F	15.4	2	62
	10	F	15.6	3	69
	09	F	12.8	7	54
	07	F	13.6	8	45
	04	M	12.8	10	43
	03	M	12.1	8	45
	01	M	12.2	5	30
	05	M	11.9	8	37
	22	M	15.9	2	56 (est.)
	11	F	17.8	1	51
	x19	M	na	na	84
	x16	M	na	na	87
	x20	M	na	na	45
	x23	F	na	na	-

APPENDIX B

Table 1 Characteristics of the Subjects in Each Group	388
Table 2 Acquisition Scores, Time 2 to Time 4	389
Table 3 Multi-Valued Implicational Scales	390
Table 4 Coefficients of Reproducibility	440
Table 5 Mean Scores	449

TABLE 1 Characteristics of Subjects in Each Group

Group	Subject No.	Sex	AOA in years	LOR in months	Acquisition Score, Time 1
C:Arabic	09	M	14.2	10	87 (est.)
	06	M	13.6	15	97
	08	F	16.4	10	91 (est.)
	05	M	12.9	31	85 (est.)
	01	F	13.2	8	60
	07	M	11.8	10	66
	02	F	11.6	8	69
	x03	M	na	na	16
	x04	F	13.3	23	77

Group	Subject No.	Sex	AOA in years	LOR in months	Acquisition Score, Time 1
D:Vietnamese	24	F	14.4	9	90
	20	F	15.1	13	99
	04	M	11.0	19	72
	11	F	13.6	10	94
	02	F	15.8	9	96
	18	F	16.2	2	74
	22	M	17.6	7	87
	21	M	12.2	7	60
	13	M	13.3	2	71
	14	M	12.1	2	68
	19	F	16.0	2	54
	23	F	16.6	7	54
	03	F	15.6	1	52
	15	F	12.5	3	47
	12	M	12.2	2	52
	16	M	15.5	3	35
	06	M	12.1	1	37
	25	M	10.8	10	42
	01	F	11.9	9	55
	07	M	11.9	21	39
	08	M	na	na	32
	17	M	12.5	3	26
	x10	F	11.3	21	29
	x09	F	13.2	21	49
	x05	M	13.0	9	49

Table 2: Acquisition Scores, Time 2 to Time 4.

A: Spanish				B: Russian				C: Arabic				D: Vietnamese			
Subject Number	2	3	44	Subject Number	2	3	4	Subject Number	2	3	4	Subject Number	2	3	4
11	96	93	98	17	78	79	86	09	87	89	92	24	82	84	88
17	96	92	90	13	75	80	80	06	99	95	100	20	97	97	98
16	80	80	89	18	59	61	59	08	89	92	93	04	63	70	72
13	82	82	67	15	76	78	81	05	-	89	90	11	94	93	97
03	82	83	86	06	45	55	54	01	71	81	82	02	93	92	97
05	85	87	92	14	55	50	58	07	74	81	87	18	74	68	79
10	71	72	79	02	44	51	44	02	74	73	77	22	84	85	90
04	74	83	87	12	65	67	69	x03	35	36	-	21	63	75	76
12	67	62	60	08	46	50	54	x04	84	-	-	13	73	75	79
02	73	73	80	10	71	69	74	14	67	75	86	14	67	75	86
14	53	57	61	09	65	70	72	19	49	71	68	19	49	71	68
01	38	33	38	07	48	39	49	23	59	60	50	23	59	60	50
07	35	40	41	04	49	37	46	03	50	45	53	03	50	45	53
15	43	35	51	03	47	58	53	15	40	38	33	15	40	38	33
08	78	84	86	01	44	50	57	12	61	56	68	12	61	56	68
06	38	37	47	05	44	45	58	16	38	37	34	16	38	37	34
x09	71	66	-	22	37	40	33	06	46	62	70	06	46	62	70
x19	62	-	-	11	39	45	45	25	39	35	25	25	39	35	25
x21	-	-	-	x19	87	-	-	01	51	53	52	01	51	53	52
x20	-	-	-	x16	-	-	-	07	33	36	42	07	33	36	42
x22	-	-	55	x20	-	-	-	08	51	47	53	08	51	47	53
				x23	-	-	40	17	11	16	30	17	11	16	30
								10	30	29	-	10	30	29	-
								x09	48	49	-	x09	48	49	-
								x05	-	-	-	x05	-	-	-

Table 3.1: Multi-valued Implicational Scales for Copula

A: SPANISH

A.1 Time 1

SUBJECT NUMBER	ADJ	ENVIRONMENT		PART
		NP	PP	
10	100	100	100	100
11	100	100	100	93
17	100	100	100	93
X 09	93	100	100	93
16	100	100	100	87
X 21	100	100	100	87
03	100	93	100	87
05	100	93	100	80
13	93	67*	100	80
02	100	93	100	67
X 19	93	100	87	87
04	93	87	93	50
14	93	87	80	53
12	93	73	93*	80
01	87	73	60	53
15	73	67	67	47
06	67	80*	47	40
08	67	67	53	50
07	67	67	33	40
X 20	67	47	47	33

X denotes a non-core subject

* denotes a deviation from the implicational pattern

Environments

ADJ = preceding a predicative adjective

NP = preceding a normal phrase

PP = preceding a locative prepositional phrase

PART = preceding an adjectival participle

R = .96

A.2 Time 2

SUBJECT NUMBER	ADJ	ENVIRONMENT		PART
		NP	PP	
17	100	100	100	100
03	100	100	100	100
05	100	100	100	100
11	100	100	100	93
16	100	100	100	93
10	100	100	93	93
X 09	100	100	100	87
13	100	100	100	87
X 19	100	100	100	87
04	100	100	100	87
02	100	93	100	87
08	100	100	100	80
12	100	93	93	80
15	93	50	80*	40
06	67*	87	80	40
01	80	73	60	67
14	80	67	100*	60
07	73	80	60	73*

R = .94

A.4 Time 4

SUBJECT NUMBER	ENVIRONMENT			PART
	ADJ	NP	PP	
11	100	100	100	100
17	100	100	100	100
03	100	100	100	100
16	100	100	100	93
10	100	100	100	93
08	100	100	100	93
05	100	100	100	87
13	100	100	100	87
04	100	100	100	80
02	100	100	100	80
14	93	100	93	60
06	73*	100	87	33
01	100	93	53	40
12	93	93	80	60
15	100	67	80*	60
x 22	87	93	73	33
07	87	87	50	40

R = .97

A.3 Time 3

SUBJECT NUMBER	ENVIRONMENT			PART
	ADJ	NP	PP	
05	100	100	100	100
11	87*	100	100	100
17	100	100	100	93
03	100	100	100	93
04	100	100	100	93
13	100	100	100	87
x 09	100	100	100	80
10	100	100	100	80
02	93	100	100	80
08	100	100	100	73
12	93	93	93	47
16	100	100	87	93
14	93	87	100*	60
07	67*	87	87	60
01	80	73	20	47*
15	67	40	60*	40
06	60	73*	53	33

R = .91

B: RUSSIAN

B.1 Time 1

SUBJECT NUMBER	ADJ	ENVIRONMENT		PART
		NP	PP	
x 19	100	100	100	100
13	100	100	100	100
x 16	100	100	100	93
15	100	100	93	93
14	100	93	100	93
17	93	93	93	87
09	93	100	93	73
10	93	93	93	67
12	100	93	100	60
18	100	93	93	53
06	93	93	80	87
08	93	100	73	80
02	93	87	60	73*
07	100	80	53	67*
22	87	73	87*	73
11	80	93*	80	40
04	80	73	53	67*
03	80	73	47	60*
x 20	73	87*	60	67
05	60	73	60	40
01	33	20	20	20

R = .91

B.2 Time 2

SUBJECT NUMBER	ADJ	ENVIRONMENT		PART
		NP	PP	
15	100	100	100	100
14	100	100	93	100
06	100	93	100	100
x 19	100	93	100	100
17	100	93	100	93
13	100	100	100	87
08	100	93	100	80
09	93	100	93	73
10	100	100	100	67
12	93	93	100	40
02	100	93	87	80
07	100	93	80	27
05	100	87	93	87
18	93	87	87	60
04	87	73	73	80
11	80	93*	80	40
01	80	73	47	33
22	73	73	53	60
03	73	67	60	73*

R = .97

B.3 Time 3

SUBJECT NUMBER	ADJ	ENVIRONMENT		PART
		NP	PP	
15	100	100	93	100
17	100	100	100	93
13	100	100	100	93
02	100	100	100	87
18	100	100	100	80
09	100	100	93	80
05	100	100	100	73
10	93	100	100	73
06	100	93	100	60
14	100	100	93	60
12	100	100	100	40
08	93	100	80	73
11	93	80	87	53
03	87	100*	67	80*
22	87	67	80*	67
04	80	80	60	33
01	73	87*	47	33
07	73	80	47	20

R = .94

B.4 Time 4

SUBJECT NUMBER	ADJ	ENVIRONMENT		PART
		NP	PP	
17	100	100	100	100
13	100	100	100	93
15	100	100	100	93
08	93	100	93	93
18	93	100	100	80
05	93	100	100	80
09	100	100	93	73
11	93	93	100	73
02	100	100	100	67
10	100	100	100	67
14	100	100	100	60
12	93	100	100	40
01	80*	93	93	40
06	100	93	87	87
x 23	93	100	87	40
07	93	93	73	27
03	93	87	80	33
04	93	73	73	93*
22	60	53	27	27

R = .97

C: ARABIC

C.1 Time 1

SUBJECT NUMBER	ENVIRONMENT			PART
	PP	ADJ	NP	
05	100	100	87*	100
06	100	100	100	93
08	100	100	100	87
X 04	100	100	100	87
09	100	100	93	87
02	100	93	73	87*
01	100	87	87	73
07	93	73	80	80
X 03	7	0	20*	0

R = .92

C.2 Time 2

SUBJECT NUMBER	ENVIRONMENT			PART
	PP	ADJ	NP	
05	100	100	100	100
06	100	100	100	100
08	100	100	100	100
09	100	100	100	100
X 04	93	100	100	100
01	100	93	100	93
07	93	93	90	100
02	100	100	100	80
03	67	73	40	27

R = 1.00

C.3 Time 3

SUBJECT NUMBER	ENVIRONMENT			PART
	PP	ADJ	NP	
05	100	100	100	100
06	100	100	100	100
08	100	100	100	100
09	100	100	100	100
07	100	100	100	93
01	100	100	100	87
02	100	100	100	67
X 03	67	80*	53	27

R = .97

C.4 Time 4

SUBJECT NUMBER	ENVIRONMENT			PART
	PP	ADJ	NP	
05	100	100	100	100
06	100	100	100	100
08	100	100	100	100
09	100	100	100	100
07	100	100	100	93
01	100	100	100	80
02	100	100	100	73

R = 1.00

D: VIETNAMESE

D.1 Time 1

SUBJECT NUMBER	NP	ENVIRONMENT		PART
		ADJ	PP	
02	100	100	100	100
11	100	100	100	100
20	100	100	100	100
24	100	100	100	100
04	100	100	100	100
18	100	100	100	100
22	100	93	100	93
21	100	100	100	100
14	100	100	100	80
13	100	100	100	60
19	100	100	100	40
x 09	100	87	67	80*
23	100	87	53	47
03	93	33	7	20*
15	87	93	87	93
06	87	67	33	20
12	80	93*	87	80
01	80	80	73	7
16	80	73	67	73
x 05	80	67	60	20
x 10	80	27	20	13
25	73	80	73	40
07	67	60	27	27
08	60	73*	27	50*
17	47	33	27	27

R = .95

D.2 Time 2

SUBJECT NUMBER	NP	ENVIRONMENT		PART
		ADJ	PP	
02	100	100	100	100
11	100	100	100	100
20	100	100	100	100
24	100	100	100	93
22	100	93	100	93
21	93	100	100	93
12	93	100	93	73
13	100	100	100	47
18	100	93	100	47
04	100	100	100	40
14	100	93	100	40
x 09	93	93	80	60
03	100	60	73*	13
23	93	87	100*	67
08	93	87	80	53
25	93	87	60	50
16	93	70	67	67
19	87	93	87	53
15	87	47	67*	33
x 10	87	40	33	27
06	80	60	33	13
01	73	80	73	20
07	73	67	0*	20
17	20	20	7	13

R = .96

D.3 Time 3

SUBJECT NUMBER	NP	ENVIRONMENT ADJ	ENVIRONMENT PP	PART
20	100	100	100	100
11	100	100	100	100
02	100	100	100	100
21	100	100	100	100
24	100	100	100	93
04	100	100	100	80
19	100	100	93	80
14	100	93	100	80
12	100	100	100	73
23	100	93	100	73
22	100	93	100	73
18	100	100	100	60
13	100	100	100	47
01	93	100	100	33
06	87*	100	93	13
03	93	87	93	0
x 09	93	80	73	50
08	93	80	67	27
07	87	80	7	7
16	87	67	73	60
15	33*	80	80	27
25	80	80	73	47
x 10	60	40	27	20
17	40	53*	13	7

R = .97

D.4 Time 4

SUBJECT NUMBER	NP	ENVIRONMENT ADJ	ENVIRONMENT PP	PART
20	100	100	100	100
11	100	100	100	100
02	100	100	100	100
24	100	100	100	100
22	100	100	100	93
19	100	100	100	87
18	100	93	100	87
14	100	100	100	80
04	100	100	100	73
21	100	100	100	67
12	100	100	100	60
23	100	80*	100	50
13	100	100	100	33
06	93	100	100	13
03	100	87	93	27
01	100	100	87	27
16	93	67	53	50
08	87	87	93	47
07	87	87	7	27*
15	73	47	73*	13
25	67	53	20	7
17	60	60	47	13

R = .97

Table 3.2: Multi-Valued Implicational Scales for Predicate
Complementation according to Complementiser.

A: SPANISH

A.1: Time 1	Complementation Type			ING
SUBJECT NUMBER	THAT	TO		
11	9	8	4.5	
05	8	8	0	
17	8	6	4.5	
03	8	6	3	
X21	7	7	2	
04	3	7*	1	
12	5	8*	0	
13	6	2	0	
16	5	1	0	
02	4	1	0	
X09	4	1	0	
15	3	4	0	
14	3	2	0	
10	5	0	0	
06	2	0	0	
08	2	0	0	
01	2	0	0	
X20	2	0	0	
07	0	0	0	
X19	0	0	0	

R = .97

A.2: Time 2

SUBJECT NUMBER	Complementation Type		ING
	THAT	TO	
17	9	9	7.5
11	9	9	5
13	7	7	1
02	7	3	3
05	6	9*	1
03	4	6*	1
04	6	8*	0
12	3	7*	0
16	7	3	0
08	5	6	0
X09	4	1	0
15	2	3	0
14	2	2	0
10	4	0	0
X19	2	0	0
06	1	0	0
01	1	0	0
07	0	0	0

R = .93

A.3: Time 3

Complementation Type

SUBJECT NUMBER	THAT	TO	ING
17	9	9	9
11	8	6	8
08	8	9	0
03	7	4	4
05	6	9*	1.5
13	6	7	1
02	6	4.5	1
16	5	4.5	1
04	7	9*	0
14	4.5	2	0
10	4	3	0
12	3	9*	0
15	2	2	0
X09	3	0	0
06	2	0	0
01	1	0	0
07	0	0	0

R = .92

A.4: Time 4

Complementation Type

SUBJECT NUMBER	THAT	TO	ING
11	8	9	9
17	9	9	7.5
04	8	9	3
08	8	9	1
16	8	8	2
02	8	8	0
03	8	4	1
05	6	9*	6
14	6	3	1
10	6	3	1
13	5	8*	1
12	2	7*	0
15	2	5*	0
X22	3	0	0
06	1	0	0
01	0	1	0
07	0	0	0

R = .92

B: RUSSIAN

B.1: Time 1

Complementation Type

SUBJECT NUMBER	THAT	TO	ING
X19	9	9	7
15	8	9	3
14	8	4	0
X16	7	8	6
17	7	7	0
13	7	4	0
06	6	1	0
12	5	3	0
18	4.5	6*	0
10	4.5	2	0
09	4	2	0
22	3	2	0
02	3	1	0
01	3	1	0
03	2	2	0
04	5	0	0
X20	3	0	0
11	2	0	1
08	2	0	0
07	2	0	0
05	1	0	0

R = .98

B.2: Time 2

Complementation Type

SUBJECT NUMBER	THAT	TO	ING
X19	9	9	7
13	8	7	0
15	6	9*	4.5
17	6	9*	3
12	6	7	1
10	6	4.5	0
09	5	6	0
18	4.5	8*	0
14	4	6*	0
06	3	3	0
01	2	2	0
22	0	2	0
02	2	1	0
03	4.5	0	0
07	4	0	2
04	3	0	0
08	3	0	0
11	2	0	0
05	2	0	0

R = .90

B.3: Time 3

Complementation Type

SUBJECT NUMBER	THAT	TO	ING
13	8	9	2
17	8	8	4
15	6	9*	4
12	5	8*	1
09	4	7*	1
06	6	3	1
18	4.5	9*	0
03	6	4.5	0
01	5	4.5	0
10	4.5	3	0
22	2	1	0
14	5	0	0
08	3	0	0
04	3	0	0
02	2	0	0
05	2	0	0
07	1	0	0
11	1	0	0

R = .93

B.4: Time 4

Complementation Type

SUBJECT NUMBER	THAT	TO	ING
13	9	9	1
17	9	8	4
15	5	8*	3
14	4	4	1
12	7	9*	0
18	6	8*	0
01	5	8*	0
03	7	5	0
09	6	7	0
06	4.5	6*	0
10	6	2	0
07	6	1	0
05	5	1	0
08	4	1	0
X23	3	1	0
02	3	0	0
11	2	0	0
22	1	0	0
04	1	0	0

R = .91

C: ARABIC

C.1: Time 1

SUBJECT NUMBER	TO	THAT	ING
05	9	9	5
08	9	9	4.5
06	8	9	7.5
09	8	9	7
X04	9	7	2
07	5	5	1
02	6	6	0
01	3	6*	0
X03	2	0	0

R = .96

C.2: Time 2

SUBJECT NUMBER	TO	THAT	ING
05	9	9	9
06	9	9	9
X04	9	8	8
09	9	8	8
08	9	6	7
07	8	6	2
01	7	9*	1
02	7	6	0
X03	0	2*	0

R = .93

C.3: Time 3

SUBJECT NUMBER	TO	THAT	ING
06	9	9	9
08	8	9	9
09	9	9	8
05	9	9	7
07	9	8	6
01	8	9	0
02	7	4.5	1
X03	0	2	0

R = .96

C.4: Time 4

SUBJECT NUMBER	TO	THAT	ING
06	9	9	9
09	9	9	9
08	9	8	8
01	8	9	8
05	8	8	8
07	9	7	5
02	9	4	2

R = 1.00

D: VIETNAMESE

D.1: Time 1

Complementation Type

SUBJECT NUMBER	THAT	TO	ING
20	9	9	9
02	8	9	7
11	8	9	4.5
22	8	8	3
24	9	5	7
18	9	6	0
14	6	3	2
12	2	0	2*
13	6	7	0
04	6	5	0
21	5	1	0
03	3	7*	0
19	3	3	0
23	3	1	0
X09	2	2	0
08	1	2	0
07	6	0	0
25	3	0	0
X05	3	0	0
15	2	0	0
16	2	0	0
06	2	0	0
01	2	0	0
17	1	0	0
X10	1	0	0

R = .96

D.2: Time 2

Complementation Type

SUBJECT NUMBER	THAT	TO	ING
20	8	9	9
11	7*	9	8
24	9	6	7
18	8	5	3
02	7	8	7
22	4.5	9*	4.5
13	4	5	1
21	7	4	0
03	1	6*	0
04	4.5	4	0
14	4	4	0
06	4	1	0
07	3	2	0
19	2	2	0
23	2	1	0
01	2	1	0
X10	1	1	0
12	5	0	0
08	2	0	0
25	1	0	0
15	1	0	0
16	1	0	0
X09	0	2	0
17	0	0	0

R = .94

D.3: Time 3		Complementation Type		D.4: Time 4		Complementation Type	
SUBJECT NUMBER	THAT	TO	INC	SUBJECT NUMBER	THAT	TO	INC
20	8	9	9	20	8	9	9
11	8	8	9	11	9	9	8
24	8	8	8	24	9	9	8
02	5*	8	7	02	8	9	8
19	6	6	1	21	8	7	1
18	6	3	3	13	6	5	1
04	5	7*	1	18	5	5	4
13	5	6	1	22	4.5	9*	4.5
22	4.5	9	4	04	3	9*	3
21	7	7	0	06	4.5	9*	0
03	2*	6	0	14	7	8	0
06	4	2	0	19	2	8*	0
01	3	3	0	01	7	1	0
23	3	2	0	03	6	6	0
07	3	1	0	07	5	3	0
X09	1	4.5	0	23	4	3	0
08	1	2	0	08	3	4.5*	0
12	3	0	0	12	3	0	0
10	1	0	0	25	1	0	0
25	1	0	0	16	1	0	0
15	1	0	0	17	1	0	0
16	1	0	0	15	0	0	0
14	0	6*	0				
17	0	0	0				

R = .92

R = .92

B: RUSSIAN

B.1: Time 1

SUBJECT NUMBER	SI TYPE EQUI	NON-EQUI

X19	9	8
X16	8	9
15	6	7
13	4.5	2
17	4	6
14	3	4
18	2	4.5
10	2	1
03	2	1
06	1	2
09	1	2
04	1	2
22	1	1
01	2	0
02	2	0
12	0	6
X20	0	2
08	0	1
11	0	1
07	0	0
05	0	0

R = .91

B.2: Time 2

SUBJECT NUMBER	SI TYPE EQUI	NON-EQUI

X19	8	9
17	8	5
15	6	7
13	6	5
12	5	3
18	4	5
14	3	4
10	3	3
07	3	2
09	2	6*
01	2	1
06	1	2
02	1	1
08	1	1
05	1	1
22	1	0
03	0	2*
04	0	1
11	0	1

R = .95

B.3: Time 3

SUBJECT NUMBER	SI TYPE EQUI	NON-EQUI

13	8	8
17	8	6
18	6	5
15	6	5
01	6	3
12	4.5	6*
06	4.5	3
09	3	4
03	3	4
10	2	4*
14	1	3*
04	1	2
08	1	2
05	1	1
22	1	1
07	1	0
11	1	0
02	0	2*

R = .89

B.4: Time 4

SUBJECT NUMBER	SI TYPE EQUI	NON-EQUI

17	8	8
18	7	6
15	7	5
12	7	5
13	6	7
09	6	4
01	4.5	5
03	4	4.5
14	4	3
06	3	6*
07	3	3
05	3	3
10	3	2
X23	2	1
02	1	2
08	1	1
11	1	1
04	1	0
22	1	0

R = .97

C: ARABIC

C.1: Time 1

SUBJECT NUMBER	SI TYPE		NON-EQUI
	EQUI		
05	9	9	
06	9	8	
09	8	8	
08	8	8	
X04	7	5	
02	3	4	
01	3	2	
07	2	5*	
X03	1	1	

R = .94

C.2: Time 2

SUBJECT NUMBER	SI TYPE		NON-EQUI
	EQUI		
05	9	9	
06	9	9	
X04	8	9	
09	8	8	
08	7	7	
07	5	7*	
01	5	6	
02	5	4	
X03	1	0	

R = .94

C.3: Time 3

SUBJECT NUMBER	SI TYPE		NON-EQUI
	EQUI		
06	9	9	
09	9	8	
08	9	8	
05	9	8	
07	7	9*	
01	7	6	
02	6	3	
X03	1	1	

R = .94

C.4: Time 4

SUBJECT NUMBER	SI TYPE		NON-EQUI
	EQUI		
09	9	9	
06	9	9	
08	9	9	
01	8	8	
05	7	9*	
07	7	8	
02	6	5	

R = .93

Table 3.3: Multi-valued Implicational Scales for four Auxiliary + Neg Types

A: SPANISH

A.1 Time 1

SUBJECT NUMBER	NEGATIVE TYPE		AUX 'BE'		DO		HAVE	
	COP +	NEG	+	NEG	+	NEG	+	NEG
11	100	100	100	100	100	100	100	100
x 21	98	100	100	100	100	100	100	100
17	100	100	100	100	100	100	86	86
03	100	100	100	100	100	100	86	86
02	95	100	100	100	100	100	33	33
10	88	100	100	100	100	100	50	50
16	93	100	100	100	88	88	86	86
x 09	98	93	93	93	89	89	22	22
05	85	91	91	91	88	88	-	-
x 19	95	100	100	100	11	11	22	22
112	92	86	86	86	88	88	22	22
13	90	87	87	87	89	89	33	33
04	95	77	77	77	80	80	33	33
14	85	80	80	80	44	44	11	11
15	71	54	54	54	56	56	11	11
08	65*	80	80	80	71	71	22	22
06	45	29	29	29	22	22	11	11
01	48	53	53	53	11	11	0	0
x 20	20*	33	33	33	44	44	0	0
07	33	60*	60*	60*	0	0	0	0

R = .96

A.2 Time 2

SUBJECT NUMBER	NEGATIVE TYPE		AUX 'BE'		DO		NEG	
	COP +	NEG	+	NEG	+	NEG	+	NEG
11	100	100	100	100	100	100	100	100
03	95	100	100	100	100	100	93	93
17	100	100	100	100	100	100	86	86
16	98	100	100	100	100	100	71	71
05	93	100	100	100	100	100	56	56
08	92	92	92	92	100	100	50	50
02	90	93	93	93	100	100	33	33
13	88	93	93	93	100	100	50	50
10	93	100	100	100	67	67	56	56
04	93	86	86	86	89	89	50	50
12	87	71	71	71	75	75	22	22
x 19	85	87	87	87	44	44	22	22
14	85	57	57	57	67	67	11	11
x 09	83	86	86	86	100*	100*	33	33
15	36	33	33	33	67*	67*	11	11
06	37	13	13	13	11	11	0	0
07	32	21	21	21	13	13	0	0
01	22	20	20	20	22	22	0	0

R = .97

A.3 Time 3

SUBJECT NUMBER	NEGATIVE TYPE		DO +	HAVE +
	COP +	AUX 'BE' NEG		
05	98	100	100	89
17	98	93	89	89
11	100	100	100	86
16	98	100	100	86
04	97	100	100	80
03	98	100	100	60
08	98	100	88	50
02	95	100	100	14
10	93	100	88	33
13	92	100	100	67
x 09	90	80	89*	71
14	87	57	89*	22
12	80	73	80	22
15	43	29	56*	22
06	28	36	22	11
01	22	20	11	0
07	33	23	0	11

A.4 Time 4

SUBJECT NUMBER	NEGATIVE TYPE		DO +	HAVE +
	COP +	AUX 'BE' NEG		
11	100	100	100	100
04	95	100	100	100
16	98	93	100	88
03	97	100	100	88
17	95	93	88	89
05	98	100	100	71
13	97	93	100	75
02	95	100	100	71
10	100	100	89	29
08	100	100	83	75
12	87	67	50	11
14	85	86	56	25
15	85	64	63	25
x 22	64	67	63	13
01	57	20	13	22
06	45	13	63*	22
07	53	50	25	0

R = .99

B: RUSSIAN

B.1 Time 1

SUBJECT NUMBER	NEGATIVE TYPE		AUX 'BE'		DO		HAVE	
	COP +	NEG	AUX +	NEG	DO +	NEG	HAVE +	NEG
X 19	100	100	100	100	100	100	71	
X 16	100	100	100	100	100	100	63	
12	92	100	100	100	44	44	44	
14	97	64	64	33	33	22	22	
15	95	87	87	86	86	33	33	
17	93	85	85	63	63	25	25	
11	90	87	87	22	22	0	0	
10	80	87	87	88	88	33	33	
13	80	67	67	75	75	33	33	
08	80	53	53	67*	67*	33	33	
09	80	47	47	67*	67*	33	33	
05	73	60	60	56	56	11	11	
07	67	27	27	67*	67*	11	11	
04	57	38	38	44	44	11	11	
18	49	50	50	44	44	29	29	
03	38	21	21	75*	75*	22	22	
01	37	40	40	56*	56*	11	11	
X 20	75	73	73	50	50	0	0	
06	62	53	53	11	11	0	0	
02	43	47	47	44	44	0	0	

R = .94

B.2 Time 2

SUBJECT NUMBER	NEGATIVE TYPE		AUX 'BE'		DO		HAVE	
	COP +	NEG	AUX +	NEG	DO +	NEG	HAVE +	NEG
X 19	98	92	92	100	100	80		
17	95	100	100	44	44	13		
09	92	100	100	63	63	38		
01	93	93	93	20	20	22		
15	90	92	92	86	86	29		
12	88	93	93	50	50	75*		
14	87	67	67	29	29	22		
10	85	53	53	80*	80*	38		
13	80	100*	100*	88	88	13		
08	80	67	67	11	11	22		
07	80	60	60	33	33	25		
05	73	80	80	33	33	22		
18	67	47	47	56	56	33		
03	48	21	21	80*	80*	25		
04	40	43	43	38	38	22		
22	37*	53	53	56	56	11		
11	65	60	60	22	22	0		
06	60	40	40	22	22	0		
02	43	29	29	56*	56*	0		

R = .93

B.3 Time 3

SUBJECT NUMBER	NEGATIVE TYPE		AUX 'BE'		DO		HAVE	
	COP +	NEG	+	NEG	+	NEG	+	NEG
10	93	100	100	89	89	29	29	
09	98	100	100	56	56	43	43	
13	93	100	100	80	80	13	13	
15	93	92	92	71	71	29	29	
01	88	100	100	40	40	38	38	
17	95	87	87	43	43	33	33	
18	95	77	77	44	44	33	33	
14	88	80	80	22	22	22	22	
12	82	80	80	100*	100*	43	43	
05	77	73	73	44	44	11	11	
06	70	60	60	22	22	22	22	
08	70	50	50	33	33	33	33	
03	63	58	58	80*	80*	25	25	
07	58	53	53	11	11	33*	33*	
04	57	47	47	25	25	11	11	
22	32	33	33	56*	56*	22	22	
02	65	60	60	33	33	0	0	
11	62	53	53	22	22	0	0	

R = .94

B.4 Time 4

SUBJECT NUMBER	NEGATIVE TYPE		AUX 'BE'		DO		HAVE	
	COP +	NEG	+	NEG	+	NEG	+	NEG
13	97	100	100	88	88	50	50	
15	93	100	100	100	100	43	43	
10	90	100	100	100	100	50	50	
09	98	100	100	67	67	71	71	
17	97	100	100	75	75	57	57	
01	92	100	100	80	80	60	60	
14	85	86	86	50	50	22	22	
12	83*	100	100	75	75	86	86	
18	82	64	64	67	67	33	33	
05	82	38	38	56*	56*	22	22	
03	73	54	54	50	50	33	33	
08	73	33	33	38	38	38	38	
07	58	67	67	11	11	22	22	
04	57	50	50	88*	88*	22	22	
22	33	20	20	56*	56*	11	11	
x 23	27	8*	8*	33	33	44	44	
06	73	60	60	11	11	0	0	
02	57	29	29	22	22	0	0	
11	53	20	20	56*	56*	0	0	

R = .92

C: ARABIC

C.1 Time 1

SUBJECT NUMBER	NEGATIVE TYPE		DO +	HAVE +
	COP +	AUX 'BE' NEG		
06	100	100	100	100
09	100	100	100	86
05	98	100	88	86
08	98	100	100	71
X 04	98	93	100	71
02	95	100	100	44
07	97	100	71	38
01	92	93	63	22
X 03	5	0	22*	11

R = .97

C.2 Time 2

SUBJECT NUMBER	NEGATIVE TYPE		DO +	HAVE +
	COP +	AUX 'BE' NEG		
06	100	100	100	100
05	100	100	100	-
02	97	100	100	67
08	97	100	89	50
X 04	98	89	88	43
09	100	100	75	75
07	90	100	80	40
01	95	86	75	29
X 03	28	14	67*	22

R = .97

C.3 Time 3

SUBJECT NUMBER	NEGATIVE TYPE		DO +	HAVE +
	COP +	AUX 'BE' NEG		
09	100	100	100	100
06	100	93	100	100
05	100	100	100	86
08	98	100	100	60
07	97	100	100	22
01	92	92	100	56
02	92	92	86	67
X 03	33	36	67*	25

R = .97

C.4 Time 4

SUBJECT NUMBER	NEGATIVE TYPE		DO +	HAVE +
	COP +	AUX 'BE' NEG		
06	100	100	100	100
08	98	100	100	100
09	100	93	100	100
05	100	91	100	100
02	97	100	100	67
07	95	92	88	33
01	92	80	86	57

R = 1.00

D: VIETNAMESE

D.1 Time 1

SUBJECT NUMBER	NEGATION TYPE		DO +	HAVE +
	AUX 'BE' COP +	NEG		
24	100	100	100	89
11	100	100	100	89
20	100	98	100	89
02	100	98	100	80
18	100	92	100	13
13	100	88	100*	22
22	87	95	100	87
04	100	97	44	33
21	98	93	38	13
01	93	80	56	38
x 05	93	57	63	22
14	87	83	100*	29
12	87	72	67	11
23	80	53	56	44
19	64	70	75	38
x 09	60	77*	33	11
07	33	32	33	11
08	27	30	22	11
x 10	20	27	22	11
25	80	73	11	0
06	67	67	22	0
03	36	35	56*	0
17	7*	27	22	0
15	73	70	0	0
16	60	52	0	0

R = .95

D.2 Time 2

SUBJECT NUMBER	NEGATION TYPE		DO +	HAVE +
	AUX 'BE' COP +	NEG		
24	100	98	100	100
11	100	100	100	88
20	100	100	100	71
02	100	97	100	67
22	100	90	100	87
13	93	95	100	75
04	100	93	75	43
18	100	82	100*	43
14	80	70	100*	50
08	80	72	22	11
x 09	80	72	11	22
12	75	73	100*	50
01	64	62	25	38*
21	60	70	44	11
23	53	50	80*	33
03	44	30	80*	33
07	33	37	22	22
06	33	35	80*	33
19	23*	43	100*	50
x 10	20	25	11	11
15	80	23*	80	0
25	40	37	11	0
16	38	32	43	0
17	0	2	11	0

R = .90

R = .91

D.4 Time 4

SUBJECT NUMBER	NEGATION TYPE		DO		HAVE	
	AUX 'BE'	COP	+	NEG	+	NEG
18	100	88	100	100	100	100
24	100	100	100	100	100	89
20	100	100	100	100	100	88
02	100	100	100	100	100	88
19	100	100	100	100	100	71
14	100	98	100	100	100	87
22	100	98	100	100	100	80
04	100	93	100	100	100	56
12	100	90	100	100	100	86
11	100	100	88	88	86	86
13	93	97	86	86	75	75
08	80	80	0*	0*	22	22
21	77	90*	29	29	25	25
06	57	57	71*	71*	67	67
15	50	17*	50	50	11	11
23	40	48	33	33	44	44
07	14*	43	38	38	22	22
01	31	53	22	22	25	25
03	21*	38	33	33	56*	56*
17	13	18	22	22	11	11
25	13	22	22	22	0	0
16	7	13	44*	44*	0	0

D.3 Time 3

SUBJECT NUMBER	NEGATION TYPE		DO		HAVE	
	AUX 'BE'	COP	+	NEG	+	NEG
24	100	100	100	100	87	87
20	100	100	100	100	86	86
11	100	100	100	100	80	80
02	100	100	100	100	75	75
13	100	92	100	100	29	29
22	100	90	100	100	80	80
19	100	90	100	100	71	71
14	92	95	100	100	80	80
12	100	88	89	89	43	43
04	100	87	80	80	75	75
06	89	37	100*	100*	29	29
18	87	85	89	89	50	50
x 09	87	77	22	22	11	11
21	82	85	22	22	22	22
23	80	60	11	11	50*	50*
08	67	70	11	11	22	22
15	67	33	25	25	33	33
03	43	25	67	67	33	33
07	40	53*	13	13	24	24
x 10	20	20	11	11	11	11
01	64	59	22	22	0	0
25	27	39*	0	0	0	0
16	7	0	67*	67*	0	0
17	0	2	22*	22*	0	0

R = .94

Table 3.4: Multi-valued Scales for COP + NEG in four Environments

A: SPANISH

A.1 Time 1

SUBJECT NUMBER	ENVIRONMENT			NP	PART
	PP	ADJ			
11	100	100		100	100
17	100	100		100	100
03	100	100		100	100
X 09	100	100		93	100
X 21	100	100		100	93
12	93	87		93	93
02	100	93		100	87
04	93	100		100	87
X 19	93	100		100	87
16	93	93		100	86
13	100	93		87	80
10	93	93		87	80
14	100	87		80	73
05	93	80		93*	71
15	86	80		67	50
08	67	80*		53	60
06	53	60		47	20
01	40*	53		47	53
07	29	47*		29	36
X 20	13	20		33*	14

R = .95

* denotes deviation from implicational pattern

A.2 Time 2

SUBJECT NUMBER	ENVIRONMENT			NP	PART
	PP	ADJ			
11	100	100		100	100
17	100	100		100	100
16	100	100		100	93
04	93	93		92	93
03	100	100		100	80
10	93	100		100	80
05	100	100		100	73
02	100	100		93	67
13	100	92		100	57
08	100	100		87	80
14	100	87		86	64
12	93	87		86	80
X 19	93	86		80	80
X 09	91	89		88	69
15	50	47		21	27
06	47	33		20	47*
07	36	27		20	47*
01	33	7*		21	27

R = .96

A.3 Time 3

SUBJECT NUMBER	ENVIRONMENT			NP	PART
	PP	ADJ			
11	100	100		100	100
10	100	93		100	100
17	100	100		100	93
03	100	100		100	93
05	100	100		100	93
08	100	100		100	93
04	100	93		100	93
10	100	93		93	87
02	100	100		100	80
13	100	100		93	75
14	100	100		93	60
12	93	92		67	67
x 09	100	89		89	89
15	75	62		36	21
07	46	29		20	43*
01	36	27		13	13
06	25	36*		20	36*

R = .96

A.4 Time 4

SUBJECT NUMBER	ENVIRONMENT			NP	PART
	PP	ADJ			
11	100	100		100	100
10	100	100		100	100
08	100	100		100	100
16	100	100		100	93
05	100	100		100	93
13	100	93		100	93
17	93	93		100	93
03	100	100		100	87
02	93	100		100	87
04	100	100		100	80
14	80*	93		93	73
12	93	100		80	73
15	86	91		77	80
x 22	64	67		75	50
01	57	67		53	47
07	54	50		57	47
06	43*	60		47	36

R = .97

B: RUSSIAN

B.1 Time 1

SUBJECT NUMBER	ENVIRONMENT			NP	PART
	PP	ADJ			
X 19	100	100		100	100
X 16	100	100		100	100
14	100	100		87*	100
15	100	87		93	100
11	93	87		87	93
17	93	93		100	87
12	100	100		100	67
10	100	87		80	53
13	93	80		86	60
08	93	80		80	57
09	86	100		80	53
X 20	73	80		80	67
05	67*	80		80	67
07	80	77		60	47
04	40*	60		69	60
06	60	67		60	60
18	56	50		58	33
02	53	40		27	53*
01	27	33		60*	22
03	21*	47		53	36

R = .93

B.2 Time 2

SUBJECT NUMBER	ENVIRONMENT			NP	PART
	PP	ADJ			
X 19	100	93		100	100
01	100	93		86	93
15	100	67*		100	93
17	100	100		100	80
X 09	100	100		93	73
12	93	100		100	60
10	100	86		93	57
08	100	73		80	67
13	93	67		93*	67
14	87	87		80	93*
07	87	87		90	57
11	90	73		40	67*
18	73	67		80*	47
03	73	53		47	20
06	71	57		40	67*
05	67	80*		67	80*
02	60	67		13	33*
22	53	33		33	27
04	53	33		53*	20

B.3 Time 3

SUBJECT NUMBER	ENVIRONMENT			NP	PART
	PP	ADJ			
X 09	100	100		93	100
18	100	93		93	93
17	93	100		93	93
15	93	87		93	100
13	100	93		93	87
10	100	93		100	77
12	93	100		100	31
14	100	100		87	67
01	93	93		87	80
03	93	47		64*	47
08	86	80		67	47
05	80	87		67	73
06	80	80		60	57
07	80	80		60	14
02	71	67		60	60
11	71	47*		67	60
04	64	53		67*	40
22	43	33		21	33*

R = .94

B.4 Time 4

SUBJECT NUMBER	ENVIRONMENT			NP	PART
	PP	ADJ			
09	100	100		100	93
17	100	100		93	93
15	100	80*		100	93
13	100	100		100	86
10	100	100		93	69
01	100	93		100	71
12	93	100		100	43
06	57*	93		67	73
18	93	87		87	60
03	87	80		80	47
14	87	87		87	80
05	87	87		87	64
03	87	80		80	47
08	87	73		64	67
07	73	73		47	43
04	73	73		47	33
02	67	53		67*	40
11	60	40		67*	47
22	40	33		33	27
X 23	40	27		33	7

R = .95

C: ARABIC

C.1 Time 1

SUBJECT NUMBER	ENVIRONMENT PP	ADJ	NP	PART
09	100	100	100	100
06	100	100	100	100
07	100	87*	100	100
05	100	100	100	93
08	100	100	100	93
X 04	100	100	100	93
02	100	100	87	93
01	93	100	87	87
X 03	0	7	13*	0

R = .94

C.2 Time 2

SUBJECT NUMBER	ENVIRONMENT PP	ADJ	NP	PART
09	100	100	100	100
06	100	100	100	100
05	100	100	100	100
X 04	100	100	100	92
08	92	100	100	93
02	100	100	100	86
01	100	100	100	80
07	100	100	80	82
X 03	27	33	27	27

R = 1.00

C.3 Time 3

SUBJECT NUMBER	ENVIRONMENT PP	ADJ	NP	PART
09	100	100	100	100
06	100	100	100	100
05	100	100	100	100
08	100	100	100	93
07	100	93	100	92
01	100	91	92	80
02	100	100	92	71
X 03	38	43	33	20

R = 1.00

C.4 Time 4

SUBJECT NUMBER	ENVIRONMENT PP	ADJ	NP	PART
09	100	100	100	100
06	100	100	100	100
05	100	100	100	100
08	93	100	100	100
02	100	100	87*	100
07	100	92	92	92
01	100	92	87	86

R = .96

D: VIETNAMESE

D.1 Time 1

SUBJECT NUMBER	ENVIRONMENT			ADJ	PART
	NP	PP			
24	100	100		100	100
11	100	100		100	100
21	100	100		93	100
20	100	100		100	93
02	100	100		93	93
04	100	100		93	93
13	100	100		100	53
22	100	100		93	87
18	100	93		100	73
14	100	92		87	54
01	87	93		73	60
x 09	87	80		80	60
19	80	80		93*	29
23	80	40		53*	40
06	73	64		67	60
25	67	67		93*	67
12	67	67		73	80
15	67	60		67	87*
x 05	67	60		53	47
16	57	47		47	53
03	40	27		40*	33
07	40	13*		47	27
17	40	27		27	13
x 10	36	27		27	20
08	33	33		47*	7

R = .93

D.2 Time 2

SUBJECT NUMBER	ENVIRONMENT			ADJ	PART
	NP	PP			
11	100	100		100	100
20	100	100		100	100
24	100	100		100	93
02	100	93		100	93
13	93	100		93	100
04	100	100		93	87
22	100	93		93	73
18	100	91		100	33
14	93	80		67	40
x 09	87	87		60	53
08	80	80		80	60
12	80	85		73	50
21	80	67		73	60
07	60	27		47*	13
01	53*	67		67	57
19	50	55		46	23
23	40*	53		53	53
x 10	40	27		20	13
03	36	67*		27	15
06	33	40		33	14
25	27*	53		33	33
16	20*	38		27	40*
15	20	27		20	27
17	7	0		0	0

R = .93

D.3 Time 3

SUBJECT NUMBER	ENVIRONMENT			ADJ	PART
	NP	PP			
24	100	100		100	100
20	100	100		100	100
11	100	100		100	100
02	100	100		100	100
14	100	100		100	80
19	87	93		90	100*
13	93	93		93	87
04	100	100		80	67
22	100	100		93	67
12	100	100		93	60
21	93	91		80	73
19	93	100		87	58
19	87	93		80	100*
x 09	80	93*		67	67
08	80	71		67	60
07	60	50		57	40
23	53*	64		67	53
06	53	21		53*	23
01	50	64		60	60
03	29	36		27	13
x 10	29	20		27	7
25	20*	50		40	47
15	7*	40*		54	33
17	8	0		0	0
16	0	0		0	0

R = .92

D.4 Time 4

SUBJECT NUMBER	ENVIRONMENT			ADJ	PART
	NP	PP			
24	100	100		100	100
20	100	100		100	100
11	100	100		100	100
02	100	100		100	100
19	100	100		100	100
14	100	100		100	93
22	100	100		100	93
13	93	100		93	100
24	100	100		93	80
12	93	100		100	64
21	100	91		87	80
18	87	87		80	100*
08	80	87		93	60
07	73	20*		47	33
01	67	47		47	54
06	57	64		73	27
23	53	47		53	40
03	46	27		47*	33
25	20	27		27	13
15	20	20		20	7
16	13	13		13	13
17	0*	20		27	27

R = .96

Table 3.5: Multi-Valued Implicational Scales for Article Types

A: SPANISH

A.1 Time 1			A.2 Time 2		
SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE	SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE
11	100	100	11	100	100
x 21	100	100	05	100	89
03	100	89	10	100	89
05	100	89	08	100	89
10	92	100	x 09	100	89
08	92	100	17	100	89
04	100	11	13	100	89
x 09	92	78	16	92	89
12	92	67	03	92	89
15	92	67	14	100	33
16	83	89	x 19	92	78
17	83	78	04	92	44
14	83	44	02	92	44
13	75	100*	12	83	67
02	75	78	06	75	33
x 20	75	44	01	67	33
x 19	67	44	15	58	44
01	42	56*			
07	17	11			

R = .95

R = 1.00

A.3 Time 3			A.4 Time 4		
SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE	SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE
08	100	89	10	100	100
11	92	100	03	100	100
10	92	89	05	100	100
13	92	89	11	100	89
16	100	78	16	100	89
03	100	78	13	92	100
05	100	78	17	100	50
17	100	56	08	92	83
14	100	11	04	92	67
04	92	67	x 22	83	89
x 09	92	56	07	83	50
07	92	44	12	67	78
02	83	78	14	67	44
12	75	44	01	67	33
06	75	44	02	58	89*
01	67	56	06	58	89*
15	75	0	15	58	22

R = 1.00

R = .94

B: RUSSIAN

B.1 Time 1

SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE
08	100	89
10	100	89
17	100	56
15	92	44
13	92	22
x 16	83	78
22	83	56
02	83	33
04	83	11
03	75	44
x 19	75	22
18	75	22
07	58	44
09	58	33
x 20	58	33
12	58	22
11	50	89*
06	42	67*
14	42	44
01	42	44
05	42	33

R = .95

B.2 Time 2

SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE
10	100	78
12	100	0
17	92	78
04	83	56
07	83	11
13	75	78
x 19	75	56
02	75	11
03	67	56
18	58	56
15	58	56
09	58	56
11	58	11
01	50	44
06	50	33
08	50	22
22	50	22
05	42	11
14	33	33

R = 1.00

B.3 Time 3

SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE
17	92	67
13	92	67
10	92	67
15	92	56
12	92	22
03	92	11
11	75	56
07	75	44
09	67	67
02	67	56
06	67	33
04	67	11
08	58	56
18	50	22
01	33	44
22	33	44
05	33	22
14	25	56*

R = .97

B.4 Time 4

SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE
10	100	83
15	83	78
05	75	61
17	67	100*
13	67	72
11	58	44
03	58	28
09	50	78*
22	50	67*
07	50	61
08	50	61
06	50	50
02	50	44
12	50	44
04	50	39
x 23	42	33
18	42	17
14	17	78*
01	17	22

R = .90

C: ARABIC

C.1 Time 1

SUBJECT NUMBER	ARTICLE	
	DEFINITE	INDEFINITE
O6	100	100
X O4	83	22
X O3	67	11
O2	50	67*
O1	42	67*

R = .80

C.2 Time 2

SUBJECT NUMBER	ARTICLE	
	DEFINITE	INDEFINITE
O6	100	89
O8	100	78
O5	100	78
O9	100	33
O7	100	33
O2	100	22
X O3	83	11
X O4	75	56
O1	75	33

R = 1.00

C.3 Time 3

SUBJECT NUMBER	ARTICLE	
	DEFINITE	INDEFINITE
O6	100	67
O8	100	67
O5	100	33
O9	100	22
O7	100	22
O2	75	67
O1	67	89*
X O3	67	11

R = .94

C.4 Time 4

SUBJECT NUMBER	ARTICLE	
	DEFINITE	INDEFINITE
O6	100	100
O8	100	61
O7	100	61
O9	100	39
O5	67	78
O2	58	78*
O1	42	83*

R = .86

D: VIETNAMESE

D.1 Time 1				D.2 Time 2				D.3 Time 3				D.4 Time 4			
SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE		SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE		SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE		SUBJECT NUMBER	ARTICLE DEFINITE	INDEFINITE	
20	100	100		20	100	100		02	100	100		20	100	100	
11	100	100		02	100	100		20	100	89		11	100	100	
02	100	100		11	92	89		21	100	89		02	100	100	
22	100	78		01	92	78		13	92	89		22	100	100	
24	100	67		14	92	67		06	92	89		13	100	100	
03	100	67		06	92	67		22	100	78		21	92	100	
23	100	44		25	92	22		23	100	56		14	92	100	
21	100	22		23	83	89		01	100	44		06	92	89	
x 10	100	11		22	83	78		x 10	100	22		01	100	33	
25	100	0		21	83	56		11	92	78		25	83	11	
01	92	78		08	83	56		14	83	100*		07	75	39	
04	83	78		x 10	83	11		18	67	56		17	75	33	
14	75	56		13	75	78		25	67	33		12	67	89*	
07	75	44		18	75	67		07	67	33		08	67	56	
13	67	78		03	75	56		08	58	78*		03	67	39	
18	58	67		12	67	56		x 09	58	44		18	58	83*	
19	58	44		x 09	58	56		19	50	56		24	58	56	
17	58	44		15	58	44		15	50	56		15	58	39	
x 09	58	44		07	58	33		16	50	56		04	50	56	
15	42	67*		19	50	44		24	33	67*		23	50	50	
12	42	56*		16	50	44		04	33	67*		19	33	61*	
06	42	56*		24	42	56*		03	25	56*		16	25	72*	
08	42	56*		04	33	78*		12	25	56*					
16	42	22		17	33	22		17	58	0					
x 05	33	100*													

R = .90

R = .96

R = .88

R = .91

Table 3.6: Multi-Valued Scales for Indefinite Article in three Environments

A: SPANISH

A.1 Time 1

SUBJECT NUMBER	ENVIRONMENT*		PP
	Obj	Subj	
11	3	3	3
13	3	3	3
10	3	3	3
08	3	3	3
x 21	3	3	3
16	3	3	2
03	3	3	2
05	3	3	2
17	2	3	2
02	2	3	2
x 09	2	3	2
15	2	2	2
12	2	3	1
01	2	2	1
06	2	2	0
x 20	3	1	0
14	3	0	1
x 19	2	1	1
07	1	0	0
04	0	0	1

R = 1.00

* Environments

Subj = ART N V

Obj = ART V N

PP = ART Prep N

* denotes deviation from implicational pattern

A.2 Time 2

SUBJECT NUMBER	ENVIRONMENT		PP
	Obj	Subj	
11	3	3	3
17	3	3	2
16	3	3	2
13	3	3	2
03	3	3	2
05	3	3	2
10	3	3	2
08	3	3	2
x 09	3	3	2
12	3	1	2
x 19	3	3	1
01	2	2	1
04	2	2	0
02	3	0	1
06	3	0	0
07	2	1	0
14	2	0	1
15	1	3*	0

R = .98

A.4 Time 4			
SUBJECT NUMBER	ENVIRONMENT		PP
	Obj	Subj	
13	3	3	3
03	3	3	3
05	3	3	3
10	3	3	3
08	1.5*	3	3
02	3	2	3
x 22	3	2	3
11	3	3	2
16	3	3	2
06	3	3	2
04	3	2	1
17	1.5	2	1
07	1.5	2	1
12	3	1	3*
14	3	0	1
15	0	1	1
01	0	3*	0

R = .94

A.3 Time 3			
SUBJECT NUMBER	ENVIRONMENT		PP
	Obj	Subj	
11	3	3	3
13	3	3	2
10	3	3	2
08	3	3	2
02	3	2	2
16	3	3	1
03	3	3	1
05	3	3	1
x 09	1*	3	1
04	3	2	1
01	2	2	1
17	3	1	1
07	3	0	1
12	2	0	2*
06	1	1	2
14	1	0	0
15	0	0	0

R = .96

B: RUSSIAN

B.1 Time 1

SUBJECT NUMBER	ENVIRONMENT Obj	ENVIRONMENT Subj	PP
08	3	3	2
10	3	3	2
11	3	3	2
x 16	2	3	2
06	1*	3	2
17	2	2	1
22	2	2	1
03	3	1	0
01	2	1	1
07	2	1	1
14	2	1	1
15	3	0	1
02	2	0	1
05	2	0	1
09	3	0	0
x 20	1	0	2*
13	0	1	1
18	0	1	1
12	1	1	0
x 19	1	1	0
04	0	0	1

R = .97

B.2 Time 2

SUBJECT NUMBER	ENVIRONMENT Obj	ENVIRONMENT Subj	PP
17	3	2	2
13	3	3	1
10	3	3	1
18	3	2	0
03	3	2	0
09	2	2	1
04	2	2	1
15	3	1	1
x 19	3	1	1
06	2	1	0
08	2	0	0
01	1	1	2
14	0	1	2
22	1	1	0
02	1	0	0
11	0	1	0
07	0	0	1
05	0	0	1
12	0	0	0

R = 1.00

B.3 Time 3

SUBJECT NUMBER	ENVIRONMENT Obj	Subj	PP
10	2	3	1
15	2	2	1
17	3	3	0
13	3	3	0
09	3	3	0
02	2	3	0
08	2	3	0
11	2	3	0
07	0*	3	1
14	1*	3	1
01	1	2	1
06	2	1	0
18	2	0	0
12	2	0	0
14	1	3	1
05	1	0	1
22	1	3*	0
04	0	0	1
03	1	0	0

R = .94

B.4 Time 4

SUBJECT NUMBER	ENVIRONMENT Obj	Subj	PP
17	3	3	3
15	3	2	2
09	3	2	2
13	1.5*	3	2
10	1.5*	3	3
14	3	3	1
22	3	2	1
23	0*	2	1
02	3	0	1
12	3	0	1
11	3	0	1
06	1.5	2	1
08	1.5	3*	1
07	1.5	3*	1
05	1.5	3*	1
03	1.5	1	0
04	1.5	0	2*
18	1.5	0	0
01	0	0	2*

R = .86

C: ARABIC

C.1 Time 1

SUBJECT NUMBER	ENVIRONMENT		PP
	Subj	Obj	
O6	3	3	3
O2	2	2	2
O1	3	3	0
X O4	1	0	1
X O3	0	0	1

R = 1.00

C.3 Time 3

SUBJECT NUMBER	ENVIRONMENT		PP
	Subj	Obj	
O1	3	3	2
O6	3	2	1
O8	3	2	1
O2	3	3	0
O5	0*	2	1
O9	0	1	1
O7	0	1	1
X O3	0	0	1

C.2 Time 2

SUBJECT NUMBER	ENVIRONMENT		PP
	Subj	Obj	
O6	3	3	2
O8	3	2	2
O5	2	3	2
X O4	2	2	1
O1	2	1	0
O2	2	0	0
O1	0	1	2
O9	0	1	2
X O3	1	0	0

R = 1.00

C.4 Time 4

SUBJECT NUMBER	ENVIRONMENT		PP
	Subj	Obj	
O6	3	3	3
O5	1*	3	3
O2	1*	3	3
O1	3	1.5	3*
O8	3	1.5	1
O7	1	1.5	3*
O9	0	1.5	2

D: VIETNAMESE

D.1 Time 1

SUBJECT NUMBER	ENVIRONMENT		PP
	Obj	Subj	
20	3	3	3
11	3	3	3
02	3	3	3
x 05	3	3	3
22	2	3	2
01	2	3	2
04	3	3	1
13	3	3	1
03	2	3	1
18	3	3	0
15	3	3	0
12	2	3	0
24	3	1	2
06	3	1	1
14	3	0	2*
18	3	0	2*
23	3	0	1
07	3	0	1
x 09	3	0	1
19	2	0	2
17	1	1	2
21	1	0	1
16	1	1	0
x 10	0	0	1
25	0	0	0

R = .96

D.2 Time 2

SUBJECT NUMBER	ENVIRONMENT		PP
	Obj	Subj	
20	3	3	3
02	3	3	3
11	3	3	2
23	3	3	2
04	2	3	2
22	2	3	2
01	2	3	2
06	1*	3	2
16	0*	2	2
13	3	3	1
14	3	2	1
18	2	3	1
21	3	1	1
03	3	1	1
24	2	1	2
08	2	1	2
19	2	1	1
15	2	1	1
12	3	0	2*
x 09	3	0	2*
07	2	0	1
25	1	1	0
17	1	1	0
x 10	1	0	0

R = .92

D.3 Time 3				D.4 Time 4			
SUBJECT NUMBER	ENVIRONMENT		PP	SUBJECT NUMBER	ENVIRONMENT		PP
	Obj	Subj			Obj	Subj	
02	3	3	3	20	3	3	3
14	3	3	3	11	3	3	3
20	3	3	2	02	3	3	3
21	3	3	2	22	3	3	3
13	3	3	2	21	3	3	3
06	3	3	2	13	3	3	3
08	2	2	3	14	3	3	3
24	3	1	2	06	3	2	3
11	3	3	1	12	3	3	2
22	3	3	1	18	1.5*	3	3
04	2	3	1	16	1.5*	3	2
19	2	3	0	04	0*	3	2
15	3	2	0	19	1.5*	3	1
18	1*	3	1	15	1.5*	2	0
12	1*	3	1	17	0*	2	1
16	1*	3	1	24	3	0	2*
01	0*	3	1	08	3	0	2*
07	0*	3	0	23	1.5	0	3*
23	3	0	2*	03	1.5	0	2*
03	3	0	2*	07	1.5	0	2*
X 09	2	0	2*	25	0	0	1
25	1	0	2*	01	0	3*	0
X 10	1	0	1				
17	0	0	0				

R = .88

R = .88

Table 3.7: Multi-Valued Indicational Scales for Definite Article in 3 Environments.

A: SPANISH		ENVIRONMENT		
A1: Time 1		PP	OBJ	SUBJ
SUBJECT NUMBER				
11		4	4	4
03		4	4	4
05		4	4	4
04		4	4	4
X21		4	4	4
10		4	3	4
12		3	4	4
08		3	4	4
16		3	4	3
15		4	4	3
X09		4	4	3
02		3	3	3
X20		4	2	3
X19		2	3	3
17		4	4	2
14		4	4	2.
13		3	4	2
01		1	3*	1
07		0	0	2*

R = .98

A.2: Time 2

SUBJECT NUMBER	PP	ENVIRONMENT	SUBJ
11	4	4	4
17	4	4	4
13	4	4	4
05	4	4	4
10	4	4	4
14	4	4	4
08	4	4	4
X09	4	4	4
16	4	3	4
03	4	3	4
02	4	3	4
X19	3	4	4
04	4	4	3
12	3	4	3
06	4	3	2
01	3	2	3
15	3	2	2
07	2.	2	4*

R = .98

A.3 Time 3

SUBJECT NUMBER	ENVIRONMENT			SURJ
	PP	OBJ		
17	4	4		4
16	4	4		4
03	4	4		4
05	4	4		4
14	4	4		4
08	4	4		4
X09	4	3		4
04	4	4		3
11	3	4		4
13	3	4		4
10	3	4		4
07	3	4		4
02	3	3		4
15	3	3		3
06	2	3		4
12	4	4		1
01	3	2		3

R = .98

A.4: Time 4

SUBJECT NUMBER	ENVIRONMENT			SURJ
	PP	OBJ		
11	4	4		4
16	4	4		4
03	4	4		4
05	4	4		4
10	4	4		4
17	3	4		4
13	3	4		4
04	4	3		4
07	3	3		4
X22	3	3		4
08	4	4		3
01	3	4		1
15	3	2		2
12	3	2		3
02	3	2		3
06	4	2		1
14	3	1		4 [#]

R = .98

B: RUSSIAN

B.1: Time 1

SUBJECT NUMBER	ENVIRONMENT		
	PP	SUBJ	OBJ
17	4	4	4
08	4	4	4
10	4	4	4
13	4	3	4
22	3	3	4
15	4	4	3
02	4	3	3
04	3	4	3
18	3	3	3
X20	1 ^W	3	3
X16	4	4	2
X19	4	3	2
03	4	4	1
11	1 ^E	3	2
09	4	2	1
07	3	2	2
12	3	2	2
06	3	0	2
01	3	1	1
05	2	1	2
14	2	2	1

R = .97

B.2: Time 2

SUBJECT NUMBER	ENVIRONMENT		
	PP	SUBJ	OBJ
12	4	4	4
10	4	4	4
17	4	4	3
13	4	3	2
02	4	3	2
07	4	4	2
04	4	4	2
X19	4	3	2
03	3	3	2
18	3	3	1
15	3	4	0
09	4	1	2
11	3	2	2
06	3	1	2
05	3	1	1
14	3	0	1
22	2	2	2
08	2	4 ^E	0
01	2	4 ^W	0

R = .97

B.3: Time 3

SUBJECT NUMBER	PP	ENVIRONMENT SUBJ	ORJ
17	4	3	4
15	4	3	4
10	4	3	4
13	4	4	3
12	4	4	3
03	4	4	3
11	2	4	3
02	2*	4	2
08	2	3	2
04	2	4	2
18	4	1	1
07	3	2	4
06	4	1	3
09	4	1	3
05	2	1	1
22	2	0	2
14	2	0	1
01	0*	2	2
R = .89			

B.4: Time 4

SUBJECT NUMBER	PP	ENVIRONMENT SUBJ	ORJ
10	4	4	4
13	3	1*	4
15	4	4	2
05	3	4	2
11	3	3	1
17	4	2	2
03	3	2	2
06	3	2	1
12	3	2	1
09	3	1	2
07	3	1	2
18	3	1	1
08	2	2	2
04	2	2	2
22	2	2	2
X23	1	2	2
02	2	3	1
01	1	0	1
14	2	0	0
R = .98			

C: ARABIC

C.1: Time 1

SUBJECT NUMBER	PP	ENVIRONMENT OBJ	SUBJ
06	4	4	4
X04	3	4	3
X03	3	2	3
02	2	2	2
01	2	2	1

R - 1.00

C.2: Time 2

SUBJECT NUMBER	PP	ENVIRONMENT OBJ	SUBJ
09	4	4	4
06	4	4	4
08	4	4	4
05	4	4	4
07	4	4	4
02	4	4	4
X03	4	3	3
01	3	4	2
X04	4	3	2

R - 1.00

C.3: Time 3

SUBJECT NUMBER	PP	ENVIRONMENT OBJ	SURJ
09	4	4	4
06	4	4	4
08	4	4	4
05	4	4	4
07	4	4	4
X03	2	3	3
02	3	4	2
01	3	3	2

R - 1.00

C.4: Time 4

SUBJECT NUMBER	PP	ENVIRONMENT OBJ	SURJ
09	4	4	4
06	4	4	4
08	4	4	4
07	4	4	4
05	4	2	2
02	3	2	2
01	2	2	1

R - 1.00

D.3: Time 3

SUBJECT NUMBER	SUBJ	ENVIRONMENT PP	ORJ
20	4	4	4
02	4	4	4
22	4	4	4
21	4	4	4
23	4	4	4
01	4	4	4
X10	4	4	4
06	4	3	4
11	4	4	3
13	4	4	3
14	4	3	3
07	2	3	3
18	4	3	1
08	4	2	1
25	3	2	3
X09	3	2	2
19	3	2	1
15	3	2	1
17	3	1	3
16	1	1	4
04	1	1	2
12	1	1	1
03	1	2	0
24	0	3 ⁺	1

R = .96

D.4: Time 4

SUBJECT NUMBER	SUBJ	ENVIRONMENT PP	ORJ
20	4	4	4
11	4	4	4
02	4	4	4
22	4	4	4
13	4	4	4
01	4	4	4
21	4	3	4
14	4	3	4
06	4	3	4
25	4	4	2
07	4	3	2
08	3	3	2
12	3	3	2
03	3	3	2
17	4	2	3
18	3	2	2
23	3	1	2
24	2	3	2
15	2	3	2
04	2	2	2
19	1	1	2
16	0 ⁺	2	1

R = .99

Table 4.1: Values of R for Best Orders for Multi-Valued Scales for Copula Environments.

GROUP	TIME	BEST ORDER	R
A: Spanish	1	ADJ > NP > PP > PART	.96
	2	ADJ > NP > PP > PART	.94
	3	NP > ADJ > PP > PART	.94
	4	{ ADJ } > { NP } > PP > PART	.97
	1-4	{ ADJ } > { NP } > PP > PART	.95
B: Russian	1	NP > ADJ > PP > PART	.92
	2	ADJ > NP > PP > PART	.97
	3	NP > ADJ > PP > PART	.96
	4	ADJ > NP > PP > PART	.97
	1-4	{ ADJ } > { NP } > PP > PART	.95
C: Arabic	1	PP > NP > ADJ > PART	.94
	2	{ ADJ } > { PP } > NP > PART	1.00
	3	ADJ > PP > NP > PART	1.00
	4	ALL ADJ / NP / PP COMBINATIONS = 1.00	
	1-4	PP > { ADJ } > { NP } > PART	.97
D: Vietnamese	1	NP > ADJ > PP > PART	.95
	2	NP > ADJ > PP > PART	.96
	3	NP > ADJ > PP > PART	.97
	4	NP > ADJ > PP > PART	.97
	1-4	NP > ADJ > PP > PART	.96

Table 4.2.1: Values of R and S for Complement Types, using division points of 4 and 7.

GROUP	TIME	Division Point = 4		Division Point = 7	
		BEST ORDER FOR ALL - THAT $\geq$ TO $\geq$ ING		BEST ORDER FOR ALL - TO $\geq$ THAT $\geq$ ING	
		R	S	R	S
A: Spanish	1	.93	.79	.93	.60
	2	.96	.88	.93	.67
	3	.96	.88	.92	.69
	4	.92	.73	.96	.88
	1-4	.94	.84	.94	.74
B: Russian	1	1.00	1.00	.94	.64
	2	1.00	1.00	1.00	1.00
	3	1.00	1.00	1.00	1.00
	4	1.00	1.00	.97	.82
	1-4	1.00	1.00	.97	.85
C: Arabic	1	1.00	1.00	1.00	1.00
	2	1.00	1.00	.93	.78
	3	1.00	1.00	1.00	1.00
	4	1.00	1.00	1.00	1.00
	1-4	1.00	1.00	.98	.94
D: Vietnamese	1	.97	.92	.95	.73
	2	.97	.93	.92	.57
	3	.92	.79	.97	.87
	4	.91	.73	.97	.91
	1-4	.94	.86	.95	.79

Table 4.2.2: Values of R for Multi-Valued Scaling of Complement Types.

GROUP	TIME	ORDER 1		ORDER 2	
		THAT $\geq$ TO $\geq$ ING		TO $\geq$ THAT $\geq$ ING	
		R	R	R	BEST ORDER
A: Spanish	1	.97		.82	1
	2	.93		.91	1
	3	.92		.88	1
	4	.92		.92	1 - 2
	1-4	.94		.88	1
B: Russian	1	.98		.79	1
	2	.90		.88	1
	3	.93		.85	1
	4	.91		.86	1
	1-4	.93		.84	1
C: Arabic	1	.93		.96	2
	2	.93		.93	1 - 2
	3	.96		.96	1 - 2
	4	.90		1.00	2
	1-4	.93		.96	2
D: Vietnamese	1	.96		.84	1
	2	.94		.92	1
	3	.92		.93	2
	4	.92		.96	2
	1-4	.94		.91	1

Table 4.3.1: Values of R and S for Bimodal Scaling of SI Types, Division point = 7.

GROUP	TIME	ORDER 1	
		R	S
A: Spanish	1	1.00	1.00
	2	1.00	1.00
	3	.94	.67
	4	.94	.78
	1-4	.97	.83
B: Russian	1	1.00	1.00
	2	.95	.50
	3	1.00	1.00
	4	.95	.67
	1-4	.96	.67
C: Arabic	1	1.00	1.00
	2	1.00	1.00
	3	1.00	1.00
	4	1.00	1.00
	1-4	.97	.91
D: Vietnamese	1	1.00	1.00
	2	1.00	1.00
	3	.96	.80
	4	.96	.83
	1-4	.98	.89

Table 4.3.2: Values of R for Multi-Valued Scaling of SI Types.

GROUP	TIME	ORDER	
		EQUI	NON-EQUI
A: Spanish	1	R	.95
	2		.97
	3		.91
	4		.91
	1-4		.94
B: Russian	1		.91
	2		.95
	3		.89
	4		.97
	1-4		.93
C: Arabic	1		.94
	2		.94
	3		.94
	4		.93
	1-4		.94
D: Vietnamese	1		.98
	2		.94
	3		.98
	4		.98
	1-4		.97

Table 4.4: Values of R and S for Bimodal Scaling of
AUX + NEG Types (division point = 80%)

GROUP	TIME	ORDER 1		BEST ORDER		R	S	R	S
		COP > AUX > DO > HAVE							
A: Spanish	1	.95	.84	Order 1					
	2	1.00	1.00	Order 1					
	3	.94	.79	COP > DO > AUX > HAVE	1.00	1.00			
	4	1.00	1.00	Order 1					
	1-4	.97	.91	Order 1					
B: Russian	1	1.00	1.00						
	2	.92	.73						
	3	.97	.91	Order 1					
	4	.95	.83						
	1-4	.96	.86	Order 1					
C: Arabic	1	1.00	1.00						
	2	1.00	1.00						
	3	1.00	1.00	Order 1					
	4	1.00	1.00						
	1-4	1.00	1.00	Order 1					
D: Vietnamese	1	.92	.77	AUX > COP > DO > HAVE	1.00	1.00			
	2	.81	.46	DO > AUX > COP > HAVE	.94	.82			
	3	.94	.84	AUX > COP > DO > HAVE	.98	.95			
	4	1.00	1.00	Order 1					
	1-4	.92	.79	AUX > DO > COP > HAVE	.94	.85			

Table 4.5: Values of R for Multi-Valued Scaling of
AUX + NEG Types

GROUP	TIME	BEST ORDER		R
		COP > AUX 'BE' > DO >	HAVE	
OTHER BEST ORDER				
A: Spanish	1		.96	R
	2		.97	
	3		.97	
	4		.99	
	1-4		.97	
B: Russian	1		.94	
	2		.93	
	3		.93	
	4		.92	
	1-4		.93	
C: Arabic	1		.97	DO >> AUX 'BE' >> COP >> HAVE 1.00 ALL COP/AUX 'BE'/'DO COMBINATION - - AUX 'HE' >> COP >> DO >> HAVE .98
	2		.97	
	3			
	4		1.00	
	1-4		.98	
D: Vietnamese	1			AUX 'BE' > COP >> DO >> HAVE .98 AUX 'BE' > COP > DO >> HAVE .91 AUX 'BE' > COP > DO >> HAVE .93 DO >> AUX 'BE' >> COP >> HAVE .93 AUX 'BE' >> COP > DO >> HAVE .90
	2			
	3			
	4			
	1-4			

DO > AUX 'BE' > COP > HAVE 1.00
ALL COP/AUX 'BE'/DO
COMBINATION -
- AUX 'BE' > COP > DO > HAVE .98
AUX 'BE' > COP > DO > HAVE .98
AUX 'BE' > COP > DO > HAVE .91
AUX 'BE' > COP > DO > HAVE .93
DO > AUX 'BE' > COP > HAVE .93
AUX 'BE' > COP > DO > HAVE .90

Table 4.6.1: Values of R and S for Bimodal Scaling of
COP + NEG Environments, division point = 80%.

GROUP	TIME	BEST ORDER	R	S
A: Spanish	1	__ADJ>__PP>__NP>__PART	1.00	1.00
	2	__ADJ/_PP/_NP all =	1.00	1.00
	3	{__ADJ>__NP>__PART __PP>__}	1.00	1.00
	4	__ADJ/_PP/_NP all =	1.00	1.00
	1-4	__ADJ>__PP>__NP>__PART	1.00	1.00
B: Russian	1	{__ADJ>__PP>__PART __NP>__}	.98	.93
	2	__NP>__PP>__ADJ>__PART	.90	.72
	3	__PP>__ADJ>__NP>__PART	1.00	1.00
	4	__ADJ>__PP>__NP>__PART	.97	.93
	1-4	__PP>__ADJ>__NP>__PART	.95	.85
C: Arabic	1	__ADJ/_NP/_PP all =	1.00	1.00
	2	__ADJ/_NP/_PP all =	1.00	1.00
	3	__ADJ/_NP/_PP all =	1.00	1.00
	4	all combinations =	1.00	1.00
	1-4	__ADJ/_NP/_PP all =	1.00	1.00
D: Vietnamese	1	__NP>__ADJ>__PP>__PART	.92	.82
	2	__NP>__PP>__ADJ>__PART	1.00	1.00
	3	__NP>__PP>__ADJ>__PART	1.00	1.00
	4	__PP/_NP/_ADJ all =	1.00	1.00
	1-4	__NP>__PP>__ADJ>__PART	.98	.96

Table 4.6.2: Values of R and S for Bimodal Scaling of
COP + NEG Environments, division point = 90%.

GROUP	TIME	BEST ORDER	R	S
A: Spanish	1	__PP>__ADJ>__NP>__PART	.95	.87
	2	__PP>__ADJ>__NP>__PART	1.00	1.00
	3	__PP>__ADJ>__NP>__PART	1.00	1.00
	4	__ADJ>__NP>__PP>__PART	.97	.91
	1-4	__PP>__ADJ>__NP>__PART	.97	.92
B: Russian	1	__PP>__NP>__ADJ>__PART	.90	.69
	2	__PP>__NP>__ADJ>__PART	.92	.76
	3	__PP>__ADJ>__NP>__PART	.97	.93
	4	__PP>{__ADJ>__NP>__PART __NP>__}	.95	.84
	1-4	__PP>__NP>__ADJ>__PART	.92	.77
C: Arabic	1	{__PP>__ADJ>__PART>__NP __ADJ>__}	.94	.75
	2	{__PP>__ADJ>__NP>__PART __ADJ>__}	1.00	1.00
	3	{__ADJ>__NP>__PP>__PART __NP>__}	1.00	1.00
	4	{__ADJ>__PP>__NP>__PART __PP>__}	1.00	1.00
	1-4	{__ADJ>__PP>__NP>__PART __PP>__}	.96	.76
D: Vietnamese	1	__ADJ>__PP>__NP>__PART	.96	.90
	2	__NP>{__ADJ>__PP>__PART __PP>__}	1.00	1.00
	3	__PP>__NP>__ADJ>__PART	.98	.94
	4	__ADJ>__NP>__PP>__PART	.96	.91
	1-4	__PP>__NP>__ADJ>__PART	.97	.92

Table 4.7: Values of R for Best Order for Multi-Valued Scales of COP + NEG Environments.

GROUP	TIME	BEST ORDER	R
A: Spanish	1	—ADJ > —PP > —NP > —PART	.95
	2	—PP > —ADJ > —NP > —PART	.96
	3	—PP > —ADJ > —NP > —PART	.96
	4	—ADJ > —PP > —NP > —PART	.97
	1-4	—PP > —ADJ > —NP > —PART	.96
B: Russian	1	—PP > —ADJ > —NP > —PART	.91
	2	—PP > —NP > —ADJ > —PART	.88
	3	—PP > —ADJ > —NP > —PART	.94
	4	—PP > { —ADJ } > { —NP } > —PART	.95
	1-4	—PP > —ADJ > —NP > —PART	.92
C: Arabic	1	—PP > —ADJ > —NP > —PART	.94
	2	—PP > —ADJ > —NP > —PART	1.00
	3	—PP > —ADJ > —NP > —PART	1.00
	4	—PP > —ADJ > —NP > —PART	.96
	1-4	—PP > —ADJ > —NP > —PART	.98
D: Vietnamese	1	—NP > —PP > —ADJ > —PART	.93
	2	{ —NP } > { —PP } > —ADJ > —PART	.93
	3	—PP > —NP > —ADJ > —PART	.92
	4	—NP > —PP > —ADJ > —PART	.96
	1-4	—NP > —PP > —ADJ > —PART	.93

Table 4.8: Values of R and S for Bimodal Scaling of Article Types, division point = approx. 80%. (7/9 and 9/12)

GROUP	TIME	ORDER 1		OTHER BEST ORDER	
		DEFINITE	INDEFINITE	INDEFINITE	DEFINITE
A: Spanish	1	1.00	1.00		
	2	1.00	1.00		
	3	1.00	1.00		
	4	.82	.50		
	1-4	.96	.87		
B: Russian	1	.85	.85		
	2	1.00	1.00		
	3	1.00	1.00		
	4	-	-	.95	.75
	1-4	.95	.81		
C: Arabic	1	1.00	1.00		
	2	1.00	1.00		
	3	.88	.33		
	4	.57	.00		
	1-4	.86	.53		
D: Vietnamese	1	.92	.79		
	2	.96	.88		
	3	.96	.90		
	4	.91	.80		
	1-4	.94	.85		

Table 4.9: Values of R for Multi-Valued Scaling of Article Types.

GROUP	TIME	ORDER	
		DEFINITE	INDEFINITE
A: Spanish	1		.95
	2		1.00
	3		1.00
	4		.94
	1-4		.97
B: Russian	1		.95
	2		1.00
	3		.97
	4		.90
	1-4		.96
C: Arabic	1		.80
	2		1.00
	3		.94
	4		.86
	1-4		.91
D: Vietnamese	1		.90
	2		.96
	3		.88
	4		.91
	1-4		.91

Table 4.10: Values of R and S for Bimodal Scaling of Indefinite Article in 3 Environments, Division point = 2.

GROUP	TIME	BEST ORDER	R	S
A: Spanish	1	Subj $\gg$ PP $\gg$ Obj	.93	.83
	2	Subj $\gg$ Obj $\gg$ PP	.89	.67
	3	Subj $\gg$ Obj $\gg$ PP	.84	.58
	4	Subj $\gg$ Obj $\gg$ PP	.88	.57
	1-4	Obj $\gg$ Subj $\gg$ PP	.91	.68
B: Russian	1	Subj $\gg$ PP $\gg$ Obj	.87	.58
	2	Subj $\gg$ Obj $\gg$ PP	.86	.53
	3	Subj $\gg$ Obj $\gg$ PP	1.00	1.00
	4	Subj $\gg$ Obj $\gg$ PP	.75	.36
	1-4	Obj $\gg$ Subj $\gg$ PP	.85	.61
C: Arabic	1	$\left\{ \begin{array}{l} \text{Subj} \\ \text{PP} \end{array} \right\} \gg \text{Obj}$	.87	.67
	2	Subj $\gg$ PP $\gg$ Obj	.85	.56
	3	Subj $\gg$ Obj $\gg$ PP	1.00	1.00
	4	PP $\gg$ Subj $\gg$ Obj	.71	.14
	1-4	Subj $\gg$ Obj $\gg$ PP	.82	.61
D: Vietnamese	1	Obj $\gg$ Subj $\gg$ PP	.76	.46
	2	PP $\gg$ Subj $\gg$ Obj	.81	.58
	3	Subj $\gg$ PP $\gg$ Obj	.78	.48
	4	PP $\gg$ Subj $\gg$ Obj	.82	.46
	1-4	Obj $\gg$ Subj $\gg$ PP	.77	.40

Table 4.11: Values of R for Multi-Valued Scaling of Indefinite Article in 3 Environments.

GROUP	TIME ORDER 1		BEST ORDER	
	OBJ	SUBJ	PP	
R				
A: Spanish	1	1.00	Order 1	
	2	.98	Order 1	
	3	.96	{Obj }>PP {Subj }>PP	
	4	.94		
	1-4	.97	Order 1	
B: Russian	1	.97	Order 1	
	2	1.00	Order 1	
	3	.94	Subj >> Obj >> PP	.96
	4	.86	Subj >> Obj >> PP	.89
	1-4	.94	Order 1	
C: Arabic	1	1.00	{Subj }>>PP {Obj }>>PP	1.00
	2	.89	Subj >> Obj >> PP	1.00
	3	1.00	Order 1	
	4	.71	PP >> Obj >> Subj	.91
	1-4	.94	{Subj >> Obj >> PP } {PP >> Obj >> Subj }	.94
D: Vietnamese	1	.96	Order 1	
	2	.92	Obj > PP >> Subj	.96
	3	.88	Subj >> Obj >> PP	.92
	4	.88	PP > Subj >> Obj	.91
	1-4	.92	{Obj }>>PP {Subj }>>PP	.92

Table 4.12: Values of R and S for Bimodal Scaling of Definite Article in 3 Environments, Division point = 3.

GROUP	TIME	BEST ORDER	R	S
A: Spanish	1	Obj > PP > Subj	.93	.64
	2	PP > Subj > Obj	.93	.33
	3	{ Subj } > Obj	.92	-.33
	4	{ PP } > Subj > Obj	.96	.75
	1-4	PP > Obj > Subj	.91	.29
B: Russian	1	PP > Subj > Obj	.94	.81
	2	PP > Subj > Obj	.93	.67
	3	Subj > PP > Obj	.82	.58
	4	PP > Subj > Obj	.93	.71
	1-4	PP > Subj > Obj	.89	.68
C: Arabic	1	{ Subj } > Obj	1.00	1.00
	2	{ Obj } > Subj	1.00	1.00
	3	{ Obj } > Subj	.92	.33
	4	PP > { Subj } > Obj	1.00	1.00
	1-4	PP > Obj > Subj	.95	.79
D: Vietnamese	1	Subj > PP > Obj	.92	.77
	2	PP > Subj > Obj	.97	.91
	3	Subj > Obj > PP	.89	.68
	4	Subj > PP > Obj	.91	.71
	1-4	Subj > PP > Obj	.90	.70

Table 4.13: Values of R for Multi-Valued Scaling of Definite Article in three Environments.

GROUP	TIME	BEST ORDER	R
A: Spanish	1	{ PP } > Subj	.98
	2	All combinations =	.98
	3	PP > Obj > Subj	1.00
	4	PP > { Obj } > Subj	.98
	1-4	PP > Obj > Subj	.99
B: Russian	1	PP > Subj > Obj	.97
	2	PP > Subj > Obj	.97
	3	PP > Obj > Subj	.94
	4	PP > Subj > Obj	.98
	1-4	PP > Subj > Obj	.94
C: Arabic	1	All combinations =	1.00
	2	{ PP } > Subj	1.00
	3	{ PP } > Subj	1.00
	4	PP > Obj > Subj	1.00
	1-4	PP > Obj > Subj	1.00
D: Vietnamese	1	Subj > PP > Obj	.99
	2	PP > Subj > Obj	.99
	3	Subj > PP > Obj	.96
	4	Subj > PP > Obj	.99
	1-4	Subj > PP > Obj	.97

Table 5.1: Mean Scores for Copula in Four Environments and Total Score (core only).

GROUP	TIME	Environment (full groups)				TOTAL (CORE ONLY)
		ADJ	NP	PP	PART	
A: Spanish	1	89.3	84.7	83.0	70.0	81.4
	2	94.1	91.3	92.6	83.0	89.5
	3	90.6	91.4	88.2	74.1	85.5
	4	96.1	96.1	89.2	72.9	89.6
	1-4	92.4	90.6	88.1	75.0	
B: Russian	1	88.2	86.7	78.1	71.1	79.6
	2	93.3	89.8	86.7	72.6	84.9
	3	93.3	93.7	85.9	66.7	84.9
	4	93.7	94.0	89.8	66.7	86.4
	1-4	92.0	90.9	84.9	69.4	
C: Arabic	1	83.7	83.0	88.1	77.0	92.0
	2	95.5	92.2	94.8	88.9	98.0
	3	97.5	94.2	95.9	84.2	98.1
	4	100.0	100.0	100.0	92.4	98.1
	1-4	93.7	91.8	94.3	85.3	
D: Vietnamese	1	81.9	88.5	72.0	60.1	78.5
	2	82.1	90.0	77.2	54.9	77.1
	3	88.6	89.4	83.1	56.3	81.5
	4	89.1	93.6	85.2	57.0	81.2
	1-4	85.3	90.3	79.2	57.1	

Table 5.2: Mean Scores for Complementatation Types and Total Score (core only).

GROUP	TIME	Complementation Type (full groups)			TOTAL (core only)
		THAT	TO	ING	
A: Spanish	1	47.8	33.9	8.3	32.2
	2	48.8	45.1	11.4	37.9
	3	53.2	51.0	16.7	42.2
	4	57.6	60.1	21.2	48.5
	1-4	51.7	46.9	14.1	
B: Russian	1	50.8	32.3	9.0	25.7
	2	46.8	43.0	10.2	29.4
	3	46.9	40.8	8.0	31.9
	4	54.7	45.7	5.2	36.3
	1-4	49.9	40.2	8.1	
C: Arabic	1	74.1	72.9	33.3	66.7
	2	77.8	82.7	54.3	77.8
	3	82.7	82.0	55.6	82.8
	4	85.7	96.8	77.8	86.8
	1-4	79.7	82.9	53.9	
D: Vietnamese	1	49.0	34.2	15.3	36.0
	2	40.8	36.6	18.3	34.1
	3	40.0	45.1	19.9	37.1
	4	53.0	57.3	23.4	44.6
	1-4	45.6	42.9	19.1	

Table 5.3: Mean Scores for SI Types

GROUP	TIME	SI Type (full groups)	
		EQUI	NON-EQUI
A: Spanish	1	33.6	26.7
	2	37.7	36.4
	3	41.8	47.7
	4	50.7	48.7
	1-4	39.7	38.4
B: Russian	1	25.7	31.5
	2	32.2	34.5
	3	35.8	36.4
	4		
	1-4	32.9	34.2
C: Arabic	1	61.7	61.7
	2	70.4	72.8
	3	79.2	72.2
	4	87.3	90.5
	1-4	72.1	71.3
D: Vietnamese	1	37.6	27.8
	2	33.8	27.8
	3	41.9	32.9
	4	54.8	41.7
	1-4	41.2	31.8

Table 5.4: Mean Scores for AUX + NEG Types and Total Score for Negation (core only).

GROUP	TIME	AUX + NEG Type (full group)		TOTAL (core only)
		COP	'BE'	
A: Spanish	1	79.9	81.3	69.1 38.3 67.3
	2	78.3	74.7	75.3 41.7 67.5
	3	79.5	77.1	77.2 47.8 69.6
	4	85.3	79.2	76.1 53.2 74.8
	1-4	80.7	78.2	74.2 45.0
B: Russian	1	70.3	64.3	60.2 24.3 51.9
	2	73.7	67.9	50.6 25.8 52.3
	3	76.7	73.7	47.3 24.4 55.4
	4	73.9	64.7	59.1 35.0 59.8
	1-4	74.6	67.5	54.5 27.4
C: Arabic	1	87.1	87.3	82.7 58.8 87.2
	2	89.5	87.7	86.0 53.3 85.2
	3	89.0	89.1	94.1 64.5 90.5
	4	97.4	93.7	96.3 86.7 93.5
	1-4	90.4	89.2	89.2 64.9
D: Vietnamese	1	70.8	73.9	56.8 29.6 60.0
	2	62.1	66.2	66.8 38.2 60.7
	3	66.1	73.0	60.4 41.6 62.8
	4	70.2	68.1	65.4 54.1 64.4
	1-4	67.3	70.4	62.2 40.5

Table 5.5: Mean Scores for COP + NEG Environments

GROUP	TIME	COP + NEG (full groups)				PART
		ADJ	NP	PP		
A: Spanish	1	83.3	80.5	82.3		73.5
	2	80.4	77.4	84.9		70.2
	3	82.8	77.9	86.8		72.7
	4	89.1	87.4	86.1		78.4
	1-4	83.8	80.7	84.9		73.6
B: Russian	1	76.6	78.0	76.8		66.0
	2	74.5	72.5	83.7		63.2
	3	79.6	76.2	85.6		64.6
	4	77.8	76.4	81.3		59.8
	1-4	77.1	75.8	81.7		63.4
C: Arabic	1	88.2	87.4	88.1		84.3
	2	92.6	89.7	91.0		84.4
	3	90.9	89.6	92.3		82.0
	4	97.7	95.1	99.0		96.9
	1-4	92.1	90.2	92.2		86.5
D: Vietnamese	1	74.1	76.8	70.8		61.6
	2	62.7	66.6	67.9		51.0
	3	67.7	68.1	70.3		58.1
	4	72.7	72.8	70.5		64.4
	1-4	69.3	71.1	69.9		58.6

Table 5.6: Mean Scores for two Article Types and Total Score (core only).

GROUP	TIME	TYPES (full groups)		TOTAL (core only)
		DEFINITE	INDEFINITE	
A: Spanish	1	81.3	69.4	75.4
	2	89.3	69.1	78.0
	3	89.8	62.1	76.0
	4	83.3	74.9	78.6
	1-4	85.8	68.9	
B: Russian	1	71.0	46.6	58.9
	2	66.3	40.3	52.6
	3	66.7	44.4	55.6
	4	53.9	55.9	55.9
	1-4	64.6	46.8	
C: Arabic	1	68.3	53.3	(70.8)
	2	92.6	48.1	74.4
	3	88.6	47.2	72.0
	4	80.9	71.4	76.2
	1-4	84.5	54.4	
D: Vietnamese	1	74.7	59.1	68.1
	2	72.9	60.2	67.9
	3	70.8	62.0	67.4
	4	74.7	68.4	71.5
	1-4	73.3	62.3	

Table 5.7: Mean Scores for Indefinite Article in three Environments.

GROUP	TIME	ENVIRONMENT		PP
		Subj	Obj	
A: Spanish	1	73.0	78.3	56.7
	2	72.3	89.0	46.3
	3	62.7	78.3	45.0
	4	76.3	79.3	68.7
	1-4	71.3	81.3	54.3
B: Russian	1	43.0	60.3	36.7
	2	40.3	56.0	24.7
	3	64.7	55.7	13.0
	4	56.0	65.7	45.7
	1-4	50.7	59.7	30.3
C: Arabic	1	60.0	53.3	46.7
	2	55.7	48.0	40.7
	3	50.0	58.3	33.3
	4	57.0	71.3	85.7
	1-4	55.3	57.3	50.7
D: Vietnamese	1	53.3	77.3	46.7
	2	58.3	72.3	50.0
	3	69.3	68.0	48.7
	4	68.7	66.0	71.3
	1-4	62.0	71.0	53.7

Table 5.8: Mean Scores for Definite Article in three Environments.

GROUP	TIME	ENVIRONMENT		PP
		Subj	Obj	
A: Spanish	1	76.3	86.3	81.3
	2	90.3	86.0	91.8
	3	91.3	91.3	86.8
	4	83.8	79.5	86.8
	1-4	85.0	85.8	86.5
B: Russian	1	70.3	63.0	79.8
	2	71.0	44.8	83.0
	3	61.0	65.3	73.5
	4	50.0	44.8	67.0
	1-4	63.3	54.5	76.0
C: Arabic	1	65.0	70.0	70.0
	2	86.0	94.5	97.3
	3	84.5	93.8	87.5
	4	75.0	78.5	89.3
	1-4	79.3	86.3	88.0
D: Vietnamese	1	80.0	67.0	77.0
	2	76.0	61.5	81.3
	3	76.0	66.8	69.8
	4	79.5	70.5	74.0
	1-4	78.0	66.3	75.0

BIBLIOGRAPHY

Abbreviations for Journals

LL	= Language Learning
WPB	= Working Papers on Bilingualism
TESOL Q	= TESOL Quarterly
SSLA	= Studies in Second Language Acquisition
IRAL	= International Review of Applied Linguistics
ISB	= Interlanguage Studies Bulletin

- Agnello, F. (1977). 'Exploring the pidginization hypothesis: a study of 3 fossilized negation systems' In Henning (ed.): 225-234.
- Alderson, J.C. (1978). A Study of the Cloze Procedure with Native and Non-Native Speakers of English. Unpublished Ph.D. Thesis, University of Edinburgh.
- Al-Jumaily, A. (1982). A Developmental Study of the Acquisition of certain Syntactic Features by Arabic-Speaking Learners. Unpublished Ph.D. Thesis, University of Edinburgh.
- Andersen, R.W. (1976). 'A functor acquisition hierarchy study in Puerto Rico' Paper presented at the 10th Annual TESOL Convention, New York.
- " (1977). 'The Impoverished State of Cross-sectional Morpheme Acquisition/Accuracy Methodology'. WPB, 14 : 47-82.
- " (1978). 'An Implicational Model for Second Language Research'. LL, 28 : 221-282.
- " (ed.) (1978a) The Acquisition and Use of Spanish and English as First and Second Languages, TESOL, Washington.
- " (ed.) (1980). New Dimensions in Second Language Acquisition Research. Newbury House, Rowley, Mass.
- Anderson, J. (1978). 'Order of difficulty in adult second language acquisition'. In W. Ritchie (ed.): 91-108.
- Bailey, C-J.N. (1968). 'Dialectal differences in the syllabification of non-nasal sonorants in American English'. General Linguistics, 8 : 79-91.
- " (1971). 'Trying to talk in the new paradigm'. Papers in Linguistics, 4 : 312-338.
- " (1974). Variation and Linguistic Theory, Georgetown University Press, Washington, D.C.
- " and R.W. Shuy (eds.). (1973). New Ways of Analysing Variation in English. Georgetown University Press, Washington, D.C.
- Bailey, N., C. Madden and S. Krashen (1974). 'Is there a natural sequence in adult second language learning'. LL 24 : 235-243.

- Bart, W.M. and D.J. Krus (1973). 'An ordering-theoretic method to determine hierarchies among items'. Educational and Psychological Measurement, 33 : 291-300
- Beebe, L.M. (1980). 'Sociolinguistic variation and style shifting in second language acquisition'. LL 30 : 433-447.
- Beeston, A.F.L. (1970). The Arabic Language Today, Hutchinson and Co., London.
- Bialystok, E. (1978). 'A theoretical model of second language learning'. LL, 28 : 69-83.
- " (1979). 'Explicit and implicit judgements of L2 grammaticality'. LL, 29 : 81-103.
- " (1981). 'A psycholinguistic framework for exploring the basis of second language proficiency'. Paper presented at the BAAL Seminar, Lancaster, England.
- " (1982). 'On the relationship between knowing and using linguistic forms'. Applied Linguistics 3 : 181-206.
- Bickerton, D. (1971). 'Inherent variability and variable rules'. Foundations of Language, 7 : 457-492.
- " (1973). 'On the nature of a creole continuum'. Language, 49 : 640-649.
- " (1975). Dynamics of a Creole System. Cambridge University Press, London.
- Borland, H.E. (1981). 'Teaching Russian immigrant children at Elwood High School'. Polycom, 29 : 2-6.
- Borras, F.M. and R.F. Christian (1971). Russian Syntax. Oxford University Press, Oxford.
- Brown, R. (1973). A First Language - The Early Stages. MIT Press, Cambridge, Mass.
- Burt, M., H. Dulay and M. Finocchiaro (eds.) (1977). Viewpoints on English as a Second Language. Regents. New York.
- Buteau, M.F. (1970). 'Students' errors and the learning of French as a second language, a pilot study'. IRAL, 8 : 133-145.
- Butterworth, G.A. (1972). A Spanish-speaking Adolescent's Acquisition of English Syntax. MA-TESL Thesis, UCLA.
- Cazden, C.B., H. Cancino, E. Rosansky and J. Schumann (1975). Second Language Acquisition Sequences in Children, Adolescents and Adults. Final Report to National Institute of Education.
- Cedergren, H.J. and D. Sankoff (1974). 'Variable rules : performance as a statistical reflection of competence'. Language, 50 : 333-355.
- Chomsky, N. (1959). 'A review of B.F. Skinner's Verbal Behaviour'. Language, 35 : 26-58.
- " (1965). Aspects of the Theory of Syntax, MIT Press, Cambridge, Mass.

- Clyne, M. (1968). 'Zum Pidgin-Deutsch der Gastarbeiter'. Zeitschrift für Mundartforschung, 35 : 130-139.
- Comrie, B. (1981). Language Universals and Linguistic Typology. Basil Blackwell. Oxford.
- Corder, S.P. (1967). 'The significance of learners' errors'. IRAL, 5 : 161-170.
- " (1971a). 'Idiosyncratic dialects and error analysis'. IRAL, 9 : 147-159.
- " (1971b). 'Describing the language learner's language'. CILT Reports and Papers, 6.
- " (1976). 'The study of Interlanguage'. Proceedings of the 4th International Congress of Applied Linguistics, vol. 2.
- " (1977a). ' "Simple codes" and the source of the second language learner's initial heuristic hypothesis'. SSLA, 1.
- " (1977b). 'Language continua and the Interlanguage hypothesis'. In Corder and Roulet (eds.) : 1-17.
- " (1978). 'Language distance and the magnitude of the language learning task'. SSLA, 2.
- " (1980). 'Formal simplicity and functional simplification in second language acquisition'. in Andersen, R. (ed.) (1980).
- " (1981). 'A role for the mother tongue'. Paper presented at conference on Language Transfer, to be published in Selinker, L. and S. Gass. Language Transfer.
- " and E. Roulet (eds.) (1977). The Notions of Simplification, Interlanguages and Pidgins. Actes du 5 eme Colloque de Linguistique Appliquee de Neuchatel.
- Cummins, J. (1979). 'Cognitive/Academic Language Proficiency, linguistic interdependence, the optimum age question and some other matters', WPB, 19 : 197-205.
- " (1981a). 'Age on arrival and immigrant second language learning in Canada : a reassessment'. Applied Linguistics, 2 : 132-149.
- " (1981b). 'Age on arrival and immigrant second language learning'. Paper presented in Lund at AILA '81.
- Dahl, Ö. (1977). 'Negation in universal grammar'. Gothenburg Papers in Theoretical Linguistics, 33.
- " (1979). 'Typology of sentence negation'. Linguistics, 17 : 79-106.
- d'Anglejan, A. and G.R. Tucker. (1975). 'The acquisition of complex English structures by adult learners'. LL, 25 : 281-293.
- Dato, D. (ed.) (1975). Developmental Psycholinguistics. (Monograph Series on Languages and Linguistics). Georgetown University Press, Washington, D.C.

- De Camp, D. (1968). 'Towards a generative analysis of a post-creole speech continuum'. Paper delivered at the conference on Pidginization and Creolization of Languages. Mona, Jamaica. In Hymes, D. (ed.) (1971) : 349-370.
- " (1971). 'Implicational scales and sociolinguistic linearity'. Linguistics, 73 : 30-43.
- " (1973). 'What do implicational scales imply'. In Bailey and Shuy (eds.) : 141-148.
- de Villiers, J. and P. de Villiers. (1973). 'A cross-sectional study of the acquisition of grammatical morphemes in child speech'. Journal of Psycholinguistic Research, 2 : 267-278.
- Dickerson, L.J. (1975). 'The learner's interlanguage as a system of variable rules'. TESOL Q, 9 : 401-407.
- Dickerson, W. (1976). 'The psycholinguistic unity of language learning and language change'. LL, 26 : 215-231.
- Dickerson, L.J. and W. Dickerson. (1977). 'Interlanguage phonology : current research and future directions'. In Corder and Roulet (eds.) : 18-32.
- Dulay, H.A. and M.K. Burt (1972). 'Goofing : an indicator of children's second language learning strategies'. LL, 22 : 235-252.
- " " (1973). 'Should we teach children syntax?'. LL, 23 : 245-258.
- " " (1974a). 'Natural sequences in child second language acquisition'. LL, 24 : 37-53.
- " " (1974b). 'A new perspective on the creative construction process in child second language acquisition'. LL, 24 : 253-278.
- " " (1974c). 'Errors and strategies in child second language acquisition'. TESOL Q, 8 : 129-136.
- " " (1975). 'A new approach to discovering universals of child second language acquisition'. In Dato (ed.) : 209-233.
- " " (1977). 'Remarks on creativity in second language acquisition'. In Burt, Dulay and Finocchiaro (eds.) : 95-126.
- Dulay, H., M. Burt and S. Krashen (1982). Language Two. Oxford University Press. New York.
- Duong Thanh Binh (1971). A Tagmemic Companion of the Structure of English and Vietnamese Sentences. Mouton, The Hague.
- Duskova, L. (1969). 'On sources of error in foreign language learning'. IRAL, 4 : 11-36.
- Eckman, F.R. (1977). 'Markedness and the contrastive analysis hypothesis'. LL, 27 : 315-330.

- Eckman, F.R. (1981). 'Markedness and degree of difficulty in second language learning'. Paper presented at AILA 1978, Montreal. Published in *Proceedings of 5th Congress*, J. Savard and L. Laforge (eds.) : 115-126.
- Ekstrand, L. (1976). 'Age and length of residence as variables related to the adjustment of migrant children'. In G. Nickel (ed.). Proceedings of the 4th International Congress of Applied Linguistics, vol. 3. Hochschul Verlag, Stuttgart : 179-197.
- Elder, B. (1983). A Longitudinal Study of the Acquisition of Certain Morphemes by an 11-year old Vietnamese Boy. Unpublished Masters Thesis, University of Edinburgh.
- Elliot, D., S. Legum and S.A. Thompson (1969). 'Syntactic variation as linguistic data'. Paper from 5th Regional Meeting of the Chicago Linguistic Society.
- Emeneau, M.B. (1951). Studies in Vietnamese (Annamese) Grammar. University of California Press, Los Angeles.
- Ervin-Tripp, S. (1974). 'Is second language learning like the first?' TESOL Q, 8 : 111-127.
- Fairbanks, K. (1982). 'Variability in Interlanguage'. Unpublished manuscript, ESL Program, University of Minnesota.
- Fasold, R.W. (1970). 'Two models of socially significant linguistic variation'. Language, 46 : 551-563.
- " (1973). 'The concept of 'earlier-later' : more or less correct'. In Bailey and Shuy (eds.) : 183-197.
- Fasold, R.W. and R.W. Shuy (eds.) (1975). Analyzing Variation in Language. Georgetown University Press, Washington, D.C.
- Fathman, A. (1975). 'The relationship between age and second language productive ability'. LL, 25 : 245-266.
- Felix, S. (1978). 'Some differences between first and second language acquisition'. In Waterson and Snow (eds.) : 469-479.
- " (1980). 'Interference, interlanguage and related issues'. In Felix (ed.) : 93-108.
- " (ed.) (1980). Second Language Development : Trends and Issues. Gunter Narr, Tübingen.
- Ferguson, C.A. (1959). 'Diglossia'. Word, 15 : 325-340.
- " (1971). 'Absence of copula and the notion of simplicity : a study of normal speech, baby talk, foreigner talk and pidgins'. In Hymes (ed.) : 141-150.
- Ferguson, C.A. and D. Slobin (eds.) (1973). Studies of Child Language Development. Holt, Rinehart and Winston, New York.
- Fries, C. (1945). Teaching and Learning English as a Foreign Language. University of Michigan Press, Ann Arbor.
- Fuller, J. (1978). An Investigation of Natural and Monitored Difficulty Orders by Non-native Adult Students of English. Unpublished Ph.D. Thesis, Florida State University.

- Garrett, H.E. (1965). Statistics in Psychology and Education. London.
- Gatbonton, E. (1977). 'A patterned phonetic variability in second language speech : a gradual diffusion model'. Canadian Modern Language Review, 34 : 335-348.
- Gillis, M. and R. Weber (1976). 'The emergence of sentence modalities in the English of Japanese-speaking children'. LL, 26 : 77-94.
- Givón, T. (1979). On Understanding Grammar. Academic Press, New York.
- Gingras, R.C. (ed.) (1978). Second Language Acquisition and Foreign Language Teaching, Centre for Applied Linguistics, Washington, D.C.
- Guttman, L. (1944). 'A basis for scaling qualitative data'. American Sociological Review, 9 : 139-150.
- Hakuta, K. (1974). 'A preliminary report on the development of grammatical morphemes in a Japanese girl learning English as a second language'. WPB, 3 : 18-43.
- " (1976). 'A case study of a Japanese child learning English as a second language'. LL, 26 : 321-352.
- Hall, R. (1966). Pidgin and Creole Languages. Cornell University Press, Ithaca.
- Halliday, M.A.K. and R. Hasan (1976). Cohesion in English. Longmans London.
- Hanania, E. and H. Gradman (1977). 'Acquisition of English structures : a case study of an adult native speaker of Arabic in an English-speaking environment'. LL, 27 : 75-92.
- Hansen-Bede, L. (1975). 'A child's creation of a second language'. WPB, 6 : 103-123.
- Hart, B.K. and J. Schachter (1976). 'Research in Interlanguage : syntax'. Paper presented at TESOL Convention. In Fanselow, J. and R. Crymes (eds.) On TESOL '76. TESOL, Washington, D.C. (1977).
- Hatch, E. (1974). 'Second language learning - universals?'. WPB, 3 : 1-18.
- " (ed.) (1978). Second Language Acquisition : A Reader. Newbury House, Rowley, Mass.
- Haugen, E. (19⁵³~~68~~). The Norwegian Language in America, University of Pennsylvania Press, Philadelphia.
- Henning, C. (ed.) (1977). Proceeding of the Los Angeles Second Language Research Forum. University of California, Los Angeles.
- Hernandez-Chavez, E. (1972). 'Early code separation in the second language speech of Spanish-speaking children'. Paper presented at the Stanford Child Language Research Forum, Stanford University, Stanford.
- Huang, J. and E. Hatch. (1978). 'A Chinese child's acquisition of English'. In Hatch (ed.) (1978) : 119-131.

- Huebner, T.G. (1979). 'Order of acquisition vs. dynamic paradigm : a comparison of methods in Interlanguage research'. TESOL Q, 13 : 21-28.
- Hyltenstam, K. (1977). 'Implicational patterns in Interlanguage syntax variation'. LL, 27 : 383-411.
- " (1978a). 'A framework for the study of Interlanguage continua'. Working Papers, 16 : 65-86. Dept of Linguistics, Lund University.
- " (1978b). 'Variation in Interlanguage syntax'. Working Papers, 18, Dept of Linguistics, Lund University.
- " (1978c). Progress in Immigrant Swedish Syntax : A Variability Analysis. Doctoral Dissertation, University of Lund.
- " (1981). 'The use of typological markedness conditions as predictors in second language acquisition : the case of pronominal copies in relative clauses'. Paper presented at European-Nth. American Workshop on Cross-Linguistic Second Language Acquisition Research, Los Angeles.
- " (1982). 'On descriptive adequacy and psychological plausibility : a reply to Jordens'. LL, 32 : 167-173.
- Hymes, D. (ed.) (1971). Pidginization and Creolization of Languages. Cambridge University Press, Cambridge.
- Jordens, P. (1977). 'Rules, grammatical intuitions and strategies in foreign language learning'. ISB, 2.
- " (1982). 'Interlanguage research : interpretation or explanation'. LL, 30 : 195-207.
- Jordens, P. and Kellerman, E. (1978). 'Investigations into the "transfer strategy" '. ISB, 3.
- Kauffman, D. (1973). 'Negation in English and Spanish'. In Nash (ed.) : 156-175.
- Kellerman, E. (1977). 'Towards a characterisation of the strategy of transfer in second language learning'. ISB, 2 : 58-146.
- " (1978a). 'Giving learners a break : native language intuitions as a source of predictions about transferability'. WPB, 15 : 59-92.
- " (1978b). 'Transfer and non-transfer : where are we now?'. Paper presented at the Colloque de Linguistique Appliquee de Berne, June 1978.
- Kessler, C. (1969). Noun Plural Realizations in Black English. Unpublished paper. Georgetown University School of Languages and Linguistics, Washington, D.C.
- Kessler, C. and I. Idar (1977). 'The acquisition of English syntactic structures by a Vietnamese child'. In Henning (ed.) : 295-307.

- Klein, W. and N. Dittmar (1978). Developing Grammars. Springer-Verlag, Heidelberg.
- Klima, E.S. and U. Bellugi (1966). 'Syntactic regularities in the speech of children'. In Lyons, J. and Wales, R.J. (eds.) Psycholinguistic Papers : 183-208.
- Kleinman, H. (1978). 'The strategy of avoidance in adult second language acquisition'. In Ritchie (ed.) : 157-174.
- Krashen, S. (1975). 'A model of second language performance'. Paper presented at the winter meeting of the Linguistic Society of America, San Francisco.
- " (1976). 'Formal and informal linguistic environments in language learning and language acquisition'. TESOL Q 10, 157-168.
- " (1977a). 'Some issues relating to the Monitor Model'. In Brown, H.D., C. Yorio and R. Crymes (eds.) On TESOL '77. TESOL, Washington, D.C. : 144-158.
- " (1977b). 'The Monitor Model for adult second language performance'. In Burt, Dulay and Finocchiaro (eds.) : 152-161.
- " (1978). 'Individual Variation in the use of the Monitor'. In Ritchie (ed.) : 175-183.
- " (1980). 'Attitude and aptitude in relation to second language acquisition and learning'. In K. Diller (ed.) Individual Differences and Universals in Language Learning Aptitude. Newbury House, Rowley Mass.
- " (1981). Second Language Acquisition and Second Language Learning.
- Krashen, S., J. Butler, R. Birnbaum, J. Robertson (1978). 'Two studies in language acquisition and language learning'. ITL : Review of Applied Linguistics, 39-40 : 73-92.
- Krashen, S. and L. Galloway (1978). 'The neurological correlates of language acquisition'. SPEAQ Journal, 2 : 21-35.
- Krashen, S., N. Houck, P. Giunchi, S. Bode, R. Birnbaum, and G. Strei (1977). 'Difficulty order for grammatical morphemes for adult second language performers using free speech'. TESOL Q, 11 : 338-341.
- Krashen, S., M. Long and R. Scarcella (1979). 'Age, rate of acquisition and eventual attainment in second language acquisition'. TESOL Q, 13 : 573-582.
- Krashen, S., V. Sferlazza, L. Feldman and A. Fathman (1976). 'Adult performance on the SLOPE test : more evidence for a natural sequence in adult second language acquisition'. LL, 26 : 145-151.
- Labov, W. (1963). 'The social motivation of a sound change'. Word, 19 : 273-309.
- " (1966). The Social Stratification of English in New York City. Center for Applied Linguistics, Washington, D.C.

- Labov, W. (1969). 'Contraction, deletion and inherent variability of the English copula'. Language, 45 : 715-762.
- " (1972a). Sociolinguistic Patterns, University of Pennsylvania Press, Philadelphia.
- " (1972b). Language in the Inner City : Studies in the Black English Vernacular. University of Pennsylvania Press, Philadelphia.
- Lado, R. (1957). Linguistics Across Cultures. University of Michigan Press, Ann Arbor.
- " (1978). 'Language and thought : effect of translation versus interpretation'. Paper presented at TESOL '78 in Mexico City.
- Larsen-Freeman, D. (1975). 'The acquisition of grammatical morphemes by adult ESL learners'. TESOL Q, 9 : 409-419.
- Lawler, J. and L. Selinker (1971). 'On paradoxes, rules and research in second language learning'. LL, 21 : 27-43.
- Lehmann, W.P. and Y. Malkiel (1968). Directions for Historical Linguistics. University of Texas Press, Austin.
- Leisching, G. (1982). An Analysis of the Use of the Definite Article in the Written Work of Thai learners of English. Unpublished M.Sc. Paper, Department of Linguistics, University of Edinburgh.
- LoCoco, V. (1975). 'An analysis of Spanish and German learners' errors'. WPB, 7 : 96-124.
- Lyons, J. (1968). 'Towards a 'notional' theory of the 'parts of speech''. Journal of Linguistics 212 : 209-236.
- " (1977). Semantics : 2, Cambridge University Press, Cambridge.
- Madden, C., N. Bailey, M. Eisenstein and L. Anderson (1978). 'Beyond statistics in second language acquisition research', in Ritchie (ed.) : 109-125.
- Makino, T. (1979). 'English morpheme acquisition order of Japanese secondary school students'. Unpublished Doctoral Dissertation, University of New Mexico.
- Milon, J. (1974). 'The development of negation in English by a second language learner'. TESOL Q, 8 : 137-143.
- Naiman, N. (1974). 'The use of elicited imitation in second language acquisition research'. WPB, 2 : 1-37.
- Nash, R. (1973). Readings in Spanish-English Contrastive Linguistics. Inter American University Press, Hato Rey, Puerto Rico.
- Natalicio, D. and L. Natalicio (1971). 'A comparative study of English pluralization by native and non-native English speakers'. Child Development, 42 : 1302-1306.
- Nemser, W. (1971). 'Approximative systems of foreign language learners'. IRAL, 9 : 115-123.

- Newmark, L. (1966). 'How not to interfere with language learning'. International Review of American Linguistics, 40 : 77-83.
- Newmark, L. and D. Reibel (1968). 'Necessity and sufficiency in language learning'. IRAL, 6.
- Nie, N., C.H. Hull, J. Jenkins, K. Steinbrenner and D. Bent (1975). Statistical Package for the Social Sciences. Second Edition. McGraw Hill, New York.
- Nielson, T. (1974). 'Early stages in the Non-native Acquisition of English Syntax : A study of Three Children from Zaire, Venezuela and Saudi Arabia'. Unpublished Ph.D. Dissertation, Indiana University.
- Oller, J.W. (1972). 'Cloze tests of second language proficiency and what they measure'. LL, 23 : 105-118.
- Oyama, S. (1976). 'A sensitive period for the acquisition of a non-native phonological system'. Journal of Psycholinguistic Research, 5 : 261-285.
- Palmer, H.E. (1917). The Principles of Language Study. Oxford University Press, Oxford.
- Patkowski, M. (1980). 'The sensitive period for the acquisition of syntax in a second language'. LL, 30 : 449-472.
- Penfield, W. and L. Roberts (1959). Speech and Brain Mechanisms. Princeton University Press, Princeton.
- Pienemann, M. (1980). 'The second language acquisition of immigrant children'. In Felix (ed.) : 41-56.
- Platt, J.T. (1976). 'Implicational scaling and its pedagogical implications'. Working Papers in Language and Linguistics, 4 : 46-60.
- " (1977a). 'English past tense acquisition by Singaporeans - Implicational Scaling versus group averages of marked forms'. ITL, 38 : 63-83.
- " (1977b). 'The 'creoloid' as a special type of interlanguage'. ISB, 2 : 22-38.
- " (1979). 'Variation and implicational relationships : copula realization in Singapore English'. General Linguistics, 19 : 1-14.
- Platt, J. and H. Weber (1980). English in Singapore and Malaysia, Oxford University Press, Kuala Lumpur.
- Porter, R. (1977). 'A cross-sectional study of morpheme acquisition in first language learners'. LL, 27 : 47-62.
- Quirk, R., S. Greenbaum, G. Leech and J. Svartvik (1972). A Grammar of Contemporary English. Longmans, London.
- Ramirez, A.G. and R.L. Politzer (1978). 'Comprehension and production in English as a second language by elementary school children and adolescents'. In Hatch (ed.) : 313-332.
- Ramsey, M.M. (1965). A Textbook of Modern Spanish. London.

- Rashid, A.F. (1980). A Cross-sectional Investigation in the Acquisition of the Verb 'to be' as a copula'. Unpublished M.Sc. Paper, Department of Linguistics, University of Edinburgh.
- Rave#m, R. (1968). 'Language acquisition in a second language environment'. IRAL, 6 : 175-185.
- " (1974). Second Language Acquisition : A Study of two Norwegian Children's Acquisition of English Syntax in a Naturalistic Setting. Ph.D. Dissertation, University of Essex.
- " (1975). 'The development of WH- questions in first and second language learners'. In Schumann, J. and N. Stenson (eds.) New Frontiers in Second Language Learning. Newbury House, Rowley, Mass.
- Ritchie, W. (ed.) (1978). Second Language Acquisition Research : Issues and Implications. Academic Press, New York.
- Rosansky, E. (1976). 'Methods and morphemes in second language acquisition'. LL, 26 : 409-425.
- Rosenbaum, P. (1967). The Grammar of English Predicate Complement Constructions. MIT Press, Cambridge, Mass.
- Rousseau, P. and D. Sankoff (1978). 'Advances in variable rule methodology'. In Sankoff (ed.) : 57-68.
- Sajavaara, K. (1978). 'The monitor model and monitoring in foreign language speech communication'. In Gingras (ed.) : 51-67.
- Samarin, W.J. (1971). 'Salient and substantive pidginization'. In Hymes (ed.) : 117-140.
- Sampson, G.P. (1978). 'A model for second language learning'. Canadian Modern Language Review, 34 : 443-454.
- Sankoff, D. (ed.) (1978). Linguistic Variation : Models and Method. Academic Press, New York.
- Schachter, J. (1974). 'An error in error analysis'. LL, 24 : 205-214.
- Schmidt, R.W. (1977). 'Sociolinguistic variation and language transfer in phonology'. WPB, 12 : 79-95.
- Schumann, J. (1975). Second Language Acquisition : The Pidginization Hypothesis. Unpublished Doctoral Thesis, Harvard University Graduate School of Education.
- " (1976). 'Second language acquisition : the pidginization hypothesis'. LL, 26 : 391-408.
- " (1978a). 'The relationship of pidginization, creolization and decreolization to second language acquisition'. LL, 28 : 367-379.
- " (1978b). 'The acquisition of English negation by speakers of Spanish'. In Andersen (ed.) (1978).

- Selinker, L. (1969). 'Language Transfer'. General Linguistics, 9 : 67-92.
- " (1972). 'Interlanguage'. IRAL, 10 : 209-231.
- Selinker, L. and J. Lamendella (1981). 'Updating the Interlanguage hypothesis'. SSLA, 3 :
- Simukoko, Y.T. (1981). Some Aspects of the English of Bantu Speakers in Urban Primary Schools in Zambia. Unpublished Ph.D. Thesis, University of Edinburgh.
- Skinner, B.F. (1957). Verbal Behaviour. Appleton-Century-Croft, New York.
- Slobin, D. and C. Welsh (1973). 'Elicited imitation as a research tool in developmental psycholinguistics'. In Ferguson and Slobin (eds.) : 485-497.
- Snow, C. and M. Hoefnagel-Hohle (1978). 'The critical period for language acquisition : evidence from second language learning'. Child Development, 49 : 1114-1128.
- Stauble, A-M. (1977). 'An exploratory analogy between decreolization and second language acquisition : negation'. In Henning (ed.) : 246-261.
- Stockwell, R., J.D. Bowen and J. Martin (1965). The Grammatical Structures of English and Spanish. Chicago.
- Stolz, W. and G. Bills (1968). 'An investigation of the standard-non-standard dimension of Central Texan English'. Final Report to U.S. Office of Economic Opportunity. Child Development Evaluation and Research Center, University of Texas, Austin.
- Tarone, E. (1983). 'On the variability of Interlanguage systems'. Applied Linguistics, 4 : 142-163.
- Tarone, E., U. Frauenfelder and L. Selinker (1976). 'Systematicity/variability and stability/instability in Interlanguage systems'. Papers in Second Language Acquisition, H.D. Brown (ed.), LL Special Issue No. 4 : 93-133.
- Taylor, B.P. (1975). 'The use of overgeneralisation and transfer learning strategies by elementary and intermediate students of ESL'. LL, 25 : 73-88.
- Thompson, L.C. (1965). A Vietnamese Grammar. University of Washington Press, Seattle.
- Torgerson, W. (1957). Theory and Methods of Scaling. Wiley, New York.
- Traugott, E. (1973). 'Some thoughts on natural syntactic processes'. In Bailey and Shuy (eds.) 313-322.
- " (1977). 'Natural Semantax : its role in the study of second language acquisition'. In Corder and Roulet (eds.) : 132-162.
- Valdman, A., and J. Phillips (1977). 'Pidginization, creolization and the elaboration of learner systems'. In Corder, S.P. and E. Roulet (eds.) Theoretical Models in Applied Linguistics. Indiana University Linguistics Club, Bloomington. Also in SSLA, 1 : 21-40.

- Voegelin, C.F., and F.M. Voegelin (1964). 'Languages of the World : African Fascicle One'. Anthropological Linguistics, 6 : 1-339.
- " (1966). 'Languages of the World : Indo-Pacific Fascicle Eight'. Anthropological Linguistics, 8/3 : 1-53.
- Vuong Gia Thuy (1970). Vietnamese in a Nutshell, Newark.
- Walberg, H., K. Hase and S. Rasher (1978). 'English acquisition as a function of experience rather than age'. TESOL Q 12 : 427-437.
- War, J. (forthcoming). Acquisition of Features of English Syntax by Indian Children in English-Medium and non-English medium schools. Ph.D. Thesis, University of Edinburgh.
- Waterson, N. and C. Snow (eds.) (1978). The Development of Communication. Wiley, Chichester.
- Weinreich, U. (1953). Languages in Contact : Findings and Problems. Mouton, The Hague.
- Weinreich, U., W. Labov and M.I. Herzog (1968). 'Empirical foundations for a theory of language change'. In Lehmann and Malkiel (eds.) : 95-195.
- White, L. (1977). 'Error analysis and error correction in adult learners of English as a second language'. WPB, 13 : 42-58.
- Wilkinson, R.J. (1982). Implicational Patterns in Definite Article Acquisition. Unpublished M.Sc. paper, Department of Linguistics, University of Edinburgh.
- Wode, H. (1976). 'Developmental sequences in naturalistic L2 acquisition'. WPB, 11 : 1-31.
- " (1977). 'Developmental principles in naturalistic L2 acquisition'. In G. Drachman (ed.) Akten der 3. Salzburger-Jahrestagung fur Linguistik, Salzburg, pp. 207-220.
- " (1978). 'Free vs. bound forms in three types of language acquisition'. ISB, 3 : 6-22.
- " (1979). 'Operating principles and 'universals' in L1, L2, and FLT'. IRAL, 17 : 217-231.
- " (1981). 'Language acquisition, pidgins and creoles'. SSLA, 3.
- " (1981a). Learning a Second Language : An Integrated View of Language Acquisition. Gunter Narr Verlag, Tübingen.
- Wode, H., J. Bahns, H. Bedey and W. Frank (1978). 'Developmental Sequence : an alternative approach to morpheme order'. LL, 28 : 175-185.

- Wolfram, W. (1969). A Sociolinguistic Description of Detroit Negro Speech. Center for Applied Linguistics, Washington, D.C.
- " (1973). 'On what basis variable rules?' In Bailey and Shuy (eds.) : 1-12.
- Wolfram, W. and R. Fasold (1974). The Study of Social Dialects in American English. Englewood Cliffs.
- Yamada, J. and N. Matsuura (1982). 'The use of the English article among Japanese students'. RELJ Journal. 13 : 50-63.
- Zobl, H. (1980a). 'Developmental and transfer errors : their common bases and (possibly) differential effects on subsequent learning'. TESOL Q, 14 : 469-479.
- " (1980b). 'The formal and developmental selectivity of L1 influence on L2 acquisition'. LL, 30 : 43-57.
- " (1980c). 'Contact-induced language change, learner-language and the potentials of a modified CA'. Paper presented at the Los Angeles Second Language Research Forum.
- " (1982). 'A direction for Contrastive Analysis: the comparative study of developmental sequences'. TESOL Q, 16 : 169-183.

Addenda to Bibliography

- Chafe, W.E. (1976). 'Givenness, contrastiveness, definiteness, subjects, topics and point of view', in Li, C.N. (ed.)
- Dulay, H.E. and M.K. Burt (1980) 'On acquisition orders', in Felix, S. (ed.): 265-328.
- El-Kary, A. (1977). A longitudinal study of the learning of the definite article. Unpublished Masters paper, University of Edinburgh.
- Kim, J-O and F.J. Kohout (1975) 'Analysis of variance and covariance: subprograms ANOVA and ONEWAY', in Nie et al. (eds.): 398-433.
- Labov, W.; C. Robins, P. Cohen and J. Lewis (1975) 'Classroom correction tests', in J. Dillard (ed.) Perspectives on Black English, Mouton, The Hague, pp. 313-330.
- Li, C.N. (ed.) Subject and Topic, Academic Press, New York.
- Li, C.N. and S.A. Thompson (1976) 'Subject and Topic: a new typology of language', in Li, C.N. (ed.): 457-489.
- Nidue, J. (1979) The preliminary analysis of the use of the definite article 'the' and the use of the three aspects of the verb phrase. Unpublished masters paper, University of Edinburgh.