SOCIOLINGUISTICS OF PHONOLOGICAL INTERFERENCE IN YORUBA - ENGLISH

by

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SUMMARY

The research seeks to demonstrate not only that variation exists in L2 speech but also that such variation is explainable in terms of describable linguistic and nonlinguistic variables. This contradicts the assumption, implicit in most existing contrastive analyses, that L2 speech of speakers with the same L1 background is homogenous and monolectal. In the present work, predictions of L1 interference based on a contrastive analysis of the phonological systems of English and Yoruba were verified from an analysis of actual English speech samples of Yoruba immigrants in England. Using a quantitative model analysis, frequencies of occurrence of target and nontarget language forms were then interpreted in relation to certain linguistic and extralinguistic problems.

In the first, while the predictive-power rating of the contrastive analysis (on the Transformational Generative model) was very high the informants' L2 speech was not homogenous either at the intra- or inter-personal levels. Three types of phonological rules were identified with respect to rule variability. Finally, it was observed that the so called dynamic paradigm proved, in practice, an extension of the quantitative method.

In the second, though none of the independent variables (sex, education, phonetic training and length of sojourn in England) reached significance in its effects on the informants' speech at one percent at least one was very close. Since the present work was limited only to the investigation of segmental phonology, it is suggested that similar investigations of the other linguistic levels are needed to fully evaluate language teaching programmes such as the 'Year-abroad' and 'Speech-training' schemes run for second- and foreign-language students in many educational systems world-wide.

R. O. ATOYE.

CHAPTER ONE

SOME CURRENT ISSUES IN CONTRASTIVE LINGUISTICS

1.1 Introduction

1.2 Trends in Variability Study

1.3 Validity of Contrastive Analysis

1.4 Generative Phonology in Contrastive Linguistics

1.5 The Dynamic vs Quantitative Paradigm

1.1 INTRODUCTION

A review of existing work has become something of an axiom as an introductory chapter to a thesis of this kind. It is however the view of the present writer that the value of existing works resides in their contribution to the formulation or refinement of general theories rather than in the provision of erratic facts about their chosen subjects. Because of this belief the conventional review of sometimes disparate existing work is dispensed with in the present work. Attention is focused instead on the main trends in variability studies and contrastive linguistics since a clear insight into these is necessary if the reader is to be enabled to put the present work in a proper perspective. Each of the existing works discussed in what amounts to a literature review under 'Trends in Variability Study' is, therefore, chosen for its specific contribution to the development of linguistic thought in that area. The other issues discussed, namely the validity of predictive contrastive analysis, the dynamic versus the quantitative paradigms in linguistic investigation and the contribution of generative phonology to contrastive study and interference, are all central to the present investigation since it is in relation to them that the data obtained in the research were analysed and interpreted. It will be observed that instead of merely stating quantitative facts about nontarget language frequencies, such facts were employed in the discussion and clarification of certain important current issues raised in this introductory chapter. This is because of the belief, hinted at earlier on, that the particular is of little value except in its contribution to the general. As Chomsky (1966)

explains, the linguist is concerned with explanation but not merely with stating facts: "He tries to construct a grammar which explains particular data on the basis of general principles that govern the language in question. He is interested in explaining these general principles themselves by showing how they are derived from still more general and abstract postulates drawn from universal grammar". He would have to find a way to account, as Chomsky further points out, for the "universal grammar on the basis of still more general principles of the human mental structure". Both the structure and content of the present chapter, no less than of the whole thesis, is governed by the commitment to explain principles. This commitment, in my view, is ample justification for the unconventional structure of the present chapter.

1.2 TRENDS IN VARIABILITY STUDY

1.2.1. Introduction

Variability study is concerned with the analysis of variation in language use. Such variation may occur across social and geographical groups; Labov (1966), Trudgill (1973, 1974, 1978). It may also occur between individuals within the same language, social or geographical grouping. A third type of variation occurs in the speech of every speaker of any language from time to time and may be governed by linguistic or extra-linguistic factors such as topic, listener and role; Ervin-Tripp (1964).

A different kind of variation exists between a native speaker's use of his language and a second-language learner's use of that same language. The attention of contrastive linguists is focused on this last kind because they believe that such differences as exist between a native speaker's and second-language speaker's use of any language is, to a great extent, caused by the differences between the systems of the second-language speaker's own first-language and the second language. It should be interesting to examine whether or not interlingual influence would exist in cases of simultaneous bilingualism in both its natural and artificial forms; (see Malherbe, 1969). Because of certain important differences between monolongual and bilingual variability the two types are discussed separately in the following paragraphs.

1.2.2 Monolingual Variability

Probably the most popular aspect of linguistic investigation today is the study of the variable use of the systems of single languages by members of linguistic communities which are normally regarded as linguistically homogenous. Outlining the importance of variation in language use, Haugen (1970), complains about the monolectal approach of structural linguistics and rejects sociolinguistics as a fit substitute because it compromises the issue by identifying language variation with social factors. He, therefore, suggests Dialinguistics as a term which more accurately describes the multi-lectal reality of language in actual usage. Two major aspects have attracted research in this part of linguistics. Investigation into the first aspect focuses on whether, or not, variation in monolingual language use is patterned; that is, systematic or otherwise - what one might call monolingual dia-linguistics. The second aspect of the investigation strives to establish whether, or not, there is correlation between intrapersonal variation and extralingual social factors. In both cases the results of many investigations in both areas, as Gatbonton (1975), points out, have proved positive.

In the case of research into whether or not there is social patterning in intrapersonal variation, that is apart from linguistic structural patterning, it has been shown that a single speaker selects one form from a varied repertoire of codes, or isolects, which he possesses. Ervin-Tripp (1964), for example, points out that choice of code by each speaker depends on the when, where and 'to whom' of speech. Fishman (1968) argues that in bilingual speech, and this, surely, is true of monolingual speech, choice of code is determined by linguistically internal and external factors irrespective of mastery or proficiency level. He says, "Proper usage dictates that only one

of the theoretically co-available languages or varieties will be chosen by particular classes of interlocutors on particular kinds of occasions to discuss particular kinds of topics". It is significant that Fishman here equates the choice of language in bilingual situations with choice of variety in monolingual ones. Not surprisingly, therefore, the term Diglossia, originally employed to describe the functional separation of distinct languages in bilingual societies by Ferguson (1959), now applies to similar functional specialisation of codes or varieties in monolingual societies; Gumperz (1964, 1966). It becomes necessary, therefore, for Fishman (1968a) to make the distinction between societies with and without bilingualism and diglossia as follows:-

RELATIONSHIPS BETWEEN BILINGUALISM AND DIGLOSSIA

	DIGLOSSIA +	DIGLOSSIA -
BILINGUALISM +	1. Both Bilingualism and Diglossia	2. Bilingualism without Diglossia
BILINGUALISM -	3. Diglossia without Bilingualism	4. Neither Bilingualism nor Diglossia

Fishman (ibid) finds examples approximating these types in the following places:-

Type 1: Paraguay
Type 2: Canada
Type 3: India
Type 4: Nil

As Fishman points out, the conditions described in these bilingual and diglossic situations are not stable and examples which fit one type at one time may subsequently become inappropriate (see Kloss, 1969).

In the purely sociolinguistic aspect, attention is focused on the relationship between variation in language use and social variables. For example, investigations are carried out about whether or not the type of dialectal variant that a person uses is an index of his social position. Such investigations, therefore, attempt to examine possible correlation between linguistic variation, on the one hand, and social variables such as sex, age, education, geographical location, attitudes and economic background, to mention a few, on the other hand. Research in this area of linguistics was popularised by William Labov in the United States and has become still more popular apparently because it removes the subject from the abstract world of academics and fixes it firmly in the human world (c.f., Labov, 1966, 1972; Wolfram, 1969; Shuy, et al., 1967 and Trudgill, 1974, 1978).

1.2.3. Bilingual Variability

Research in bilingual variability focuses on the differences between L1 and L2 usage of particular languages. The deviation of L2 from L1 usage has been described for many languages at the phonological and syntactic levels. Mackey (1962), for example, reports that some Gaelic speakers of English have uttered 'I have it read' for 'I have read it', and attributes this difference to Gaelic interference. Weinreich (1953) cites many examples of potential and actual differences between L1 and L2 usage in quite a number of languages and popularised the theory that such difference is caused by the influence of the speaker's mother tongue. Most of the works in contrastive

analysis which derive from this concept are, however, hypothetical, intuitive or unsystematic (c.f., Stockwell, 1965 and Afolayan, 1977).

The phenomenon known as code mixing, or code switching, has also attracted the attention of certain linguists, as has borrowing, but, again, most of the works rarely go beyond mere theory and the linguists' intuition. Nevertheless, some of them are important if only for the theoretical contribution they are capable of making. Weinreich (1953; p. 53) examines the linguistic and psychological causes of borrowing from an L2 into an L1. These include loose structural integration of lexical items in the borrowing language, designative inadequacy of lexical items in coping with new ideas borrowed into the primary culture, favourable social value attached to the L2, mere oversight on the part of the speaker and taboo of certain words in the L1 which causes the speaker to resort to their L2 equivalents to which similar taboo does not attach. Sackey (1975) suggests that economic, social and political advantages of the L2 encourage lexical borrowing from the speakers of the L1. Salami (1969) discussing lexical borrowing from English into Yoruba, makes an interesting distinction between "eye-loans" and "ear-loans" and explains that the possibility of two sources is reflected in the usual presence of alternative forms of a borrowed word. Clyne (1967) observes the part played by certain words in "triggering" the transfer of others, while Bell (1976, p. 142) distinguishes between anticipatory and consequential switching. As Bell (ibid) explains, anticipatory switching causes the speaker to use some other words in the other language prior to the actual word he wishes to borrow.in that language. In consequential switching such other words occur after the "switch" word. Hasselmo (1969) discusses the important issue of the problems that arise in attempting to measure interference. A more important issue which has been raised is probably due

to the influence of Generative Grammar on interference studies. It concerns the relevance of structural cohesion (Weinreich, 1953, p. 53), as well as semantic factors in borrowing and code switching. In this connection Moravcsik (1978, p. 102) agrees with Hyman (1975a) that structural and semantic constraints operate on interlingual borrowing. The sentences presented by Oke (1975) suggest the existence of similar constraints on code mixing and code switching. As mentioned earlier on, the great shortcoming of research into the differences between the speech of L1 and L2 users of language is that most of the works hardly merit the name research, being largely based on theoretical assumptions, the linguist's intuition or unsystematic evidence.

1.2.4 L2 Influence on L1

The study of interlingual influence is usually confined to the interference of the system of an L1 with that of an L2. This is understandable. Since it is assumed that it is proficiency or competence in L2 that suffers inhibition as a result of L1 interference contrastive analysis is concerned with finding ways of reducing L1 interference and not L2 interference. The system of the L1 is relevant, therefore, only to the extent that it affects the achievement of that goal. Secondly, it could be reasonably assumed that, since the bilingual has complete native-speaker competence in his L1, it would be illogical to talk of the influence of the L2 on the L1. Lastly, the influence of the L1 on the system of the L2 is certainly greater both in bulk and significance than that of the L2 on the L1. Yet the question about the influence of the L2 on the L1 has been raised long ago. Haugen (1949) refers to an assertion (by Windisch, 1897) to the effect that in a

situation of language contact it is the learner's own language that is influenced and not the language he is learning. This admittedly ambiguous opinion directs attention, at least, to the possibility of an L2 influencing an L1. A few important works that have appeared on this aspect are also largely intuitive or unsystematic. For example, Badia-Margarit (1964) condemns Spanish Catalans for their inability to speak the Catalan L1 without resorting to Spanish words. No examples of such influence were actually given. Ansre (1971) discusses the influence of English on the indigenous languages in former Anglophone West Africa. Adekunle (1976) laments (unnecessarily, though, from the non-deficit view of variability; see Fishman, 1968c and Dittmar, 1970) the inability of many Nigerians to use their own mother tongue without visible influence of the English language. He complains: "Almost none of them can write or read their native languages or any other African language. Some cannot even express themselves clearly orally in their mother tongue". It is significant that the writer singles out university students for being the most guilty of these charges. Haugen (1969, p. 120) highlights the importance of the influence of the system of the L2 on that of the L1. Oke (1975), using actual live examples, demonstrates the syntactic influence of English, an L2, on Yoruba, and discusses the problems raised by the existence of such a phenomenon for synchronic linguistics. His examples also demonstrate that Yoruba imposes syntactic constraints on code mixing in Yoruba and English. The following are adapted from his examples:

1. O dara (It is nice)
2. O dara pupo (It is very nice)
3. O nice
4. O wa nice
5. O wa very nice
*6. O very nice
*7. It is dara
*8. It O dara
*9. It is very dara
*10. It wa very nice

Sentences one to five are all attested and observe well-formedness conditions in Yoruba speech. Sentences one and two are acceptable in formal speech while three to five are acceptable in informal speech. None of sentences six to ten is acceptable in either situation. Many points could be proved from the simple data but we shall limit our observations here to those strictly relevant to the point under discussion. For example, the question of degrees of acceptability is not discussed. Now, sentences four and five each contain the Yoruba equivalent of English 'BE' (wà), which is not, as Oke points out, even remotely employed before attributive verbs or epithets in Yoruba. The reason for their occurrence in the mixed sentences is the presence of the English words in those sentences. Occurrences of (wá) in similar sentences without the English words would be regarded as ungrammatical as evidenced in:-

*11. O wa dara
*12. O wa dara pupọ

The use of English words therefore necessitates the syntactic modification in sentences four and five. Secondly, a comparison of sentence three with sentence six indicates that sentence three is acceptable (without wà) but sentence six is not. Syntactic restriction is therefore proved since in sentence three the use of (wà) is optional (c.f., sentence four as an alternative), whereas in sentences with an intensifier, the use is obligatory (c.f. sentences five and six). A lot of research is surely needed on constraints

- syntactic or otherwise - in interlingual borrowing and code-mixing. It is in this light that the works of Moravcsik (ibid) and Hyman (ibid) are of great value in the investigation of interlingual influence at these levels.

1.2.5. L2 Variability and Social Significance

Unlike in monolingual variability, little has been done to investigate the correlation between L2 variability and social variables. It appears that linguists have worked with the assumption that variability in L2 can only be studied in relation to L1-influenced deviation from the standard form of the L2. Such assumption, however, ignores variation, both intra-personal and interpersonal, in L2 usage, and the various other factors that often affect such variation. The neglect of extralinguistic factors in bilingual variation has been warned against by many authors who realised the danger of overt overgeneralisation that such neglect can encourage. Clyne (1967, p. 142), for example, warns that instead of scholars arguing on the positive and negative nature of interference they would do better to investigate the "social and sociological variables"which bring about or accompany bilingualism. Weinreich (1953, p. 4) made a clear case for it in his pioneering work: "Purely linguistic studies of languages in contact must be co-ordinated with extra-linguistic studies on bilingualism and related phenomena . . . . Similarly, the linguist who makes theories about language influence but neglects to account for the socio-cultural setting of the language contact leaves his study suspended, as it were, in mid-air."(1) Few of the works in bilingual interference seem however to have observed these warnings, the outstanding ones being Haugen (1969), Fishman and Herasimchuk (1969) Labov

(1969), Taylor et al., (1971) and more recently, Gatbontán (1975). Haugen (1969) suggests that the use of English by Norwegians in the U.S.A. is correlated with social variables such as education and length of stay. Fishman and Herasimchuk (1969), on the other hand, attempt to investigate the relationship between proficiency in English among Spanish L1 speakers in Greater New York City and the social variables of age, education, place of birth and sex. They discovered that education, which, in their research, refers to place of education, was the most important demographic variable affecting the English of Spanish L1 Puerto-Ricans in New York City area and that the cumulative effect of all the variables investigated also proved important. Taylor et al., (1971) investigated the significance of certain psychological variables, including tolerance to anxiety, intelligence, involvement in emotional experiences and perception of emotional expression. Their research was designed to test the ability to learn a second language rather than acquired competence in it and the variables were psychological rather than social or demographic, but it shows one other dimension in which research into L2 variability can be conducted for correlation patterns with extra-linguistic factors. Finally, Gatbonton (1975) investigated variability in the use of English by French L1 speakers in Montreal and found that a speaker's attitude towards English, as well as his readiness to identify himself with the French people, bore significant correlation with his performance. The writer also confirmed that her respondents' performance proved useful in grading them into competence levels in the L2. In conclusion then, one observes the tendency for positive results in all of these researches. The research by Fishman and Herasimchuk however touches on a very important point, namely, that the relationship of any of the variables as compared to

other variables could be relative and that cumulative correlation may differ significantly from the correlation indicated for each variable. Gatbonton (ibid), on the other hand, makes the important point that in the speech of an individual "one finds the pronunciation of a great many sounds to be extremely varied". She notes, for example, that "certain forms which may be described as 'well-formed' are used alternately with forms that may be called 'errors', 'goofs' or 'interferences'" (p. 2). This is an important point because it belies the impression often created in contrastive studies, that interference in a particular person's speech is either present or absent in a particular segment or syntactic form. The implications of this observation for the bilingual's behavioural pattern as presented in Contrastive Linguistics will be discussed when the data in this research have been considered. As we shall be showing in the next section, the functional advantage of a quantitative statistical method in measuring interference is stressed by this observation and must convince any investigator into interlingual influence that any such investigation not based on frequency counts cannot be valid. It is, for a similar reason that most of the interference studies mentioned in this review are deficient. With the exception of a few they all assume, erroneously, that the speech of second-language users is homogenous whether at the interpersonal or intra-personal level. The differences which may exist at these two levels are important and their relationship to other social factors need investigating. Though Gatbonton (ibid) points out variation in L2 speech the dynamic paradigm on which her analysis was based is, as is shown in 1.5, statistically unacceptable.

NOTES

(1) Weinreich refers to a similar opinion by Haugen (1950), who complains that "investigators who have erected hypotheses to explain some of the results of bilingualism have not always checked their theories by studies of the behaviour of bilingual speakers", and that "talk of substrata and superstrata must remain stratospheric" unless founded solidly on the "behaviour of living, observable, speakers".

1.3 VALIDITY OF CONTRASTIVE ANALYSIS

1.3.1 The Principle

Contrastive linguistics is concerned with the analysis of the structural systems of two or more languages with the main purpose of bringing out the similarities and differences of those systems. In so far as it is undertaken for pedagogical purposes, contrastive analysis is primarily based on the principle that a difference exists between the acquisition process of a native language and that of a second or foreign language. In acquiring a native language, for example, the learner, usually a child, is exposed to original speech data in his language's natural environment. He is thus enabled to take advantage of the natural feed-back processes coupled with his own developing mental faculties, especially the "faculté de langage" which is believed to enable a child to learn languages more easily, and more successfully, than an adult. For most people, on the other hand, a second language is learned in the environment of their L1 and this involves formal teaching and pedagogical manipulation of the data. In addition, by the time they come to learn an L2, most people have reached what Wolfe (1967) calls linguistic puberty, besides having internalised the rule system of their mother-tongue. They therefore see the new language "through the filter of the acquired system of the L1". The process of inter-lingual identification (Weinreich, 1953) will result in many correct and many incorrect identifications. As Nickel and Wagner (1968) point out, the whole system of the second language does not have to be learned afresh since much of it will already be familiar because it is similar to the native

language. Contrastive linguists believe that the areas of difference between the systems of the two languages will cause greater problems for the second-language learner, because he will be tempted to treat those areas as if they were the same as parallel areas of his mother-tongue. Errors which arise in second-language use as a result of wrong interlingual identification are said to arise from interference, that is, from inappropriate interlingual identification. Contrastive linguists believe that the incidence of interference errors can be reduced, if not removed. To achieve this goal, a systematic comparison of the systems of the languages involved, or to be involved, in bilingual speech is carried out and prediction is made, on the basis of observed differences, as to what type of interference errors will likely occur. Once these are known, ways can be devised to mitigate their chances of causing problems for the second-language learner. As Nickel and Wagner (ibid) put it, "These potential sources of errors must be given special considerations in language instruction". As is to be expected, contrastive linguists usually focus attention on the inhibiting influences of the difference between language systems. Corder (1967), however, reminds us that interlingual identification is also facilitative(1). Contrastive linguists reflect this fact in the title given to their chosen field since it would be more appropriate to reserve the more embracing term of comparative linguistics for analyses that focus on both differences and similarities.

1.3.2 Criticism of Contrastive Analysis

An indication of the importance attached to contrastive analysis is the existence of numerous works on it by respected scholars: Lado (1956, 1957), Stockwell and Bowen (1965), Di Pietro(1971) and those listed in a bibliography compiled by Hammer and Rice (1965). Unequivocal assertions of the potency of contrastive analysis in the teaching of L2 abounds. Fries' (1945) often quoted one is a case in point. He says: "The most effective materials [for teaching a foreign language] are those based on a scientific description of the language to be learned carefully compared with a parallel description of the native language of the learner". Banarthy, Trager and Waddle (1966) also assert: "The task of the writer of a foreign language teaching program is to develop materials which will be based on a statement of these differences; the task of the foreign language teacher is to be aware of these differences and to be prepared to teach them; the task of the student is to learn them". Harris (1954) supports the rather extremist claim by Fries (ibid) that, "it may prove possible to acquire a language by learning only the differences[2] between the new language and the old (leaving those features which are identical in both to be carried over untaught" (p. 259). Finally, Lado (1957) added a new dimension by asserting that it is possible for the linguist to predict the problems which a learner will face in an L2 through contrastive analysis of his L1 and the L2. A new edition of the bibliography by Hammer and Rice should attest the large following which Lado's claim enjoys.

In spite of its apparent popularity contrastive analysis is often confronted with stiff critical opposition. Coming from many quarters and challenging as many aspects of contrastive analysis, the criticisms all question the very value of its basic theory and application. Partial summaries of these criticisms are available in James (1971), Sanders (1976) and Tran-Thi-Chau (1975). They can be considered as constituting three major types. They are treated here as concerning the inadequacy of the structural linguistic basis, inadequacy of the psychological basis and inadequacy of predictive power.

Linguistic inadequacy

The criticism of the linguistic basis of contrastive analysis is straight forward and answers to the questions raised here will be found mainly in the section on generative grammar. The argument goes something like this: There are many models of structural analysis of language, none of which can be now regarded as totally acceptable amongst linguists. If a structural analysis is imperfect, how can any contrastive study based on such analysis be valid? Contrastive analysis is, therefore, necessarily constrained by the low level of knowledge attained in structural linguistics to whose apron-string it is operationally tied. Secondly, it is pointed out that since there are many and conflicting models in structural linguistics, each contrastive analyst bases his description on any preferred model. The result is that there are bound to be as many conflicting predictions as there are models.

Psychological inadequacy

Criticism of the psychological basis is similar to the first one. It is argued that the psychological concept of transfer (Harris, 1954) on which contrastive linguists base their work is a controversial one. The very idea of contrastive linguistics depending, for its concepts, on other sciences is viewed as damaging. In those fields these concepts are always being refined and changed. Slama-Cazacu[3](1971) is credited with this complaint: "The stereotyped application by specialists in other fields . . . of old concepts of psychology is often dangerous. Psychological science has evolved, some of its concepts have been modified or have disappeared, or, in their old form, no longer fit the system of knowledge - itself evolving - of other sciences". The assumption, maintained by Di Pietro (1971) for example, that the learner thinks in his L1 while learning the L2 is said to be questionable. Sanders (1976) explains that "not enough is yet known about the complex interaction between language and thought". Wardhaugh (1974) also subscribes to the view that the reliance of contrastive linguistics on other sciences is a limiting factor.

Predictive inadequacy

Criticism of the predictive power of contrastive analysis falls into many parts, though they all boil down to the same general theme. First, certain errors, as pointed out by Wardhaugh (1970), are due to other causes than interference. Such errors, which Jain (1974) describes as "L2 - independent" are traceable to external factors which cannot be predicted, such as mental ability, state of mind and pedagogical sources. These are discussed by Dusková (1969), Corder (1967) and Lee (1968), amongst others.

There still remains another type of errors which contrastive analysis is incapable of predicting and, therefore, totally powerless in eliminating. Nemser (1971) describes them as being traceable to "internal interference". They occur through overgeneralisation from one aspect of the grammar of one single language to another part of it, and are responsible for errors such as 'goed' and 'childs' - by analogy from 'kicked' and 'books' respectively - which are likely to be made in language learning both by native speakers and second-language learners of English. Many other examples of errors traceable to intralingual interference are cited both by Afolayan (1971) and Richards (1974), commenting on errors common to speakers of the same second language who have different first language backgrounds. Richards (ibid) attributes them to learning strategies. "The elements that differ are those effects of language transfer or interference while those that we find in common are the results of other learning strategies." As will be explained later in this section, this idea is only partially true because the facts of linguistic universals point to the possibility that a number of languages may share, in common, certain properties which make possible identical interference in a common second language.

A third aspect of the criticism is that not all of the errors predicted in contrastive analysis will occur in actual L2 speech. It is argued, therefore, that it is wasteful to predict errors which may never occur. It is therefore suggested (James, 1971; Stockwell, 1968; Sampson and Richards, 1973) that it is more realistic to first collect actually occurring errors in L2 speech and then explain them through the tools of contrastive analysis. This is deemed more economical too. What is generally referred to as explanatory contrastive analysis, and regarded as a weak version of

predictive contrastive analysis, appears to be favoured by many linguists in this field, notably Ritchie (1968), Wilkins (1968) and Wolfe (1967).

The fourth and final aspect of the criticism of the predictive power of contrastive analysis is implied but equally important. Jain (ibid) asserts that contrastive analysis "overlooks many errors that the learner seems to make notwithstanding his language background". The importance of the quoted partial statement is its implication that people of diverse L1 background may be found to make the same errors in learning a particular L2 in spite of the differences in their L1. For all these reasons contrastive analysis is judged to be "fragmentary", inadequate, and of no practical value to the classroom teachers who, as Corder (1967) says "have not always been impressed by this contribution from the linguist for the reason that their practical experience has usually already shown them where these difficulties lie and they have not felt that the contribution of the linguist has provided them with any significantly new information". In conclusion, contrastive analysis is rejected because of its predictive inadequacies, and, in the words of Sanders (1976), "its affinities with structural Linguistics and Behaviourist Psychology". These criticisms have not been left unanswered by contrastive analysis' defendants, including, notably, Carl James (1971) and Di Pietro (1976). In the following section I shall review the defence, and, since I support them, add my own wherever necessary. Again I take them type by type, lumping together the queries concerning its psychological and structural bases.

1.3.3 The Exculpation of Contrastive Analysis

The two issues of psychological and structural bases of contrastive analysis are similar in content and can therefore be given similar defence. The point raised is that both the psychological and structural bases of contrastive analysis are themselves questionable and therefore stand to be refined. The notion of transfer, through linguistic habit, which forms the psychological base of contrastive analysis cannot be taken for granted since psychologists are always busy reshaping and refining their concepts. Models of language structure are even less definitive as refinements are everyday taking place. Generative Grammar (Chomsky, 1957, 1968) represents the latest addition. Wardhaugh (1974, p. 143), therefore poses the question: "If so little is known about the structure of language it seems difficult to explain how a second language can be learned through some of the simplistic psychological learning modes that are available; for example, any kind of stimulus-response theory, that is, through a theory in which language is regarded as a simple habit system". It would be seen at once that what the critics fail to acknowledge is that as the other sciences keep developing their own theories and concepts so also does contrastive analysis continue to refine its own concepts in pace with the new ideas. For example, as soon as structural linguists offered generative grammar, contrastive linguists applied its concepts in their own study (see Di Pietro, 1971). As Dwight Bolinger explains in his introduction to Di Pietro's book, contrastive analysis keeps changing the bath while keeping the baby. The truth is that the availability of diverse theories and models is advantageous in that it enables contrastive analysis to compare and evaluate them in terms of practical utility.

The criticism of contrastive analysis' predictive power is equally not tenable. First, it is argued that it fails to predict errors from other sources besides interference. Contrastive analysis, it should be remembered, is not intended to predict non-interference errors (see James, 1971). In addition, since contrastive analysis does not claim the ability to predict all errors it is not proper to blame it for not doing so. The claim for contrastive analysis is expressed by Lado (1964), who describes the difference or similarity of two language systems as the "most important factor" determining ease or difficulty of learning one of them as a second language. These differences, Lado goes on to explain, "<u>are the chief source of difficulty</u>" (p. 21). Note that the writer does not say that they are the only factor or the only source. Nickel (1971) expresses the same opinion by asserting that "Contrastive linguistics is not at all committed to the view that all mistakes made by learners of foreign languages are caused by interference from the source language". Finally, Corder (1974) explains that most of the non-interference errors are usually non-systematic while contrastive analysis seeks to predict systematic errors. It is therefore not surprising that a non-systematic error is not predicted by a method designed to predict only systematic errors. Corder (ibid) considers the difference between the two types of errors so important that he suggests that the systematic type should be called errors while the other type should be called mistakes. He concludes by saying that it is from a learner's systematic error that we are able to construct his competence in the new language. One is therefore compelled to agree with Miller (1966) that it would be useless to attempt predicting or making rules for mistakes. The criticism that contrastive analysis fails to predict errors arising from inter-lingual interference

(see Nemser, 1971) is similar to the ones discussed above. To this, one only needs to point out that since contrastive analysis is designed to predict errors of inter-lingual interference it is to be expected that it does not predict errors of intra-lingual interference. These criticisms are, therefore, no serious objections to contrastive analysis.

The most important criticism of contrastive analysis is that it is wasteful because not all errors that are thereby predicted will actually occur. Since, it is argued, there is little point in predicting errors, some of which will perhaps never occur, it is better to devote time and other resources to the explanation of actually occurring errors. In other words what has been termed Explanatory Contrastive analysis is proposed as a substitute for Predictive Contrastive analysis (see Wilkins, 1968 and Wardhaugh, 1970). The difference in operational strategy between the two versions of contrastive analysis is explained by Stockwell (1968): "The task - comparison in search of sources of interference, commonly called contrastive analysis, can obviously be approached in either of two ways: by collecting lists of errors students have made and then trying to describe the conflict between the systems that give rise to such errors, (not all of them can be traced to this source of course), or by setting up a systematic comparison which scans the differences in structure in search of sources of interference and predicting that such-and-such errors will occur from such-and-such conflicts" (p. 18). Snook (1971), who dismisses predictive analysis (p.a.) as "based on a false premiss" asserts that one "must first know what kinds of errors are made" (see Dusková, 1969, for work on Czech/English errors within that frame-work).

The appropriate answer to this criticism of predictive contrastive analysis has been provided by its supporters (see Hamp, 1968; James, 1971 and Schachter and Celce-Murcia, 1977, amongst others). The last writers referred to explained what amounts to six serious weaknesses of explanatory error analysis. Hamp (ibid) explains the superior goals of predictive contrastive analysis very precisely: "We want instead to develop a theory adequate to explain cases not actually in our corpus . . . . We want, if you like, some kind of competence model here". In other words the linguist is interested in developing a theory that will enable him to make statements about both actual and potential errors of interference. The difference between the two approaches, as Hamp goes on to explain, is between "a priori prognostic analysis" and "aposteriori diagnostic analysis". One is preventive while the other is curative, and prevention is generally known as the best of cures. Secondly, there is no doubt that it is explanatory analysis that is wasteful in first collecting all errors before sorting out those due to interference. The possibility of misallocating errors to sources in that method is very real. Lastly, the fact that a predicted error does not occur in one corpus does not indicate that it could never occur. The argument that predictive contrastive analysis is wasteful for this reason is, therefore, not a strong one.

The argument that predictive contrastive analysis is valueless because L2 speakers from various L1 backgrounds are known to commit similar errors in the second language is equally weak. The idea is that if such speakers all commit such errors then these errors cannot be traceable to interference. But it is possible that the various L1's involved are similar in particular

aspects of their structure and therefore share similar differences from the L2 in respect of those aspects. In this case interference from the systems of the various source languages would cause identical errors in the target language. That languages do share many features in common is attested in the ongoing work in language universals which has run into four volumes to date (Greenberg, 1978). The facilitative interference exerted by a source language on the acquisition of a second language arises from such similarities in language systems.

Another objection is that even in cases where certain errors can be traced to interference predictive contrastive analysis cannot predict precisely which of any competing substitutes will be adopted. Baird (1967), for example, cites the dental /t̪/ and the retroflex /t/ of the Indian languages in relation to English. He discloses that in reality the retroflex /t/ usually substitutes for English /t/ while the dental /t̪/, with aspiration added, substitutes for /θ/. One could make two comments[4] on the problem raised. First, Baird tells us only what USUALLY happens, thus creating the impression that the reverse is sometimes the case. In other words the choice may be governed not by linguistic factors, in which case predictive contrastive analysis cannot be expected to predict it, especially if it is a case of free variation at the linguistic level. The likely position, however, is that a more precise linguistic analysis will surely reveal why one sound is substituted for /t/ while another is substituted for /θ/. Generative phonology is likely to solve the problem, which is similar to those discussed by Ritchie (1967, 1968; see 1.3 below). On the other hand, failure to achieve precise prediction in predictive contrastive analysis may arise from the linguist's own errors even when he works with

the most sophisticated linguistic model available. For example, James (1969) reports that Slavic languages have articles at a deeper level than their Germanic counterparts, though Dušková (1969) fails to discover articles in Czech. James (1971) suggests, rightly, I believe, that closer examination of the systems of contacting languages may reveal that many errors not now traceable to interference are indeed traceable to that source.

The last type of objections to be referred to here are discussed by Sanders (1976). One is that contrastive analysis fails to establish the right hierarchy of difficulties as between learners' problems. Secondly, it is argued that it encourages the waste of learners' time in class by making them learn differences in systems. The ability of a contrastive linguist will depend on the linguistic model in which he works. Here again the high degree of analytical refinement already achieved in Generative Grammar will be of immense value to the linguist. For example, a comparison of the phonetic-feature composition of two sounds would enable him to work out which is phonetically more similar to a third and which would therefore be a more phonetically likely substitute for that sound, though, as is illustrated in 4.1.5 below, this may not always be the case. The second aspect of the objection has been adequately answered by Sanders (ibid). He says that it is "too readily forgotten that the immediate findings of contrastive analysis are not for classroom consumption", but for the benefit of the text-book writer, the curriculum planner and the language teacher. Many of the criticisms of contrastive analysis, as that writer points out, actually arise from misapplication of its findings.

A fitting conclusion from the foregoing is that the goal of contrastive analysis should be to predict, and thereby prevent, potential errors of interference, not to explain them after they have been committed. Secondly, any contrastive linguist seriously concerned about his work will, of necessity, take advantage of the most sophisticated structural methods available to him. With correct application there can, then, be no doubt about the value of contrastive analysis.

NOTES

(1) Thus J. B. Carroll (1968) distinguishes between negative and positive transfer.

(2) Newmark and Reibel (1968) take the extreme opposite stand that any teaching material based on contrastive analysis will hinder second-language learning.

(3) See Tran-Thi-Chau (1975, p. 124).

(4) This same example is cited by Lee (1968). A similar example by Wilkins (1968) concerns the unpredictable alternation between French /s/ or /z/ for English /θ/ and French /t/ or /d/ for English /ð/.

1.4 GENERATIVE PHONOLOGY IN CONTRASTIVE LINGUISTICS

1.4.1 Introduction

Most of the objections to predictive contrastive analysis (see 1.3 above) concern the inadequacy of the structural or descriptive model on which it is based. Di Pietro (1971, p. 12) says that an "axiom worth remembering is that a contrastive analysis is only as good as the linguistic theory on which it is based". Nickel and Wagner (1968) consider the advantages of generative grammar for contrastive analysis and conclude that contrastive analysis based on taxonomic pre-transformational models was premature. The advantages that generative grammar provides for descriptive and contrastive linguistics have been enumerated by many (for example, Chomsky, 1965, 1957; Chomsky and Halle, 1965; Stockwell, 1963; Dingwall, 1964 and Lado, 1968), mostly, at the syntactic level. The discussion here is however limited to the phonological component. The advantages of generative phonology over classical phonemics in contrastive and interference studies arise from three major properties of generative phonology, namely, the notion of phonetic features, that of underlying and surface structures and the recognition of phonological rules. These have far reaching consequences for both theoretical and applied linguistics. Though they are very much interwoven with one another it is possible to isolate them for the purpose of the present discussion.

1.4.2 Phonetic Features

Contrary to the notion of an autonomous, indivisible, phoneme, held in classical phonemics, generative phonologists recognise that sound segments are feature complexes (bundles of features) and that segments differ, one from another, in the type of features contained in their composition or in the coefficients or integers selected in respect of particular features. Various ideas of what these features are, together with their articulatory and auditory correlates, are explained by Chomsky and Halle (1968), Jakobson, Fant and Halle (1952) and Ladefoged (1971). The practical nature of the idea of phonetic features is expressed vividly by Jakobson and Halle (1956) in a passage, part of which needs quoting:

> "In a message conveyed to the listener every feature confronts him with a yes-no decision. Thus he has to make his selection between grave and acute, because in the language used for the message, both alternatives occur in combination with the same concurrent features and in the same sequences . . . The listener is obliged to choose either between two polar qualities of the same category as in the case of grave vs acute, or between the presence and absence of a certain quality, such as voiced vs voiceless . . ."

While it is an improvement over existing phonological theory to realise that, within any language, the difference between one segment and another is as a result of the difference in the phonetic features, or co-efficients of them that they select, what is even more important in contrastive studies is the fact, which thereby surfaces, that the difference between two sounds in different languages can be accounted for in a similar manner. If phonetic features characterise and exhaust all the speech producing capabilities of the human vocal apparatus, and this apparatus is known, from external evidence - e.g., physiology - to be the same for all human beings, it becomes

easy to see that differences in sound segments both within and across languages are traceable only to the various possible combinations of those phonetic features or their co-efficients. The notion of universal phonetic features, apart from rendering phonological comparison easy has led to the recognition of similar language universals in syntax and semantics (see Greenberg, 1963, 1978: Vol. 1 - 4). The recognition of linguistic universals touches on the central core of the concern of contrastive linguistics since it entails the possibility that human languages are similar in many ways as they are different in others, both at the phonological, syntactic and semantic levels. What are the results for descriptive and contrastive linguistics of the notion of phonetic features and their universality? First, the higher level of descriptive adequacy attained in generative phonology means that a higher level of contrastive adequacy is attainable in contrastive linguistics. Ritchie (1967, 1968) points out some of the details. Post-Bloomfieldian linguistics, to cite one of Ritchie's examples, would seek to differentiate between /bʌm/, /bʌn/ and /bʌŋ/ or /bʌmp/, /bʌnt/ and /bʌŋk/ by pointing out that the nasal phonemes in each group differs from the other in terms of the place of articulation. The transcription of the last set obscures the "fact that in English, the point of articulation of any nasal preceded by a vowel and succeeded by a voiceless stop is always the same" as that of the succeeding intra-morphemic stop. It, therefore, is incapable of explaining what is actually an important principle of English phonology in relation to feature distribution. Instead it only explains this phenomenon in terms of allophones. In other words, classical phonemics fails to uncover important rules of English phonology. The far reaching

consequences of this failure will be fully appreciated when we come to the function of phonological rules below. Secondly, it fails to explain the substitution of different sounds for English /θ/ by native speakers of Russian and Japanese. It is possible to explain this difference in generative phonology purely on the phonetic-feature composition theory. Though both Japanese and Russian /t/ and /s/ share similar points of articulation they differ in their phonetic feature compositions in relation to English /θ/. Japanese and Russian /t/ and /s/ and English /θ/ are (+cons, -voc, -compact, -grave, -voiced). In addition, Japanese and Russian /t/ are (-cont, +mellow) while /s/ in both sound systems is (+cont, +strident). Ritchie (ibid) explains, therefore, that the different substitutions in the two languages for English /θ/ is because the Russian speaker categorises English /θ/ as primarily mellow as his /t/, while the Japanese perceives it as primarily continuous, as his /s/. I have selected this example from Ritchie because apart from explaining the differences in substitutions between speakers of those two languages, it brings out an important fact that contrastive analysts cannot afford to ignore in the explanation of interference; namely, that even though two phonetic features may function in the phonological systems of two languages, one of those features may be more basic, and therefore more important or prominent for speakers of one language whereas the speakers of the second language may perceive the other phonetic feature to be more prominent. This, apparently, is the case in the examples offered by Ritchie. In effect one is saying that two phonological systems that are similar in the phonetic feature composition of certain segments may still cause different feature-interference in another language. What determines interference in such cases is not difference in feature composition but phonetic-feature prominence in the speaker's own

perception. This observation is particularly relevant to the hypothesis about the hierarchy of phonetic features in terms of their articulatory criteria, proposed by Fant (1973, p. 180). The possibility arises that a feature, which is lower than another on Fant's hierarchy tree may command greater functional prominence than the higher feature among speakers of particular languages. This question, however, cannot be answered here[(2)]. It is sufficient to demonstrate that the use of phonetic features in generative phonology enables one to make, in the words of James (1969), "deeper contrastive" studies and therefore to predict potential interference with greater precision. In this way generative phonology enables contrastive analysis to overcome one of the shortcomings which its opponents point out against it. Another great merit of generative phonology arises from its descriptive adequacy. Since, with the use of universal features, it is possible to describe all sound segments occurring in all human languages, and therefore all sounds in any language, it becomes feasible in contrastive analysis to compare and contrast sound segments across languages, stating precisely the nature of their differences as well as similarities. Finer and more exhaustive description of the sounds of human language achieved in generative phonology logically leads to finer and more exhaustive comparison of those sounds in contrastive analysis.

1.4.3. Phonological Rules

The recognition, in generative phonology, of sound segments as complexes of features, discussed above, leads to another great superiority of generative phonology, over autonomous phonemics, in the study of contrastive analysis and interference. The discovery that a sound segment is a bundle of phonetic features and that many segments are similar with respect to the

value they select in some of these features, in spite of their overall differences, leads to the notion of natural classes of sounds, both within and across languages. The immediate benefit of this notion, as we saw in the last section, is that, given different sounds from two or more languages, it is easy to see to what extent they are similar and to what extent they differ; c.f., the Japanese, Russian and English examples. A more fundamental advantage of the notion of natural classes of sound segments, however, is that it makes possible the formulation of phonological rules that enable us to reap important linguistic benefits in terms of economy and simplicity both in descriptive and contrastive linguistics, these being some of the evaluation criteria specified for linguistic theories by Chomsky (1965, 1967). The importance of phonological rules has been emphasised many times in the literature. Admittedly phonological rules could be formulated using the notion of autonomous phonemes but as Halle (1962) demonstrates, the phonological rules that could be formulated in generative phonology have the dual advantage of greater significant generalisation and simplicity or economy[3]. In the following examples, which Halle (ibid) uses to illustrate the point, the Jakobsonian distinctive features are used since the result would not be affected if other features were used. I reverse Halle's order for greater clarity but his original notation is maintained.

2" $$[+\text{grave}] \rightarrow [-\text{grave}] \Big/ \begin{bmatrix} \longleftarrow \\ +\text{vocalic} \\ -\text{cons} \\ -\text{diffuse} \\ +\text{compact} \\ -\text{flat} \end{bmatrix} \quad \begin{bmatrix} +\text{vocalic} \\ -\text{cons} \\ +\text{diffuse} \\ -\text{compact} \\ -\text{flat} \\ -\text{grave} \end{bmatrix}$$

4" $\left[+\ \text{grave}\right] \longrightarrow \left[-\ \text{grave}\right] / \left[\frac{\qquad}{\begin{array}{l}+\ \text{vocalic}\\ -\ \text{cons}\\ -\ \text{diffuse}\\ +\ \text{compact}\\ -\ \text{flat}\end{array}}\right] \left[\begin{array}{l}+\ \text{vocalic}\\ -\ \text{cons}\\ -\ \text{grave}\end{array}\right]$

2" and 4" are restated as 2' and 4' respectively;

2' /a/ ⟶ /æ/ ⟶ /i/

4' /a/ ⟶ /æ/ ⟶ $\left\{\begin{array}{l}/i/\\ /e/\\ /æ/\end{array}\right\}$

which in turn are restated as 2 and 4 respectively:

2. /a/ is realised as /æ/ before /i/

4. /a/ is realised as /æ/ before any front vowel

First, we observe that rules 4 - 4" are more useful than 2 - 2" because the former refer to any front vowel in the environment of which a sound segment loses or acquires phonetic features or changes values in them, since the reference "any front vowel" (a natural class) may number from two to ten or more. It therefore refers to all sound segments in that natural class rather than to just one sound segment as in 2 - 2". Generalisation is therefore more efficient in 4 because of the use of phonetic features which permits the establishment of natural classes of segments. The second merit to be observed is clearly seen by comparing rule 4" and 2". In the environment specified for the change of /a/ to /æ/ rule 2", which refers to only

one sound segment, utilises six terms[4] or symbols whereas rule 4" which refers to three sound segments in this case, but potentially to a much larger number, utilises only three symbols. Notice that if rule 2" were to refer to three segments, as 4" does, it would need a total of eighteen symbols at the rate of six symbols per segment. Rule 4" is, therefore, apart from being more general, also simpler and more economical than rule 2". The advantage of economy arises from the fact, pointed out by Liles (1971, p. 138), that a fewer number of features are needed to specify a natural class than are needed to specify any single member of that class. The point is further illustrated with Lile's example that while we need only the features (+ cons) and (+ voc) to describe both /l/ and /r/ as a natural class we need three features to describe each of them, that is, six features in all; /l/ is (+ cons, + vocalic, + anterior) and /r/ is (+ cons, + vocalic, - anterior).

The second major merit of generative phonology is the possibility it affords us to describe more meaningfully, via the notion of phonological rules, the nature of both interlingual and intralingual variation, a problem that could not be meaningfully explained in classical phonemics. As De Camp (1971) explains, autonomous phonology is inadequate because of its inability to handle variation patterns whereas generative grammar adequately explains such variation in terms of rules. It is demonstrable that variation in language use can occur from two sources in this respect; namely, the presence of different rules in each variety, which may mean that one variety has one or a few rules more than the other or that both varieties have the same number of rules but that these rules differ. Secondly two varieties may have exactly the same rules but these rules may be differently ordered in them. To illustrate a case of variation arising from different rules I

cite this common type of example from Luelsdorf (1975). It is an example of unconstrained rule since it applies universally, that is, in all environments, in the variety in which it is present(5); hence, no environment is specified for its application.

$$\begin{bmatrix} + \text{ cons} \\ - \text{ voc} \\ + \text{ cont} \end{bmatrix} \longrightarrow [- \text{ cont}]$$

The rule states that whenever fricatives occur in adult speech they are realised as their corresponding non-continuant sounds in the children's speech. In other words, the speech of those children may be said to possess one more rule(6) in excess of the rules of adult speech. A rather interesting example of the way in which the notion rule of grammar can enable us to relate seemingly patternless and unrelated data is provided by Morris Halle in his now famous article (Halle, 1962). The data concerns what is called General American and a version called Pig Latin. They are reproduced here in the original order and form.

General American	Pig Latin
/strit/	itstrə̄
/strits/	itstrə̄
/kæ t/	æ tkə̄
/kæ ts/	æ tskə̄
/rōz/	ozrə̄
/rōziz/	ozizrə̄

Halle (ibid) makes the important observation that if one adopted the criterion of mutual intelligibility, on which classical grammars depend, for establishing linguistic relationship among dialects or varieties, one would conclude that the two varieties above are unrelated since speakers of General American do not understand Pig Latin. Yet a comparison of rules

of grammar for both varieties reveals not only that Pig Latin has pattern but also that it derives from General American. It is shown that the differences arise from the fact, not discoverable through the methods of conventional phonology, that Pig Latin has two more (Halle says it is one) rules in addition to the general rules of American English, namely, shift initial consonant cluster to end of word, then add /ɚ/. The two rules which are linearly ordered from 1 to 2 may be formally stated as:-

1. $\# \text{ cc} \longrightarrow \text{ cc } \#$
2. $/\theta/ \longrightarrow /ɚ/ \; / \; \_\_ \#$

That there are two different rules, ordered in the suggested sequence, is confirmed by the fact that a different ordering would produce results not compatible with Halle's data.

Let us now consider how two varieties of language use may differ as a result of different rule ordering[7] even though they have the same rules. Chomsky and Halle (1968, p. 341) provide evidence for the effect of alternative ordering of rules in a hypothetical language. Harms (1968) also has a similar example from Finnish, but it is designed to show the effect of rule ordering rather than to describe actual dialects. The example I shall quote describes actual dialectal variation reported by Joos (1942) and described by both Chomsky and Halle (1968, p. 342) and Halle (1962). This type of variation, which defies analysis in autonomous phonology, is explained via the notion of rule ordering in generative phonology. The two dialects of Canadian English both have the following two phonological rules:-

1. $\bar{a}y \longrightarrow \wedge y \; / \; \underline{\quad} \; [-\text{ voiced}]$
2. $t \longrightarrow [+\text{ voice}] \; / \; [+\text{ voc}] \; \underline{\quad} \; [+\text{ voc}]$

The dialects apply these rules in the order 1, 2 and 2, 1 to the underlying form (taipraitə) respectively.

Dialect A:

Basic Form: /taipraitə /
Rule 1: yields /tʌyprʌytə /
Rule 2: yields /tʌyprʌydə / : Final form

Dialect B:

Basic Form: /taipraitə /
Rule 2: yields /taipraidə /
Rule 1: yields /tʌypraidə / : Final form

Joos's accounting, as Halle points out, could not explain these systematic differences because it lacked the notion of phonological rules needed to do so. The difference, as shown here, arises from the fact that dialect A applies the same rules in a different order from dialect B. There is no doubt that this type of phonological rule ordering may be of immense help in explaining second language deviance as well as intralingual variation in the same way that the absence vs presence of phonological rules can be. In this way generative phonology is capable of contributing greatly to the explanatory and predictive power of contrastive linguistics.

1.4.4 Underlying Form

One of the complaints of transformational grammarians against taxonomic linguistics is that its failure to distinguish between deep and surface structures leads to confusion. The recognition of the difference between the two levels constitutes, therefore, one of the marks of distinctiveness of transformational grammar. Transformational grammar posits the existence of deep and surface structures and explains that the relationship between them is expressed through transformational rules. The immediate consequence of the recognition of the two levels and transformational rules is the possibility, brought about, of recognising the fact, that two structures which differ at the surface level may, in fact, be similar at the deep level and vice versa(8).

Again, it is mainly in relation to contrastive linguistics that the importance of the notion of deep and surface structures can be fully appreciated. In taxonomic linguistics comparison or contrast was limited to surface structures alone, and as a result, it failed to reveal the precise nature of similarity or contrast. As Wardhaugh (1967) points out, results obtained from such surface level comparisons are necessarily superficial. In transformational grammar, on the other hand, it is possible to compare both surface and deep structures and the form of transformational rules. Since it is revealed that languages have greater similarities(9) in their deep structures it is likely that most differences would arise in surface structures as a result of transformations. Lado (1968) explains what is needed when he says: "If we explain surface structure on the basis of deep structure strings plus transformations, then contrastive studies should deal with the surface structure comparison and transformations from

the deep structures. In other words the comparisons should consider the phrase-markers and the transformations as well as the strings of elements at the surface". Lado (ibid) argues, rightly, that since deep structures "exhibit fewer differences across languages and may coincide at fundamental points", transformational grammar makes possible a "teaching strategy that begins at similar deep structure strings and ends" at the level of "greater difference at the surface". It would be possible in this way to minimise interference from the source language to the target language. Let us relate these general points to phonology. In phonology, as in semantics, all languages select features that function and combine in their respective systems from a universal set. In other words, one could say that at that level all human languages are potentially the same. Differences in sound segments arise, however, from the selection of different phonetic features. At a level still higher, the utilisation of different phonological rules would lead to still greater differences while differences arising from different rule orderings would further increase these surface differences. From this point of view transformational grammar is capable of explaining the relationship not only among various intralingual dialects, but also among different languages and ultimately all the world's languages. The relationship, which in syntax can be explained from a semantic base, can be illustrated for the phonological component as in the sketch below, taking the potentialities of the human vocal tract as the phonological base at which all languages are the same. Each node below that base represents a point at which differences arise, or are capable of arising.

Figure 1: Phonological Levels

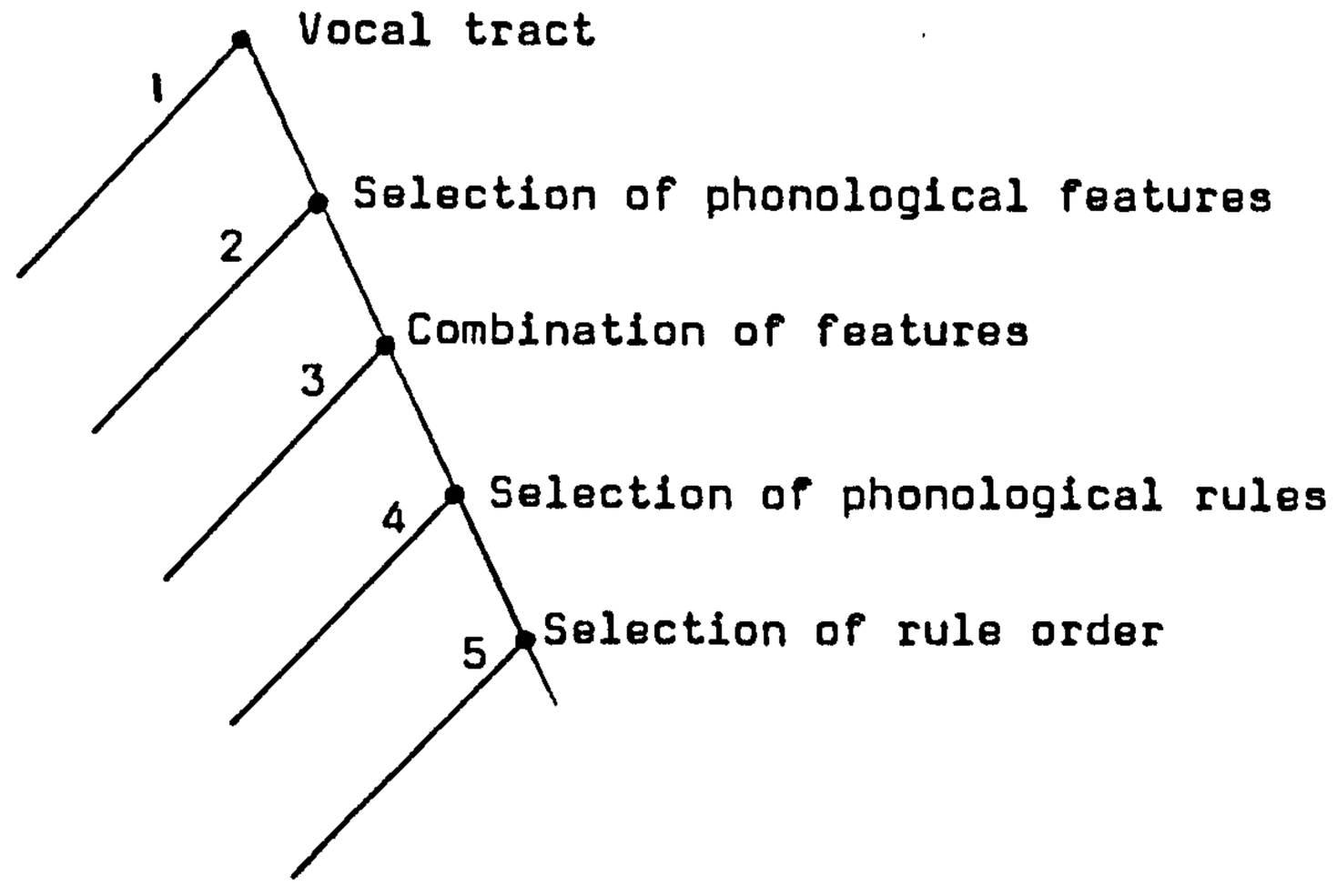

Figure 1 is a simplistic representation. It assumes that only a binary choice is possible at each node. But even with this assumption we observe that a similar selection of phonological features is capable of diverging into four different varieties or languages. Another point is that languages are not ordered in their relationship to one another. As a result, a language may select features some of which are selected by each of twenty or more other languages and yet differ from each of them in respect of a few other features. Secondly, two languages that select similar phonological rules do not necessarily select the same phonetic features at a higher or earlier node. This is made possible by the notion of natural classes, explained earlier on in this section. It is therefore not difficult to see how so many languages spoken in the world today share one common physiological base - the vocal tract - and are yet so diverse. Transformational grammar has therefore added to the refinement and richness of contrastive analysis by offering for its use the notions of universal deep structures and universal deep structure conditions as explained by Bouton (1976). This is true in phonology as in syntax and semantics.

Parallel to the theoretical notion of deep and surface structures is the functional notion of a speaker's competence and performance. Competence refers to the "latent" (cf. Lenneberg, 1967) knowledge of the language user while performance refers to the actual surface structures that are realised in his speech. This is another useful notion in that it can make great contributions to progress in the study of second-language speech and interference. Some of the critics of contrastive analysis have argued that a speaker does not use a type of knowledge solely because he does not possess it. Anybody who has learned and used a second language readily sees the falsity of this claim. That one sometimes realises a particular sound 'correctly' and 'incorrectly' at other times is proof that there is a difference, or there could be, between what one 'knows' and what one actually does in linguistic situations. If I produce a sound of English correctly half of the number of times it occurs in my actual speech it is certainly false to attribute the incorrect realisations to lack of knowledge of that sound on my part. And this is my interpretation of the data provided by Gatbonton (1975) in her research referred to earlier on in this chapter. So we see that apart from the fact that transformational grammar is able, through these notions, to account for the psychological processes of language acquisition, these notions can make it possible for us to account for the "varied pronunciation" of a great many sounds in second language speech.

We are therefore well equipped for a departure from the assumption, which characterised interference studies based on autonomous phonology, that interference either occurs or does not occur in a particular sound in second-language speech. That this is not so is the major reason why interference studies based solely on a dynamic paradigm and its implicational scale cannot succeed. Secondly, it becomes clear that the type of "independent"

grammar advocated by Luelsdorf (1975) cannot be appropriate for second-language speech. When a learner provides evidence that he knows the rules of a second language by using those rules on a number of cases, but not on others, one is convinced in the face of such evidence, that he shares the same competence as far as that particular rule is concerned with the native speaker. That he differs in performance is traceable to his possession of prior competence in his own native language, or otherwise to other causes. This reality of second-language speech cannot be accounted for without the notion of competence and performance in the same sense that the other realities referred to could not be explained without the notions of phonetic features, phonological rules and their various consequences. Transformational generative grammar therefore remains, at the present time, the grammar which, in Sciarone's (1970) words "is descriptively most adequate". The application of its tools in contrastive analysis, whether in the semantic, phonological or syntactic component, renders comparison so meaningful that one readily forgives Nickel and Wagner (1968) for saying that contrastive analyses carried out on the models of pre-transformational grammars are premature[10]. Such analyses are conspicuously superficial as are the linguistic theories on which they were based.

NOTES

(1) For an attack on the phonetic feature theory see R. D. Wilson (1966).

(2) Halle (1959) accepts this possibility when he says: "If the particular feature is either not high or utilised in the L1 of speakers who speak that language in which it is high the importance of this feature in their perception will be correspondingly low or nil".

(3) Di Pietro (1968a) explains Italian /s/ and /z/ via phonetic features.

(4) Halle and Keyser (1971) state the point precisely by saying that the conciseness of a rule is inversely proportional to the number of symbols it contains.

(5) The rule is formulated by Luelsdorf to describe the speech of two children reportedly observed by Applegate (1961).

(6) I suggest that rule addition is a more plausible proposition than rule deletion in the speech of growing children. It is therefore likely that the children in question realise two adult speech rules, namely [+ cons, - voc] ⟶ [+ cont] and [+cons, - voc] ⟶ [- cont] as one rule: [+ cons, - voc] ⟶ [- cont]. They will eventually split this rule into its two adult forms.

(7) See Kisseberth (1970) for arguments against rule ordering based on structural similarity. Functional similarity, according to Kisseberth, is more important.

(8) The point is explained by Stockwell (1977) who says: "If we have a pair (or more) of sentence types that are understood in the same way although their surface diagrams are different, we must try to find some level of representation at which their similarity (or identity) is expressed" (p. 94).

(9) The notion of linguistic universals is actually an improvement on Harris' (1954) work in which L2 is represented as L1 + (L2 - L1), showing that languages have basic similarities.

(10) The authors specifically refer to the Contrastive Structure Series of the Centre for Applied Linguistics, edited by Charles Ferguson.

1.5 DYNAMIC VS QUANTITATIVE PARADIGM

1.5.1 Introduction

Two prominent and competing approaches are current in the study of variation in language use and its social significance. One approach, called the quantitative paradigm observes the frequency of occurrence of the variant forms and attempts to correlate observed frequency with social factors. The other, styled the dynamic paradigm, attempts to show implicational relationships between the use of one variant and another and from the observed pattern, set up social and linguistic classes for the speakers. The two approaches, though usually treated as mutually exclusive, in reality, have many things in common. Both believe in the possibility of discovering correlation between linguistic performance and social variables. They both also believe that variation in language use is rule-governed and that, as Bickerton (1973a) points out, it is the duty of the linguist to discover those rules. There exist two major areas of disagreement between them, however. One concerns the nature of rules that govern language variation. The other concerns the statistical method to be applied in handling variation. I shall highlight the main features of each of them in these two areas as a way of bringing out their differences considering the fact that partisans on both sides have always mixed up these two areas and presented them as necessarily connected. It may be that both the dynamic and quantitative paradigms, whatever their operational differences, can be made to complement, rather than exclude, each other.

1.5.2 The Quantitative Paradigm

Supporters of the quantitative paradigm argue, with respect of rules, that variation in speech arises from the operation of variable rules (Labov, 1969). Labov (ibid) proposes the notion of variable rules because, as he argues, the principle of accountability requires "that any variable form (a member of a set of alternative ways of saying the same thing) should be reported with the proportion of cases in which the form did occur in the relevant environment compared to the total number of cases in which it might have occurred". Variable rules therefore form an integral part of the individual's grammar since he is capable of utilising any of the variable rules relevant in a particular environment, either when necessary or at random. The notion of variable rules therefore stems from another notion - that of inherent variability - which is responsible for the occurrence of variation "even while the speaker is maintaining the same level of style", that is, "while extralinguistic features remain constant" (Bickerton, 1971). The notion has far reaching significance for the view of the speaker's mental capacity held by supporters of the quantitative paradigm. It implies the speaker's mental ability to "maintain proportional relationships between competing phenomena over long periods of time" (Bickerton, 1973). In other words, the mind is able to maintain relationships (it does not have to be proportional, I believe) between competing rules over a long time, possibly permanently through its speaking life. This view of the speaker's mental capacity differs radically from that implied in the dynamic paradigm.

Concerning the handling of statistical data, supporters of the quantitative paradigm argue that it is necessary to reckon the frequency of each variant by actually counting the number of the times it occurs (or did not occur as the case may be) and comparing it to the number of its potential instances of occurrence. Labov (1969) says, "The study of variation is necessarily quantitative and quantitative analysis involves counting" (p. 728). He goes on to argue that "unless this principle is followed it is possible to prove any theoretical preconception by citing isolated instances of what individuals have been heard saying" (p. 738). The study of variation therefore involves the notion of variable rules which as Labov (ibid) states, is a "specific quantity, which denotes the proportion of cases" in which the rule applies as a part of the rule structure itself. This proportion, he goes on to explain, "is the ratio of cases in which the rule actually does apply to the total population of utterances in which the rule can possibly apply as defined by the specified environment, if it were a categorical rule". For Labov the notion of statistical count seems to entail that of variable rules. And this is likely to be more so in second language use.

1.5.3 The Dynamic Paradigm

Supporters of the dynamic paradigm differ in their view of linguistic rules from supporters of the quantitative paradigm. Their view concerning rules reflects their belief about language acquisition and language change. Variability, they argue, arises from the spread of language change through time and space, that is, socially and geographically. This view is given clear expression by Bickerton (1973):

> "Thus at any given point in time, the output of a speaker A (whom a given rule had not yet 'reached') would differ from that of a speaker B (whom the same rule had 'passed) with respect at least to the operation of that rule, and would leave open the possibility of a third speaker, C, whom the rule was just 'reaching', and who in consequence would sometimes produce A's output, sometimes B's. Such a model would account both for interpersonal variation (that between A's and B's outputs) and also for intrapersonal or inherent variation (that in which C's output differs from itself). Moreover, it could do so on the basis of a grammar that contained only categorical rules, with two provisos: first, that not every member of a speech community would be assumed to share the same set of rules, and second, that there be accepted a convention by which two quasi-equivalent rules (i.e., an 'old' rule and its replacement) would apply alternately for those persons in the process of losing the former and acquiring the latter." (p. 24)

The first relevant thing to observe is that, for supporters of the dynamic model, language rules are categorical, not variable in the sense of the quantitative model. Variation in language use therefore occurs when a speaker utilises two categorical rules alternately and this is to be interpreted as a reflection of the fact that he is at an intermediate stage of changing from one rule to another, the latter, in time, becoming the only rule he uses. Gatbonton (1975) illustrates it, as in Figure 1. Her illustration is considered most appropriate because it specifically refers to bilingual speakers. In the table (Gatbonton, p. 86) EC refers to environmental category, while integers refer to equivalent rules in first and second languages. Rule one may, therefore, be equated with a categorical rule, while rule two, which for her refers to a rule in the L2, may as well be equated with a second categorical rule in intralanguage variability.

Figure 1: Variation and Categorical Rule Replacement

	EC1	EC2	EC3
ACQUISITION PHASE:			
(a)	1	1	1
(b)	1	1	1,2
(c)	1	1,2	1,2
(d)	1,2	1,2	1,2
TRANSITION PHASE:			
(e)	1,2	1,2	2,1
(f)	1,2	2,1	2,1
(g)	2,1	2,1	2,1
REPLACEMENT PHASE:			
(h)	2,1	2,1	2
(i)	2,1	2	2
(j)	2	2	2

In the table, it is pointed out that both acquisition and replacement of rules begin from EC3 which is the most favourable environment, and spread to successive EC's on the left. Variation is indicated where two integers (i.e., two rules) converge, the one on the left having more prominence in the speaker's grammar. The important thing here is that the rules are discrete categorical rules and the possibility of their permanently co-existing in the grammar of one individual is denied. The implication of this for the speaker's mental capacity is that it is incapable of maintaining relationships between two (or more) competing rules over long periods of time. Bickerton (1971) therefore concludes that variable rules are unnecessary and that we have only changes in categorical rules.

On the statistical handling of data, supporters of the dynamic paradigm are opposed to frequency counts, even for the relative application of the alternative categorical rules they propose. Instead, they argue in favour of the implicational method or scalogram analysis which displays what the use of one variant implies for the use of another. In their view, since rules are ordered, the application of a rule at a higher level implies the application of another rule at a lower level. "Change normally proceeds from more marked to less marked" says Bickerton (1973). Consequently, it is the number of environments in which a rule applies in the speech of any one speaker that determines the speaker's linguistic state and possibly his social class, rather than the number of times that a particular version of a variable rule applies in any one environmental category. Also because of the implicational nature of scalogram analysis the use of a variant in EC1 implies that it would be used by the same speaker in EC2 and EC3, respectively. Thus, Anshen (1973) explains that "the use of a given variant of a linguistic variable in any instance of A_K for an individual implies its use in every instance of A_K and $A_K + 1$". In summary, then, supporters of the dynamic paradigm are of the opinion that linguistic rules are categorical rather than variable, thereby denying the speaker's mental ability to operate variant rules permanently or over long periods of time. They also deny that it is necessary to count the frequencies of occurrence of a particular variant before deciding whether a speaker uses that variant most of the time or not. They argue that the quantitative approach, to which they are opposed, is not capable of revealing obscure facts (e.g., of dynamism or change) which only the dynamic method can reveal (Decamp, 1973; Bickerton, 1973, 1973a).

1.5.4 Conclusion

Since the present work is carried out in the quantitative model one wants to point out the observed demerits of the dynamic paradigm which prevents it from being used as the basic study approach (it is employed later in 4.4). The demerits of scalogram analysis, as the dynamic paradigm is sometimes called, have been pointed out many times (see Fasold, 1970, 1973). Some of its defenders, for example Bickerton (1973a), often admit some of its flaws. Bickerton (ibid) concedes that scalogram tables are not always completely scalable though this is required of a deviant free table. In other words, the implicational theory does not usually succeed when put to empirical tests. The adherents of that paradigm are therefore, much to their dislike, constrained to admit the reality of linguistic phenomena such as delayed or premature rule acquisition or random application of rule variants. Secondly, the approach lacks a consistent principle of assigning informants to acquisition phases. For this reason Fasold (1970) objects to the practice of establishing what are referred to as percentage thresholds as arbitrary and impugnant to the integrity of implicational tables. The percentage threshold is a decision by each researcher to assign a percentage of evidence of the presence of a given rule as indicating its presence. There is no generally accepted level - for one researcher it may be 60% and for another 40%. Also, the evidence indicating absence of that rule is ignored - this enables them to deny variable rules. Finally, the cumulative effects of many instances of neglect arising from this practice is capable of falsifying data. Also, their denial of the notion of variable rules is contrary to empirical evidence since it is accepted that both free and constrained variation are linguistic realities(1). They overlook the fact

that rule variation does not have to be as a result of conscious effort on the part of the speaker, and talk of the mental capacity as if that were the case. Scalogram tables are bound to remain unscalable because of what is called incidental variation (see Kurath, 1939 and Wells, 1970) in which the occurrence of rule variants is not dependent on environmental categories. Bickerton (1971) describes them as "changes which occur" even while the speaker is "maintaining the same level of style and extra-linguistic factors are held constant". The final failure of the dynamic paradigm is the claim that it is capable of revealing facts which remain obscured in a quantitative analysis. Fasold (1970) demonstrates the falsity of that claim. He compares two tables, one each on dynamic and quantitative models derived from Wolfram (1969) and concludes that "deeper sociolinguistic structure than can be discovered with implicational analysis readily emerges from a frequency study display" (p. 558). The two tables are presented below(2).

TABLE 6: FREQUENCIES OF SIMPLIFIED CONSONANT CLUSTERS IN THE SPEECH OF DETROIT NEGROES BY LINGUISTIC ENVIRONMENT (Fasold, 1970, p. 558)

	Upper Middle	Lower Middle	Upper Working	Lower Working
C≠ - ## (V)	•07	•13	•24	•34
C - ## (V)	•28	•43	•65	•72
C≠ - ## C	•49	•62	•73	•76
C - ## C	•79	•82	•94	•97

TABLE 8: IMPLICATIONAL TABLE FROM TABLE 6 (Fasold, 1970)

	U.M.	L.M.	U.W.	L.W.
C≠ - # (V)	1	1	1	1
C - # (V)	1	1	1	1
C≠ - # C	1	1	1	1
C - # C	1	1	1	1

It is easily observed that it is possible from Table 6 to compare the relative effects of environmental categories as well as the relative performance of the social classes in these environments. In Table 8, on the other hand, the information one gets is that simplification takes place for all social classes in each environment. What the analyst apparently did in Table 8 was to establish a percentage threshold at about •1 indicating that any score below that level would be interpreted as absence of simplification and be scored zero in the table. Since there is no such case all the cases come out as similar, which is misleading. Even if the remedy of scoring zero for total absence, one for total presence and $\pm$ for partial absence and presence (see Fasold, 1970 and Bell, 1976, p. 57) is adopted, the information derived will still not be as revealing as that in Table 6.

The quantitative model will be employed in the present study because it is free from all the shortcomings described in the last paragraph. More important, it will be shown from the data analysed that there cannot be any dynamic analysis of the type described unless a quantitative analysis is first carried out. In other words, the truth of the suggestion, by Baehr (1969), Madden et al., (1978) and Fasold (1973) that the two models are complementary will be demonstrated. In fact it will be shown that the so-called dynamic paradigm is an extension of the quantitative method.

NOTES

(1) Yet, as Lakoff (1975) points out, a rule that is variable for one person may be categorical for another. Whether two rules are regarded as two categorical rules or variants of a single variable rule does not, in any important way, affect statistical reckoning of their use.

(2) A single cross-hatch indicates a morpheme boundary while a double cross-hatch indicates a word boundary.

CHAPTER TWO

RESEARCH OBJECTIVES AND STRATEGIES

2.1 OBJECTIVES

2.1.1 Introduction

The research was intended, primarily, to measure the extent of source-language phonological interference in the spoken English of Nigerian Yorubas. It was believed that a quantitative measurement was needed to signal the beginning of objective, more practical, discussion of the interference phenomenon and take it a step further than the limits of intuition. Because of the belief, expressed in the first chapter (introduction) that a catalogue of facts signifies nothing until related to specific problems it was considered necessary to examine the scientifically obtained interference rates in relation to certain problems that are current in linguistic thought and practice. A careful analysis of the facts would, it was believed, shed some light on those theoretical problems and the assumptions underlying certain practices current in the teaching of English in particular and second and foreign languages in general, and could, subject to the findings from subsequent work, influence the direction of future linguistic thought and pedagogical practice. The problems examined in relation to the interference data fall into two broad classes, namely the linguistic and the sociological. Each of them is explained briefly in the following paragraphs. Since they are all inter-related the division is merely for analytical convenience. Reports on the linguistic and sociological studies are presented in Chapters Four and Five respectively.

2.1.2 Linguistic Problems

Four linguistic problems, most of them already discussed in Chapter One, were examined. They are summarised as follows.

2.1.2.1 Predictive Power of Contrastive Analysis

This problem was examined because of the disagreement (see 1.3) about the practical usefulness of predictive contrastive analysis vis a vis explanatory contrastive analysis. Since the quality of any theoretical model is reflected in the quality of a contrastive analysis based on it, any decision arrived at on the predictive power of the analysis here is, at the same time, a decision on the analytical efficacy of transformational generative grammar of which generative phonology is a component. In order to evaluate the predictive power of the analysis, it was necessary to compare actual phonological interference with the predicted phonological interference derived from the contrastive analysis carried out in Chapter Three. The actual interference was the interference rate in the spoken English of the fifty informants interviewed for the research. The findings from the investigation of the problem should facilitate decision taking on the usefulness, or otherwise, of predictive contrastive analysis in the preparation of material for second- and foreing-language courses and actual classroom methods.

2.1.2.2 The Nature of L2 Speech

The investigation of the nature of second-language speech was considered necessary because it was suspected that though most of the existing works on contrastive analysis give the impression that source-language interference is an "all-or-none" feature of second-language speech this might indeed not be so. The observation by Gatbonton (1975) that L2 speech is a mixture of source-language and target-language forms strengthens that suspicion. Most of the existing works in this aspect seem to assume that an L2 speaker would use the sounds of his L1 in substitution for unfamiliar sounds of the L2

(cf. Weinreich, 1953 and on Yoruba-English, Afolayan, 1968) unless he somehow manages to learn the new sounds; in which case it is equally assumed that he will then stick to the new sounds and forget the 'old' source-language substitutions for good. In order to confirm or deny that suspicion, it was decided to examine the number of times that the informants could possibly have used a source-language form and compare that with the number of times that they actually did. It was possible in this way to decide whether the L2 speech of the informants, both jointly and severally, was indeed a mixture of both forms, both in overall speech, sound segment types and in individual sound segments, these being some of the levels at which the null and alternative hypotheses, formulated from Gatbonton's suggestion, could be interpreted. At the lowest level, for example, it was examined whether or not each informant used both source-language and target-language forms of a particular sound, and if so, in what proportions.

2.1.2.3 Variable Rules

Second-language speech appears to provide extremely suitable data for reconsideration of the concept of rule variability. The reconsideration became necessary because it was suspected that many of the so-called variable rules describe material that is, in fact, not variable at all or only marginally so. An examination of the degree of systematicity in L2 speech variation in relation to linguistic and non-linguistic environments (see 4.4)was considered appropriate for a reconsideration of the concept. A quantitative analysis of the frequencies of competing phonological forms in the two types of environments is undoubtedly the surest way to describe variation in speech. The frequencies obtained from the basic analysis therefore provide authentic, practical, data for that purpose.

2.1.2.4 Quantitative and Dynamic Paradigms

The investigation of these two approaches was carried out because of the current disagreement over them amongst many highly placed linguists (see 1.5). It was suggested (Madden et al., 1978) that the two approaches need not be contradictory but could be complementary to each other in revealing obscure linguistic information. The decision to investigate their relative values and relationship was sparked off by that suggestion. In the investigation, it was assumed that a quantitative analysis was a basic analysis and that only after that was it possible to use any other methods. In fact it was suspected that the so-called dynamic paradigm was not a different method but merely an extension of the use of the quantitative method. The investigation was therefore intended to examine that assumption in the light of the available data.

2.1.3 Sociological Problems

Four problems were also chosen for investigation. The first two, concerning the influence of phonetic training and sojourn, relate directly to some aspects of the teaching of English in Nigeria. The other two concern questions of general interest and the assumptions underlying certain popular beliefs about the competence of various sociological groups in language arts in general. These include the influence of exposure rate to a target language, which, in Nigeria, can be measured by the education level of the speaker, and the effect of sex differentiation on linguistic performance. Each of these is explained below and the reports of the findings on them are presented in the sociological study in Chapter Five.

2.1.3.1 Phonetic Training

The decision to examine the influence of 'phonetic training' on the performance of the informants was taken for pedagogical reasons. It was observed that many Nigerian secondary schools and universities offer courses in the pronunciation of English to their students. At the secondary school level such courses run for the last three years of the course and are examined as a subject for the West African School Certificate which is equivalent to the G.C.E. ordinary level. At university level the course lasts one year and is open to all freshmen in their first year of registration. Since many other schools and universities do not offer similar courses there are today Nigerian speakers who have received such training and many more who have not. Such courses, it was considered, could only have been introduced in the institutions which offer them on the assumption that the performance of their beneficiaries in English pronunciation would thereby be improved. It was decided, therefore, that a quantitative evaluation of the influence of such phonetic training programmes would be an appropriate way of confirming or disproving the basic assumption on which that practice is based.

2.1.3.2 Sojourn

There are practical and theoretical reasons for investigating the influence of sojourn on the performance of the informants in English. It is the practice, in many institutions of higher education both in Nigeria and elsewhere, of sending learners of a foreign language to live in a country where that language is a native tongue. Thus students of the French language are compelled to spend a "year abroad" in France during

the second year of their university course. The influence of sojourn in a "native environment" on competence in language use has also been examined by theoretical linguists. Upshur (1966), Mason (1971), Briere (1966) and more recently Krashen et al., (1978), all maintain that the acquisition of a second-language in informal environments may be more important than formal study. McCarthy (1978) denies the claim that pronunciation need not be taught because it is more easily acquired "after a period of time among native speakers of the language". McCarthy's opinion does not lend support to the "year-abroad" programme referred to earlier on. It was decided that a comparison of performance between informants who have lived in England for long periods of time and those who have not would provide a reliable evaluation of the influence of sojourn and thereby confirm either of the two conflicting opinions referred to on the subject.

2.1.3.3 Education

One assumption, to which the present writer subscribes, is that the level of education has significant influence on the competence of the Yoruba person in English. The assumption rests on the awareness that, as early as the first year in the secondary school in Nigeria, English becomes the main, almost sole, language of instruction in school subjects; this apart from the fact that English continues to be taught as a separate subject. This means that, apart from having had more hours of formal instruction, the more natural avenue for exposure to English for the person with higher education is considerably greater as compared to the person whose educational level is lower. A person's level of education remains

the major way by which to estimate that person's amount of exposure to English since Nigerians make the least possible [illegible] use of English outside the classroom. There is no doubt that the higher the educational level of the speaker the better his competence level in English will be. What was investigated here was whether such assumed higher proficiency level would be reflected in phonological performance. It was strongly suspected that a higher proficiency level in English among the Yoruba does not imply higher segmental phonological proficiency but higher proficiency levels in other aspects, particularly syntax, lexis, and the suprasegmentals.

2.1.3.4 Sex

The last sociological variable, sex, was examined in relation to informants' performance because of the very popular (in Nigeria, at least) assumption that members of the female sex are generally more endowed not only for language learning but for certain arts subjects, including painting and music. It was suspected that this supposed superiority of the female over the male sex either does not exist at all, or does not include language acquisition in its sphere. It was further suspected that if it included the language arts it would, at best, not be reflected in phonological performance among the informants. A quantitative analysis provides the most appropriate method for verifying this.

2.2 STRATEGIES

2.2.1 Elicitation and Storage of Data

Since the research involved the analysis of spoken language the only acceptable method was by the recording of informants' speech on tape. The problem as to whether such recording should be by surreptitious or open methods was also largely pre-determined. There is no doubt about the merits of surreptitious observation. Labov (1972a, p. 113) points out that to obtain the data most suitable for linguistic theory we have to observe how people speak when they are not being observed. Meyers and Grossen (1978) also assert that in order to observe behaviour as it occurs in the "real world" it has to be observed without interference. Two important reasons prevented that method from being adopted in the research however. First, it was considered both illegal and unethical to intrude into the informants' privacy without their consent. This was confirmed by the refusal of a few informants to have their speech recorded in spite of all attempts at persuasion. Secondly, the great number of informants involved in the short time available, the nature and diversity of the locations and circumstances - homes, offices, etc., - all would have made it impracticable. Even then the method suggested by Wolfram and Fasold (1974) was adopted: the informant was aware that his speech was being recorded but was given only the general purposes of the interview. For example, it was not made known that the specific purpose was phonological investigation. The only question, as to whether an informant had received 'phonetic training' or not, which would have provided a clue to the specific purpose, was delayed until the very end of the interview. This method would appear to have been successful judging from the fact that one

informant in Liverpool insisted that his recorded speech be erased when he suspected the specific purpose as he reckoned that he did not "pronounce well".

Another method that was reluctantly adopted was the use of a set questionnaire. This involved the reading of a set passage by each informant as part of the interview. It was recognised that this, again, seriously limited the naturalness of the data but it was necessitated by the great number of informants interviewed in the short time available. More important, however, was the large number of sounds tested and the necessity that each informant pronounced each sound in phonetic environments that are identical to those in which other informants pronounced them. As a last attempt to increase naturalness of the interview situation an introductory chat always preceded the real interview in order to establish the much needed rapport and divert the informant's attention. This was followed by the first part in which the informant gave personal details - except those on phonetic training. Even during the reading, informants were allowed to digress and ask questions as they wished, all being recorded from the very beginning to avoid any sudden change in the interview situation. It was however recognised that, as pointed out by Meyers and Grossen (ibid), the interviewer's mere presence is sufficient to alter the behaviour being observed - the observer paradox. All the tactics just described were therefore a pitiable compromise, but the ideal, as is well known, is always to be achieved.

2.2.2 The Sample

The population involved in the research was clearly defined since it had to do with natural qualifications. First, the informant had to be a Nigerian Yoruba. Secondly, Yoruba had to be his L1, which meant, naturally, that he must have lived the formative first part of his life in Yorubaland in Nigeria. Since the interview was in English the informant had to speak English. This meant that he had to be bilingual in Yoruba and English with the former as the L1 and the latter as L2. Finally, he or she had to be resident in England at the time of the interview since it took place in England. Children still in their formative years at the time were excluded because they were considered not linguistically mature in either of the languages. No person under twenty years of age was actually encountered apart from those who have lived all their lives in England and who hardly speak Yoruba fluently. The informants were therefore all adult Yoruba Nigerians whose L1 is Yoruba and whose L2 is English.

The sample was a free one. This means that once the basic criteria, discussed in the last paragraph, were met the major factor that determined who was interviewed was availability (see Moser, 1958, p. 52). This, it was observed was not the best sampling method that could have been used but the limitations of time, energy and money made it the most practicable. Secondly, as Anshen (1978, p. 39) points out, the use of that method "has not yet been shown to result in any seriously distorted claims". Since students are generally the most available informants special care was taken to include as many non-students among the sample as possible. In this respect, some officials of both the London and Liverpool Nigerian High Commission Offices not only agreed to be interviewed but also introduced

non-students known to them. It was however observed that non-students were generally less willing to have their speech sample recorded as many regarded it as a test of their competence in English. Others frowned at questions about their education and length of stay in England. An officer in Liverpool refused to complete the interview which he had continued in hardly audible whispers but actually took me to about six willing informants in the evening. Interviews took place in London, Sheffield, Leeds, Manchester, Liverpool and Nottingham. A number of visitors from Essex, Birmingham and Newcastle however became (un)willing informants in one or the other of the towns visited. For example, of four visitors to Manchester, two refused to be interviewed. One of the two who agreed to be interviewed was obviously falsifying his personal data with respect to education and sojourn ; and the two interviews were marred by deliberate noise by whoever was not being interviewed. Such recordings were not processed for the data. It also appeared that the oldest informants, who, generally, did not seem to have come to England for definite goals and did not appear to want to go back, were more enthusiastic about being interviewed.

2.2.3 Coding and Analysis of Data

The first step was to transcribe the data. Because of the volume of material involved it was not possible to get a second person to transcribe so as to compare transcriptions. Two steps were adopted. A second transcription of a few of the interviews by a colleague in the department was obtained. Then a second transcription of a quarter of the interviews by the first transcriber was carried out. Both were compared with the original transcription and differences, which were few anyway, were reconciled. The whole transcription was then rechecked.

Next was the coding system to be adopted. A simple ordinal method was employed for all the variables. For the phonetic realisations a score of one indicated a target-language realisation while two indicated a source-language pronunciation in each sound. A similar coding system was adopted in categorising informants in respect of each of the sociological variables. For example, a score of one in a cell within the sex column indicated a male informant while a score of two indicated a female. The coding system employed made all necessary calculations both easy and verifiable. For example, the total number of source-language realisations produced by any informant was easily derivable by counting the number of twos scored against his number in the relevant sound segments.

2.3 ORGANISATION

The report of the research is divided into five chapters of which the last two could be properly called reports. The first chapter discusses some of the problems investigated as they exist in literature. The present, which is the second, is an attempt to summarise relevant problems encountered in the planning and execution of the research, as well as explaining its comprehensive goals. These first two chapters are therefore preliminary in a sense. The third chapter contains a comparison of the phonological systems of English and Yoruba from which predictions of phonological interference were made. Problems relating to the choice of sound segments and other aspects to be tested were tackled only after that was done and the questionnaire was as a result of all the steps taken in that chapter. The reports on the linguistic aspects of the findings are presented in Chapter Four while those on the sociological aspects are given in the fifth and final chapter.

CHAPTER THREE

PREDICTION OF PHONOLOGICAL INTERFERENCE

3.1 INTRODUCTION

Three important steps are necessary in the prediction of interference between any aspects of the systems of two languages. A thorough analysis of that aspect of the system of each language concerned is first carried out. This is to highlight the salient features of the system. After that a comparison of the features of the two systems should be undertaken in order to bring out their differences and similarities. Finally, from the contrasts observed in the two systems a prediction of the potential interference between them can then be made. The three steps are therefore ordered from one to three in the sense that the first precedes the second, which, also precedes the third. Justification for the exclusion of suprasegmental interference in the present work is given in 3.5.

3.2 SUMMARY C.A. OF ENGLISH AND YORUBA PHONOLOGY

3.2.1 Distinctive Features Employed

The distinctive features employed in characterising segments here are basically those used by Chomsky and Halle (1968) and most generative phonologists. Some improvements, suggested by Ladefoged (1971), are incorporated, as well as one or two modifications deemed necessary for this particular work. The following controversial phonetic features need special comment:-

[vocalic]

Chomsky and Halle (1968, hereafter S.P.E.) suggest that [syllabic] should replace [vocalic] (p.354). Schane (1973, p. 26), however, argues that [syllabic] "characterises the role a segment plays" in the syllable structure. Grace (1975) supports the use of [vocalic] but also wants to retain [syllabic] as a separate phonetic feature, because, according to her, syllabic and non-syllabic nasals and liquids are phonetic variants. Finally, Jakobson, Fant and Halle (1951) point out that some unstressed vowels lose syllabicity in certain environments: for example, when adjacent to another vowel, as in a diphthong. My view is that [syllabic] is a phonetic feature but that it has a domain larger than a single segment. Ladefoged (1971, p. 81) agrees that the syllable is a valid phonological unit sometimes comprising more than one segment. [Syllabic] can, therefore, not form part of the constituent features of a single segment. Most important, [syllabic] is not a distinctive phonetic feature in either of the two languages with which I am concerned. Finally, were we to admit [syllabic] as a phonetic feature we would then have to list all segments, especially vowels, nasals and liquids,

which are capable of syllabic and non-syllabic realisations, twice. We would first list the [+ syllabic] segments and then their [- syllabic] cognates. I therefore reject [syllabic] as a segment-structure feature and employ [vocalic] instead. [Syllabic] is however introduced in the description of syllable structure in SL11 and ESS2a.

[High]

The S.P.E. system of [high] and [low] is considered not sufficiently distinguishing among segments. Ladefoged (1971, p. 103) suggests the need to modify it because, as he points out, [- high] is not necessarily [+ low] in the S.P.E. system. A suggested alternative using a multivalued system has become more popular. It, however, has the disadvantage that every linguist chooses any number of integers which he considers adequate. Ladefoged (ibid), for instance, uses a four-integer system for Danish vowels. Sommerstein (1977, p. 10) also uses four for English segments, while Johnson (1972) uses a six-integer system for Tswana vowels. Until a universal height schema is proposed and accepted this will continue to happen. But this system is particularly useful in contrastive analysis where a [+ high] segment in one language may be lower than a [+ high] segment in another. I adopt a four integer system here since this is sufficient to bring out height differences between and among English and Yoruba sound segments.

[long]

S.P.E. features [lax, tense] are replaced here by [long]. Lass (1976) offers the main argument against the lax-tense dichotomy. After detailed consideration he concludes "that [+ tense] is not a specification, like [+ high], that is verifiable in phonetic output . . ." . Fant (1967) calls for more experimental "data to illuminate this very interesting problem". I support the view expressed by Anderson (1972), to the effect that a "monophthongal lax

vowel differs from its corresponding tense vowel in two respects: qualitatively and quantitatively". The qualitative difference is accounted for here by [high], leaving only the quantitative difference to be represented. Ladefoged (1972) suggests four degrees of length, namely ballistic, normal, long and extra-long, for these quantitative differences. I, however, restrict myself to a two-term system of [+ long] and [- long] because the feature [long] is not distinctive in Yoruba. In English, where it combines with qualitative differences to be distinctive, the binary opposition of plus and minus is the only relevant one.

3.2.2 Distinctive Feature Matrices for English and Yoruba

The standard practice in generative phonology is to represent phonological systems as matrices. In a matrix each column stands for a sound segment [phoneme] while a row stands for a distinctive feature. The entry in a particular cell, which is where a column and a row intersect, indicates what value that segment selects of the phonetic feature in question. Feature matrices are visual representations and are therefore easy to read. Comparison of different segments in respect of distinctive features is also easily carried out. The following distinctive-feature matrices for English and Yoruba segments are based on existing work in these languages, with modifications, some of which have just been pointed out in the last paragraph. For the distinctive feature matrices in English Sommerstein (1975), Chomsky and Halle (1968), Liles (1971), Hyman (1975) and Ladefoged (1971) form the major sources. Courtenay (1968) provides a useful guide in the generative phonology of Yoruba though most of the errors of many of the existing analyses of Yoruba (see 3.2.3, below) are incorporated into that work, especially in the segmental aspect. The matrices are fully specified (including redundancies) to facilitate comparison.

DISTINCTIVE-FEATURE MATRIX FOR ENGLISH CONSONANTS

	p	b	t	d	k	g	č	ǰ	f	v	θ	ð	s	z	š	ž	m	n	ŋ	l	r	j	w	h
Vocalic	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	+	−	−	−
Consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	−	−	−
Continuant	−	−	−	−	−	−	−	−	+	+	+	+	+	+	+	+	−	−	−	−	+	+	+	+
Delayed Release	−	−	−	−	−	−	+	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
Voiced	−	+	−	+	−	+	−	+	−	+	−	+	−	+	−	+	+	+	+	+	+	+	+	−
Labial	+	+	−	−	−	−	−	−	+	+	−	−	−	−	−	−	+	−	−	−	−	−	−	−
Nasal	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	+	+	−	−	−	−	−
Anterior	+	+	+	+	−	−	−	−	+	+	+	+	+	+	−	−	+	+	−	+	−	−	−	−
Coronal	−	−	+	+	−	−	+	+	−	−	+	+	+	+	+	+	−	+	−	+	+	−	−	−
Strident	−	−	−	−	−	−	+	+	+	+	−	−	+	+	+	+	−	−	−	−	−	−	−	−
Back	−	−	−	−	+	+	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	−	+	−
High	2	2	2	2	4	4	4	4	2	2	2	2	2	2	4	4	2	2	4	3	2	4	4	2

DISTINCTIVE-FEATURE MATRIX FOR YORUBA CONSONANTS

	kp	gb	b	t	d	k	g	ʃ	f	s	ʂ	m	n	ŋ	l	r	j	w	h
Vocalic	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-
Consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-
Continuant	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	+	+	+	+
Delayed Release	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
Voiced	-	+	+	-	+	-	+	+	-	-	-	+	+	+	+	+	+	+	-
Labial	+	+	+	+	-	-	-	-	-	+	-	-	+	-	-	-	-	-	-
Nasal	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-
Anterior	+	+	+	+	+	-	-	-	+	+	-	+	+	-	+	-	-	-	-
Coronal	-	-	-	+	+	-	-	+	-	+	+	-	+	-	+	+	-	-	-
Strident	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-	-	-	-	-
Back	+	-	+	-	-	-	-	+	+	-	-	-	-	-	+	-	-	+	-
High	4	2	4	2	2	2	2	4	4	2	2	2	4	2	2	4	3	2	4	4	2

DISTINCTIVE-FEATURE MATRIX FOR ENGLISH VOWELS

	I	ʊr	ɛ	ʌ	æ	ɔ	ə	u:	a:	ɔ:	ɜ:	i:	eI	aI	ɔI	əʊ	aʊ	Iə	ɛə	ʊə
Vocalic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Consonantal	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
Back	−	+	−	+	−	+	−	+	+	+	−	−	+−	+−	+−	+	+	−+	−+	+
Round	−	+	−	−	−	+	−	+	−	+	−	−	−	−	+−	−+	−+	−	−	+−
Long	−	−	−	−	−	−	−	+	+	+	+	+	+	+	+	+	+	+	+	+
High	3	3	2	2	2	2	2	4	1	1	2	4	23	13	13	23	13	32	22	32
Nasal	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

DISTINCTIVE-FEATURE MATRIX FOR YORUBA VOWELS

	i	u	ɛ	o	a	ɔ	e	ɪ	ɛ̃	ã	ũ
Vocalic	+	+	+	+	+	+	+	+	+	+	+
Consonantal	−	−	−	−	−	−	−	−	−	−	−
Nasal	−	−	−	−	−	−	−	+	+	+	+
Back	−	+	−	+	+	+	−	−	−	+	+
Round	−	+	−	+	−	+	−	−	−	−	+
High	4	4	2	2	1	2	2	4	2	1	4
Long	−	−	−	−	−	−	−	−	−	−	−

3.2.3 Notes on Certain Segment Types

It may have been observed that some segment types are present or absent in the distinctive-feature matrices. Their inclusion or exclusion is briefly explained here.

3.2.3.1 Diphthongs

Diphthongs are not represented in the distinctive-feature matrices for Yoruba vowels. Both Ward (1952) and Afolayan (1968) argue for the presence of diphthongs in Yoruba. Examples usually cited include the following types:-

(a) àì as in airi (failure to see)

(b) áú as in raurau (completely; with burn)

(c) ùọ̀ as in kuọkuọ (sluggishly; with jump)

(d) eũ as in jẹun (eat)

(e) ìṹ as in kiniun (lion)

(f) ei as in ẹiyẹ (bird)

My contention however is that there are no diphthongs in Yoruba whether in the underlying or surface phonological level. The examples cited above are vowel clusters or sequences of vowels. That they are not diphthongs can be explained in a number of ways. Sommerstein (1977) describes a diphthong as a sequence of two vowels only one of which is syllabic. In each of the examples above both vowels are syllabic except in (f). Each of them has its own tone-level since there is considerable segment juncture between the two vowels. Secondly, in Yoruba, the domain over which a tone has dominance is the syllable. We know that a segment cannot transgress a syllable boundary, that is, to become or belong to two syllables. Since each of the vowel

clusters has two tone marks they must be or belong to two different syllables. Two syllables cannot constitute a single segment just as a segment cannot constitute two syllables. Thirdly, the clustering of these vowels is a result of the deletion of consonant segments which are present in their underlying form. This is the case in (a) - (e) above. That the consonants are still sometimes realised in some Yoruba dialects is evidence in support of this claim. Our examples can be explained as follows:-

(a) airi ⟶ ayiri

(b) raurau ⟶ rawurawu

(c) kuọkuọ ⟶ kuwọkuwọ

(d) jẹun ⟶ jẹ-ohun (vowel and consonant deletion)

(e) kiniun ⟶ kiniwun

In (d) it should be observed that the vowel before the deleted consonant segment is also deleted and that this allows the two separate words to fuse into one. Similar examples of consonant deletion, which is a popular phonological process in Yoruba, include the following:-

aoko ⟶ awoko (parrot)

okoo ⟶ okowo (twenty in Yoruba numeric system)

oogun ⟶ ogungun (medicine - consonant deletion plus vowel harmony)

daradara ⟶ daadaa

A fourth argument against (a) is that each of the two vowel segments signifies a different grammatical function. This is demonstrable as follows:-

Morpheme	Word	Class	Function of Morpheme
ri	ri	Verb	Stem
i-	iri	Noun	Nominalisation
a-	airi	Noun	Negativisation

It is therefore clear that each of the vowel segments is a morpheme and that it indicates a definite syntactic process in the language.

The last case, (f), is an instance of the very common mis-spellings of Yoruba words occasioned by the attempts of earlier writers (especially first language users of English) to model Yoruba orthography on that of English. The error has been put right by the Yoruba Orthography Association. The correct forms of this and a few other words are as indicated here:

ẹiyẹ ⟶ ẹyẹ (bird)

Awtan ⟶ Ọtan (name of a town)

Ilesha ⟶ Ilẹṣa (name of a town)

Ẹffọn ⟶ Efọn (name of a town)

Ọshogbo ⟶ Ọṣogbo(name of a town)

Ọshọ ⟶ Ọṣọ (name of person)

3.2.3.2 Long Vowels

There are also no long vowels in Yoruba as revealed in the distinctive-feature matrices. De Gaye and Beecroft (1957), as well as Ward (1952) argue in favour of long vowels in Yoruba, but Siertsema (1958, 1957b) explains that though some vowels in Yoruba are subject to lengthening in certain environments, as is the case in English, there are no phonemically significant long vowels. In other words, [length] is not a distinctive feature in Yoruba phonology since no contrast between two segments is referrable to that feature. What are usually referred to as long vowels in Yoruba are,

in fact, vowel clusters which, as already pointed out arise from consonant deletion. It is customary to write such clusters as one segment plus [length], but, again, the Yoruba Orthography Association has ruled that the practice should stop. Instead, two vowels should be written. As Siertsema (1959) points out, each of the vowel segments in these clusters usually belongs to different syllables. Some are, in fact, different words joined to a preceding vowel segment, but this is purely an orthographical error. For example, Ward's example:

> O gọ̃. (It fed him = He is fed up with it), should actually be: O gọ́ ọ̄.

In that sentence, the last vowel segment is a third person singular pronoun (he, she, it) while the preceding syllable is a word and a noun. The main problem for the type of analysis offered by Ward (ibid) is its inability to make a distinction between lengthened (contextually) vowel segments and [+ length] vowel segments. Failure of a similar nature, namely to distinguish between nasalised and [+ nasal] consonants, led Ward (1952) to posit the presence of nasal consonants / w̃, ỹ, r̃ / in Yoruba. It has been explained by Siertsema (1957a), Ladefoged (1964) and Afolayan (1968) that certain consonant segments are, naturally, nasalised in the environment of [+ nasal] vowel segments.

3.2.3.3 Nasal Vowels

Only four of the vowel segments in Yoruba are [+ nasal] segments. The fifth [+ nasal] segment, recognised by Ward (1952), is /ɔ̃/; orthographically written as 'ọn' as in 'àgbọn' (coconut), 'ìbọn' (gun) and 'ifọ̀n' (rashes). It is however a phonetic variant of /ã/, written as 'an' as in 'ọkàn' (heart) and 'ẹ̀gàn' (derision). The two sounds are not contrastive(1). Both may occur in the speech of the same person, but though the one represented in the matrix

is the most widespread, a few people may make habitual use of the other. Even in the orthography /ɔ̃/ appears to occur after (+ labial) consonants while /ã/ occurs in other environments. Secondly, /ɔ̃/ usually occurs in any environment in affected or elevative speech and is, therefore, more common among those who like to pretend to be important, civilised or impressive. It is therefore to be heard more frequently in places like Lagos or from people coming from Lagos, which, in Nigeria, is generally regarded as the home of phoniness. Contrary to Siertsema (1957a), however, /ũ/ is by no means a contextual variant of /ɔ̃/. They contrast in many words such as 'ĩyùn' (silver) and 'ĩyàn' (argument).

3.2.3.4 Complex Segments

Hoard (1971) proposes the concept of complex segment as a segment which, for at least one feature, has two or more specifications. Sommerstein (1977), explains that the "phonetic correlates of these specifications are taken to appear in temporal succession" (p. 104). This useful device is employed here to work out the distinctive-feature composition of two consonant segments in Yoruba, namely /kp/ and /gb/. The airstream (and other articulation) mechanism involved in their production is explained by Siertsema (1958), Ladefoged (1964) and Chomsky and Halle (1968). The major characteristics are the closure of the oral cavity at two points and a combined egressive-ingressive airstream. These processes are however simultaneous rather than temporally successive. It is clear also that both affricates and diphthongs constitute a subclass of complex segments in English, going by their articulatory characteristics.

3.3 PHONOLOGICAL DIFFERENCES BETWEEN YORUBA AND ENGLISH

3.3.1 Introduction

The phonological differences examined here are of two major types, namely segment structure differences and segment sequence differences. Segment structure refers to the distinctive-feature composition of sound segments. Two languages may differ in the type of distinctive features combined in their sound segments. They may also differ in the co-efficients of chosen distinctive features that can be present in their sound segments. A description of these types of differences between two languages is generally called segment inventory differences. An easy way of doing this is to count the sound segments in the distinctive-feature matrices but the relationship among corresponding segments would not thereby be known. In other words, we would not know which segment in one language most resembles another segment in the other language in terms of their composition. The importance of such knowledge is that it enables one to predict how speakers of the first language are likely to realise a particular sound of a second language if that sound does not occur in their own language. It therefore provides the groundwork for prediction of potential interference. Similarly, a statement of segment sequence in two languages enables us to predict potential interference in segment arrangement or segment patterning, usually referred to in autonomous phonology as phonotactics. It describes the permissible co-occurrence of sound segments in a language. The distinction is a necessary one because it is possible for two languages to share a common inventory of sound segments and yet differ in segment sequence patterns. To arrive at segment structure differences and segment sequence differences between two languages one needs therefore to compare their segment structure and segment sequence conditions

respectively. From these two one would arrive at segment structure and segment sequence constraints which describe such differences or contrasts.

Two important distinctions need to be further made. The first is that segment structure or segment sequence conditions differ from phonological rules, which, as stated by Lightner (1973), delete, permute or convert segments and are specifically referred to as rewrite or transformational rules. Secondly, a distinction is made between universal and language-specific structure and sequence conditions and constraints. Universal conditions ensure what Sampson (1970) refers to as phonetic plausibility which requires that a sound in natural language must be pronounceable. A universal constraint would be that [+ high] segments cannot be [+ low]. A condition observed by Hyman (1975, p. 107), is that [+ del. release] segments are universally [- nasal]. For a contrastive study of two or more languages, however, one is only concerned with language-specific conditions and constraints. Conditions and constraints shared by the two languages under study are ignored here since they do not lead to any differences in their systems. A comparison of the distinctive-feature matrices for both languages reveals differences in segment structure conditions.

3.3.2 Segment Structure Conditions

3.3.2.1 Consonants

The first thing to observe from the distinctive-feature matrices is that Yoruba has fewer consonant segments than English in spite of the numerous identical segments in both languages. Seventeen of the nineteen consonant segments in Yoruba also occur in English, but the latter has a total of twenty-four consonant segments. This difference is an indication

that there are certain segment structure constraints which operate in Yoruba but not in English. A statement of the structure conditions for corresponding segments or classes of segments enables us to discover such constraints.

In Yoruba [+ continuant] consonant segments are [- voice]. Corresponding consonant segments in English, on the other hand, are either [+ voice] or [- voice]. These can be formally stated as YSC1 and ESC1 respectively.

YSC1
$$\begin{bmatrix} - \text{ voc} \\ + \text{ cons} \\ + \text{ cont} \end{bmatrix} \longrightarrow \begin{bmatrix} - \text{ voice} \end{bmatrix}$$

ESC1
$$\begin{bmatrix} - \text{ voc} \\ + \text{ cons} \\ + \text{ cont} \end{bmatrix} \longrightarrow \begin{bmatrix} \pm \text{ voice} \end{bmatrix}$$

The segment structure constraint on Yoruba segments belonging to this class is therefore expressed as YC1.

YC1
$$\begin{bmatrix} + \text{ voc} \\ + \text{ cons} \\ + \text{ cont} \end{bmatrix} \not\longrightarrow \begin{bmatrix} + \text{ voice} \end{bmatrix}$$

where the symbol $\not\longrightarrow$ means 'is not'. As a result of this particular segment structure constraint all the [+ voice, + continuant] consonant segments symbolised as /v/, /z/, /ʒ/ and /ð/ which are present in English segment inventory are not present in that of Yoruba.

The second segment structure condition to be observed concerns the feature [strident]. In Yoruba all [+ continuant] consonant segments are [+ strident]. In English corresponding segments are either [+ strident] or [- strident]. These conditions are stated as YSC2 and ESC2 respectively.

The observed segment structure constraint on Yoruba segments in respect of this feature is stated as YC2.

YSC2

$$\begin{bmatrix} - \text{ voc} \\ + \text{ cons} \\ + \text{ cont} \end{bmatrix} \longrightarrow [+ \text{ strident}]$$

ESC2

$$\begin{bmatrix} - \text{ voc} \\ + \text{ cons} \\ + \text{ cont} \end{bmatrix} \longrightarrow [\pm \text{ strident}]$$

YC2

$$\begin{bmatrix} - \text{ voc} \\ + \text{ cons} \\ + \text{ cont} \end{bmatrix} \not\longrightarrow [- \text{ strident}]$$

This segment structure constraint accounts for the non-occurrence in Yoruba of the segments /θ/ and /ð/ which occur in English. Note that the last of these two segments is also barred by YC1. It is therefore doubly barred from occurring in Yoruba.

Third, it is observed from the matrices that [+ delayed release] consonantal sounds are [+ voice] or [-voice] in English. On the other hand, they are only [+ voice] in Yoruba, thus giving rise to another segment structure restriction in that language. The segment structure conditions in both languages and the segment structure constraint in Yoruba are expressed formally as YSC3, ESC3 and YC3 respectively.

YSC3

$$[+\ \text{delayed release}] \longrightarrow [+\ \text{voice}]$$

ESC3

$$[+\ \text{delayed release}] \longrightarrow [\pm\ \text{voice}]$$

YC3

$$[+\ \text{delayed release}] \not\longrightarrow [-\ \text{voice}]$$

As a result of YC3 /ɛ̀/ does not occur in the segment inventory for Yoruba though it occurs in English. Both languages however have /ʃ/ among their consonantal sound segments.

The last type of segment structure condition to be derived from the distinctive-feature matrices for consonantal sounds in the two languages concerns [+ labial] segments. In Yoruba, sound segments in this class are either [+ back] or [- back]. In English, on the contrary, all that are [+ labial] are [- back]. Compared to Yoruba, therefore, English segments in this class are constrained in respect of the features [labial] and [back]. The structure conditions for the segments concerned as well as the constraint in English are formally statable as YSC4, ESC4 and EC1.

YSC4

$$[+\ \text{labial}] \longrightarrow [\pm\ \text{back}]$$

ESC4

$$[+\ \text{labial}] \longrightarrow [-\ \text{back}]$$

EC1

$$[+\ \text{labial}] \not\longrightarrow [+\ \text{back}]$$

As a result of these segment structure conditions and EC1 the sounds represented as /p/ and /b/ occur in English while /kp/ and /gb/ do not occur. All four sounds are capable of occurring in Yoruba in the light of YSC4 but we observe that /p/ does not occur in the distinctive-feature matrix for that language. A more detailed observation of the matrices should reveal a further constraint which prevents its occurrence. This constraint is expressed as YC4, which permits the occurrence of /b/, /kp/ and /gb/ but not /p/.

YC4

$$\begin{bmatrix} +\text{ labial} \\ -\text{ back} \\ -\text{ cont} \end{bmatrix} \not\rightarrow [-\text{ voice}]$$

Specifically, YC4 permits the occurrence of /b/ in Yoruba but bars the occurrence of /p/ in that language.

It is observed, therefore, that a total of seven sound segments which occur in English do not occur in Yoruba. Conversely, two sound segments occur in Yoruba but not in English.

3.3.2.2 Vowels

A comparison of the distinctive-feature matrices for vowels in the two languages reveals immediately two major areas of difference in the segment structure of these sounds. First, Yoruba vowel sounds are either [+ nasal] or [- nasal]. English vowels, on the other hand, are necessarily [- nasal]. In other words, none of the four [+ nasal] vowels which occur in Yoruba occurs in English. The respective segment structure conditions for vowels in respect of [nasal] in Yoruba and English are stated as YSC5 and ESC5. The segment structure constraint which prevents [+ nasal] vowels in English is stated formally as EC2.

YSC 5

$$\begin{bmatrix} + \text{ vocalic} \\ - \text{ cons} \end{bmatrix} \longrightarrow \begin{bmatrix} \pm \text{ nasal} \end{bmatrix}$$

ESC5

$$\begin{bmatrix} + \text{ vocalic} \\ - \text{ cons} \end{bmatrix} \longrightarrow \begin{bmatrix} - \text{ nasal} \end{bmatrix}$$

EC2

$$\begin{bmatrix} + \text{ voc} \\ - \text{ cons} \end{bmatrix} \not\longrightarrow \begin{bmatrix} + \text{ nasal} \end{bmatrix}$$

The second major difference observed is that while English vowel sounds are either [+ long] or [- long] all Yoruba vowels are [- long]. A formal statement of these facts is made as YSC6 and ESC6 for Yoruba and English respectively.

YSC6

$$\begin{bmatrix} + \text{ voc} \\ - \text{ cons} \end{bmatrix} \longrightarrow \begin{bmatrix} - \text{ long} \end{bmatrix}$$

ESC6

$$\begin{bmatrix} + \text{ voc} \\ - \text{ cons} \end{bmatrix} \longrightarrow \begin{bmatrix} \pm \text{ long} \end{bmatrix}$$

The segment structure constraint preventing [+ long] vowels in Yoruba is then stated as YC5.

YC5

$$\begin{bmatrix} + \text{ voc} \\ - \text{ cons} \end{bmatrix} \not\longrightarrow \begin{bmatrix} + \text{ long} \end{bmatrix}$$

A few other less prominent differences are observable from the distinctive-feature matrices for vowels in the two languages. First among these is that there are no complex [+ vocalic] segments in the Yoruba matrix, but since, in English, all such sounds are also [+ long] the new segment structure condition does not exclude any new segments nor does it explain the presence of any new one in English. It was explained at the beginning of this chapter that complex segments combine either contradictory co-efficients in respect of one or more distinctive features, or similar co-efficients in respect of mutually exclusive or polar distinctive features. Notice that some English diphthongs do just that in respect of [back] and [high], especially [back] in which they combine positive and negative co-efficients.

A few other vowel segment differences are observable from the matrices. In the distinctive-feature matrices for English vowels those segments that are [+ back] and [2 high] are either [+ round] or [- round]. In the Yoruba matrices corresponding segments are [+ round]. These segment structure conditions are stated as YSC7 and ESC7 for Yoruba and English respectively.

YSC7

$$\begin{bmatrix} V \\ +\ \text{back} \\ 2\ \text{high} \end{bmatrix} \longrightarrow \begin{bmatrix} +\ \text{round} \end{bmatrix}$$

ESC7

$$\begin{bmatrix} V \\ +\ \text{back} \\ 2\ \text{high} \end{bmatrix} \longrightarrow \begin{bmatrix} \pm\ \text{round} \end{bmatrix}$$

The constraint on Yoruba vowel system arising from YSC7 is stated as YC6.

YC6

$$\begin{bmatrix} v \\ +\ back \\ 2\ high \end{bmatrix} \not\longrightarrow \quad [-\ round]$$

The effect of YC6 is that /ʌ/ does not occur in Yoruba, though /o/, which is a [+ round] segment occurs. /ɔ/ occurs in both Yoruba and English since it fits both conditions described in YSC7 and ESC7. The only remaining difference in the vowel segment inventory is the occurrence of /ə/ in English and its non-occurrence in Yoruba. Since this sound is generally accepted as not occurring even in English at the underlying form it is a form derived through a pure phonological rule usually referred to as the vowel reduction rule. Chomsky and Halle (1968) express the rule as (103) with the proviso that unstressed [- high] vowels reduce to /ə/ in word-final positions while unstressed, non-tense, vowels reduce in word-medial positions (S.P.E., p. 110).

(103)

$$\begin{bmatrix} -\ stress \\ -\ tense \\ v \end{bmatrix} \longrightarrow \quad [ə]$$

The effect of the absence of /ə/ in Yoruba and the absence of (103) in Yoruba phonology will be examined in the final section of the present chapter.

Attention will be directed to word-final segments only in the investigation.

3.3.3 Segment Sequence Conditions

3.3.3.1 Minimally and Maximally Restrictive Conditions

Two languages may differ in four ways in respect of segment conditions (Shen, 1961). The first of these is the segment structure condition discussed in 2.3.2. Secondly, they may differ in the permissible sequence of vocalic and consonantal types of segments in general. For example, English may permit a sequence of two consonantal segments while Yoruba does not. Shen (ibid) refers to this level as segment arrangement. Thirdly, two languages which both permit a sequence of two consonantal segments may differ if one allows such clusters only in syllable-initial position and the other allows them only in syllable-final position. A fourth and last type of difference occurs when two languages which permit similar segment arrangement impose different restrictions or constraints on what particular segment structure may co-occur in certain positions in a cluster. For example, it is known that when three consonantal segments begin an English syllable the first of these three may only be /s/. This type of constraint may be described as a maximally restrictive one compared with segment arrangement constraints which are minimally restrictive. A contrastive analysis of English and Yoruba segment-sequence conditions will reveal at which of these levels they differ. The analysis of English segment sequence is based mainly on that of Cohen (1952), though many of his ideas are rejected because they describe orthographic rather than phonological segments. Finally, the feature [syllabic] is now introduced to characterise the function of sound segments within the syllable. The syllable is therefore the domain of segment sequence and the terms initial and final refer to that unit. Sequences of segments across a syllable boundary are, as suggested by Pulgram (1970) not considered relevant to this analysis. I, however, employ the term 'sequence' contrary to Pulgram's

suggestion that it should refer to intersyllable rather than to intrasyllable series (Pulgram, 1970, p. 79).

At the least restrictive level, that is segment arrangement, the permissible sequence of segments within the syllable exhibits considerable difference between Yoruba and English. The conditions can be economically stated using C as a symbol for consonantal segments and V for vocalic segments. Segments that are [+ vocalic] and [+ consonantal] and those that are [- vocalic] and [- consonantal] are symbolised as C since in standard English or standard Yoruba they are mainly consonantal in function. Yoruba has a very simple segment sequence arrangement in that it permits only two types of syllable structure in the underlying form. A syllable, in Yoruba, is either a single vocalic segment or a combination of one vocalic segment and a consonantal segment which always precedes the vocalic. The only deviation from this norm is the occurrence of /m/ or /ŋ/ before another consonantal segment as in /mbɔ/ (is coming) or /ŋlɔ/ (is going). This does not invalidate the analysis for two reasons. First the occurrence of this sequence of two consonants in the surface structure is the result of the deletion[2] of an underlying vowel segment, the underlying forms for the examples given here being /mibɔ/ and /milɔ/ respectively. These full forms are still used in certain dialects of Yoruba (e.g. Ijesha) and in leisurely speech even of users of what might be called standard Yoruba. They can be most easily heard, however, in Yoruba songs. The sound is therefore /m/ in the underlying form, but is realised at the surface level as /ŋ/ after vowel deletion in all environments except before [+ labial, + voiced] consonants. A second reason for excluding this sequence in the analysis is that it represents a whole syllable on its own as can be seen from its underlying form. In addition, even in its surface realisation it has its own tone mark, tone in Yoruba being a phonological

property of the syllable. Lastly, the [+ nasal] consonant in question indicates a grammatical operation, that is, [+ continuous], in relation to the verb stem to which it is prefixed and is therefore semantically different. It is unique however in being the only [+ syllabic] consonant segment in Yoruba but this is possible only because of the deletion of the succeeding vowel.

3.3.3.2 Sequence Conditions

Having explained that possible confusion we state the segment sequence conditions for Yoruba, using the angled bracket notation as YSS1, expanded into YSS1a and b:

YSS1 Syllable ⟶ <[C]> [V]

YSS1a Syllable ⟶ [C] [V]

YSS1b Syllable ⟶ [V]

The corresponding segment sequence conditions for English syllables are formulated as ESS1.

ESS1

Syllable ⟶ $\langle_3[C]_3\rangle$ $\langle_2[C]_2\rangle$ $\langle_1[C]_1\rangle$ [V] $\langle_4[C]_4\rangle$ $\langle_5[C]_5\rangle$ $\langle_6[C]_6\rangle$ $\langle_7[C]_7\rangle$

ESS1 will be expanded into ESS1a - h. In expanding angled brackets those with the same numerical indices are removed together.

ESS1a: Syllable ⟶ [V]

ESS1b: Syllable ⟶ [C] [V]

ESS1c: Syllable ⟶ [C] [C] [V]

ESS1d: Syllable ⟶ [C] [C] [C] [V]

ESS1e: Syllable ⟶ [V] [C]

ESS1f: Syllable ⟶ [V] [C] [C]

ESS1g: Syllable ⟶ [V] [C] [C] [C]

ESS1h: Syllable ⟶ [V] [C] [C] [C] [C]

When one compares YSS1 and ESS1 and their respective expansions one discovers that both are similar in permitting a [V] syllable, that is, a one-segment syllable provided that that segment is [+ vocalic] and [- consonantal]. They also both permit [C] [V] as a syllable structure, but there the similarity ends. It is observable that Yoruba does not permit a sequence of two or more consonant segments within the syllable whereas English syllables can contain up to three consonantal segments in the syllable-initial and up to four in the syllable-final position. Another feature of English phonology not neatly presentable in ESS1 is the fact that English permits a sequence of # [C] [C] #, where # represents syllable boundary, but imposes restrictions of a more maximal character on its composition, namely that the final segment is (+ syllabic). This segment sequence condition is now formulated as ESS2.

ESS2: Syllable ⟶ $[C^1]$ $[C^2]$ where $C^2 = [+ \text{ syllabic}]$

The constraints on Yoruba segment sequence within the syllable, as compared with English, are therefore of two major types, namely those relating to segment sequence proper and those relating to segment function. The two types are stated as YCC1 and YCC2 respectively.

YCC1: Syllable ≤ [C] [V] (where ≤ means equal to or less)

YCC2: [C] ⟶/⟶ [+ syllabic] in any position

The facts described in YCC1 and YCC2 are that a sequence of two consonantal segments does not occur (YCC1) and that a consonantal segment is not syllabic in any position (YCC2). In English there are more maximally restrictive constraints arising from various segment sequence conditions in that language but they do not account for any more differences between Yoruba and English phonology. One such constraint bars all other sound segments except /s/ and /t/ from occurring in the last position in final quadrisegmental clusters. Having exhausted the relevant differences between English and Yoruba both in relation to segment structure and segment sequence conditions, the next step is to predict the potential phonological interference of Yoruba on English in the light of those contrasts.

3.4 PREDICTION OF PHONOLOGICAL INTERFERENCE

One of the major principles of contrastive linguistics is that inter-lingual differences constitute a potential source of interference. The potential interference of Yoruba on English phonology described in this section is based on the differences between the two systems as examined in the last section. Interference is predicted in relation to the subsystems identified in that section, namely segment structure, segment sequence and their minor subdivisions. It will be necessary therefore to refer back to the segment structure and segment sequence conditions and contrasts which will be referred to here by their notational and categorial indices.

3.4.1 Segment Structure Interference

3.4.1.1 Consonant Interference

The segment structure conditions for [+ continuant] consonant segments in English and Yoruba are formalised as ESC1 and YSC1 (see 3.3.2.1) respectively. The segment structure constraint in Yoruba is described in YC1 as follows:

YC1

$$\begin{bmatrix} - \text{ voc} \\ + \text{ cons} \\ + \text{ cont} \end{bmatrix} \not\longrightarrow [+ \text{ voice}]$$

YC1 thus states that Yoruba consonants that are [+ continuant] are not [+ voice]. In realising the [+ voice, + continuant] consonant segments in English it is logical to predict that the Yoruba L1 speaker will pronounce them as [- voice] in agreement with the segment structure permitted in his mother tongue for that class of sound segments. The interference expected in this class of sound is formally stated as $SL1^{(3)}$.

SL1: $\begin{bmatrix} - \text{ voc} \\ + \text{ cons} \\ + \text{ cont} \\ + \text{ voice} \end{bmatrix} \longrightarrow [- \text{ voice}]$

SL1 will result in the following commutations in Yoruba English:

/v/ ⟶ /f/ e.g. /vɛrɪ/ ⟶ /fɛrɪ/

/z/ ⟶ /s/ e.g. /zi:l/ ⟶ /si:l/

/ʒ/ ⟶ /š/ e.g. /vɪʒn/ ⟶ /vɪšn/

/ð/ ⟶ /θ/ e.g. /ðɪs/ ⟶ /θɪs/?

Both YSC2 and ESC2 (3.3.2) describe the segment structure conditions for another class of consonantal segments in Yoruba and English respectively. Arising from these two is YC2 which states that [+ continuant] consonantal segments are not [- strident] in Yoruba.

YC2: $\begin{bmatrix} - \text{ voc} \\ + \text{ cons} \\ + \text{ cont} \end{bmatrix} \not\longrightarrow [- \text{ strident}]$

The potential interference in this class of sound segments is stated formally as SL2.

SL2: $\begin{bmatrix} - \text{ voc} \\ + \text{ cons} \\ + \text{ cont} \\ - \text{ strident} \end{bmatrix} \longrightarrow [+ \text{ strident}]$

If YC2 bars the occurrence of /ð/ and /θ/ in Yoruba we can predict from SL2 that [- strident] sound segments in English will be replaced by their [+ strident] cognates in terms of distinctive feature composition. These should be /z/ and /s/ for /ð/ and /θ/ respectively, and could be exemplified as follows:

/ð/ ⟶ /z/ e.g. /ðɪs/ ⟶ /zɪs/ ?

/θ/ ⟶ /s/ e.g. /θɪn/ ⟶ /sɪn/ ?

Notice however that the last item in the predictions from SL1 is now nullified since /θ/, to which /ð/ should convert according to that prediction, is itself not permitted to occur as indicated in SL2. Secondly, from SL2 we see that /ð/ should be pronounced as /z/ because they are the same in respect of every other feature except [strident]. An examination of SL1 however reveals that /z/ itself is not permitted in Yoruba because it has the distinctive-feature structure [+ continuant] and [+ voice] among other things. Since /z/ is to be replaced by /s/ according to the prediction in SL1 one would suggest the following substitutions:

/ð/ ⟶ /z/ ⟶ /s/ ?

and

/θ/ ⟶ /s/ ?

Both /ð/ and /θ/ should therefore be realised as /s/ in Yoruba English. A further examination of the distinctive-feature matrices reveals still another possibility. Both /ð/ and /θ/ differ from another pair of sound segments in respect of only one distinctive feature, namely [continuant]. /ð/ is [+ cont] while /d/ is [- cont]; but both are similar in respect of all other distinctive features in the matrices. Similarly /θ/ is [+ cont] while /t/ is [- cont] and they are both [- voice], as opposed to members of the first pair which are [+ voice]. This means that /d/ and /t/ have equal chances of substituting for /ð/ and /θ/ respectively as has /s/. This alternative substitution is exemplified as follows:

/ð/ ⟶ /d/ e.g. /ðæ t/ ⟶ /dæ t/

/θ/ ⟶ /t/ e.g. /θɔ:t/ ⟶ /tɔ:t/

Which ever substitution of these two is adopted in actual speech, if any of them is adopted, will depend on which of the distinctive features, [continuant] and [strident], ranks higher in the perception, and therefore, the distinctive-feature hierarchy of Yoruba native speakers as Halle (1959) suggests (see Chapter One). There is a possibility of more certainty in our prediction, at least in respect of /ð/, which in the alternative substitution converts first to /z/ and then to /s/. Since two distinctive features distinguish /ð/ from /s/, namely [strident] and [voice], the second prediction that /ð/ may be replaced by /d/ from which it is distanced in respect of only one distinctive feature, namely [continuant], is mathematically stronger and is to be preferred. Finally, there is evidence for preferring the prediction that /θ/ will be replaced by /t/ rather than by /s/. Closer observation of the distinctive-feature matrices for Yoruba reveals that the feature [strident] which distinguishes /θ/ from /s/ is in fact not distinctive in Yoruba since there are no two sounds differentiated in respect of this feature alone. On the other hand, the feature [continuant] in respect of which /θ/ and /t/ are differentiated is a distinctive feature in Yoruba phonology and is therefore to be more relevant in the perception of Yoruba native speakers. The second prediction is therefore better.

A comparison of YSC3 with ESC3 leads us to state YC3 as a segment structure constraint in Yoruba.

YC3 [+ delayed release] ⟶/ [- voice]

YC3 indicates that in Yoruba a sound segment that is [+ delayed release] is not [- voice]. Any [+ del. release] segment in that language is therefore [+ voice]. Yoruba therefore has /ʒ/, but not /č/. Since the difference between these two segments is in respect of one distinctive feature only, it is predictable that for English /č/ the Yoruba speaker of English would pronounce /č/ as /ʒ/, which is the most similar segment to it in his own first language. The prediction is stated as SL3.

SL3: $\begin{bmatrix} + \text{ del. rel} \\ - \text{ voice} \end{bmatrix} \longrightarrow \begin{bmatrix} + \text{ voice} \end{bmatrix}$

Both YSC4 and ESC4 (3.3.2.1) state the segment structure conditions for a subclass of [+ labial] consonant segments in Yoruba and English respectively. The constraint, EC1, resulting from these conditions is stated formally as follows:-

EC1: $\begin{bmatrix} + \text{ labial} \end{bmatrix} \longrightarrow \begin{bmatrix} + \text{ back} \end{bmatrix}$

EC1 states that a consonantal segment that is [+labial] cannot be [+ back] in English, while as YSC4 indicates, similar segments in Yoruba can be either [+ back] or [- back]. In the distinctive-feature matrices for both languages it is observed that while English has /p/ and /b/ as [- continuant], [+ labial] sound segments Yoruba has /b/, /kp/ and /gb/ as members of a similar class. Since /b/ occurs in both language systems no problem is envisaged in that sound for Yoruba speakers of English. There is however no /p/ in Yoruba just as there is neither /kp/ nor /gb/ in English. How then is the Yoruba speaker likely to pronounce the English /p/? It is predictable, by feature counting, that he will substitute the most similar sound in his native language for it.

That sound is /kp/, which differs from English /p/ in respect of one distinctive feature only: both are [+labial, - voice] but while English /p/ is [- back], Yoruba /kp/ is also [+ back]. The substitution predicted is SL4.

SL4: $\begin{bmatrix} + \text{ labial} \\ - \text{ voice} \\ - \text{ back} \end{bmatrix} \longrightarrow \begin{bmatrix} \pm \text{ back} \end{bmatrix}$

In the light of SL4 the following type of substitution should be expected in Yoruba English:

/p/ ⟶ /kp/ e.g. /pɔt/ ⟶ /kpɔt/

Since there is no other sound in English consonantal system to be accounted for the Yoruba sound symbolised as /gb/ will be ignored for the present, being regarded as a sound which the Yoruba speaker knows but will not make use of in his English speech. The prediction of interference in vocalic sound segments will next be undertaken.

3.4.1.2 Vowel Interference

The first major difference observed between Yoruba and English vowel structure is in respect of the feature [nasal]. The respective segment structure conditions for Yoruba and English are stated as YSC5 and ESC5 (3.3.2.2) and the structure constraint on English vowel segments resulting from these is expressed as EC2:

EC2: $\begin{bmatrix} + \text{ vocalic} \\ - \text{ consonantal} \end{bmatrix} \not\longrightarrow \begin{bmatrix} + \text{ nasal} \end{bmatrix}$

EC2 states the observation that there are no nasal vowels in English. It is expected that, since both [- nasal] and [+ nasal] vowels occur in Yoruba, the Yoruba speaker of English will substitute [+ nasal] vowels for their [- nasal] cognates in the appropriate contexts. The appropriate phonological

environment in which such substitution is expected to take place is described tentatively as before, after or between two [+ nasal] consonants, since, in Yoruba, the instruction that a [+ vocalic] segment should be realised as [+ nasal] is indicated by the presence of a [+ nasal] consonant segment adjacent to it. This instruction is expressed in formal language as YPR2.

YPR2:

$$\begin{bmatrix} + \text{ voc} \\ - \text{ cons} \end{bmatrix} \longrightarrow \begin{bmatrix} + \text{ nasal} \end{bmatrix} \Big/ \langle_1 \begin{bmatrix} + \text{ cons} \\ + \text{ nasal} \end{bmatrix} \rangle_1 \longrightarrow \langle_2 \begin{bmatrix} + \text{ cons} \\ + \text{ nasal} \end{bmatrix} \rangle_2$$

It is predicted therefore that any of the [- nasal] cognates of the Yoruba [+ nasal] vowels that occurs in identical phonological environments will be perceived and pronounced as its [+ nasal] equivalent by the Yoruba speaker and listener. The interference predicted in these environments is stated as SL5.

SL5:

$$\begin{bmatrix} + \text{ voc} \\ - \text{ cons} \end{bmatrix} \longrightarrow \begin{bmatrix} + \text{ nasal} \end{bmatrix} \text{ in appropriate environment}$$

The following substitutions are therefore predicted:

/i:/ ⟶ /ɪ̃/ e.g. /di:n/ ⟶ /dɪ̃n/

/ʌ/ ⟶ /ɔ̃/ e.g. /mʌn dɪ/ ⟶ /mɔ̃ndɪ/

/u:/ ⟶ /ʊ̃/ e.g. /tiun/ ⟶ /tʊ̃n/

/ɛ/ ⟶ /ɛ̃/ e.g /mɛn/ —— /mɛ̃n/

Note that it has been shown that both [ɔ̃] and [ã] are merely phonological variants.

The second type of vowel interference that is predicted arises from the segment structure conditions described in YSC6 and ESC6, and from which YC5 is formulated.

YC5:

$$\begin{bmatrix} +\ \text{voc} \\ -\ \text{cons} \end{bmatrix} \longrightarrow\!\!\!\!\!\!\rightarrow \quad [+\ \text{long}]$$

It is predicted from YC5 that all [+ long] English vowels will be pronounced as their Yoruba [- long] cognates. This substitution is expressed as SL6.

SL6: $$\begin{bmatrix} +\ \text{voc} \\ -\ \text{cons} \\ +\ \text{long} \end{bmatrix} \longrightarrow [-\ \text{long}]$$

The following substitutions are predicted from SL6:

/a:/, /æ/	⟶	/a/	e.g.	/ka:t/, /Kæ t/	⟶ /kat/
/I/, /i:/	⟶	/i/	e.g.	/ŠIp/, /Ši:p/	⟶ /Šip/
/ɛ/, /ɜ:/	⟶	/ɛ/	e.g.	/bɛd/, /bɜ:d/	⟶ /bɛd/
/ɔ/, /ɔ:/	⟶	/ɔ/	e.g.	/kɔt/, /kɔ:t/	⟶ /kɔt/
/ʊ/, /u:/	⟶	/u/	e.g.	/fʊl/, /fu:l/	⟶ /ful/

It should be observed that YC5 also describes the absence of diphthongs in Yoruba. In addition, it was explained that we do have sequences of vowel segments in Yoruba. Though these are not diphthongs in the phonological sense (3.2.3.1), many of them do resemble English diphthongs so well as to facilitate mutual identification between the two sets. The following are some of the sequences of vowel segments occurring in Yoruba, described as

diphthongs by Afolayan (1968) and are easily identifiable with diphthongs in English:

ai	in	bàìbàì
au	in	ráúráú
eu	in	kéúkéú
ɛu	in	rɛ̀ùrɛ̀ù
ɔi	in	wọ́íwọ́í
oi	in	kóíkóí
uɔ	in	kùòkùò

In spite of the differences between Yoruba and English in diphthongs any sequence of vowel segments is easily regarded as an equivalent of a similar sequence in Yoruba and there is, therefore, no problem either of production traceable to the difference at the underlying phonological level. Any influence of the system of Yoruba on English diphthongs is therefore traceable to other sources in the two systems. One notable of such other differences is the absence, in Yoruba, of any phonological rule similar to the English vowel reduction rule (S.P.E., p. 111, rule 103), which causes any [+ back, + low] vowel which is not stressed to be reduced to /ə/ especially in word-final position.

S.P.E., Rule 103:

$$\begin{bmatrix} -\text{ stress} \\ -\text{ tense} \\ \text{v} \end{bmatrix} \longrightarrow [\text{ə}]$$

The absence of the vowel reduction rule in Yoruba will give rise to observable interference both in diphthongal and non-diphthongal contexts in which the reduced vowel normally occurs in English. In such cases it is predicted that /ə/ will be replaced by the underlying vowel that would have originally been reduced. This amounts to saying that vowel reduction

will not take place in Yoruba English. The following substitutions described in SL7 are predicted, /a/ and /ɔ/ being the Yoruba equivalents of English vowels that are subject to such reduction.

SL7:

$$[ə] \longrightarrow \begin{Bmatrix} /a/ \\ /ɔ/ \end{Bmatrix}$$

Predictable examples are as follows:-

/ə/ ⟶ /a/ e.g. 1. /fi:də/ ⟶ /fi:da/ (feeder)

2. /fɛə/ ⟶ /fɛa/ (fair)

3. /fiə/ ⟶ /fia/ (fear)

/ə/ ⟶ /ɔ/ e.g. 1. /kæptə/ ⟶ /kæptɔ/ (captor)

2. /pʊə/ ⟶ /puɔ/ (poor)

Finally, another type of interference is predictable from the segment structure conditions YSC7 and ESC7. The segment structure constraint for Yoruba arising from these is stated as YC6, which permits /ɔ/ but not /ʌ/ to occur in Yoruba.

YC6:

$$\begin{bmatrix} +\text{ back} \\ 2\text{ high} \\ \text{v} \end{bmatrix} \not\longrightarrow \begin{bmatrix} -\text{ round} \end{bmatrix}$$

The interference predicted from YC6 is stated as SL8.

SL8:

$$\begin{bmatrix} +\text{ back} \\ 2\text{ high} \\ -\text{ round} \\ \text{v} \end{bmatrix} \longrightarrow \begin{bmatrix} +\text{ round} \end{bmatrix}$$

In other words /ʌ/ is predicted to be identified as /ɔ/ by Yoruba speakers of English. The following are examples of such substitution:

/ʌ/ ⟶ /ɔ/ e.g. 1. /bʌt/ ⟶ /bɔt/

2. /kʌt/ ⟶ /kɔt/

As a result of this substitution no distinction will be made, or be capable of being made, between /kʌt/ and /kɔt/ in Yoruba English.

3.4.2 Segment Sequence Interference

The prediction of segment sequence interference will be limited to consonant sequences since there is no significant difference in vowel segment sequences in Yoruba and English. Prediction of interference arising from differences in segment sequence is based on differences observed in the segment sequence conditions in the two languages as previously analysed in 3.3.3.

In the analysis referred to, the segment sequence constraints operative in Yoruba, as derived from comparison of the segment sequence conditions in both languages are expressed as YCC1 and YCC2. The significant fact expressed as YCC1 is that, in Yoruba, a syllable contains not more than one consonantal segment. This contrasts with the condition in English in which a syllable may contain a sequence of three such segments in the initial and four in the final position. It is also true from YCC1 that, in Yoruba, the last segment of any syllable is a vowel segment. In English, on the other hand, a segment in a corresponding position need not be a vowel. It is possible to predict from these contrasts what a Yoruba speaker would do when confronted with clusters of two, three or four consonant segments in a row. The expected interference arising from an attempt to interpret English in terms of Yoruba phonology is formalised as SL9.

SL9:

$$[\emptyset] \longrightarrow [V] \,/\, [C] \text{ ——— } [C]$$

SL9 is an abbreviation for SL9a.

SL9a:

$$[\emptyset] \longrightarrow \begin{bmatrix} +\text{ voc} \\ -\text{ cons} \end{bmatrix} / \begin{bmatrix} -\text{ voc} \\ +\text{ cons} \end{bmatrix} \text{ ——— } \begin{bmatrix} -\text{ voc} \\ +\text{ cons} \end{bmatrix}$$

SL9 expresses the prediction that, in using English, a Yoruba person will insert a vowel segment between any two clustering consonants. A second aspect of the interference predictable from YCC1 is that, since, in Yoruba, a syllable always ends in a vowel segment, any syllable in English which ends in a consonant segment will have a vowel segment inserted after it. This prediction is indexed as SL10.

SL10:

$$[\emptyset] \longrightarrow [V] \,/\, [C] \text{ ——— } \#$$

where # is to be interpreted as syllable boundary. Examples of interference predicted in SL9 and SL10 respectively are as follows. It is regretted that while it may be possible to predict the actual vowel segment that may be inserted in each case that exercise is beyond my immediate concern here. It appears however that a kind of vowel-consonant harmony is operative in many cases.

SL9: 1. /braɪt/ ⟶ /burait/

2. /strɛi/ ⟶ /sitirɛi/

SL10: 1. /a:t/ ⟶ /a:tɪ/

2. /sɪt/ ⟶ /sɪtɪ/

SL9 and SL10 will together result in realisation of SL9 : 1 as:

/brarɪt/ ⟶ /burarɪtɪ/

Finally, another difference is observed between English and Yoruba because of the constraint on syllable structure expressed as YCC2 in 3.3.3.2. It indicates that no consonant segment is allowed to be [+ syllabic] in the Yoruba phonological system. In English, on the contrast, a number of consonantal segments can be [+ syllabic] or [- syllabic] depending on their position in the syllable. Specifically, both /l/ and /n/ are [+ syllabic] functionally when they occur as the second segment in a two-segment syllable if the first segment is one of another group of consonant segments. The fact is formally statable as ESS2a.

ESS2a:

$$[C] \longrightarrow [+\ \text{syllabic}] \Big/ [C] \text{ —— } \#$$

The interference from Yoruba phonology that is predictable from this contrast is stated as SL11 which involves two operations indexed a and b.

SL11:

$$\begin{bmatrix} +\ \text{cons} \\ +\ \text{syll} \end{bmatrix} \longrightarrow [-\ \text{syll}] \Big/ [C] \text{ —— } \# \quad \text{(a)}$$

$$[\emptyset] \longrightarrow [V] \Big/ [C] \text{ —— } [C]\ \# \quad \text{(b)}$$

provided that SL10 will then apply to insert a syllable-final vowel after the last consonant. What is one syllable in standard R.P. would then have become two syllables in Yoruba English, for example:

1. /bʌtn̩/ ⟶ /bʌtɪn/ ⟶ /bʌtɪnɪ/
2. /k æ tl̩/ ⟶ /k æ tul/ ⟶ /kæ tulu/

3.4.3 Summary of Predicted Interference

The interference of features of the phonological system of Yoruba on English is predicted from a comparison of the phonological systems of the two languages. Contrasts in segment structure conditions are derived from the distinctive-feature matrices for sound segments in both languages. Prediction of potential interference is, in turn, based on observed contrasts in segment structure and segment sequence conditions in both systems. The predicted interference is summarised as follows. Their original indexing (SL1 - 11) is retained to facilitate cross-referencing.

SL1:
1. /v/ ⟶ /f/
2. /z/ ⟶ /s/
3. /ʒ/ ⟶ /ʃ/
4. /ð/ ⟶ /θ/ (see SL2)

SL2:
1. /ʃ/ ⟶ /d/
2. /θ/ ⟶ /t/

SL3:
/ʧ/ ⟶ /ʤ/

SL4:
/p/ ⟶ /kp/

SL5:
1. /i:/ ⟶ /ɪ/
2. /ɲ/ ⟶ /ɔ/ (before or after nasal consonants)
3. /u:/ ⟶ /ʊ/
4. /ɛ/ ⟶ /ɛ̃/

SL6:

1. /æ/ and /a:/ ⟶ /a/
2. /I/ and /i:/ ⟶ /i/
3. /ɛ/ and /ɜ:/ ⟶ /ɛ/
4. /ɔ/ and /ɔ:/ ⟶ /ɔ/
5. /u:/ and /ʊ/ ⟶ /u/

SL7: /ə/ ⟶ /a/ or /ɔ/

SL8: /ʌ/ ⟶ /ɔ/

SL9: [Ø] ⟶ [V] / [C] —— [C]

SL10: [Ø] ⟶ [V] / [C] —— ≠≠

SL11: $\begin{bmatrix} + \text{ cons} \\ - \text{ syllabic} \end{bmatrix} \longrightarrow [-\text{ syllabic}]$

3.5 SUPRASEGMENTAL INTERFERENCE

Discussion of phonological interference is almost invariably limited to segmental phonology. This is not because the suprasegmental aspect is regarded as unimportant. In fact, some linguists believe that suprasegmental phonology is as important, if not more important, than segmental. Firth (1948), who holds segmental phonologists in obvious contempt, says, "In the perception of speech by the listener whatever units there may be are prosodically integrated". He concludes by asserting that "we speak prosodies and we listen to them". Robins (1957) says "sometimes a greater part (of structures) are referable to prosodies". Finally, Lado (1957) reminds us that stress and rhythm are important, "not only because stress is phonemic but also because they both exert considerable pressure on other matters of pronunciation". What then may be the reason for the apparent neglect of this aspect of phonology in contrastive and interference studies? I summarise what I consider the equally apparent reasons under two major headings, namely Domain and Representation.

3.5.1 Domain

Suprasegmental features include such things as stress, rhythm, pitch, tone, intonation. Quantity and vowel harmony are included by a number of linguists. There is however no agreement on the domain in relation to which these features may be characterised. According to Leben (1973) each of segment, syllable, morpheme, word and sentence has been proposed. In fact, one can legitimately talk about supra-sentential or discourse prosody. In the literature, tone and intonation feature prominently among the supra-

segmentals, and the dispute about domain is equally limited to the segment and the suprasegment. The syllable is rejected by many linguists, even as a unit in descriptive structural phonology, especially generative phonologists, not to mention its being considered as an admissible domain for suprasegmentals. Those who contend that prosodic features, especially tone, are segmental include Woo (1969) and Maddieson (1971). For example, Mitchel (1975) describes prosodic features as "phonetic features whose domain extend beyond those of the (more practical) phoneme". Lehiste (1970) considers the problem of domain-oriented definitions for suprasegmentals and concludes that if we define them by reference to domain "then pitch, stress and quantity would not qualify". The opinion that tone is a suprasegmental feature, on the other hand, is championed by Wang (1967), amongst others. Leben (1971) reviews the evidence from various languages in support of each of the claims and concludes that tone is both a segmental and suprasegmental property and that there is no contradiction. The same position is maintained in Leben (1973, 1978) but the dual representation of tone, or any other feature, in the underlying form does not make comparison easy, however welcome such deeper insight may be. It is, however, possible that with more penetrating research the problem may be settled one day.

3.5.2 Representation

When, eventually the problem of whether prosodic features are segmental or suprasegmental in respect of domain, is finally settled there will probably remain another problem, equally controversial, about these features. It concerns their quantitative representation and this is especially important if we are to be able to compare prosody in two or more languages for

the purpose of studying or detecting interference. A cursory look at any of the descriptions of tone or intonation using the traditional contour method (e.g. Vandersbice and Pierson, 1967) is sufficient to make one realise how futile an attempt to compare two such descriptions would be, perhaps more fruitless than the comparison of segmental phonemes in traditional phonemics. Attempts have therefore been made to integrate suprasegmentals into the phonetic feature theory of generative phonology(4) and many of the problems facing contrastive analysis in this area have accordingly surfaced. Chomsky and Halle (1968) provided a quantitative way of representing stress, which, as implied in their analysis, is segmental. A number of attempts to represent tone in a similar way have not been too successful. Wang (1967, p. 97) proposes two integers, High and Mid, to distinguish three levels of tone. Sampson (1969), on the other hand, suggests a High and Low specification for the same purpose. Hyman (1975) compares the rival systems (see below) and observes that some languages have been reported to utilise up to five levels of tone, though four levels would appear to be the acceptable limit. In the case of languages with four levels of tone, Hyman (ibid) suggests that Wang's features can be redistributed to include ('m) to indicate a lowered-mid tone as follows:

Wang's System				Sampson's System				Hyman's System				
	H	M	L		H	M	L		H	M	'M	L
High	+	-	-	High	+	-	-	High	+	+	-	-
Mid	-	+	-	Low	-	-	+	Mid	-	+	+	-

Maddieson (1971) argues that the above features reveal nothing about the function of tone. He points out that the contrast between High and Low may be analysed as [+ Raised] vs [- Raised] in one language but as [+ lowered] vs [- Lowered] in another, depending on whether High or Low is the marked tone in that language(5). In other words, were one to accept the suggestion

by Fromkin (1972) that "whether High and Low are called Raised and Lowered" is immaterial, one would face a problem in comparing two languages if one of them had [+ High] as the marked tone and the other had the same level as the unmarked. The problem for contrastive phonology, therefore, is how to devise a scheme of representation for tone which would indicate, not only the relative levels of tones, but also the apparently more functionally important aspect of markedness. It would be interesting, for example, to examine whether a speaker whose L1 utilises [+ High] tone as the unmarked tone would use the same level of tone as unmarked in an L2 where it is the marked tone.

A final problem connected with tone representation is the relationship between tone and intonation. As to whether intonation can be perceived and represented as a succession of discrete units of tone, Hyman (1975) admits that the relationship between them is not yet well understood. Schacter (1965) suggests that both may be the same thing because, as he observes, downdrift (which causes a [+ high] tone occurring after a [+ low] tone to be realised on a lower level than the high tone preceding that low tone) is a property of intonation. Abe (1972) believes that there is a certain connection, but agrees that it is not clear how it can be defined. Leben (1973) observes that the so-called intonation contours "do not behave like indivisible units as the features [rising], [falling] and [rising-falling] would imply". The trend therefore is in favour of abandoning the popular, but subjective, view of intonation represented in contours as continuous, indivisible units in an utterance. This view, if it gains acceptance, will have important consequences for the study of suprasegmental phonology in general. For example, the often made distinction between tone and intonation languages will have to

be abandoned, or at least modified. To cite an instance, it is generally said that Yoruba is a tone language (e.g. Afolayan, 1968) yet it is not true that Yoruba does not differentiate between utterances by intonation. In fact, Yoruba does not depend as much on word order, as English does, to separate questions from statements, but on intonation and other situational cues. Secondly, the relationship between tone and stress needs to be reconsidered. It is usually said that Yoruba employs tone for contrast but it is equally true that English, for example, employs stress for contrast - as shown in these examples:-

YORUBA (tone)			ENGLISH (stress)		
ọ́kọ́	:	hoe	'insult	-	noun
ọ̀kọ̀	:	spear	in'sult	-	verb
ọ̄kọ̄	:	husband	'project	-	noun
ọ̌kọ̌	:	vehicle (land, water or air)	pro'ject	-	verb

Observe that while Yoruba tone is altered to change lexical meaning English stress is altered to change grammatical meaning. There is also no doubt that, as in English, sentence stress can be used to indicate both contrast and emphasis in Yoruba.

In concluding, one may say that the absence of prosody in most phonological studies of interference is not unconnected with the problems mentioned above. As Anderson (1978) concedes, it can be said that at present any of the alternative systems so far proposed is equally (un)satisfactory. This should be so because "at this point, we know little about the specifics of intonation as it relates to dialectology". It is indeed possible that most of the communication problems between Yoruba and native speakers of

English arise from suprasegmental, rather then segmental differences in their speech. Yet it is impracticable, for the reasons stated above, to include suprasegmental aspects in studies, such as the present, which endeavour to characterise linguistic matter in precise quantitative terms.

NOTES

(1) Siertsema (1958) points out that both of the variants /ɔ̃/ and /ã/ are used in identical words by Crowther (1852) in his Grammar and Dictionary of Yoruba.

(2) The vowel deletion rule in this case is to be formally stated as YPR1.

YPR1:

$$[V] \longrightarrow [\emptyset] \Big/ \begin{bmatrix} c \\ +\text{nasal} \end{bmatrix} \quad \text{——} \quad \begin{bmatrix} \text{verb} \\ +\text{continuous} \end{bmatrix}$$

(3) There is no way of explaining bilingual interference without resorting to what Luelsdorf (1975) calls "dependent grammar" which he is able to avoid because the American Black, whose English he describes, is not bilingual. Since the target of L2 teaching is competence in the standard form of the L2 any meaningful grammar of the bilingual speaker's use of that language is necessarily formulated with reference to the L2 standard form. It is, in that sense, 'dependent'.

(4) It is of interest that Lehiste (1970) attempts, in obvious imitation of segmental phonologists, to specify the articulatory correlates of some suprasegmental features.

(5) In this connection, Anderson (1978), is of the opinion that two items may be distinctly represented "only if they can potentially distinguish two signs in the system of the language". For example, a distinction between High and Low which does not reflect a definite parallel distinction of markedness is hardly worth making.