

Errors in English Pronunciation among Arabic Speakers

Analysis and Remedies

Mohamed Fathy Khalifa



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I dedicate this book to my father, Fathy Khalifa, my mother Amina Ilshabrawy, my wife Dr Eman Abdelwahed and children Yasmin, Khalid, Maryam, Ammar and Reem.

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ABSTRACT

This study is a contrastive analysis of Arabs' errors in English pronunciation regarding segmentals-consonants, consonant clusters and vowels-and suprasegmentals-main word stress. It also explains the main interlingual reasons behind these errors and presents some teaching suggestions for surmounting them. This research has two hypotheses. First, the subjects substitute their own Arabic sounds (i.e. L1 negative transfer) for the unfamiliar English ones, producing incorrect English sounds. Second, the subjects apply Arabic main word stress rules (i.e. L1 negative transfer) instead of English ones, producing incorrect English stress patterns. These hypotheses were confirmed, albeit to different degrees due to sounds and stress patterns (word class), as shown in the results.

Forty five Arab subjects, all of whom speak English as a foreign language, took part in this study: fifteen Saudi Arabians, fifteen Egyptians and fifteen Libyans. The educational setting for this research was the Saudi School in Sheffield, England where I worked as a teacher of English to Arab students.

This research was based on analysing recorded data collected through elicitation: 'reading aloud' and 'guided composition'. The subjects were asked to record their reading of lists of English words and description of a picture. All the recordings were transcribed and tables showing correct and incorrect pronunciation were drawn up.

The subjects found difficulty in pronouncing some English consonants such as /p/, /v/, /ŋ/, dark /ɫ/, syllabic consonants and consonant doubling. They also had trouble with two-element clusters beginning with /p/, /s/, /g/, /θ/, consonant + /j/, /dw/ and all three-element clusters. In addition, they inserted a vowel between the elements of medial and final clusters. Regarding vowels, the subjects confused most of the English vowels and diphthongs with each other or substituted Arabic vowels for English ones. Finally, they stressed the last syllable of English words ending in V:, V:C and VCC and the first syllable of words having the syllabic pattern CVCVCV(C).

It is hoped that this study will be of interest and help to Arabs who are interested in learning and teaching English as a foreign language.

MAIN ABBREVIATIONS AND SYMBOLS USED IN THIS STUDY

C	Consonant
CA	Contrastive Analysis
Cd	Coda
CLA	Classical Arabic
EA	Error Analysis
H	Heavy Syllable
IPA	International Phonetic Alphabet
IRAL	International Review of Applied Linguistics
L	Light Syllable
L1	First Language
L2	Second Language
MSA	Modern Standard Arabic
MT	Mother Tongue
N	Nucleus
O	Onset
R	Rime
RP	Received Pronunciation
SL	Second Language / Source Language
SLA	Second Language Acquisition
SPE	The Sound Pattern of English
TEFL	Teaching English as a Foreign Language
TL	Target Language
V	Vowel
V:	Long vowel
v.ed	Voiced sound
v.less	Voiceless sound
vd.	Voiced sound
vl.	Voiceless sound
σ	Syllable
*	Erroneous form follows
[?]	Glottal Stop

CHAPTER ONE

INTRODUCTION

1.1 Research Area and Definition of Terminology

I take it you already know
Of tough and bough and cough and dough?
Others may stumble but not you
On hiccough, thorough, lough and through.
Well done! And now you wish, perhaps,
To learn of less familiar traps?
Beware of heard, a dreadful word,
That looks like beard and sounds like bird.
And dead: it's said like bed, not bead –
For goodness sake don't call it 'deed'
Watch out for meat and great and threat
(They rhyme with suite and straight and debt)

(T.S.W. 1970)

Correct pronunciation is a means of achieving a confident grasp of the spoken language, as suggested by Jones (1967), O'Connor (1973), Roach (1983) and Kenworthy (1987). This study is an error analysis of English pronunciation errors among Arabs. It is an attempt to pinpoint the phonological problems that may be encountered by Arabs as non-native speakers of English regarding segmentals (consonants and vowels) and suprasegmentals (main word stress). It also studies the main reasons behind these errors and presents some teaching suggestions for surmounting them. This study does not deal with other suprasegmentals: secondary stress, sentence stress, intonation or rhythm.

There are some phonetic problems standing in the way of Arabs as non-native speakers of English (Heliel, 1972). First, English spelling is not phonetic due to the mismatch between orthography and pronunciation in many words. Second, many English sounds and stress rules do not occur in learner's first language (Lado, 1957; Smith, 1987). The main difficulties in learning to speak a second or foreign language correctly are expressed by Jones (1967, 2), as follows:

(1) Difficulty No. 1. He must learn to recognise readily and with certainty the various speech sounds occurring in the language, when he hears them pronounced; he must moreover learn to remember the acoustic qualities of those sounds.

Difficulty No. 2. He must learn to make the foreign sounds with his own organs of speech.

Difficulty No. 3. He must learn to use those sounds in their proper places in connected speech.

Difficulty No. 4. He must learn the proper usage in the matter of the 'sound attributes' or 'prosodies' as they are often called (especially length, stress and voice-pitch).

Difficulty No. 5. He must learn to catenate sounds, i.e. to join each sound of a sequence on to the next, and to pronounce the complete sequence rapidly and without stumbling.

The student, who wishes to become proficient in the written as well as the spoken language, has an additional difficulty, which we may call **Difficulty No. 6.** He has to learn the shapes of the conventional letters and the relations between the conventional orthography and the pronunciation.

The present study tries to test the above six difficulties mentioned by Jones in general and nos. 2 and 4 in particular. Difficulty nos. 2, 4, 5 and 6 are tested directly through asking the subjects to pronounce some lists of words and sentences. The aim is to check their production of English sounds, stress placement, pronunciation of consonant clusters and recognition of the relationship between orthography and pronunciation. In addition, difficulty nos. 1 and 3 are tested indirectly through reading lists of words and describing a picture. This is to check the Arab learners' recognition of English sounds and their proper use of these sounds in connected speech.

Word stress location differs greatly from one language to another (Hayes, 1995). Some languages have 'fixed' stress, for example, in Finnish stress falls on the first syllable of the word, in Polish on the next to the last syllable and in French on the last (Ladefoged, 1993). Others, such as English, have 'free', or 'movable' stress, so that when a speaker of any of the aforementioned languages or Arabic learns English, mastering the position of stress in the word is a matter of some difficulty (Weinreich, 1953; James, 1980; Smith, 1987).

When Arabs speak a foreign language in general and English in particular, they tend to pronounce the sounds and place the stress according to the rules of their own language, Arabic (Heliel, 1972; Broselow, 1983, 1984). Arabs learning English as a foreign language have not normally had early acquisition of the sounds and stress system of this language. The learning starts after the person has already developed a set of linguistic habits of his own native language. These linguistic habits may come into conflict with the habits of the new language. The Arab learners, therefore, have to acquire the new habits and at the same time try to avoid interference from the old habits. In particular, they need to learn how to stress the English words, since knowing the correct stress placement is part and parcel of what we mean when we say that a person has command of English (Kingdon, 1958).

The stress rules of English are more complicated than those of many other languages (Halle and Vergnaud, 1987; Hayes, 1995; Kager, 1995 and many others). Indeed, the English and Arabic stress patterns are sufficiently different to create difficulty for Arab learners, due to the seemingly unpredictable nature of English in comparison with the relatively straightforward Arabic stress placement rules. The Arab learners, therefore, have to learn the stress pattern of each English word, in the face of a lot of Arabic interference.

The purpose of this study is to analyse interlingual errors (due to L1 interference) in English sounds and main word stress that may be encountered by Arabs as non-native speakers of English. Furthermore, it sheds light on the interlingual reasons behind these errors and suggests some remedial work in the form of teaching. This will hopefully help Arabs to overcome the errors which stand in the way to their linguistic proficiency. This study begins with a brief definition of terms, followed by aims and justification of the study, linguistic background, methodology, theories of second language (L2) acquisition and comparison of English and Arabic sounds and main word stress rules. The results are discussed, the interlingual reasons behind the errors are explained and finally some teaching suggestions are presented.

1.1.1 Mistake and Error

Corder (1967) makes a distinction between mistake and error. A mistake is a random performance slip caused by fatigue, excitement, etc., and therefore can be readily self-corrected. An error is a systematic deviation made by learners who have not yet mastered the rules of the second

language (L2). Richards (1971) notices two types of error: interlingual and intralingual errors, as follows.

- *Interlingual* errors are those which second language (L2) learners may commit due to first language interference.
- *Intralingual* errors are those committed by L2 learners, regardless of their first language.

1.1.2 Contrastive Analysis (CA)

Crystal (1997, 90) defines contrastive analysis (CA), as follows.

- (2) The phrase contrastive analysis (CA) identifies a general approach to the investigation of language, particularly as carried out in certain areas of APPLIED LINGUISTICS, such as foreign-language teaching and translation. In a contrastive analysis of two languages, the points of STRUCTURAL difference are identified, and these are then studied as areas of potential difficulty (INTERFERENCE or 'negative transfer') in foreign-language learning.

Here the following two points can be noticed:

- The present contrastive analysis is between British English (Received Pronunciation, RP) and Modern Standard Arabic (MSA). RP is the accent chosen for contrast for its richness in teaching materials in the Arab countries.
- Mother tongue interference is not the only cause of error. Faulty initial teaching, misconceptions, simplification, hypercorrection, false concepts and overgeneralisations also cause errors (James, 1980).

1.1.3 Error Analysis (EA)

Crystal (1997, 139) defines error analysis (EA), as follows.

- (3) In language learning and teaching, error analysis is a technique for identifying, classifying and systematically interpreting the unacceptable forms produced by someone learning a foreign language, using any of the principles and procedures provided by linguistics.

Following Crystal's definition, the present study includes the three stages of EA identification, classification, and interpretation of the learners' errors. It also provides some teaching suggestions for surmounting them.

Error analysis is a complex matter, and not all errors are internal to the language system (Broselow, 1984). They may be due to external factors such as inadequate teaching or poorly prepared materials (Selinker, 1972). Some errors may even be tolerated by teachers in pursuit of greater fluency on the part of learners.

1.1.4 Interference and Interlanguage

Interference, also called negative transfer, refers to the errors a speaker introduces into one language as a result of contact with another (Trask, 1996). Most commonly these errors arise as a result of native tongue interference. Broselow (1984, 254) points out that ‘it is clear that interference is one factor in accounting for learners’ errors’.

The language system that the learner constructs out of the linguistic input to which he has been exposed has been referred to as an ‘idiosyncratic dialect’ (Corder, 1971), ‘an approximative system’ (Nemser, 1971) and an ‘interlanguage’ (Selinker, 1972). While these three terms differ somewhat in their emphases, it is actually ‘interlanguage’ that has entered common parlance.

1.1.5 Stress

Phonetic stress refers to the extra degree of force used in pronouncing a particular word or syllable (Crystal, 1997). Stressed syllables are more prominent than unstressed ones (Archibald, 1998, Hammond, 1999), e.g. the first syllable in ‘PHOtograph’, the second in ‘phoTOgrapher’ and the third in ‘photoGRaphic’ are more prominent than the others. This prominence is usually achieved by an increase in the LOUDNESS of the stressed syllable, but can also be due to an increase in LENGTH or PITCH or a combination of all the three (Trask, 1996, Archibald, 1998). O’Connor (1973, 194) defines stress, as follows.

- (4) Stress is the name given to the stronger muscular effort, both respiratory and articulatory, which we feel in connection with some syllables as opposed to others in English and other languages. For instance, *August* has more effort on the first than the second syllable, we hit it harder; but *august* has the greater effort on the second syllable.

This research is an error analysis of Arabs’ interlingual errors in English main word stress and sounds and the reasons behind these errors. It also

presents some teaching suggestions for overcoming them. In addition, it does not deal with English secondary word stress.

1.2 Aims and Justification of the Study

This section explains the main aim of this research. It also points out the importance of studying the errors made by Arabs in English sounds and main word stress and the reasons behind them.

1.2.1 Aims of the Study

Errors, like straws, upon the surface flow;
He who would search for pearls must dive below.
(John Dryden)

The main aim of this study is to analyse the specific areas and types of errors in English pronunciation among Arabic speakers in the light of a short contrastive study of English and Arabic sound systems and stress placement rules. It also sheds light on the main reasons for these errors and suggests some teaching recommendations for overcoming them. It includes three groups of Arab subjects: Egyptians, Saudi Arabians and Libyans.

Two groups of features of pronunciation are involved: segmentals and suprasegmentals. Segmentals refer to the basic inventory of distinctive sounds (consonants and vowels) and the way they combine to form a spoken language. Suprasegmentals are concerned with features above the level of the segment and include stress, rhythm and intonation. Only sounds and main word stress are analysed in this study.

1.2.2 Justification of the Study

The study of errors that L2 learners make can certainly provide vital clues as to their competence in the TL. (Harley, 1980, 4)

The primary aim of this CA is to focus on analysing Arabs' errors in English pronunciation. Learners' errors are invaluable to the study of the language-learning process. Errors are studied to enable us to infer the nature of the learner's knowledge at that point in his learning career and discover what he still has to learn. By describing and classifying his errors, we build up a picture of the features of the language which are causing him learning problems. Error analysis thus provides a check on the predictions of bilingual comparisons and the strategies employed by

students learning another language. Corder (1981, 13) mentions that by studying a learner's errors:

- (5) We may be able to allow the learner's innate strategies to dictate our practice and determine our syllabus; we may learn to adapt ourselves to *his* needs rather than impose upon him *our* preconceptions of *how* he ought to learn, *what* he ought to learn and *when* he ought to learn it.

Contrastive studies of the native language and the target language have been widely accepted by linguists as a sound basis for teaching a foreign language. Fries and Lado are among the advocates of these studies. Fries (1945, 5) expresses the importance of basing teaching material on a contrastive basis:

- (6) ...only with sound materials based upon an adequate descriptive analysis of both the language to be studied and the native language of the student (or with continued expert guidance of a trained linguist) can an adult make the maximum progress toward the satisfactory mastery of a foreign language.

The significance of this contrastive study is assessed in pinpointing the different types of pronunciation errors encountered by Arabs as non-native speakers of English.

1.2.3 Stakeholder Analysis

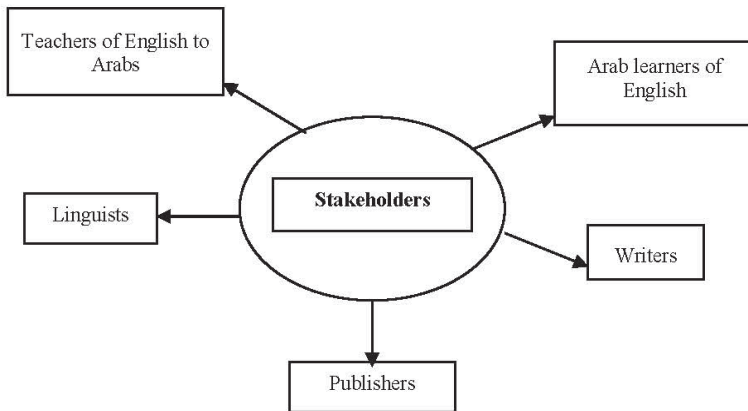


Figure 1: Visual Representation of Stakeholder Analysis

TEACHERS

Errors provide feedback and tell the teacher something about the effectiveness of teaching materials and his teaching techniques and show him what parts of the syllabus have been inadequately learned or taught and need further attention.

ARAB LEARNERS

The findings of this research are clearly of interest to Arab learners because the making of errors can be regarded as a device used to learn. They can also reflect to them how far they have progressed and what remains to be learnt. Moreover, with careful preparation and avoidance of these errors, pronunciation can play an important role in supporting Arab learners' overall communicative power.

LINGUISTS

Learners' errors can be invaluable to both applied linguists and psycholinguists. For the applied linguist errors can shed light on how language is learnt or acquired, what strategies or procedures the learner is employing in his discovery of the language. The psycholinguist predicts that the nature of the mother tongue will facilitate or make difficult the learning of certain aspects of an L2.

WRITERS AND PUBLISHERS

Analysing errors can provide writers and publishers with the necessary information for designing a remedial syllabus or programme of re-teaching dealing with the specific problems of Arabs in English pronunciation.

1.3 Background to the Study

This section provides the linguistic and theoretical background for this study. The linguistic background covers some information about the Arabic language and Arabic speakers of L2 English. The theoretical background section sheds light on the three theories of L2 acquisition which are used to analyse Arabic speakers' errors in English sounds and main word stress. These theories are: Contrastive Analysis (CA) (Fries, 1945), Error Analysis (EA) (Corder, 1967) and Markedness Theory (Eckman, 1977).

1.3.1 Linguistic Background

The linguistic background covers the Arabic Language and dialect of the Study. There is, then, a section about the Arab learners of English and TEFL in the Arab schools which shows the obstacles that have led to the low standard of Arabs' spoken English. Finally, it has two sections on English pronunciation problems faced by Arab learners, English stress patterns and effective communication.

1.3.1.1 The Arabic Language

Arabic is one of the world's major languages, spoken in a broad belt extending from the Arabian Peninsula across the Fertile Crescent and on to the Atlantic Ocean. It is the mother tongue of some 280 million people (Watson, 2002). In addition, many millions of Muslims in other countries have some knowledge of Arabic because of its position as the language of Islam and of the Holy Qur'an (Mitchell, 1962). Arabic is the chief member of the Semitic family of languages (Tritton, 1943; Watson, 2011), which also includes Hebrew and Amharic, the main language of Ethiopia. In 1974, Arabic was made the sixth official language of the United Nations. The largest numbers of Arabic speakers are found in Egypt, Iraq, Morocco, Saudi Arabia, Sudan, Syria, Tunisia, Yemen and Algeria.

Great languages spring from great Empires, and Arabic is no exception. Until the seventh century AD, its use was confined to the Arabian Peninsula. But the language was carried far beyond its original borders through the spectacular Islamic conquests, and almost supplanted all the previous languages of Iraq, Syria, Egypt and North Africa. Further conquests in succeeding centuries temporarily spread the presence of Arabic as far as Afghanistan in the east and Spain in the west. Like the other Semitic languages, Arabic is written from right to left and its alphabet consists of twenty eight consonant letters, with vowel signs being optionally indicated by marks above or below the letters (Tritton, 1943; Mitchell, 1962). The Arabic alphabet is second only to the Roman alphabet in its use world-wide. Socio-linguistically, Arabic is noted for its diglossic situation (Mitchell, 1962), and phonetically for the use of sounds which involve the pharynx (notably the pharyngeal consonants). According to Watson (2002), apart from its great intrinsic interest, the importance of the Arabic language for phonological and morphological theory lies in its rich root-and-pattern morphology and its large set of guttural consonants.

There are three main types of Arabic – Classical Arabic (CIA), Modern Standard Arabic (MSA) and local dialects (Mitchell, 1962). Classical Arabic was originally the dialect of Mecca, in what is now Saudi Arabia. MSA is an adapted form of CIA and is taught in schools throughout the Arab countries. It is the language of contemporary literature, journalism, broadcasting, public address (Mitchell, 1962), and in conversation between educated Arabs from different countries – it is the language of government and formal affairs. It differs very little from CIA in phonology, morphology or syntax. The main difference lies in the realm of lexicon. Spoken Arabic naturally varies from one country to another (Mitchell, 1962), but Classical Arabic has hardly changed since the seventh century. CIA has played a prominent role as a great unifying force in the development and standardisation of the language. Local dialects vary, and a Moroccan may have difficulty understanding an Iraqi, although they speak the same language.

1.3.1.2 Dialect of the Study

The dialect of this study is Modern Standard Arabic (MSA) which is the standardised and literary variety of Arabic across the Middle East, North Africa and Horn of Africa. It is used in writing and in most formal speech throughout the Arab world to facilitate communication. Most Arabic speakers consider the two varieties to be two registers of one language, although the two registers can be referred to in Arabic. MSA is chosen to be the dialect of this study, since it is a standardized language and its spoken form is used as a lingua franca across the Arab world. British English (Received Pronunciation, RP) is the accent chosen for contrast for its richness in teaching materials in the Arab countries.

1.3.1.3 The Arab Learner of English

English is the lingua franca in many countries and it plays a prominent role in developing the world's education and business. This global significance makes English receive special attention in the Arab countries. Teaching English as a foreign language (TEFL) in many Arab countries is gaining increased importance due to the importance of English for business, transport, science and technology. Over the last few decades, the Arab learners have shown a keen interest in recognising the English language as a language of common usage in business and education. The preparation of the Arab learner varies from one Arab country to another. However, the learner spends six to eight years learning English. This should enable him to communicate fluently and efficiently. But, this is not

the case. Guided by my experience in teaching English to Arab students for twenty years, I noticed that there are many errors in their English pronunciation. This is due to many reasons such as:

- (a) Most Arab countries consider English as a 'school subject' rather than a means of communication. In addition, English is taught through Arabic.
- (b) Pronunciation is completely neglected as most teachers are neither phonetically trained nor in possession of the skill to teach spoken English. Thus, learners are eye-minded rather than ear-minded.
- (c) Examinations test the student's knowledge of facts about the language and his ability to memorise but not his ability to use and understand English.
- (d) The lack of discussing pronunciation errors related to interference between Arabic and English.
- (e) Arabic and English have different sound and orthography systems, syllable structures, stress patterns and different cultural background.

The obstacles depicted above, have led to a deterioration of the standard of Arabs' spoken English. All Arab learners, therefore, should receive enough oral practice, as it is the key feature of mastering pronunciation.

1.3.1.4 TEFL in the Arab Schools

English is used as a foreign language in the Arab countries and is not spoken as a second language. Therefore, teaching English to Arab EFL learners has always been an exacting task. In early English teaching in the Arab schools, teachers used various classroom techniques: grammar-translation, reading methods and direct methods. Then most countries adopted the lingual approach, which proved to be desirable. Later on, the communicative approach was partially adopted by some Arab countries. However, many Arab EFL learners' proficiency in English remains inadequate and below expectation. This is due to inadequate preparation of teachers, lack of motivation on the part of the learners, teacher centred methods and inadequate assessment techniques.

Some of the problems the EFL Arab teachers face are absence of listening and speaking tests, teaching method not being communicative, students' attitude towards speaking and lack of necessary facilities. Arab EFL students also face main problems such as lack of linguistic knowledge, lack of motivation and confidence and excessive use of Arabic language.

1.3.1.5 English Pronunciation Problems and Arab Learners

A basic knowledge of phonetics is essential for any person who works with language. Language teachers, particularly, require both theoretical and practical phonetic knowledge to analyse their students' pronunciation errors and to prepare suitable remedial measures. Similarly, language students need the same knowledge to monitor their own pronunciation. The following quotation throws more light on the importance of phonetics in the teaching of foreign languages. Malmberg (1963, 109) states that 'the teaching of foreign languages is also a field in which phonetics has a very great practical importance. Anyone wishing to learn to pronounce a foreign language properly will first have to acquire the mastery of a large number of new articulatory habits. He must accustom himself to articulate the foreign sounds exactly as native speakers do in the language in question, and not to continue using habits particular to his native tongue'.

In his influential book 'An Outline of English Phonetics', Jones (1967) mentions that a person learning a foreign language does not normally have the opportunity of the early acquisition of the segmental and suprasegmental features of that language. As a result, an Arab person learning English will encounter some vowels and consonants which are unknown to him such as [p], [ŋ] and [ə] and some word stress rules which are different from Arabic ones. Parker and Graham (1994, 6) confirm this view by stating that 'however, learners do not, of course, acquire the whole phonology of a foreign language evenly or, indeed, identically. Particular learners will demonstrate particular difficulties with particular sounds or features of pronunciation'.

Although there are not many teaching materials designed specifically for Arab learners, some researchers have carried out contrastive studies of English and Arabic. The weakness of these studies lies in the importance they give to the segmentals and the little attention given to the suprasegmentals. These analyses reinforce the tendency of both teacher and student to neglect the other equally important suprasegmental features. As a result, the students fail to understand and be understood by English people in spite of making English sounds quite well.

Two of these studies are related to this book:

- (1) Raja Nasr's *The Teaching of English to Arab Students* (1963), is a contrastive study of Classical Arabic and English. Classical Arabic is not in everyday use and so this study is less useful than one based on Colloquial or Modern Standard Arabic.

- (2) W.F. Stirling's *'An Introduction to English Phonetics for Arabic-speaking Students'* (1960) is a good guide for Arab learners to the pronunciation of English consonants and vowels. But stress is only mentioned briefly and consonant clusters and English rhythm are not mentioned at all.

To my mind, however useful the phoneme-oriented studies are, we must not think that teaching all the segmental sounds is equal to teaching the pronunciation of a language. The ability to use these sounds in connected speech is as important as the ability to make them in isolation.

Regarding Arabs' pronunciation errors, three books are also related to this book:

- (1) Kharma and Hajjaj (1997) *'Errors in English among Arabic Speakers: Analysis and Remedy'*

This book identifies specific difficulties experienced by Arab students and explains them in sound linguistic terms. Based on actual students' work, it explores and explains problems with pronunciation and sentence structure. In addition, it includes some practical teaching suggestions and examples which can help Arab learners to surmount these difficulties.

This book explains Arabs' errors in English pronunciation in Part Two: The Sound System. It classifies these errors into two types: (a) sounds in isolation and (b) sounds in connected speech. Although the authors discuss the above errors and their causes, they do not explain clearly the effect of L1 interference.

- (2) Swan and Smith (1987) *'Learner English: a teacher's guide to interference and other problems'*

In this book, the authors discuss briefly Arabs' problems in English pronunciation regarding vowels, consonants, consonant clusters, rhythm, stress and intonation. In addition, they study some grammatical errors that Arabic speakers may make in English.

Regarding English vowels, I do not agree with Smith (1987, 143) that '...virtually all vowels may cause problems'. But I agree with him that:

- (7)...the following are the most common confusions:
1. /ɪ/ and /e/ are often confused: *bit* for *bet*.
 2. /ɒ/ and /ɔ:/ are often confused: *cot* for *caught*.

Similarly, regarding English consonants, I agree with Smith that most of them can be articulated by Arabs without great difficulty and the main problems are related to the following phonemes: /p/, /v/, /ŋ/, /ʒ/ and /r/. But I do not agree with him that some Arabs tend to pronounce English /ð/ as /d/. From my teaching experience, I noticed that they replace English /ð/ with /z/. For example, ‘zat’ for ‘that’. In addition, I agree with him that ‘the range of consonant clusters occurring in English is much wider than in Arabic’. As a result, Arabic speakers of L2 English tend to insert short vowels to assist pronunciation as in ‘ʔispring’ or ‘sipring’ for ‘spring’ and ‘monthiz’ for ‘months’.

Concerning stress, I agree with Smith (1987, 145) that ‘Arabic word stress in particular is predictable and regular. Arabic speakers, therefore, have problems grasping the unpredictable nature of English word stress’.

(3) Baker (1982) *‘Introducing English Pronunciation: a teacher’s guide to Tree or Three?’*

In this book, Baker mentions some of the Arabs’ errors in English pronunciation. Regarding consonants, I agree with most of the errors in her list such as:

(8) p sounds close to b
r strongly trilled
pronounced where normally silent
(Baker, 1982, 138)

But I do not agree with her that Arabs pronounce /v/ as /f/ or /b/ and /w/ as /v/. First, Arabs sometimes replace /v/ by /f/ but not by /b/: their pronunciation of the words ‘van’ and ‘fan’ will be the same, /fæn/. Second, Arabic speakers have no problems with /w/ as it is common in many Arabic words such as ‘wahid’ (one) and ‘walad’ (boy).

Although the three books mentioned above discuss briefly the specific English pronunciation errors made by Arabs, they work as a catalyst for this book. But this book differs in the following points:

- (1) It studies, in more detail, only errors in English consonants, vowels and word stress
- (2) It explains more fully the interlingual reasons for these errors.

1.3.1.6 English Stress and Effective Communication

In cross-language comparison, stress location in words differs greatly from one language to another. Some languages have a ‘fixed’ stress, for example, in Finnish stress falls on the first syllable of the word, in Polish on the next to the last syllable, in French on the last. Others, such as English, have a ‘free’, or ‘movable’ stress, so that when a speaker of any of the aforementioned languages or Arabic learns English, mastering the position of stress in the word is a matter of some difficulty.

In his book *‘The Groundwork of English Stress’*, Kingdon (1958, xi) explains the importance of correct stressing in English as follows:

- (9) In a strongly stressed language like English, where vowel quality is so frequently influenced by the presence or absence of stress, wrong stressing disguises words far more effectively than does wrong intonation.

In the treatment of English stress, there are two extremes: those which consist of long lists of words with their stress patterns and those which concentrate on the theoretical aspects. Both are not very helpful to the foreign learner who wants to learn the basics of English stress to be able to predict the stress patterns of new words. A good treatment should bring together the practical and the theoretical, the lists and the principles.

First of all, Kingdon’s *‘Groundwork of English Stress’* (1958) is considered as one of the main approaches to the question of English stress. His investigations showed that the main problems arose from ‘compounds’ which he classified into three types:

- (1) *Romanic*: root plus affixes, where the root may or may not be an independent word.
- (2) *Greek*: two or more roots that do not as a rule stand alone as complete words.
- (3) *English*: two or more roots that are independent words.

Kingdon’s great contribution is the explanation of the effect of suffixes on stress placement in Romanic compounds and the main influence of the final root in Greek compounds.

Kingdon’s conclusions may be refined and strengthened in several ways:

- (1) He does not differentiate between strong and weak syllables.
- (2) He does not recognise that a suffix which throws stress two syllables back will throw it one syllable only if there are not two syllables. For example, '*preferable*, '*lovable*.

Until fairly recently, each English word was thought to have its own idiosyncratic stress. Jones (1967, 248) states:

- (10) Generally speaking there are no rules determining which syllable or syllables of polysyllabic English words bear the main stress. The foreign student is obliged to learn the stress of each word individually.

But Chomsky and Halle in their '*The Sound Pattern of English*' (1968, 59) argue that:

- (11)...both the placement of main stress and the stress contours within the word and the phrase are largely predictable from the syntactic and the non-prosodic phonological structure of an utterance by means of a transformational cycle.

In fact, my own research does not follow Chomsky and Halle's use of the cyclic principle. But it makes use of Kingdon's book to prepare word lists to record and analyse Arabs' errors in English main word stress. Moreover, this research studies not only Arabs' problems in English word stress but in consonants and vowels as well.

Finally, it is hoped that the findings of this study will help Arab learners of English to eliminate many of their faulty stressing and segmental pronunciation errors.

1.3.2 Theoretical Background

This research is an analysis of the interphonology (sound and main word stress errors) of the Arabic speakers of L2 English within the framework of three theories of second language acquisition: Contrastive Analysis (CA) (Fries, 1945), Error Analysis (EA) (Corder, 1967) and Markedness Theory (Eckman, 1977). CA explains L2 learners' acquisitional difficulties on the basis of the differences and similarities between L1 and L2. Different L1 and L2 features are difficult to acquire, whereas similar features are easy to acquire. L2 learners' errors are due to L1 negative transfer. EA explains L2 learners' errors by comparing the learner's interlanguage with the L2 norm. It explains both interlingual (L1 negative

transfer) and intralingual errors. Intralingual errors are not related to L1 negative transfer and are due to other factors, such as faulty teaching techniques or materials, overgeneralization of L2 rules and age of L2 acquisition. Markedness Theory is the CA plus typological markedness. It explains both the L2 learners' difficulties (CA) and the degree (levels) of these difficulties (markedness). Markedness Differential Hypothesis (MDH) states that L2 structures that are both different and more marked than corresponding L1 structures will cause learning difficulty. Unmarked structures are acquired before and easier to acquire than marked structures. These theories are discussed in detail in Chapter 2: Theories of Second Language Acquisition.

1.4 Methodology

This section explains how this research was conducted and the used method of data collection. The data collection involved materials (a production test and description of a picture), sample and tape recording. The data analysis consisted of error analysis and statistical analysis. Linguistic analysis explains the reasons for the Arabic speakers' errors in English pronunciation and main word stress. The statistical analysis explains the percentage of these errors.

1.4.1 Choice of Method

This research is an analysis of errors in English pronunciation that may be encountered by Arabs regarding English consonants, vowels and main word stress. This analysis was based on data collected through 'elicitation' from three different groups of Arab subjects.

Studying subjects' spontaneous production may be desirable but the presence of an observer can result in unspontaneous performance as the subjects may take more care over their speech. Even with completely spontaneous production data, we cannot rely solely on them in studying the SLA process due to the following drawbacks:

- (1) Unless some constraints are placed on the range of a subject's possible responses, it is impossible to study all aspects of his developing performance. In normal conversation, certain language features cannot be studied because of their infrequent occurrence.
- (2) Learners will place their own limitations on the data (Corder, 1981). In other words, they tend to use only those aspects in which they feel more confident and avoid the troublesome aspects in

which the researcher may be most interested.

- (3) Comparing one study with another would be difficult if only spontaneous data were used, and also collecting enough data to make generalisations about L2 learners would take a long time.

1.4.2 Elicitation

The method used for this study was elicitation. An elicitation procedure is any method which provokes a learner to generate reliable linguistic data either in the form of factual utterances or judgements about utterances. The idea of eliciting data from subjects has always formed part of the methodology of descriptive linguistic research. Nunan (1992, 136) says:

- (12) Elicitation techniques have been a feature of second language acquisition research since the original morpheme order studies of the 1970s.

Having adopted the elicitation technique, it enabled me to:

- oblige the Arab subjects to produce the items I wanted to study;
- obtain as natural a performance as possible while the subjects remained unaware of the investigated items.

Corder (1981, 61) explains the importance of elicitation procedures as follows:

- (13) Elicitation procedures are used to find out something specific about the learner's language, not just to get him to talk freely. To do this, constraints must be placed on the learner so that he is forced to make choices within a severely restricted area of his phonological, lexical, or syntactic competence.

1.4.2.1 Elicitation Techniques

There are many elicitation procedures employed in SLA research. Nunan (1992, 136) states:

- (14) Elicitation techniques vary enormously in scope, aim, and purpose. They include studies which obtain their data by means of a stimulus, such as a picture, diagram or standardised test, as well as those based on questionnaire, survey, and interview data.

Larsen-Freeman and Long (1991) mention some of these procedures roughly in order of the degree of control over the learners' performance. In

addition, they cite some representative studies in which the elicitation procedure has been used. I have shown some of these procedures in the following table.

Table 1: Some Elicitation Procedures in SLA Research

Elicitation Procedure	Field	Method	Representative Studies
<i>1) Reading aloud</i>	Second language pronunciation	- Subjects read aloud word lists, sentences or passages containing particular sounds. - The subjects' performance is recorded for later analysis.	Beebe (1980) Flege (1980)
<i>2) Structured exercises</i>	Morphology or syntax	- Subjects perform some grammatical manipulation so that researchers can study subjects' performance. - Some exercise types include: a) transformation exercises b) fill-in-the-blanks with the correct form c) sentence-rewrite d) sentence-combining e) multiple-choice	a) Cazden et al (1975) b) Larsen-Freeman (1975) c) Schmidt and McCreary (1977) d) Schmidt (1980) e) Bialystok (1982)
<i>3) Completion task</i>	L1 acquisition or SLA: grammar, morphology, or oral production	a) Subjects listen to or read the beginning of a sentence and complete it using their own words. b) Subjects read a written dialogue and a brief summary statement and are then asked to complete the dialogue.	a) Richards (1980) b) Bialystok (1982)

4) <i>Elicited imitation</i>	Grammar	<ul style="list-style-type: none"> - The researcher reads to the subject a particular set of sentences containing examples of the structure under study. - The subject imitates each sentence after it is read. 	Naiman (1974)
5) <i>Elicited translation</i>	Oral production	Subjects are asked to translate a sentence from their L1 to their L2 or vice versa.	Ravert (1968)
6) <i>Guided composition</i>	Oral or written production	Subjects produce oral or written composition in response to given stimuli for example: a) picture sequences b) an arrangement of content words.	a) Richards (1980) b) Ioup (1984)
7) <i>Question and answer (with stimulus)</i>	Bilingual Syntax Measure and oral production	a) Subjects look at a picture or a series of pictures and answer questions designed to elicit particular structures under study. b) Subjects listen to a description of some personalised situations ending with a question to which they are asked to give an appropriate response.	a) Burt, Dulay, and Hernandez-Chavez (1975) b) Bialystok (1982)
8) <i>Reconstruction (story telling) (paraphrase recall)</i>	Testing oral or written skills through recall	a) Subjects read or listen to a story or b) Subjects watch a film. They then retell or reconstruct the story orally or in writing.	a) Larsen-Freeman (1983) b) Godfrey (1980)

9) <i>Oral interview</i>	Testing oral skills	<p>a) Some researchers exercise control over the topics to encourage the subjects to produce the structure being studied.</p> <p>b) Other researchers allow subjects to choose the topics to encourage the subjects to produce more spontaneous speech.</p>	b) Johnston (1985)
10) <i>Free composition</i>	Testing writing skills	The researcher establishes a topic to encourage the production of certain structures as opposed to others, for example studying grammatical morphemes.	Anderson (1976)

1.4.2.2 Study Elicitation Techniques

In this research, I used two of the above elicitation procedures:

- (a) *Reading aloud*: Three groups of Arab subjects were asked to read aloud and record lists of English words to test particular consonants, vowels and word stress placement.
- (b) *Guided composition*: The same subjects were given a picture and asked to describe and record the scene in their own words.

The above two elicitation procedures were chosen for my study for the following reasons:

- Reading aloud enabled me to record the actual language pronounced by the Arab subjects.
- This objective record was later analysed to pinpoint their errors in English pronunciation.
- Guided composition also enabled me to record and analyse samples of the Arab subjects' naturally occurring English language which were different from the constraints of the lists of words.

1.4.3 Data Collection

1.4.3.1 Materials

The main study consisted of two parts as now shown and in Appendix (A). The first part was made up of sets of words and sentences testing English sound and main word stress, as follows.

1.4.3.1.1 Production Test

The production test items were divided into three word groups (511 words total), which were chosen on the basis of Arabic and English sounds and stress placement rules and the expected areas of L1 transfer. These word groups had twenty five word classes, each testing a different aspect of English consonants, vowels and main word stress rules.

Word group I (319 words, 10 classes) tested errors in English consonants, word group II (102 words, 7 classes) tested errors in English vowels and word group III (90 words, 8 classes) tested errors in main word stress. The experimental items of the production test are now presented, followed by predictions of how these words will be pronounced and stressed by the subjects.

(A) Segmental Errors:

Word Group I: Consonants (319 words)

Prediction: Arabic speakers will have difficulty with some English consonants and will substitute their own Arabic consonant sounds for the unfamiliar English ones (i.e. L1 negative transfer), producing incorrect English consonants.

- Class 1: (Plosives) (20 words)

park, spark, help, slept, wept, bark, symbol, job, tie, sty, part, die, handle, hard, kill, skill, monarch, gill, forget, bag

Prediction: The English voiceless plosive /p/ will be difficult for Arabic speakers and will be pronounced as /b/ or unaspirated /p/.

- Class 2: (Fricatives) (39 words)

thumb, method, bath, months, baths, sixth, south, southern, southerly, then, leather, bathe, clothes, bathes, smooths, fine, rifle, off, vine, rival,

of, sharp, version, ash, pleasure, treasure, rouge, seal, person, bus, cats, birds, watches, zeal, busy, buzz, head, behind, haphazard

Prediction: The English fricative sounds /θ/, /ð/, /v/ and /ʒ/ will be difficult for Arabic speakers and will be pronounced as /s/, /z/, /f/ and /g/ respectively.

- Class 3: (Affricates) (8 words)

chapter, purchase, church, cello, gem, soldier, judge, lounge

Prediction: The English affricate sounds /tʃ/ and /dʒ/ will be difficult for Arabic speakers and will be pronounced as /f/ and /g/ respectively.

- Class 4: (Nasals) (12 words)

man, number, farm, name, hand, bean, thing, singer, singing, longer, thank, wings

Prediction: The English nasal sound /ŋ/ will be difficult for Arabic speakers and will be pronounced as /ng/.

- Class 5: (Laterals) (15 words)

rubbish, airport, river, far, far from, far from, right, light, leaf, look, polite, help, eel, well

Prediction: The English lateral sounds /r/ and /l/ will not be very difficult for Arabic speakers.

- Class 6: (Semi-vowels) (6 words)

year, beyond, few, wine, when, which

Prediction: The English semi-vowels /j/ and /w/ will not be very difficult for Arabic speakers.

- Class 7: Orthography and Pronunciation

- (7 a) (Letter Sound Mismatch) (11 words)

enough, hiccough, suite, ewe, cello, cognac, soldier, lounge, lieutenant, phlegm, gnaw

Prediction: These English words will be difficult for Arabic speakers, since there is a mismatch between English orthography and pronunciation, whereas Arabic spelling is simple and virtually phonetic.

- (7 b) (Silent Letters) (24 words)

psalm, corps, subtle, plumb, nestle, fasten, handkerchief, handsome, knight, knave, feign, gnarled, alms, salmon, colonel, folklore, heir, annihilate, wrath, sword, plough, borough, solemn, damn

Prediction: These English words will be difficult for Arabic speakers, since there is a match between Arabic orthography and pronunciation, and a single letter represents a single sound.

- (7 c) (Consonant Doubling) (22 words)

stubborn, account, address, odd, affair, suggest, allow, collect, accommodation, announcer, inn, support, correct, discuss, attack, attempt, butt, puzzle, buzz, midday, misspelled, dissatisfied

Prediction: These English words will be difficult for Arabic speakers, since gemination is common in Arabic.

- (7 d) (Syllabic Consonants) (16 words)

middle, tunnel, little, panel, rhythm, button, threaten, eleven, Britain, cousin, Hungary, hungry, national, literal, visionary, veteran

Prediction: These English words will be difficult for Arabic speakers, since Arabic makes no use of syllabic consonants.

Errors in Consonant Clusters (146 words)

- Class 8: (Initial Consonant Clusters) (44 words)

plane, black, clean, glass, fleet, sleep, pray, train, creep, brain, drive, great, freeze, throw, shrink, pure, beauty, tube, duty, cure, mute, news, sue, view, lewd, huge, few, twin, dwarf, queen, thwack, swing, spare, stay, scare, smile, snake, sphere, spleen, spring, string, scream, stew, square

Prediction: These English initial consonant clusters will be difficult for Arabic speakers, since English permits much longer initial consonant clusters than Arabic and initial three-element clusters do not occur in Arabic.

- Class 9: (Medial Consonant Clusters) (11 words)

transport, transplant, landscape, handmark, grandmother, grandson.
long skirt, strange dream, bent screw, next, spring, She tempts strangers.

Prediction: These English medial consonant clusters will be difficult for Arabic speakers, since Arabic does not permit more than two consonants word-medially.

- Class 10: (Final Consonant Clusters) (91 words)

- (10 a) (Clusters of two consonants) (52 words):

grabbed, begged, seemed, cleaned, filled, wronged, proved, bathed, raised, helped, marked, coughed, pronounced, published, cabs, seeds, flags, arms, pins, songs, loves, smoothies, steals, leaps, seats, backs, laughs, eighth, width, warmth, month, length, fifth, wealth, depth wasp, grasp, task, risk, lamp, triumph, faint, dance, rank, bulb, silk, help, belt, film, shelf, else, valve

Prediction: Arabic speakers will find varying degrees of difficulty with final two consonant clusters, since Arabic permits some two consonant clusters word-finally.

- (10 b) (Clusters of three consonants) (34 words)

bronzed, filmed, delved, judged, changed, lapsed, taxed, midst, jumped, triumphed, touched, sensed, linked, amongst, helped, milked, pulsed, grasped, hands, builds, elms, shelves, scripts, facts, camps, nymphs, thanks, lifts, lisps, lists, tasks, helps, halts, milks

Prediction: These English final three consonant clusters will be difficult for Arabic speakers, since Arabic does not permit three-element consonant clusters word finally.

- (10 c) (Clusters of four consonants) (5 words)

contexts, tempts, glimpsed, drenched, changed

Prediction: These English final four consonant clusters will be difficult for Arabic speakers, since Arabic does not permit four-element consonant clusters word finally.

Word Group II: (Vowels) (102 words):

Prediction: Arabic speakers will have difficulty with some English vowels and will substitute their own Arabic vowel sounds for the unfamiliar English ones (i.e. L1 negative transfer), producing incorrect English vowels.

- Class 11: (Short Vowels) (18 words)

heavy, sit, deaf, set, pad, rash, gone, wash, wood, look, rub, hut, attempt, about, polite, postman, breakfast, sailor

Prediction: Some of the English short vowels will be difficult for Arabic speakers, since English has a greater number of vowels than Arabic.

- Class 12: (Long Vowels) (12 words)

field, leaf, through, food, boot, cigar, heart, board, cork, fur, word, work

Prediction: Some of the English long vowels will be difficult for Arabic speakers, since English and Arabic have two different vowel structures or patterns.

- Class 13: (Diphthongs) (16 words)

raid, fate, bite, ripe, boil, point, grow, stove, crown, mouth, beer, beard, bear, stare, tour, moor

Prediction: Some of the English diphthongs will be difficult for Arabic speakers, since Arabic has no diphthongs.

- Class 14: (Easily Confused Vowels) (56 words)

The poor mastery of English vowels is the most noticeable feature in the English speech of Arabic speakers. Therefore, English vowels were tested twice using different lists of words.

- (14 a): (Short Vowels) (14 words)

miss, mess, bitter, better, luck, lock, cot, caught, gone, gun, put, pot, look, lock

Prediction: Some of the English short vowels will be difficult for Arabic Speakers.

- (14 b): (Long Vowels) (20 words)

sheep, ship, hurt, heart, dirt, dart, worm, warm, word, ward, staff, stuff, task, tusk, ball, phone, food, good, fool, stood

Prediction: Some of the English long vowels will be difficult for Arabic Speakers.

- (14 c): (Diphthongs) (22 words)

sail, sell, vain, vine, pain, pine, hate, hat, fain, fan, fine, fin, bite, bit, bear, beer, chair, sheep, beard, bird, boat, bought

Prediction: Some of the English diphthongs will be difficult for Arabic Speakers.

- Class 15: (Intrusive Vowels) (5 words)

spring, swing, worked, changed, grandfather

Prediction: Some of these consonant clusters will be difficult for Arabic speakers and they will use an intrusive vowel as a cluster breaker.

Class 16: (Vowel Reduction to Schwa) (10 words)

Here they are, They are coming, Shoot at him, Stop at the next house, There is nothing to do, What do you see?, What is he waiting for?, He is waiting for pay. Read as much as you should., How should I know?.

Prediction: Reducing the vowels of English function words to schwa /ə/ will be difficult for Arabic speakers, since function words in Arabic do not have two forms and unstressed vowels keep their full value.

- Class 17: (Vowel Length) (22 words)

cap, cab, seat, seed, dock, dog, leaf, leave, belief, believe, vacation, occasion, faith, bathe, tooth, smooth, loose, lose, cease, seize, catch, cadge

Prediction: Vowel length would be difficult for Arabic speakers, since Arabic vowels vary in length regardless of the following consonant.

(B) Suprasegmental Errors:**Word Group III: (Errors in Word Stress) (90 words)**

Prediction: Arabic speakers will have difficulty with English main word stress and will apply Arabic stress rules (L1 negative transfer), producing incorrect English stress patterns.

- Simple Word Stress (78 words)**- Class 18: (unstressed final V: or VV) (10 words)**

'multiply, 'holiday, 'igloo, 'beautify, i'dentify, 'castaway, 'carboy, 'cargo, 'whitlow, 'bungalow

Prediction: The final V: or VV will be stressed, as in Arabic.

- Class 19: (unstressed final –CVVC) (12 words)

'prosecute, 'substitute, 'gratitude, 'multitude, 'criticise, 'exercise, 'demonstrate, 'captivate, 'carbide, 'carmine, 'telegraph, 'telescope

Prediction: The final –CVVC will be stressed, as in Arabic.

- Class 20: (unstressed final –CVCC) (16 words)

'manifest, 'scientist, 'punishment, 'applicant, 'product, 'difficult, 'concept, 'impact, 'evident, 'impotent, 'management, ad'vertisement, con'versant, a'ppellant, 'occupant, 'specialist

Prediction: The final –CVCC will be stressed, as in Arabic.

- Class 21: (the CV'CVCV(C) syllabic pattern) (4 words)

pa'cific, te'rrific, de'posit, so'licit

Prediction: The initial CV will be stressed, as in Arabic.

- Class 22: (stressed antepenult) (12 words)

'silently, 'messenger, 'orchestra, 'barrister, 'cucumber, 'calender, 'currency, 'helicopter, 'protestant, 'passenger, 'currency, 'thermostat

Prediction: The English unstressed heavy penult will be stressed, since it is common in Arabic for a heavy penult to be stressed.

- Class 23: (stress preantepenult) (12 words)

'necessary, 'mercenary, 'category, 'demonstrator, la'boratory, 'speculator, 'characterise, 'matrimony, 'legislative, 'imaginary, 'accuracy, a'dequacy

Prediction: The antepenultimate syllable will be stressed, as in Arabic, since stress in Arabic never precedes the three-syllable window.

- Class 24: (stress contrasts) (12 words)

we pro'test, our 'protest, we ob'ject, our 'object, we pre'sent, our 'present, to ex'port, our 'export, to pe'rmit, a 'permit, to pro'gress, our 'progress

Prediction: Arabic speakers will find difficulty in English contrastive stress, since it is not common in Arabic which uses word order to show contrast.

- Class 25: (compound stress) (12 words)

'apple tree, 'flowerpot, 'blacksmith, 'greengrocer, 'birthday, 'sheepdog, 'workshop, 'midnight, 'make-up, 'setback, 'greenhouse, 'classroom

Prediction: Arabic speakers will find difficulty in these compound nouns and will apply Arabic compound stress rules. They will either place two main stresses on both elements of the compound or one main stress on the second element.

The words in each word group were randomised in order not to make it easy for the subjects to deduce the tested rules or word stress patterns. While analysing stress errors, the tested words were re-categorised into their original groups.

1.4.3.1.2 Description of a Picture

The second part of the test consisted of one page of a stimulus large picture to be described by all the subjects. This enabled me to record and analyse samples of the subjects' naturally occurring English language.

1.4 3.2 Sample

Sample Size

At the outset, it was decided that ten subjects from each of six Arab groups (Egyptians, Saudi Arabians, Libyans, Yemenis, Algerians and Omanis) would be used in this study. However, due to the lack of willing subjects

from the last three groups and the time limit of the research, the study was carried out with forty five subjects: fifteen subjects from each of the first three groups (Egyptians: 11 male, 4 female), (Saudi Arabians: 15 male) and (Libyans: 14 male, 1 female). The sample size was large and reliable enough for phonetic analysis, simple statistical analysis and generalisations of the findings within the three selected nationalities.

The educational setting for this project is the Saudi School in Sheffield, England where I work as a teacher of English to Arab students. This school includes mixed Arab nationalities. The students themselves were too few to constitute reliable samples. As a result, their parents, brothers and some postgraduate students in Sheffield were chosen. The profile of the Arab subjects who took part in this study can be represented as follows.

Table 2: Profile of the Arab Subjects in Sample

	Nationality	Male	Female	Age Range	Average Years of Learning English
Group 1	Saudi Arabians	15	-	27-37 years	6-8 years
Group 2	Egyptians	11	4	30-40 years	6-8 years
Group 3	Libyans	14	1	28-40 years	6-8 years

Sampling Method

Nunan (1992) mentions six strategies for sampling, which he adapted from Cohen and Manion (1985) as follows: simple random, systematic, stratified, cluster, convenience and purposive. In this research, the first method was used – *simple random sampling*. It involved selecting the required number of subjects at random from a list of the population. Thirty Arab subjects were postgraduate students living in Sheffield, England, while the remaining fifteen were parents and brothers of my students in the Saudi School in Sheffield.

1.4.3.3 Tape Recording

The data required for this study were collected by tape recording. Each recording session began with a few minutes of social questions: How are you today? Such questioning helped to put the subjects at ease before

starting the recording of the materials. The recording lasted for approximately twenty minutes. Twenty minutes was thought to be the maximum period for each session before fatigue and performance drops. The setting was kept as informal as possible, usually in a quiet location. There were some oral instructions for each subject at the beginning of each recording session with lists of words with varying degrees of difficulty and a picture to be described (see Appendix A).

Each recording was made with a clip-on microphone and a small tape recorder placed in front of each subject. Nine tapes were recorded, three tapes for each subject sample. The quality of the recordings was satisfactory for phonetic analysis and of excellent fidelity. Two persons were present in each recording session: the participant and the researcher. The function of the researcher was to note phonetic errors and other factors which could be significant in the interpretation of the subject's phonetic competence. There are numerous advantages of recording:

- It enables the researcher to study the recorded material in an unhurried way without irritating the subject.
- It allows the researcher to listen many times to a given utterance until being satisfied of detecting all the various sound and word stress errors.
- This recording may be kept for future reference in studies analysing some other linguistic points in the subjects' speech.

At the end of the recording, I thanked the subjects for their co-operation and willingness to take part in this study. In addition, I promised to give a summary of the findings of the study to those subjects who were interested. This helped to give the subjects the feeling that the recording was a pleasant experience.

1.4.4 Data Analysis

1.4.4.1 Linguistic Analysis

This research data are analysed in the light of the following three theories of second language acquisition: Contrastive Analysis (CA) (Fries, 1945), Error Analysis (EA) (Corder, 1967) and Markedness Theory (Eckman, 1977). These theories are explained in detail in Chapter 2: Theories of Second Language Acquisition. Moreover, a CA of English and Arabic sound systems and word stress rules was used to analyse the question of L1 Arabic interference (negative transfer) in the acquisition of L2 English. Lado

(1957, 72) states that ‘the list of problems resulting from the comparison of the foreign language with the native language...must be considered a list of hypothetical problems until the final validation is achieved by checking against the actual speech of students’.

The recorded data, as the phonetic output of each subject, were analysed. Following the analysis, all the errors were singled out and tables showing transcriptions of correct and incorrect forms were drawn up as shown in Chapter 4: Results and Analysis.

The analysis of errors in this study was based on Rossipal’s model of error analysis (EA) as stated in Chapter 2: Theories of Second Language Acquisition. This model included six steps as follows.

- (a) types of errors
- (b) frequency of errors
- (c) points of difficulty in the target language
- (d) cause of errors
- (e) degree of disturbance caused by errors
- (f) therapy

Apart from step (e), my analysis of Arabs’ errors in English pronunciation addressed Rossipal’s steps by:

- diagnosing types of errors in the Arabic speakers’ English sounds and main word stress;
- studying the frequency of Arabic speakers’ interlingual errors;
- finding out the reasons for these errors;
- suggesting some teaching recommendations for overcoming these errors.

While analysing the subjects’ segmental and word stress errors, the following linguistic parameters were taken into account:

A) Linguistic Parameters

1) Proficiency level of English

2) Reading versus pictures

Finally, inter-judge reliability was used in this research – the subjects’ recordings were transcribed separately by the researcher who is a native Arabic speaker, and by a second transcriber who is a native English speaker

with experience in transcription. The two transcriptions were then compared and the few cases of disagreement were resolved by the two transcribers.

1.4.4.2 Statistical Analysis

In order to be able to better evaluate and compare the errors in English pronunciation and main word stress made by the Arab subjects whose phonetic output was analysed, it was necessary to examine the frequency of the different types of error. A frequency measure was applied by finding out what percentage of the target population got the item wrong. Means and different types of descriptive statistics are also used in this research.

1.5 Chapter Summary

This chapter shows that the current research is an error analysis of English pronunciation errors among Arabic speakers regarding consonants, consonant clusters, vowels and main word stress. Its aim is to find out their segmental and word stress errors, the reasons behind them and to present some teaching suggestions as remedial work. It is a contribution to the relatively understudied area of L2 phonology acquisition (L2 sounds and stress production). Its justification was also discussed as a sound basis for teaching English pronunciation to Arabic speakers. The key terminology of the research was defined: mistake, error, contrastive analysis, error analysis, interference, interlanguage and stress. Elicitation was the method used for this study. Forty five Arab subjects, who were postgraduate students living in Sheffield, England, took part and were assigned two tasks. The first task was a production test and its items were divided into three word groups (511 words total, 25 word classes), which were chosen on the basis of Arabic and English sounds, word stress placement rules and the expected areas of L1 transfer. The second task was a description of a picture. Finally, the linguistic background covered the Arabic language, dialect of the study, the Arab learner of English, TEFL in the Arab schools, English pronunciation problems and Arab learners and English stress and effective communication.

The next chapter explains some theories of second language acquisition which are related to this study. The predictions based on these theories will be tested in Chapter 4: Results and Analysis.

CHAPTER TWO

THEORIES OF SECOND LANGUAGE ACQUISITION

2.0 Introduction

A number of different theories and hypotheses in the field of second language (L2) acquisition (Larsen-Freeman and Long (1991) estimate around 40) have been formed in an effort to provide explanations as to how L2 learning takes place, to identify the variables responsible for L2 acquisition and to offer guidance to L2 teachers. Research in L2 acquisition is closely related to several disciplines including linguistics, sociolinguistics, psychology, neuroscience and education, and consequently most theories of L2 acquisition can be identified as having roots in one of them. Each theory accounts for language acquisition from a different perspective and can be thought of as shedding light on one part of the language learning process. However, no one theory of L2 acquisition has yet been widely accepted by researchers.

This section includes three main points. First, it explains some theories of L2 acquisition: a description of each theory and its contribution to SLA research. These theories are Contrastive Analysis (CA) (Fries, 1945), Error Analysis (EA) (Corder, 1967), Markedness Theory (Eckman, 1977), Universal Grammar (UG) (Chomsky, 1981), Monitor Theory (Krashen, 1985) and the Ontogeny Phylogeny Model (OPM) (Major, 2001). Second, it summarises these theories of L2 acquisition. Third, it presents some predictions based on these L2 theories. The theories discussed below (presented in chronological order) mainly focus on L2 phonology, especially L2 sounds and stress production which are more relevant to the current research. This chapter is based on Khalifa's (2017) explanation of theories of L2 acquisition.

2.1 Contrastive Analysis (CA)

Contrastive linguistics plays an important role in the creation of language awareness (James, 2005; Mair, 2005). Judged by the rules of the source language (SL), learners regularly produce erroneous or ill-formed utterances. It was thought that errors could be corrected by repeating the explanations until the errors disappeared. This gave way to the idea that errors were an indication of the learner's difficulties, which could be traced back to transfer of the mother tongue (MT) habits to the target language (TL). Lado (1957, 1) states that:

- (1) Individuals tend to transfer the forms and meanings and the distribution of forms and meanings of their native language and culture to the foreign language and culture – both productively when attempting to speak the language and act in the culture and receptively when attempting to grasp and understand the language and the culture as practised by natives.

In this case, errors were to be dealt with by more intensive drilling of the sound patterns and sentence structure of the TL. Errors occurred because of interference and therefore a structural comparison or contrast between the MT and the TL could predict the learner's difficulties (Broselow, 1984). The belief that almost all errors had their origin in MT interference gave rise to Contrastive Analysis (henceforth, CA) (Fries, 1945; Weinreich, 1953; Lado, 1957). CA theory developed out of behaviourism, a theory in psychology and a foreign language teaching programme (Zampini, 2008).

2.1.1 L1 and L2 Features

The publication of *Teaching and Learning English as a Foreign Language* by Fries (1945) opened a new horizon in the study of SLA. Fries (1945, 9) assumes that 'the most efficient materials [for foreign language teaching] are those that are based upon a scientific description of the language to be learned, carefully compared with a parallel description of the native language of the learner'.

It was thought that the greater the differences between the structures of the MT and the TL, the greater the problems and difficulties in learning and performance would be. Lado (1957, 2) explains these difficulties for the foreign learner, as follows:

- (2) Those elements that are similar to his native language will be simple for him, and those elements that are different will be difficult.

2.1.2 L1 Transfer

Within CA, one major concept that is given a prevalent place and has contributed to the explanations of errors found in L2 learners is the concept of transfer (George, 1972; Dulay and Burt, 1974). Major (2008, 64) states that ‘the fundamental claims of CA are that transfer explains all errors and on this basis it is possible to predict all errors’. Even though ‘most L2 phonologists do not necessarily claim or admit that transfer is the focus of their work, transfer is implicated in almost every instance’ (Major, 2008, 83). Broselow (1983, 302-303) states that ‘language transfer does play a significant role in second language acquisition: certain systematic errors can be directly attributed to the use by language learners of a phonological rule in the production of second language forms’. Many studies conducted in L2 learning have dealt with transfer theory in great depth, because it was noticed that there exists a relation between ‘errors’ and ‘interference’. For example, George (1972) found out that one third of the errors found in his corpus could be explained via ‘negative transfer’ which has been referred to as ‘interference’. Selinker (1966, 103) defines transfer as ‘a process occurring from the native to the foreign language if frequency analysis shows that statistically significant trend in the speaker’s native language...is then paralleled by a significant trend toward the same alternative in the speaker’s attempted production of the foreign language sentences’. On the other hand, James (1980, 25) regards transfer as ‘the psychological corner of CA’. Zampini (2008, 2) states that ‘while other domains of SLA research such as morphology, syntax, and pragmatics have also focused on transfer, it is within the domain of L2 phonology that transfer has been most heavily researched, due to the recognition that it is within this area of acquisition that transfer is most prevalent’.

2.1.3 Types of L1 Transfer

There are two types of language transfer: positive and negative transfer. This is pointed out by Gass and Selinker (1983, 821) who support the view that language transfer is

- (3) a technical term denoting ‘the positive’ interaction of two or more similar areas of language resulting in correct linguistic output (positive transfer) or denoting the negative interaction of two or more similar

areas of language and languages resulting in incorrect linguistic output ‘negative transfer’.

According to Littlewood (1984), positive transfer is viewed when the L1 structure equates the L2 structure. Therefore, the L2 learner ends up with correct performance, because the L1 structure has been seen as a facilitating tool in the process of L2. This is supported by Van Els et al (1984, 49), as follows.

- (4) Positive transfer, or facilitation, is a transfer of a skill X which facilitates the learning or has a positive influence on the command of a skill because of similarities between both skills.

The second type of language transfer is ‘negative transfer’ and is defined by Van Els et al (ibid.), as follows.

- (5) [Negative transfer] is a transfer of a skill X which impedes the learning or has a negative influence on the command of a skill Y because of differences between both skills.

Broselow (1984, 253) points out negative transfer by stating that ‘one would expect to find negative transfer operating in cases which, for example, the native language had a rule which the target language lacked. Thus a German speaker learning English might devoice final obstruents in English in accord with the rules of German phonology’. These two types of transfer (i.e. positive and negative) will be tested in Chapter 4: Results and Analysis, to see if they have affected the Arabic speakers’ interlanguage.

2.1.4 Factors Affecting L1 Interference

The phenomenon of interference has promoted a number of investigations to find out the factors that induce such phenomenon to occur. James (1980, 146) points out the various factors that contribute to the occurrence of interference, as follows.

- (a) *Amount and nature of L2 input*: Interference occurs when the L2 learner’s input is very limited in both ‘quantity’ and ‘scope’. This phenomenon can be manifested especially when L2 is learned in an L1 environment (schools).
- (b) *Level of linguistic analysis*: Most research has been done at the levels of morphology and syntax rather than at the phonological and lexical level. It is because of these two levels that ‘interference’

as a linguistic term has been included in the literature.

- (c) *Linguistic distance between L1 and L2*: Related linguistic systems induce the interference phenomenon to manifest itself. Hence, since the two languages are different, L2 learners have a tendency to translate the features from L1 into L2.
- (d) *L2 learning stage*: Taylor (1975) pointed out that interference phenomenon is more frequent among beginners than among advanced learners during the L2 learning process.
- (e) *Task focus*: Interference is common among L2 learners if the focus of L2 is on grammatical forms rather than on ‘communicative effectiveness’.

In Chapter 4: Results and Analysis, these factors will be considered alongside L1 transfer as possible explanations for the Arabic speakers’ segmental and word stress errors.

2.1.5 Criticism of Contrastive Analysis

Despite the fact that CA has raised some fundamental issues in language learning, by the 1970s people started questioning its validity. There have been doubts about the status and applicability of contrastive linguistic studies to language teaching (Ritchie, 1967; Nemsler, 1971; Slama-Cazacu, 1971; Dulay and Burt, 1974). This is due to many reasons:

- 1) Difficulties predicted by CA were not always found to be so (Nickel, 1971):
 - Where there were similarities between the languages, errors occurred although CA predicted no difficulty (Major, 2008).
 - Where there were big differences between the languages, errors often did not occur although CA predicted difficulty (Broselow, 1984).
- 2) Not all difficulties and errors arise from the influence of the MT (Dušková, 1969; Richards, 1971; Dulay and Burt, 1973; Broselow, 1984; Swan, 1997; Ellis, 2008). This is also pointed out by Broselow (1983, 292) who states that ‘it is certain that many factors other than transfer from the first language are involved in phonological errors made by language learners’.
- 3) Adequate comparisons of languages were faced with purely theoretical problems which made the whole operation of doubtful validity (Hamp, 1965; Van Buren, 1974; Krzeszowski, 1974).

As a result, there was a reappraisal of the theoretical basis for such studies and its value for language teaching. Wardhaugh (1970) distinguished between the strong and weak hypothesis of CA:

- The strong hypothesis stated that a systematic CA could predict the learner's difficulties and remedial teaching materials could then be devised.
- The weak hypothesis stated that a comparison between the MT and the SL might help to explain the difficulties evident from the learner's errors.

Nehls (1974) and James (1971) have made a reasoned reply to all these criticisms. James argues that many of the claims for which the analysts are attacked have never been made by them. Indeed, since 1968 contrastive analysts have gradually abandoned the stronger claims. In addition, research in this area has broadened its scope in two directions towards:

- 1) more theoretical objectives in language typology and the search for universals;
- 2) psycholinguistic explanation of second language acquisition.

The weakness of contrastive analysis was pointed out by Broselow (1983, 292), as follows.

- (6) The failure to predict errors from an examination of the linguistic systems of the first and second languages by no means constitutes sufficient grounds for abandoning the contrastive analysis hypothesis altogether....and it is likely that a more sophisticated linguistic theory may in fact allow us to predict many of the systematic phonological errors made by speakers of a second language.

Ellis (1994, 308) states that 'it was not surprising to see contrastive analysis lose ground to error analysis in the 1970s'. Here the broadened CA merged with EA.

2.2 Error Analysis (EA)

2.2.1 Contrastive and Error Analysis

Contrastive Analysis (CA) worked well on the phonological level but failed to predict errors in other areas. This led to a growing interest in Error Analysis (henceforth, EA), which was established in the 1960s by Stephen Pit Corder and colleagues. EA was an alternative to CA which

was abandoned by linguists and teachers due to its ineffectiveness and unreliability. EA showed that CA was unable to predict a great majority of errors, although its more valuable aspects have been incorporated into the study of language transfer. EA started with the errors and then tried to find out their causes. James (1998, 1) defines Error Analysis 'as the process of determining the incidence, nature, causes and consequences of unsuccessful language'. EA is also referred to as the study of linguistic ignorance which investigates 'what people do not know and how they attempt to cope with their ignorance' (James, 1998, 62-63). The fact that L2 learners find ways to cope with their linguistic ignorance makes a connection between EA and L2 learners' strategies. A key finding of EA has been that many learners' errors are produced by learners making faulty inferences about the rules of the new language. Writers highlighted the points of weakness of CA (Richards, 1974; Dulay and Burt, 1975; Broselow, 1984; and many others) and pressed the claims of EA. But they should have concentrated more on errors not caused by MT interference which CA failed to predict. Early works in EA dealing with L2 data were taxonomic in the sense that they focused on collecting and classifying errors (James, 1998). For a time, the literature on EA tried to prove the existence of numerous errors not caused by MT interference.

Corder (1975, 207) suggests that Error Analysis can be distinguished from 'performance analysis' in the sense that 'performance analysis is the study of the whole performance data from individual learners, whereas the term EA is reserved for the study of erroneous utterances produced by groups of learners'. In both analyses 'the learners' errors are a register of their current perspective on the TL' (James, 1998, 7).

2.2.2 Significance of Learners' Errors

James (1998, 12) gives Corder's five crucial points, originally published in Corder's (1967) paper titled 'The Significance of Learners' Errors', as follows.

- (7) 1. L1 acquisition and L2 learning are parallel processes, they are ruled by the same mechanisms, procedures and strategies. Learning an L2 is probably facilitated by the knowledge of the L1.
2. Errors reflect the learners' inbuilt syllabus or what they have taken in, but not what the teachers have put into them. So there is a difference between 'input' and 'intake'.
3. Errors show that both learners of L1 and L2 develop an independent language system – a 'transitional competence'.
4. The terms 'error' and 'mistake' should not be used interchangeably.

5. Errors are important because they (a) tell the teacher what he or she should teach, (b) are a source of information for the researcher about how the learning proceeds, and (c) allow the learners to test their L2 hypotheses.

Attitudes towards errors, aims of Error Analysis, the process of Error Analysis and models of Error Analysis are now explained. Finally, the criticism of Error Analysis is presented.

2.2.3 Attitudes towards Errors

Attitudes towards language learners' errors vary greatly. According to Corder (1967), there are two schools of thought towards these errors:

- (1) The first school considers the occurrence of errors as nothing but a sign of the present inadequacy of our teaching techniques. That is, if the teaching methods were perfect, errors would never occur.
- (2) The second school believes that we live in an imperfect world and however great our efforts, errors will always occur. Thus, we should concentrate on devising suitable remedial techniques for dealing with these errors.

In this research, I agree with the second school and the Arabic speakers' English segmental and main word stress errors are analysed and remedial measures are suggested. Although I agree that the better the method of teaching, the fewer the learner's errors, I disagree with the first school, as it is impossible to find a perfect method of teaching without errors. However perfect the method may be, the learner's part can not be ignored. In other words, a perfect teacher's efforts will be useless with an inattentive or indifferent learner.

2.2.4 Aims of Error Analysis

There are a number of general statements which explain clearly what EA is concerned with: Nickel (1972) in German; Lange (1974) in French; and Corder (1973), Svartik (1973), Richards and Sampson (1974), and Schumann and Stenson (1975) in English. Whereas CA concentrates only on the cases of interlingual transfer, EA is concerned with both inter- and intralingual errors. The aims of EA range from the practical to the theoretical side. Hammarberg (1979, 108) states that Rossipal (1972, 110) hopes that EA may provide relevant data within the following areas:

- (8) • contrastive language description, prediction of potential interference;
 • improving the description of the target language;
 • describing general traits of linguistic errors;
 • describing linguistic universals;
 • improving language teaching.

2.2.5 The Process of Error Analysis

Pedagogically, in order to know the principal learning difficulties of groups of learners, we need to apply three stages (Corder, 1975):

- a) Classification of errors;
- b) Evaluation of errors;
- c) Explanation of errors.

This is in line with James (1998), 5) who explains that EA ‘involves first independently or ‘objectively’ describing learners’ IL...and the TL itself, followed by a comparison of the two, so as to locate mismatches’. Each stage will now be discussed in detail.

2.2.5.1 Classification of Errors

Traditionally, errors were classified into four categories:

- Errors of omission: e.g. **I was not afraid the dog.*
- Errors of addition: e.g. **He did not let me to go.*
- Errors of substitution: e.g. **That lady is our new typewriter.*
- Errors of ordering: e.g. **I asked her how was she.*

In my view, such a classification is far from sufficient due to the following reasons:

- The items omitted, added, etc. need to be assigned to more general classes: prepositions, tense forms, questions, and so on, to be of benefit to the learner and to explain difficulties.
- It depends on our interpretation whether we regard an error as being one of e.g. omission or substitution. For example, **Dog is a faithful animal* can be classified under omission of definite article: *The dog is a faithful animal* or substitution of singular nouns for plural: *Dogs are faithful animals.*

Corder (1981, 36) describes this classification, as follows:

- (9) This superficial classification of errors is only a starting point for systematic analysis. It is only the evidence or data for an analysis. It is usual for teachers to go a bit further in their classification. They will usually state at what linguistic level the error has been committed.

A more adequate classification of errors, then, involves assigning them to various levels of linguistic description, i.e. phonological (both speaking and listening), orthographic (spelling and punctuation), syntactic (grammatical), lexico-semantic (choice of vocabulary), and situational or socio-linguistic (appropriacy). These levels, in turn, can be sub-classified as systems, e.g. vowel or consonant systems, tense, aspect, number, gender or case.

Such classification is more abstract and systematic. But again one error may be assigned to more than one level of description depending on interpretation and reconstruction e.g. **Please bring me a flour*. This error may be classified as syntactic (substitution of *a* for *some*), or lexical or phonological (substitution of *flour* for *flower*).

More recent classifications describe errors in terms of violations of the grammatical or phonological rules according to various generative and transformational models of description.

Of all the various classifications of errors, I follow the one based on the various levels of linguistic description (phonology). The subjects' segmental and main word stress errors are classified as errors in consonants, consonant clusters, vowels, simple word stress and compound word stress.

2.2.5.2 Evaluation of Errors

The demand for accurate evaluation of errors arises from the need to:

- assess the learner's knowledge for grading/markings purposes;
- assign priorities to remedial procedures.

There are various linguistic approaches to the evaluation of error gravity:

- a) James (1974) evaluates the degree of deviance of an error from the correct TL by assessing the number and nature of the rules violated.
- b) Burt and Kiparsky (1975) differentiate between two types of errors: global and local.
 - Global errors are deviations in the overall structure of sentences.
 - Local errors are deviations in the structure of constituents of

simple sentences and subordinate clauses.

- c) Johanssen (1973) evaluates how much an error may disturb the effectiveness of communication according to its frequency, generality or comprehensibility. In addition, some researchers (Lindell, 1973; Olsson, 1973; James, 1975; among others) measure error gravity by the degree of tolerance shown towards it by native speakers or language teachers.

My evaluation of the subjects' segmental and word stress errors follows James (1974) with particular attention to MT interference. I also follow Burt and Kiparsky (1975) regarding 'local errors' only, by studying the Arabic speakers' phonological deviations concerning English sounds and main word stress.

2.2.5.3 Explanation of Errors

Richards, J. C. (1971) identifies three main causes of error:

- Interlingual causes of error;
- Intralingual causes of error;
- Faulty teaching techniques or materials.

This agrees with Eckman (2008,101) who states that 'it has been recognized since the early days of Error Analysis (Schachter, 1974) that learners' errors are not the only measure of difficulty, and at times may not even be the most reliable measure'. The causes above are discussed in Chapter 1, p. 13. The current research investigates the interlingual causes in detail and the intralingual and teaching causes in brief.

2.2.6 Models of Error Analysis

According to Nickel (1972, 11), these are the three main aspects of the study of errors:

- (10) a) description;
 b) grading;
 c) therapy.

Another model of error analysis is pointed out by Rossipal (1972, 109), as follows:

- (11) a) types of errors;
 b) frequency of errors;

- c) points of difficulty in the target language;
- d) cause of errors;
- e) degree of disturbance caused by errors;
- f) therapy.

In my view, however comprehensive these models may be, they miss out a further step: checking the effectiveness of the therapy. This can be done by having a regular reanalysis of the learner's errors and a reassessment of the remedial measures. Without this step, the learner will be like a patient given medication without being followed up. This research follows Rossipal's model in a slightly different way by (a) analysing points of difficulty in the TL (English) due to MT (Arabic) interference and (b) not studying the degree of disturbance (error gravity) caused by the errors.

Arabic speakers' errors in English pronunciation are analysed by (a) diagnosing areas and types of English segmental and word stress errors among the Arabic speakers, (b) studying the frequency of the Arabic speakers' interlingual errors, (c) finding out the reasons for these errors and (d) suggesting some teaching recommendations for overcoming these errors.

2.2.7 Criticism of Error Analysis

Bell (1974, 35) criticises EA by calling it 'a recent pseudoprocedure in applied linguistics'. In his opinion, the EA data are of only poor statistical inference, errors are usually interpreted subjectively and it lacks predicative power. Schachter (1974) also criticises EA by pointing out that EA does not take into consideration the strategy of avoidance, i.e. that learners tend to avoid certain language items which they are not sure about and so they do not make errors in the areas where they would be expected to make them. More criticism comes from Dulay et al (1982, 141-143) who point to the fact that 'EA confuses explanatory and descriptive aspects, in other words the process and the product; and also that error categories lack precision and specificity'. In addition, Larson-Freeman and Long (1991, 61) state that 'Error Analysis as a mode of inquiry was limited in its scope and concentrated on what learners did wrong rather than on what made them successful'. In that respect, EA is limited in its explanatory power. Finally, Cook (1993, 2) considers EA as 'a methodology for dealing with data' rather than a theory that explains the process of L2 acquisition. However, despite all the criticism, EA remains widely used, because it has proven to be an effective approach to L2 learners' errors.

The next section explains a different theory of L2 acquisition (i.e. markedness theory) which does not rely on L1-L2 differences only, but

takes into consideration both L1 transfer and language universals.

2.3 Markedness Theory

2.3.1 Definition of Markedness

The markedness theory explains the role of typological markedness in the explanation of facts about L2 phonology (Eckman, 2008) and takes into account both native language transfer and language universals (Zampini, 2008). Markedness universals deal with occurrences and likelihood of occurrences of phenomena (Major, 2008). Markedness is defined in various ways (Chomsky and Halle, 1968; Hyman, 1975; Greenberg, 1978; Hawkins, 1984; Carr, 1993). One definition employs ‘implicational hierarchies: x is more marked than y if the presence of x implies the presence of y but not vice versa’ (Major, 2008). Markedness is explained by Eckman (1987, 60), as follows: ‘a phenomenon A in some language is considered to be more marked than a phenomenon B if the presence of A in a language implies the presence of B, but the presence of B does not imply the presence of A’. For example, final voiced obstruents imply voiced obstruents in initial and medial position but not vice versa (Eckman, 1977, 1985; Eckman and Iverson, 1994). Markedness can also refer to statistical frequencies. In L1 acquisition, markedness means that less marked phenomena are acquired before more marked phenomena. Eckman (2008, 96) explains the principle of markedness, as follows.

- (12) The idea behind this concept was that binary oppositions between certain linguistic representations (e.g. voiced and voiceless obstruents, nasalized and oral vowels, open and closed syllables) were not taken to be simply polar opposites. Rather, one member of the opposition was assumed to be privileged in that it had a wider distribution, both within a given language and cross languages ... the member of the opposition that was more widely distributed than the other was designated as unmarked, including that it was, in some definable way, simpler, more basic and more natural than the other member of the opposition, which was in turn defined as the marked member.

Linguists have been able to apply typological markedness to virtually all kinds of linguistic expressions, including phonological, lexical, morphological and syntactic structures. This section focuses on the role of markedness in L2 phonology, more specifically, the claim that marked structures are more difficult to learn than the corresponding unmarked structures (Eckman, 2008).

2.3.2 Markedness Hypotheses

There are two hypotheses relevant to L2 phonology that have been formulated using the construct of typological markedness: the Markedness Differential Hypothesis (MDH) (Eckman, 1977) and the Structural Conformity Hypothesis (SCH) (Eckman, 1991). Each hypothesis is now considered in turn.

2.3.2.1 Markedness Differential Hypothesis (MDH)

Major research findings have shown that predicting areas of difficulty and explaining L2 phonological acquisition is much more complex than a straightforward contrastive analysis of the first language and the second (Zampini, 2008). Eckman's (1977) Markedness Differential Hypothesis is, in fact, a reformulation of the Contrastive Analysis Hypothesis (CAH) (Lado, 1957) by incorporating the notion of typological markedness into CAH. Therefore, unlike the CAH, which predicts that different L2 sounds will be difficult to learn, the MDH postulates that different sounds are only difficult to learn if they are typologically marked; if typologically unmarked, these sounds should not create learning difficulty. That is, the more marked a rule, the more difficult it is to learn. Eckman (1977, 321) proposes the MDH, as follows.

(13) The Markedness Differential Hypothesis (MDH)

The areas of difficulty that a language learner will have can be predicted such that

- (a) Those areas of the target language which differ from the native language and are more marked than the native language will be difficult.
- (b) The relative degree of difficulty of the areas of the target language which are more marked than the native language will correspond to the relative degree of markedness.
- (c) Those areas of the target language which are different from the native language, but are not more marked than the native language will not be difficult.

The MDH in (13) predicts that (a) marked L2 patterns are more difficult to learn than unmarked ones, (b) marked L2 patterns that are less marked than the patterns of the mother tongue are not difficult to learn, and (c) marked L1 patterns are less likely to be transferred than unmarked ones. This shows that not all L1-L2 differences will cause equal difficulty for the L2 learner (Eckman, 2008). The MDH asserts that, within the areas of difference between the L1 and L2, marked structures are more difficult to acquire than the corresponding unmarked structures. The kind of evidence

adduced in support of the MDH showed that L2 learner's errors could not be accounted for on the basis of L1-L2 differences alone, but that typological markedness was necessary to explain the difficulty that L2 learners encountered (Eckman, 2008). Major (2008) points out that numerous predictions of the MDH have been found to be true, for example, in studies of voicing contrasts (Yavas, 1994; Major and Faudree, 1996), epenthesis in initial consonant clusters in Egyptian learners of English (Broselow, 1983), fossilisation in Brunei English (Mossop, 1996) and speech pathology (Gierut, 1986; Hodson and Edwards, 1997).

The MDH and its typological markedness approach received some criticism. Eckman (2008, 100) states that 'the methodological issues that have confronted the MDH in the literature on L2 phonology stem from the fact that the MDH is completely programmatic with the Contrastive Analysis Hypothesis (CAH) in two important respects. First, both the MDH and the CAH make claims about L2 learning difficulty, and second, both hypotheses base their claims about such difficulty, at least in part, on the areas of difference between the NL: and TL'. There were two problems with the MDH. First, how one measures learning difficulty. Second, as Eckman (2008, 101) points out 'some reported error patterns corresponded directly to markedness principles, but the errors did not occur in an area of difference between the NL and TL. In this situation, the spirit of the MDH seemed to be invoked, in that more marked structures caused more errors than the corresponding less marked structures; however, the letter of the MDH prevented the hypothesis from making any predictions'. Regarding the first problem, Eckman (2008) explains that the vast majority of work in L2 phonology has measured difficulty in terms of learner's errors: the more errors made on a structure, the more difficult that structure is interpreted to be. However, learner's errors are not the only measure of difficulty and at times may not even be the most reliable measure (Schachter, 1974). Therefore, the Similarity Differential Rate Hypothesis (Major and Kim, 1996) addressed this problem by considering rate of acquisition, rather than difficulty, as a more insightful measure of learning. To deal with the first problem, above and the second problem with the MDH (i.e. that NL-TL differences are crucial to the predictions), Eckman (2008) formulated an alternative hypothesis: the Structural Conformity Hypothesis (SCH), which is now discussed.

2.3.2.2 Structural Conformity Hypothesis (SCH)

Eckman (2008, 107) points out that 'the Structural Conformity Hypothesis addresses the shortcomings of the Markedness Differential hypothesis.

First, by making predictions about the nature of interlanguage grammars rather than about learning difficulty, and second, by expanding the domain of the hypothesis beyond only areas of difference between the NL and TL. The SCH simply asserts that ILs will obey the same universal generalizations as primary languages'. The SCH is stated by (Eckman, 1991, 24), as follows.

(14) The Structural Conformity Hypothesis (SCH)

The universal generalizations that hold for primary languages hold also for interlanguages.

The strongest kind of evidence that has been adduced in support of the SCH is an interlanguage pattern that is neither NL-like nor TL-like, but nevertheless obeys the kinds of universal patterns found in some of the world's languages. Eckman (1991), Carlisle (1997, 1998) and Eckman and Iverson (1994) are examples of this evidence. Each of these studies considered the case of consonant clusters in onsets or codas, where the TL allowed both a greater number of clusters, as well as more marked clusters, than did the NL. According to Eckman (2008), these studies supporting the SCH had one point in common: in each instance the IL grammars contained cluster types that were more complex than those allowed by the NL, but not as complex as those required by the TL. In this respect, the IL grammars fell between the NL and TL, but always did so in a way that was in conformity with the applicable universal generalisations.

2.3.3 Criticism of Markedness Theory

The SCH has provided an explanation for a number of different facts about L2 phonology, however, some SLA researchers have taken the position that markedness, in general, and the SCH, in particular, are not viable explanatory principles. There are two main arguments for this position. The first is that markedness itself is simply a fact to be explained, and as such does not offer an explanation. This position is taken by Archibald (1998, 150) and is stated in (15).

- (15) My general assessment of this sort of typological universals approach to second language acquisition is that it provides an interesting *description* of the phenomena to be explained. I'm less sure of their status as an explanation of the observed facts. All in all, I prefer to assume some sort of structural explanation.

The second position was taken by Gass and Selinker (2001, 154) who assert that invoking typological universals as explanatory principles raises

more questions than it answers. This position is represented in (16).

- (16) For implicational universals to have any importance in the study of second language acquisition, two factors must be taken into consideration. First, one must understand why a universal is universal. It is not sufficient to state that second languages obey natural language constraints because that is the way languages are. This only pushes the problem of explanation back one step.

Despite the criticism of the Markedness Differential Hypothesis (MDH) and the Structural Conformity Hypothesis (SCH), these two hypotheses have had considerable influence in the literature on L2 speech production (Zampini, 2008). In addition, typological markedness has played a significant role in the explanation of facts about L2 phonology and the markedness theory will be used to explain the difficulties faced by the Arabic speakers regarding stress production.

The next section explains a different and very common theory of L2 acquisition (i.e. Universal Grammar) which shows how L2 acquisition occurs on the basis of L1 acquisition (Chomsky, 1981).

2.4 Universal Grammar (UG)

Universal Grammar (UG) is the most influential theory of language acquisition. In this linguistic theory (UG), Chomsky (1981) tried to explain not only what constitutes knowledge of language, but also how this knowledge of language is acquired. UG challenged the behavioural model (Skinner, 1959) which proposed that human infants are born with blank sheets in their minds, and that through the process of stimulation, response and reinforcement, children gradually get in mind the vocabulary and grammar of their mother tongue.

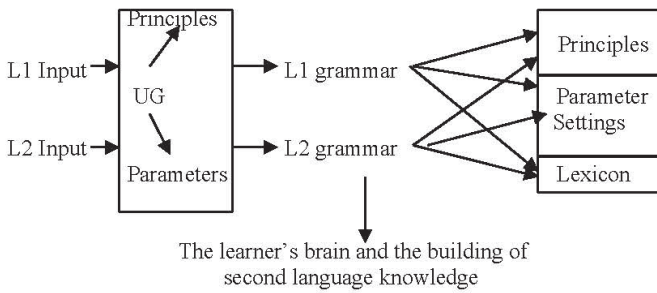
2.4.1 Principles and Parameters

Universal Grammar consists of a set of principles, which are common to all languages (i.e. basic properties which all languages share), and a set of parameters, which have language-specific values (i.e. properties which can vary between languages). Grammars of individual languages are therefore the result of the variation of the settings of the different parameters plus language-specific rules. Cook (1991, 34) states that 'Universal Grammar (UG) sees the knowledge of a grammar in the mind as made up of two components: 'principles' that all languages have in common and

‘parameters’ on which they vary. All human minds are believed to honour the common principles that are forced on them by the nature of human minds that all their speakers share. They differ over the settings of their parameters for particular languages’.

Cook and Newson (1996, 81) suggest the following diagrams as an attempt to determine the components of a UG model of L2 learning.

Figure 1: The Components of a UG Model of L2 Learning (Cook and Newson, 1996, 81)



For example, a ‘principle’ says that all sentences in all languages have subjects. Even those sentences without obvious subjects have their implicit subjects either semantically or syntactically. For the ‘subject’ matter, there is a ‘parameter’ called ‘pro-drop’, which determines whether in a specific language, the subject of a sentence should be obviously present or not.

2.4.2 Language Acquisition Device (LAD)

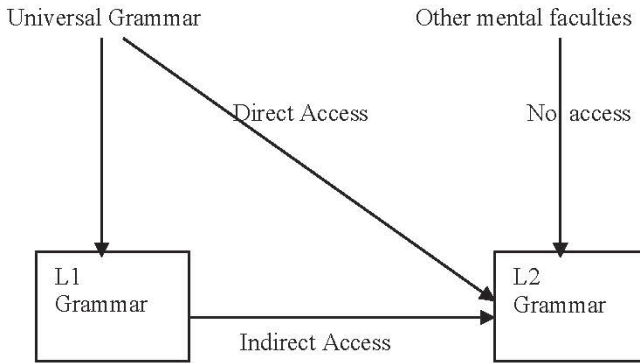
In UG, Chomsky proposes that all people have an innate, biological ability to acquire a language and that they possess a Language Acquisition Device (LAD), a sort of neurological wiring that, regardless of the language to be acquired, allows a child to listen to a language, decipher the rules of that language, and begin creating with the language at a very young age. With the LAD they are able to make or understand utterances that they have not previously heard. Their first language is acquired with no direct instruction, no practice, no drills and with no apparent difficulty. This proposes that the human mind must have some built-in mechanism that helps the learner in the process of acquisition. This built-in mechanism is referred to as Universal Grammar and is sometimes substituted by ‘mental grammar’ (Ellis, 1985; Fortos, 2001).

Originally, UG theory did not concern itself with L2 learning (L1 acquisition only). However, Chomsky suggests that, if provided with the correct input, the LAD predisposes all people to the acquisition of a second language in basically the same L1 manner. Cook (1991, 117) states that 'learning in the UG model is a straightforward matter of getting the right input. In this theory language input is the evidence out of which the learner constructs knowledge of language'. The UG principles were adopted by second language researches and were applied in the field of L2 acquisition. From a UG perspective, learning the grammar of a second language is simply a matter of setting the correct L2 parameters. This suggests that the L2 Arab learners of English can successfully acquire the L2 English stress production if they set the correct L2 English stress parameters. Universal Grammar also provides a succinct explanation for much of the phenomenon of language transfer (Hilles, 1986). For example, Spanish and Arabic learners of English who make the mistake 'Is raining' instead of 'It is raining' have not yet set their pro-drop parameters correctly and are still using the same setting as in Spanish and Arabic respectively.

2.4.3 Second Language Access to UG

Evidence was provided that adults have some sort of access to knowledge of UG and this knowledge is used in the development of foreign language competence (Bley-Vroman, Felix and Joup, 1988). The argument in favour of UG in first language is almost equally valid for L2 learners who can attain high levels of linguistic knowledge which cannot be attributed to input or instruction alone. Felix (1988, 286-287), for instance, shows that L2 learners do have access to UG principles 'which are neither learnable on positive evidence nor transferable from corresponding structures of the learner's mother tongue'. Similarly, Bulut (1996) and Cem (1996) report that advanced Turkish learners of English are able to acquire the L2 reflexive system which cannot be attributed to grammar instruction nor to input alone. Linguists have been debating for a long time over this issue: whether UG applies to L2 acquisition as it is the case in L1 acquisition. As Ellis (1994) points out, it is difficult to reach a 'verdict' among these different studies. However there are four different, opposite sometimes, positions on the accessibility of UG in L2 acquisition. These four positions are the direct access model, the indirect access model, the no-access model and the dual model. Cook (1985, 12), proposes three possibilities using the following diagram.

Figure 2: Access to Universal Grammar in L2 Acquisition (Cook, 1985, 12)



Each one of the four positions is now discussed in detail.

2.4.3.1 The Direct Access Model

In the direct access model, some researchers (e.g. Ritchie, 1978; Otsu and Naoi, 1986) believe that UG is available directly to L2 learners in the sense that they have access to it separately from the L1. According to Cook (1993), in this model, L2 learners learn exactly the same way as L1 learners; they set values for parameters according to the L2 evidence they encounter without any other influence. The studies that support this model, tested the availability of some principles in learning some L2 properties by L2 learners which do not exist in their L1. For example, Otsu and Naoi (1986) studied Japanese L1 learners of L2 English by testing the operation of the Subject-Dependency Principle in the L2 English. The subjects were 11 female teenagers (ages 14 – 15) who had studied English for two years. The results strongly supported Otsu and Naoi's claim of L2 learners' direct access to UG. They found that most of the subjects were guided by UG and produced the tested L2 English items correctly. However, some of those who deny that UG is available for L2 restrict their claim to adult L2 learners and consider that the subjects of this study were too young. Another study by Ritchie (1978) supported this direct access model. Ritchie has tested the Right Roof Constraint (RRC) and used a grammaticality judgement test. He found that the RRC was operating and suggested that UG was accessible to his subjects. However, similar to Otsu and Naoi, (1986), his study was rejected by some researchers, because most of his subjects were not adult. Although these two studies received some criticism, they seem to support the suggestion that the

Underdetermination Principle (i.e. L1 acquirers produce sentences that they have never heard before) which is used as an evidence of the role of UG in L1 acquisition, is also available in L2 acquisition. In addition, the subjects in these studies showed the ability of L2 learners to produce sentences that they (a) do not have in their L1 and (b) did not learn in the L2.

2.4.3.2 The Indirect Access Model

In the indirect access model, researchers (e.g. White, 1986; Flynn, 1987) propose that UG operates in L2 acquisition, but via the L1. In other words, L2 learners start with the L1 principles and parameters, then they try to reset the L1 parameters when their parametric values differ from the L2 (Cook, 1993). This happens on the base of L2 input and with activity of UG. White (1986) investigated the ‘pro-drop’ parameter in adult L2 acquisition by comparing French learners with Spanish learners of English (French and English are non-pro-drop languages, while Spanish is a pro-drop language). She found that L2 Spanish learners of English, at first stages, produced sentences with null subject much more than L2 French learners of English. She concluded that L2 Spanish learners had been influenced by their L1 parameters especially at first stages.

2.4.3.3 The No-Access Model

In the no-access model, UG is not available to L2 learners. In other words, UG is accessible to L1 parameters only and the parameter settings in the L1 cannot be reset for L2 acquisition (i.e. UG has nothing to do with L2 learning at all (Cook, 1993)). Researchers (e.g. Clahsen and Muysken, 1986; Schachter, 1988, 1989), who support this model, claim that there are major differences between L1 and L2 acquisition. Clahsen and Muysken (1986) investigated the availability of Universal Grammar to adult and child learners by comparing the acquisition of the word order in German by German children with L2 learners from different L1 backgrounds. Their study has shown that children start with subject-object-verb (SOV) order and gradually acquire subject-verb-object (SVO) order, whereas L2 learners start with SVO and learn SOV. They argue that, in the case of children, this is because of ‘learning capacities specified to languages’, but in the case of adults, (Clahsen and Muysken, 1986, 111) refer to ‘acquisition strategies which may be derived from principles of information processing and general problem solving strategies’. Schachter (1988, 1989) tested the accessibility of the Subjacency principle through grammaticality judgement test. The results supported the claim that UG is

unavailable to L2 learners, since they did not use the principle for structures that they knew. Bley-Vroman (1989) has argued also that if there is inefficiency in L2 learning, it is because L2 learners do not have UG available to them and they acquire L2 through other mental processes.

2.4.3.4 The Duel Model

The duel model (Ellis, 1994) is also named ‘the competition model’ by Felix (1985). This model suggests that L2 learners have partial access to UG. According to these two researchers, the language specific system, which is equivalent to UG, and the problem solving system enter into competition for acquisition in light of L2 input. While children have complete access to UG only which enables them to achieve full competence, adults’ access to UG is blocked by using the problem solving system. This accounts for the fact that adults do not succeed in having native-like competence.

The models and studies above show that the question of availability of UG in L2 acquisition is not clear. There are different (sometimes opposite) opinions in these studies. This suggests that it is not an easy task to measure the L2 learner’s competence or to be sure of access to UG in L2 acquisition. However, most of the researchers in this area stand between the indirect access position and the no-access position.

2.4.4 Criticism of Universal Grammar

There are some advocates and critics of Universal Grammar as a theory of L2 acquisition, although researchers have used UG to generate a number of interesting hypotheses about second language acquisition. Generative theorists regard UG as the best theory of grammar because of its descriptive and explanatory adequacy (Ellis, 1994). It is also suggested by (Ellis, 1985) that UG has helped to overcome one of the major problems of contrastive analysis by restricting the effects of L1 transfer to ‘non-core’ features or parameters. This means that UG can be used to help predict which differences between L1 and L2 result in L2 learning difficulties. Brown (2007, 214) advocates UG by stating that ‘the hope is that by discovering innate linguistic principles that govern what is possible in human languages, we may be better able to understand and describe contrasts between native and target languages and the difficulties encountered by adult second language learners. Research on UG has begun to identify such universal properties and principles, and therefore represents an avenue of some promise’. Fortos (2001, 269) also mentions

that Chomsky in the 1980s developed a ‘radically different way of looking at grammar which has become popular in recent years; a grammar tries to see what human languages have in common because of the nature of the human mind’. However, other researchers such as McLaughlin (1987) criticises UG theory because its empirical evidence has been restricted to the acquisition of a small set of syntactic phenomena, whereas a general theory of L2 needs to cover a wider range of phenomena. Even the fervent advocates of UG such as Pinker and Jackendoff turn out to be hard line reductionists when it comes to the role of UG in SLA. In addition, still for many UG theorists innate mechanisms for language acquisition atrophies especially after puberty which is generally assumed to be the critical period for natural language acquisition (Gregg, 1984; Bley-Vroman, 1988; Clashen and Muysken, 1989). Finally, the main shortcoming of UG in describing L2 acquisition is that it does not deal with the psychological processes involved in learning a language. UG is only concerned with whether parameters are set or not, not with *how* they are set.

In recent years, some phonologists have favoured an Optimality Theoretic (OT) (Prince and Smolensky, 1993) approach instead of the parametric model proposed by Chomsky (UG). In OT, UG is viewed as a set of principles and a set of constraints, instead of parameters. The way language-specific grammars differ depends on the way that the constraints are ranked and interact. In addition, unlike parameters, constraints are violable.

2.5 Monitor Theory

2.5.1 Comprehensible Input and Chomsky’s LAD

The Monitor Theory, often known as the Input Hypothesis, was developed by the linguist Stephen Krashen in the late 1970s. By the 1980s, this theory had become the most influential and well-known theory of L2 acquisition. It is an overall theory of L2 acquisition that had important implications for language teaching. Krashen suggested that language acquisition is driven solely by ‘comprehensible input’ (CI), language input that learners can understand. Understanding spoken and written language input is seen as the only mechanism that results in the increase of underlying linguistic competence, and language output is not seen as having any effect on learners’ ability. Furthermore, Krashen claimed that linguistic competence is only advanced when language is subconsciously *acquired*, and that conscious *learning* cannot be used as a source of spontaneous language production. Finally, learning is seen to be heavily

dependant on the learner's mood, with learning being impaired if the learner is under stress or does not want to learn the language (Krashen, 1985). Krashen's Monitor Theory was based on Chomsky's concept of a LAD (Language Acquisition Device) which is the main part of the Theory of Universal Grammar, as follows: only 'comprehensible input' to L2 learners can activate the LAD and then L2 acquisition begins (Krashen, 1977). Krashen posits that without comprehensible input, the second language learner is left with a group of words that are perceived as incomprehensible noise and cannot be processed in the LAD.

2.5.2 Monitor Theory Hypotheses

The Monitor Theory has five hypotheses: the Input Hypothesis, the Acquisition-Learning Hypothesis, the Monitor Hypothesis, the Natural Order Hypothesis and the Affective Filter Hypothesis. Each hypothesis and its criticism are now explained in detail.

2.5.2.1 The Input Hypothesis

The Input Hypothesis could be considered the most influential hypothesis in L2 acquisition, as it provides theoretical and practical foundations for the way L2 learners internalise the knowledge. It is exclusively attributed to acquisition, not learning. Krashen follows the innate approach by applying Chomsky's Government and Binding theory and concept of Universal Grammar (UG) to L2 acquisition. He does so by proposing a Language Acquisition Device that uses L2 input to define the L2 parameters within the constraints of UG and to increase the L2 learner's proficiency. This hypothesis states that learners progress in their knowledge of the language when they comprehend language input that is slightly more advanced than their current level. Krashen called this level of input 'i+1', where 'i' is the language input and '+1' is the next stage of language acquisition (Krashen, 1977). Krashen (1986, 100) states that 'the acquirer understands (via hearing or reading) input language that contains structure 'a bit beyond' his or her current level of competence'. Learners can compensate for this gap by using context, knowledge of the world and extra linguistic information (Krashen, 1987). He further adds that there must be enough of i+1 for acquisition to take place, and this will happen when communication takes place. When input is understood, then i+1 will be provided automatically. Krashen hypothesises that we acquire language by first understanding the message and then acquiring its structures, which is opposite to the old view of language learning (Hatch, 1978). As

summarised by Cook (1993), Krashen's (1985) evidence for the Input Hypothesis is as follows:

- i) people speak to children acquiring their first language in special ways
- ii) people speak to L2 learners in special ways
- iii) L2 learners often go through an initial Silent Period
- iv) the comparative success of younger and older learners reflects provision of comprehensible input
- v) the more comprehensible input the greater the L2 proficiency
- vi) lack of comprehensible input delays language acquisition
- vii) teaching methods work according to the extent that they use comprehensible input
- viii) immersion teaching is successful because it provides comprehensible input
- ix) bilingual programs succeed to the extent they provide comprehensible input.

The Input Hypothesis was criticised from two angles. First, the novelty of $i+1$ formula is under question and defining i and 1 is a problematic issue (Brown, 2007). Second, the idea that acquisition takes place with enough $i+1$ is challenged by the argument that 'input is necessary but not sufficient for acquisition to take place' (Ellis, 2003, 47).

2.5.2.2 The Learning-Acquisition Hypothesis

Krashen (1985) claims that the Learning-Acquisition Hypothesis is the most basic of his five hypotheses, and believes that we have two independent ways of developing competence in a second language: acquisition and learning. Acquisition is by using language for real communication and learning by knowing about language (Krashen and Terrell, 1983). Acquisition is a subconscious process through which the learner will obtain L2 competence naturally, similar to the process of a child who internalises his L1 implicitly. Krashen further points out that this kind of competence is accumulated subconsciously with no awareness. Therefore, it would be only a mere language 'pick up' (Brown, 2007). In addition, acquisition requires meaningful interaction in the target language, during which the acquirer is focused on meaning rather than on form (Krashen, 1977). Language learning, on the other hand, is studying consciously and intentionally, the features of a language, as is common in traditional classrooms. That is learning is a conscious knowledge compilation process. An explicit teaching procedure is applied here, and

the learner should be able to extend the L2 rules to a similar context. Krashen (1987) calls such knowledge ‘know-about’ knowledge. This shows that in the acquisition process, L2 speakers do not focus on the correctness of their speech, but in the act of communication itself, whereas in the learning process, they focus on the details about the L2 language (like the rules of grammar or correct verb conjugation). According to Cook (1993), the differences between L2 acquisition and learning in Krashen’s Monitor Theory are as follows:

(17)

Acquisition	Learning
implicit, subconscious	explicit, conscious
informal situations	formal situations
uses grammatical ‘feel’	uses grammatical rules
depends on attitude	depends on aptitude
stable order of acquisition	simple to complex order of learning

For Krashen, learning is less effective than acquisition. He also believes that fluency in L2 is solely the result of acquisition, not learning, and that L2 learners must be involved in acquiring knowledge as much as possible (Brown, 2007). All in all, Krashen believes that the process of acquisition and learning is not bidirectional in the sense that learning may never lead to acquisition and vice versa.

The sharp distinction between learning and acquisition based on the definition of consciousness was, however, met with strong criticisms. McLaughlin (1990), for instance, refutes such distinction based on the fact that psychologists still have difficulty giving an exhaustive definition for the notion of consciousness. Hence, he finds that it would be implausible to extend this fuzzy distinction to the process of language acquisition and to make strong claims based on it (Brown, 2007). Gregg (1984) also rejects the most fundamental of Krashen’s hypotheses, the acquisition-learning dichotomy. Gregg concludes that under normal conditions the Monitor cannot be used and since it is the only way in which learning can be utilised, there is no need to talk about two different ways of gaining competence in a second language. Finally, some research (e.g. Norris and Ortega, 2000) shows that contrary to this hypothesis, form focused instruction can help learners improve their communicative competence according to their styles and strategies, since learned knowledge may lead to improvements in the process of acquisition.

2.5.2.3 The Monitor Hypothesis

The Monitor Hypothesis is used by Krashen to explain the relationship between acquisition and learning and it pertains to the operational application of learned knowledge. It shows how learned knowledge may be useful to achieve fluency. This hypothesis asserts that a learner's system acts as a monitor or editor to what they are producing. In other words, while only the acquired system is able to produce spontaneous speech, the learned system is used to check what is spoken. Krashen and Terrell (1983) suggests that conscious learning can only be used as a Monitor or an editor. Before the learner produces an utterance, he or she internally scans it for errors, and uses the learned system to make corrections. Self-correction occurs when the learner uses the Monitor to correct a sentence after it is uttered. The Monitor Hypothesis then predicts faster initial progress by adults than children, as adults use this monitor when producing L2 utterances before having acquired the ability for natural performances, and adult learners will input more into conversations earlier than children.

According to Krashen, for the Monitor to be successfully used, three conditions must be met: the learner must (a) know the rule, (b) be focused on correctness (form) and (c) have time to use the monitor. In addition, the simplicity of learned knowledge is of paramount importance. As long as the learned rules are easy to apply and not too complex, monitoring seems to be more efficient. Krashen also divides monitor users into three types: over-users, optimal users and under-users. Over-users are all the time obsessed with the grammaticality of their speech, and therefore over-use the monitor at the expense of their fluency. Optimal users use monitoring whenever it does not interfere in the process of communication. Finally, under-users are those who do not use their conscious knowledge, because they do not have a good command of it or prefer not to use it.

Krashen's Monitor Hypothesis has been criticised as well, since there are many difficulties with the use of the monitor, making it rather weak as a language tool. First, the condition of 'knowing the rule' is difficult to meet, because even the best students do not learn every rule that is taught and not every rule of a language is always included in a text or taught by the teacher. Second, there is a price that is paid for 'having time to use the monitor': the speaker is then focused on form rather than meaning, resulting in the production and exchange of less information, thus slowing the flow of conversation, especially by the over-users of the monitor. Third, the rules of language make up only a small portion of our language

competence: acquisition does not provide 100% language competence. Due to these difficulties, Krashen recommends using the monitor at times when it does not interfere with communication, such as while writing. Another major criticism is that Krashen relegates language monitoring to a peripheral position in language acquisition. It is seen as simply being a post-learning process, a tool for use of language in certain conditions. However, researchers such as Rubin (1975) have pointed to monitoring as a basic learning strategy. Ellis (2003) considers monitoring as one of five major aspects of successful language learning.

2.5.2.4 The Natural Order Hypothesis

Krashen (1977, 1981) believes that L2 acquisition follows a natural order in the sense that every L2 learner will acquire the rules of that language in a predictable order. This means that we can predict the sequence (e.g. morphemes) of acquisition. For example, students learning English, regardless of their cultural and linguistic background, will acquire the plural 's' (boys) before the third person singular 's' (eats). Despite the time a teacher spends practising the grammatical aspect of third person singular 's' with the students, the students will not use this grammatical aspect in L2 conversations until they have naturally acquired it. That is the natural order of acquisition is not affected by instructional sequences and is not dependent on the ease with which a particular language feature can be taught. This hypothesis was based on the morpheme studies by Dulay and Burt, which found that certain morphemes were predictably learned before others during the course of L2 acquisition. Based on different studies conducted on L1 acquisition (e.g. Brown, 1973; de Villiers and de Villiers, 1973), Krashen concludes that there must be a natural order in acquiring an L2, and studies on L2 acquisition support the predictability of such an order. Despite some differences between L1 and L2 acquisition, L2 learners have shown striking similarities in this regard and were almost consistent in the order of acquisition (Dulay and Burt, 1974; Kessler and Idar, 1977, as cited in Krashen, 1977).

The Natural Order Hypothesis also received some criticism. For example, Gregg (1984) argues that generalising the results of a study on the acquisition of a limited set of English morphemes to L2 acquisition as a whole is fallible. Morpheme studies offer no indications that L2 learners similarly acquire other linguistic features (phonology, syntax, semantics and pragmatics) in any predictable sequence, let alone in any sequence at all (Gregg, 1984). In addition, this hypothesis fails to account for the considerable influence of L1 on L2 acquisition. In fact the results of other

studies (e.g. Zafar, 2009) indicate that L2 learners acquire an L2 in different orders, depending on their native languages. Therefore, despite what this hypothesis claims, L2 learners do not necessarily acquire grammatical structures in a predictable order.

2.5.2.5 The Affective Filter Hypothesis

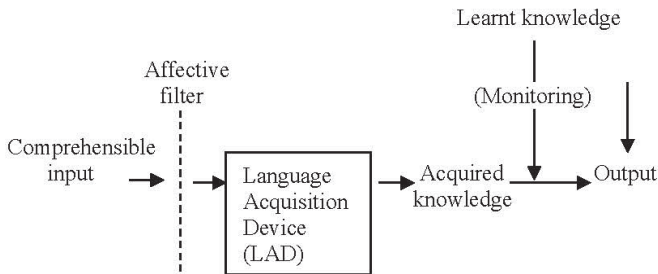
Krashen (1987) hypothesises that the ‘affective filter’ is one of the most important barriers towards L2 acquisition. The affective filter is an impediment to learning or acquisition caused by negative emotional (affective) responses to one’s environment. This filter impedes the process of absorbing L2 input and transforming it into intake. When learners come into direct contact with L2, this is referred to as ‘input’ and when they process that L2 in a way that can contribute to learning, this is referred to as ‘intake’. Krashen (1985, 100) states that ‘a mental block, caused by affective factors ... that prevents input from reaching the language acquisition device’. Krashen claims that all people possess a ‘filter’ which moves into one of two positions: low or high. A low position allows language to enter the person’s LAD and be acquired, whereas a high position prohibits language from entering the LAD thereby restricting acquisition. A low affective filter exists where the L2 learner feels comfortable and non-threatened in the learning environment and a high affective filter exists when the L2 learner is too pressured by outside factors to relax and allow the acquisition process to occur. Therefore, to ensure L2 acquisition, it is important that the L2 teacher maintains a relaxed and enjoyable learning environment. Krashen also claims that there are three factors that affect the filter: self confidence, anxiety and motivation. First, a good amount of self confidence will lower the affective filter in order to let the input in. Second, the more anxious the L2 learner is, the higher the amount of resistance against absorption of input (the higher the filter) and hence obstructing the process of L2 acquisition. Third, the more motivated the L2 learner is, the better the L2 acquisition will be. According to Krashen (1982), there are two prime issues that prevent the lowering of the affective filter. The first is not allowing for a silent period (expecting the student to speak before they have received an adequate amount of comprehensible input according to their individual needs). The second is correcting their errors too early-on in the process.

Like Krashen’s other four hypotheses, the Affective Filter Hypothesis was also criticised. This criticism questioned the claim of this hypothesis that affective factors alone account for individual variation in L2 acquisition. Krashen claims that children lack the affective filter that causes most adult

L2 learners to never completely master their L2 (Zafar, 2009). Such claim fails to withstand scrutiny because children also experience differences in non-linguistic variables such as motivation, self-confidence and anxiety that supposedly account for child-adult differences in L2 learning. In addition, there are many cases in which adults acquired a native-like proficiency (Brown, 2007).

The whole Monitor Theory (the Input Hypothesis Model) and its five hypotheses are presented in the following diagram.

Figure 3: The Input Hypothesis Model of L2 Learning and Production (adopted from Krashen, 1982, pp. 16 and 32; and Greg, 1984)



2.5.3 Criticism of Monitor Theory

Krashen's Monitor Theory, like other L2 acquisition theories, had some proponents and opponents. Some advocates consider it as a macro theory attempting to cover most of the factors involved in L2 acquisition such as age, personality traits, classroom instruction, innate mechanisms of language acquisition, environmental influences and input. For example, Lightbown (1984, 246) considers Monitor Theory as a combination of 'a linguistic theory (through its 'natural order' hypothesis), social psychological theory (through its 'affective filter' hypothesis), psychological learning theory (through its acquisition-learning hypothesis), discourse analysis and sociolinguistic theory (through both the comprehensive input hypothesis and the 'monitor' hypothesis)'.

Ellis (1990, 57) also praises 'the lucidity, simplicity and explanatory power of Krashen's theory'. On the other hand, McLaughlin (1987) acknowledges Krashen's attempt to develop an extensive and detailed theory of L2 acquisition but finds it inadequate in that some of its central assumptions and hypotheses are not clearly defined and thus are not

readily testable. McLaughlin (1987, 56) states that ‘Krashen’s theory fails at every juncture ... Krashen has not defined his terms with enough precision, the empirical basis of the theory is weak, and the theory is not clear in its predictions’. In addition, Gregg (1984, 94) points out that ‘each of Krashen’s hypotheses is marked by serious flaws: undefinable or ill defined terms, unmotivated constructs, lack of empirical content and thus of falsifiability, lack of explanatory power’. Finally, Monitor Theory was also criticised by the advocates of Universal Grammar (Nativist Theory) and by psychologists focusing on skills acquisition. Despite the various criticisms, Krashen’s Monitor Theory of L2 acquisition had a great impact on the way L2 learning was viewed and initiated research towards the discovery of orders of acquisition. Therefore, this theory will be used to explain the difficulties faced by the Arabic speakers of L2 English regarding English segmental and main word stress.

2.6 The Ontogeny Phylogeny Model (OPM)

2.6.1 L2 Learner’s Interlanguage

Major’s (2001) Ontogeny Phylogeny Model (OPM) is a framework that incorporates key concepts from SLA in order to explain and make predictions about L2 acquisition processes that make up an L2 learner’s interlanguage (IL). Major applied the biological terms ‘ontogeny’, the evolution of individual organisms and ‘phylogeny’, the evolution of species, to language, stating that ‘ontogenetically, the OPM deals with the development of an individual’s IL; phylogenetically the OPM deals with larger populations, including language contact and change’ (Major, 2001, 81). In OPM, Major (2001) tries to answer the question of why L2 learners may master the grammar and vocabulary of the new languages, but almost never achieve a native phonology. Major (2008, 74) states that ‘in this model [OPM] interlanguage is composed of elements of L1 [transfer], L2 [acquired], and universals [including UG]’. In OPM, target-like performance is described as influence from the L2 (i.e. successful L2 acquisition) and, conversely, non-target like performance can be a result of either L1 transfer or from language universals (U) including markedness.

2.6.2 Transfer and L2 Phonology Acquisition

Major’s (2001) OPM model is a revision of his earlier Ontogeny Model (OM) (Major, 1987). Both OPM and OM consider transfer as a major factor in L2 phonology acquisition. Zampini (2008, 3) points out that ‘the

OM posits that transfer is initially the major influence in L2 phonology, but that this effect decreases over time as developmental processes increase'. In the OPM, transfer is still viewed as a dominant effect in the initial stages of acquisition; however, the effects of transfer are greater on unmarked L2 features than those that are marked. As in the OM, transfer effects decrease across time as markedness constraints increase and then decrease as the L2 is acquired (Major, 2001; Zampini, 2008). Major (2001, 85-86) gives the following summary explanation for the interaction of L1, L2 and language universals (U) in an L2 learner's interlanguage (IL):

- (18) At the beginning stages the L1 influence is so strong that it prevents U[niversals] from exerting its influence. Later the learner realises (often unconsciously) that the L1 is not a sufficient substitute for the L2. As a result of this, as well as continued L2 exposure, L2 components start to develop. However, because much of the L2 may be beyond the learner's reach or is nebulous in the learner's mind, simultaneously U starts to exert its influence, which results in phenomena that are neither part of the L1 nor L2. Thus, at an early stage L1 obliterates the effect of U so nothing in U is evident that is not already in the L1; that is, U remains dormant. However, at a later stage U awakens and has a life of its own, so to speak. Then in later stages, the influence of U decreases as the L2 becomes more developed. The decreasing influence of U means that after a U principle has operated and has been 'correctly' instantiated in the IL (i.e. it is nativelike) U has 'done its work' so to speak and therefore does not appear as a nonnative part of the IL – but rather as part of the L2 component of the IL.'

2.6.3 Three Stages of L2 Acquisition

The OPM, then, states that (a) L2 learners go through three stages of L2 acquisition: initial state, development state and end state, (b) initially L2 learners start out with the phonological system of their L1 (i.e. initial stages of L2 learning are characterised by L1 transfer), (c) as learners gain more experience with the L2, target-like forms become more frequent and L1 transfer decreases, and (d) simultaneously, the influence of language universals increases and then in later stages decreases, so that in an idealised end-state, learners' interlanguage is equivalent to the phonological system of a native speaker. Major (2001, 117) does not claim that all L2 learners will reach the end-state and points out that 'a poor learner will ... often fossilize at an early stage of development'. Therefore, the OPM simply claims that as a language develops (e.g. phonology in a learner's IL), the influence of L1 decreases, L2 increases and U increases and then

decreases. Major's (2001) proposal for the components of the learner's interlanguage is as follows:

- (19) The L2 learner's Interlanguage (Major, 2001):
 $IL = \text{parts of } L1 + \text{parts of } L2 + \text{parts of } U = 100\%$

2.6.4 Four Corollaries

Major's (2001) OPM makes a general claim concerning the interrelationship between the L1, the L2 and language universals U with respect to four domains or corollaries: chronology, similarity, markedness and style.

(20) A – CHRONOLOGY

IL develops chronologically in the following manner: (a) L2 increases, (b) L1 decreases, and (c) U increases and then decreases.

B – SIMILARITY

In similar phenomena, IL develops chronologically in the following manner: (a) L2 increases slowly, (b) L1 decreases slowly, and (c) U increases slowly and then decreases slowly. Thus, the role of L1 is much greater than U for similar phenomena than for less similar ones.

C – STYLE

As style becomes more formal, (a) L2 increases, (b) L1 decreases, and (c) U increases and then decreases.

D – MARKEDNESS

In marked phenomena, IL develops chronologically in the following manner: (a) L2 increases slowly, (b) L1 decreases and then decreases slowly, and (c) U increases rapidly and then decreases slowly. Thus, the role of U is much greater than L1 for marked phenomena than for less marked ones.

2.6.4.1 Chronology

In the first case, the CHRONOLOGICAL corollary predicts that over time, the amount of influence of the L1 in a learner's pronunciation will decrease, the influence of the L2 will increase, and the influence of U in the IL will first increase and then decrease. In other words, at the starting point of L2 acquisition, learners rely 100% on phonological transfer from the L1 but, as L2 development occurs, the influence of the L1 decreases. At the same time, through exposure to the L2 sound system and

acquisition of L2 segments, influence from the L2 becomes stronger. Finally, U increases in the early stages of acquisition as learners realise the inadequacy of negative L1 transfer but cannot produce L2 segments in a target-like manner. U later decreases as learners begin to acquire target-like L2 pronunciation (Major, 2001; Zampini, 2008).

2.6.4.2 Similarity

The OPM corollaries concerning similarity and markedness also describe development over time as a function of varying amounts of L1, L2 and U. With regard to SIMILARITY, the OPM bases its claim on a large body of research that suggests that similar sounds in the L1 and L2 are more difficult to learn than dissimilar sounds (Major, 1987; Flege, 1992, 1995; Best, 1994; Kuhl, 2000). Major and Kim (1996) argue that new sounds are not more difficult to acquire, but rather are acquired at a slower rate. This premise serves as the basis for the OPM corollary on similarity which predicts that for similar sounds, L1 transfer will be initially high and decrease only slowly, while acquisition of the accurate L2 sound increases slowly. In the acquisition of dissimilar sounds, on the other hand, progress will be more rapid and language universals will have a much greater influence on IL (Major, 2001, 2008).

2.6.4.3 Markedness

The third corollary of the OPM concerns MARKEDNESS, a factor that also appears to impact L2 phonological acquisition (Eckman, 1977, 1981, 1991; Castino, 1992; Major and Faudree, 1996; Diaz-Campos, 2004). The concept of markedness relies on implicational hierarchies (strict version) or statistical frequencies (less-strict version) as a means to predict the relative difficulty of a segment. In the strict definition, sounds that are more marked are those whose existence in a language also necessarily implies the presence of other, less-marked sounds. In the less-strict definition, more marked sounds are those that occur infrequently in the world's languages. In Major's OPM, the more marked a sound, the slower the rate of learning. Markedness and similarity can interact, in which case, the OPM predicts that more similar and more marked sounds be acquired more slowly than less similar and less marked sounds (Major and Kim 1999; Major 2001; Zampini, 2008).

2.6.4.4 Style

STYLE VARIATION constitutes the final corollary of the OPM, which predicts that as style becomes more formal, L1 influence decreases, L2 increases, and U increases and then decreases (Major, 2001). This domain of Major's model stems from research in sociolinguistics and SLA which suggests that in a more formal style of speaking (e.g. pronouncing a word list), L2 learners are more conscious of form and monitor more closely their pronunciation, resulting in more accurate production and less L1 transfer. In more informal styles (e.g. spontaneous conversation), learners tend to pay more attention to meaning and less attention to form and, consequently, target-like accuracy in the L2 tends to decrease, with a corresponding increase in L1 transfer (Beebe, 1980; Schmidt, 1992; Diaz-Campos, 2006). Wode's (1981) findings with his daughter's use of English and German lend further support to Major's model. He found that his daughter would produce more transfers from her L1 German to her L2 English in informal/spontaneous speech than in more formal contexts. Labov (1994) also found this to be the case in his research as he observed that as speakers moved from more informal speech to more formal speech their accuracy increased.

By bringing the concepts of similarity, markedness and style variation together into one model, the OPM offers a comprehensive framework for analysing L2 phonological acquisition over time in interlanguage.

2.6.5 OPM's L2 Production Scenarios

The OPM states that L2 learners can be faced with two main scenarios depending on whether new or similar linguistic phenomena are involved, and it is predicted that L2 development will be different in each of them. It is also argued that new phenomena can be either normal or marked (i.e. relatively rare) (Major, 2002). Major (2001, 156) points out that 'the relative proportions of U and L1 depend on whether phenomena are normal, similar, or marked'. Both similar and new phenomena that are marked are predicted to be acquired with difficulty. Thus, during the stage at which L2 normal new phenomena will be acquired, the L1 will still be present in similar phenomena, and U will still be present in new marked phenomena, as shown in Table 2, which includes OPM's L2 production scenarios.

Table 1: OPM's L2 Production Scenarios

L2 Learning Stage	Learning Factor	Normal Phenomena	Similar Phenomena	Marked Phenomena
<i>Early Stages (Initial State)</i>	L1	dominance and decrease	dominance and slow decrease	dominance and decrease
	U	minimal influence and increase	minimal influence and slow increase	minimal influence and rapid increase
<i>Later Stages (Development State)</i>	L1	increase	slow decrease	slow decrease
	U	increase	slow increase	rapid increase
<i>Final Stages (End State)</i>	L2	L2 acquired	L2 acquired slowly	L2 acquired slowly

Major argues that Hancin-Bhatt and Bhatt (1997, 386) provide empirical evidence and theoretical support for the OPM because their Optimality-Theoretic account of the data shows that L2 learners start with mostly transfer-related errors. Later on, they show developmental errors and when they become more advanced they have neither of the previous two types of errors and have a more native-like performance. The OPM is 'purposely not presented in terms of any formal linguistic framework thus supposedly enabling it to survive any possible outdateding or refutation of current theories' (Major 2002, 88). Major (2002) states that his model makes very general claims which do not necessitate any details concerning specific phenomena such as fine-grained phonetics. He argues that this is a virtue rather than a weakness because the OPM provides a macroscopic framework for testing individual phenomena.

2.6.6 Criticism of OPM

While Major's (2001) OPM is a straightforward testable theory that attempts to combine the various linguistic factors that have been suggested as giving rise to foreign accents, concerns have been raised with respect to its ontological status and the fact that Major fails to provide clear-cut definitions of L1, L2 and U (Picard, 2002). It is, for instance, not clear at what level the various factors operate and what it means for a phone to be acquired.

2.7 Summary of L2 Acquisition Theories

This section presents a summary of the above six theories of L2 acquisition and their way of analysing L2 learners' interlanguage. These theories are Contrastive Analysis Hypothesis (CAH), Error Analysis (EA), Markedness Theory, Universal Grammar (UG), Monitor Theory and the Ontogeny Phylogeny Model (OPM). This summary is presented in Table 2.

Table 2: Summary of Six Theories of L2 Acquisition

L2 Theory	Author	Analysis of L2 (Phonology) Acquisition	Criticism
Contrastive Analysis Hypothesis (CAH):	Lado (1957) Fries (1945)	CAH explains L2 learners' acquisitional difficulties on the basis of the differences and similarities between L1 and L2. Different L1 and L2 features are difficult to acquire, whereas similar features are easy to acquire. L2 learners' errors are due to L1 negative transfer.	<ul style="list-style-type: none"> - CA predicts limited errors and interlingual errors only. - Some similar L1 and L2 features were difficult to acquire, whereas some different features were easy to acquire.
L1 Transfer: - Positive Transfer - Negative Transfer Interlingual Errors		<p>The Strong CAH: A systematic CA could predict L2 learners' difficulties (i.e. interlingual errors) and remedial teaching materials could be devised.</p> <p>The Weak CAH: A comparison between L1 and L2 might help explain the difficulties evident from the L2 learners' errors.</p>	<ul style="list-style-type: none"> - L1 interference is not the only cause of L2 learners' errors.
Error Analysis (EA): Interlingual and Intralingual Errors	Corder (1967)	EA explains L2 learners' errors by comparing the learner's interlanguage with the L2 norm. It explains both interlingual (L1 negative transfer) and intralingual errors. Intralingual errors are not related to L1 negative transfer and are due to other factors such as faulty teaching techniques or materials, overgeneralization of L2 rules and age of L2 acquisition.	<ul style="list-style-type: none"> - EA misses the L2 learner's correct form by counting incorrect forms only. - EA also misses 'avoidance': L2 learners may find ways to avoid producing L2 difficult structures.

<p>Markedness Theory:</p> <p>A. Markedness Differential Hypothesis (MDH)</p> <p>B. Structural Conformity Hypothesis (SCH)</p>	<p>Eckman (1977)</p> <p>Eckman (1977)</p> <p>Eckman (1991)</p>	<p>Markedness Theory is the CAH plus typological markedness. It explains both the L2 learners' difficulties (CAH) and the degree (levels) of these difficulties (markedness).</p> <p>MDH states that L2 structures that are both different and more marked than corresponding L1 structures will cause learning difficulty. Unmarked structures are acquired before and easier to acquire than marked structures.</p> <p>SCH states that interlanguage and primary languages obey the same set of universal generalizations.</p>	<p>- Some L2 errors did not occur in an area of difference between L1 and L2.</p> <p>- The MDH did not explain why L2 learners altered the marked structures in the way they did.</p> <p>- Markedness is a fact to be explained (Archibald, 1998).</p> <p>- Using typological universals as explanatory principles raises more questions than it answers.</p>
<p>Universal Grammar (UG): (Principles and Parameters Theory) Language Acquisition Device L2 Access to UG: A. The Direct Access Model B. The Indirect Access Model C. The No-access Model D. The Dual Model</p>	<p>Chomsky (1981)</p>	<p>UG explains L2 acquisition on the basis of L1 acquisition. UG consists of a set of principles (i.e. universal rules) and a set of parameters (language-specific variables). UG suggests that human minds have a Language Acquisition Device (LAD) that helps the learner in the process of acquisition. In UG, L2 acquisition is a matter of setting the correct L2 parameters.</p> <p>There are four positions regarding L2 access to UG: direct access as L1 learners, indirect access via L1, no-access and partial (dual) access.</p>	<p>- Its empirical evidence has been restricted to the acquisition of a small set of syntactic phenomena (McLaughlin, 1987).</p> <p>- It does not deal with psychological processes involved in learning a language.</p>

<p>Monitor Theory:</p> <p>Five Hypotheses:</p> <p>A. Input Hypothesis</p> <p>B. Acquisition-Learning Hypothesis</p> <p>C. Monitor Hypothesis</p> <p>D. Natural Order Hypothesis</p> <p>E. Affective Filter Hypothesis</p>	<p>Krashen (1985)</p>	<p>This theory is based on Chomsky's (1981) concept of a LAD, as follows: only 'comprehensible input' to L2 learners can activate the LAD and then L2 acquisition begins. This theory has five hypotheses. The Input Hypothesis states that learners progress in their language knowledge, when they comprehend language input that is slightly more advanced than their current level. The Acquisition-Learning Hypothesis states that we have two independent ways of developing L2 competence: acquisition and learning. Acquisition is an implicit and subconscious process, whereas learning is an explicit and conscious process. The Monitor Hypothesis states that a learner's system acts as a monitor or editor to what they are producing. The Natural Order Hypothesis states that L2 acquisition follows a natural, predictable order. Finally, the Affective Filter Hypothesis states that L2 learner has an affective filter that impedes L2 acquisition depending on negative, emotional (affective) responses to learner's environment.</p>	<ul style="list-style-type: none"> - Its central assumptions and hypotheses are not clearly defined and thus are not readily testable (McLaughlin, 1987). - Each hypothesis is marked by serious flaws, and thus the theory lacks falsifiability and explanatory power (Gregg, 1994).
<p>The Ontogeny Phylogeny Model OPM:</p> <p>(IL=L1+L2+U)</p> <p>Four Corollaries:</p> <p>A. Chronology</p> <p>B. Similarity</p> <p>C. Markedness</p> <p>D. Style</p>	<p>Major (2001)</p>	<p>OPM has four corollaries: chronology, similarity, markedness and style, which are explained in the light of three L2 learning stages: initial state, development state and end state. Early stages of L2 speech learning are characterised by transfer, but as transfer decreases, the relative importance of universals increases and eventually decreases, as accurate L2 forms emerge. In addition, the relative importance of transfer is greater in similar phenomena than in dissimilar ones, whereas the relative importance of universals is greater in marked phenomena than in unmarked ones.</p>	<ul style="list-style-type: none"> - Concerns have been raised with respect to its ontological status (James, 2003). - It fails to provide clear-cut definitions of L1, L2 and U. For example, not clear at what level various factors operate and what it means for a phone to be acquired (Picard, 2002).

Of the six L2 theories of L2 acquisition discussed above, the following three theories will be used to analyse the subjects' stress errors in chapter 4: Results and Analysis: Contrastive Analysis (CA), Error Analysis (EA) and Markedness Theory. This is because these three theories are very relevant to the type of this research data.

2.8 Predictions

In the light of the three theories of L2 acquisition, predictions are made with respect to the current study. These predictions will be tested in the general discussion section in chapter 4: Results and Analysis, to find out whether or not they are confirmed and if the findings provide any evidence for any of the three L2 theories.

Prediction 1: Contrastive Analysis (CA):

L2 English sounds and main word stress patterns that are different from corresponding L1 Arabic ones will cause learning difficulties for the Arabic speakers of L2 English, whereas the similar sounds and stress patterns will not. These difficulties are due to L1 negative transfer.

Prediction 2: Error Analysis (EA):

The sounds and main word stress errors made by the Arabic speakers of L2 English are due to interlingual (i.e. due to L1 negative transfer) and intralingual factors (i.e. due to other factors such as overgeneralisation of L2 rules, hypercorrection, simplification, false concepts, fossilisation, amount of exposure/use and individual differences).

Prediction 3: Markedness Theory:

The Markedness Differential Hypothesis (MDH):

L2 English sounds and main word stress patterns that are both different and more marked than corresponding L1 ones will cause learning difficulties for the Arabic speakers of L2 English.

The Structural Conformity Hypothesis (SCH):

The interlanguage of the Arabic speakers of L2 English obeys the same set of universal generalisations.

2.9 Chapter Summary

This chapter explains six theories of second language acquisition which are related to this study. These theories are Contrastive Analysis (CA) (Fries, 1945), Error Analysis (EA) (Corder, 1967), Markedness Theory (Eckman, 1977), Universal Grammar (UG) (Chomsky, 1981), Monitor Theory (Krashen, 1985) and the Ontogeny Phylogeny Model (OPM) (Major (2001). CA explains L2 learners' acquisitional difficulties on the basis of the differences and similarities between L1 and L2. Different L1 and L2 features are difficult to acquire, whereas similar features are easy to acquire. L2 learners' errors are due to L1 negative transfer. EA explains L2 learners' errors by comparing the learner's interlanguage with the L2 norm. It explains both interlingual (L1 negative transfer) and intralingual errors. Intralingual errors are not related to L1 negative transfer and are due to other factors such as faulty teaching techniques or materials, overgeneralization of L2 rules and age of L2 acquisition. Markedness Theory is the CA plus typological markedness. It explains both the L2 learners' difficulties (CA) and the degree (levels) of these difficulties (markedness). Markedness Differential Hypothesis (MDH) states that L2 structures that are both different and more marked than corresponding L1 structures will cause learning difficulty. Unmarked structures are acquired before and easier to acquire than marked structures. Universal Grammar (UG) explains L2 acquisition on the basis of L1 acquisition. UG consists of a set of principles (i.e. universal rules) and a set of parameters (language-specific variables). UG suggests that human minds have a Language Acquisition Device (LAD) that helps the learner in the process of acquisition. In UG, L2 acquisition is a matter of setting the correct L2 parameters. There are four positions regarding L2 access to UG: direct access as L1 learners, indirect access via L1, no-access and partial (dual) access. The Monitor Theory is based on Chomsky's (1981) concept of a LAD, as follows: only 'comprehensible input' to L2 learners can activate the LAD and then L2 acquisition begins. This theory has five hypotheses. The Input Hypothesis states that learners progress in their language knowledge, when they comprehend language input that is slightly more advanced than their current level. The Acquisition-Learning Hypothesis states that we have two independent ways of developing L2 competence: acquisition and learning. Acquisition is an implicit and subconscious process, whereas learning is an explicit and conscious process. The Monitor Hypothesis states that a learner's system acts as a monitor or editor to what they are producing. The Natural Order Hypothesis states that L2 acquisition follows a natural, predictable order. Finally, the

Affective Filter Hypothesis states that L2 learner has an affective filter that impedes L2 acquisition depending on negative, emotional (affective) responses to learner's environment. Finally, the Ontogeny Phylogeny Model (OPM) has four corollaries: chronology, similarity, markedness and style, which are explained in the light of three L2 learning stages: initial state, development state and end state. Early stages of L2 speech learning are characterised by transfer, but as transfer decreases, the relative importance of universals increases and eventually decreases, as accurate L2 forms emerge. In addition, the relative importance of transfer is greater in similar phenomena than in dissimilar ones, whereas the relative importance of universals is greater in marked phenomena than in unmarked ones. The first three theories and the predictions based on them will be used in Chapter 4: Results and Analysis to analyse Arabic speakers' English segmental and main word stress errors and the reasons behind them.

The next chapter explains English and Arabic sound systems (consonants, consonant clusters and vowels), syllable structures and main word stress rules. It also compares them and explains their implications for L2 English sound production and stress acquisition.

CHAPTER THREE

ENGLISH AND ARABIC SOUNDS AND WORD STRESS

3.0 Introduction

Arabic is a Semitic language, whereas English is an Indo-European language. Therefore, Arabic grammar, sound system, syllable structure and word stress rules are very different from English ones and there is a large potential for errors of interference when Arab learners produce spoken or written English. Smith (1987, 142) states that ‘the differences from country to country are more marked than, say, differences between UK, US and Australian English. Because the Arabic writing system is also totally different from that of Indo-European languages, Arabic speakers have far greater difficulties in learning English than most Europeans’.

This chapter explains English and Arabic sound systems (consonants, consonant clusters and vowels), syllable structures and main word stress rules. It also compares them and explains their implications for L2 English sound production and stress acquisition.

3.1 Consonants

3.1.1 Arabic Consonants

Arabic has thirty-two consonant sounds. In tabular form these are:

Table 1: Arabic Consonants

Type of Articulation	Point of Articulation											
	Bi-labial	Labiodental	Dental	Interdental	Alveolar	Velarized	Alveopalatal	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive vl. vd.			t d			T D			k g	q		ʔ
Fricative vl. vd.	f			θ ð	s z	S ʒ	f		x ɣ		ħ ʕ	h
Affricate vl. vd.							tʃ dʒ					
Nasal vd.						N						
Lateral vd.						L						
Trill vd.						R						
Flap vd.						r						
Semi-vowel vd.	w									j		

Note: (1) The ‘emphatic’ consonants are depicted in capital letters.

(2) /tʃ/ occurs in Arabic as a sequence of /t/ + /ʃ/.

Examples:

/b/ as in /ba:b/ ‘door’	/ʃ/ as in /ʃams/ ‘sun’
/t/ as in /ti:n/ ‘figs’	/x/ as in /xa:l/ ‘uncle’
/d/ as in /du:d/ ‘worms’	/ɣ/ as in /ɣila:f/ ‘cover’
/T/ as in /Ti:n/ ‘mud’	/ħ/ as in /ħu:t/ ‘whale’
/D/ as in /ha:miD/ ‘acid’	/ʕ/ as in /ʕe:n/ ‘eye’
/k/ as in /katab/ ‘he wrote’	/h/ as in /huna/ ‘here’
/g/ as in /ga:b/ ‘he bought’	/tʃ/ as in /tʃaɖʒaʕ/ ‘be encouraged’
/q/ as in /qalam/ ‘pencil’	/ɖʒ/ as in /ɖʒadda/ ‘grandmother’
/ʔ/ as in /saʔala/ ‘asked’	/m/ as in /martaba/ ‘mattress’
/f/ as in /fi:l/ ‘elephant’	/n/ as in /na:m/ ‘he slept’
/θ/ as in /θumma/ ‘then’	/l/ as in /lawā/ ‘he bent’
/ð/ as in /ðanab/ ‘tail’	/L/ as in /ʔaLLa:h/ ‘God’
/s/ as in /sinn/ ‘tooth’	/r/ as in /mudarris/ ‘teacher’
/z/ as in /ze:t/ ‘oil’	/r/ as in /rama/ ‘he threw’
/S/ as in /Se:f/ ‘summer’	/w/ as in /ward/ ‘roses’
/ð/ as in /məħðu:ð/ ‘lucky’	/j/ as in /jo:m/ ‘day’

3.1.2 English Consonants

English has twenty-four consonant sounds. These sounds are classified in Table 2 below with regard to their manner and place of articulation and the presence or absence of voicing (vd. refers to a voiced sound and vl. a voiceless).

Table 2: English Consonants

Type of Articulation	Point of Articulation								
	Bi-labial	Labio-dental	Dental	Alveolar	Post-Alveolar	Palato-Alveolar	Palatal	Velar	Glottal
Plosive vl. vd.	p b			t d				k g	
Fricative vl. vd.		f v	θ ð	s z		ʃ ʒ			h
Affricate vl. vd.						tʃ dʒ			
Nasal vd.	m			n l				ŋ	
Lateral vd.									
Frictionless vd. Continuant and Semi-vowels	w				r		j		

Examples:

/p/ park /ʃ/ship
 /b/ bark /ʒ/ vision
 /t/ tea/h/how
 /d/ did /tʃ/chair
 /k/ kick/dʒ/ judge
 /g/ go/m/ man
 /f/ fall /n/near
 /v/ voice /ŋ/ sing
 /θ/ thin/l/ leg
 /ð/ then /w/wet
 /s/ see /r/ red
 /z/ zoo /j/ yard

3.2 Consonant Clusters**3.2.1 Arabic Consonant Clusters***Initial Clusters:*

Initially, Arabic permits only single consonants:

/C/ /**k**alima/ ‘word’
 /**k**ita:b/ ‘book’

Medial clusters:

Medially, Arabic permits both single and compound consonants:

/C/ /ka:**t**ib/ ‘writer’
 /CC/ /ma**dr**asa/ ‘school’

Final Clusters:

Finally, Arabic permits both single and compound consonants:

/C/ /kar:**m**/ ‘generous’
 /CC/ /fa**hm**/ ‘understanding’

Connected Speech:

- Arabic permits only two consonants in close transition:

/CC//katabat **kitab**/'she wrote a book'

- In Arabic, to avoid a sequence of more than two consonants, a short epenthetic vowel occurs between the second and third consonants:

/CC-i-C/ /baʃ**di** ma na:m/ 'after he has slept'

/fi'h**imti** dars/'I understood a lesson'

/'**binti** ?uxti/ 'my sister's daughter'

3.2.2 English Consonant Clusters

Initial Clusters:

In English, a word may have an initial consonant cluster of two or three consonants as follows:

/CC/ **plane, sleep, pray, great, spare, dream**

/CCC/**string, spring, scream, street, splash**

Medial and Final Clusters:

English permits a medial and final consonant cluster of two, three or four consonants as follows:

MEDIAL FINAL

/CC/ **seldom grasp chapter lamp**

/CCC/ **transport camps landmark hands**

/CCCC/ **landscape tempts transplant prompts**

Connected Speech:

English permits up to six or seven consonants in connected speech as follows:

/CC-C/ **best man**

/CC-CC/ **strange dream**

/CC-CCC/ **bent screw**

/CCC-CCC/ **next spring**

/CCCC-CCC/ She **tempts strangers**.

3.3 Vowels

3.3.1 Arabic Vowels

Arabic has three short vowels and five long vowels:

Short Vowels:

- /i/ as in /**min**/ ‘from’
- /a/ as in /**qalam**/ ‘pencil’
- /u/ as in /**kun**/ ‘be’ (imp.)

Long vowels:

- /i:/ as in /**fi:l**/ ‘element’
- /e:/ as in /**ze:t**/ ‘oil’
- /o:/ as in /**fo:z**/ ‘victory’
- /a:/ as in /**ba:b**/ ‘door’
- /u:/ as in /**hu:t**/ ‘whale’

3.3.2 English Vowels

English has 12 pure vowels (monophthongs: 7 short vowels and 5 long vowels) and 8 diphthongs. A pure vowel is a vowel which remains constant and does not glide such as /e/, whereas a diphthong is a sound which consists of a glide from one vowel to another such as /aɪ/. These vowels can be shown as follows:

Short Vowels:

- | | |
|---------------------------|----------------------------|
| /ɪ/ as in ‘ ship ’ | /ɒ/ as in ‘ hot ’ |
| /e/ as in ‘ ten ’ | /ʊ/ as in ‘ book ’ |
| /æ/ as in ‘ hat ’ | /ə/ as in ‘ about ’ |
| /ʌ/ as in ‘ cut ’ | |

Long Vowels:

- | | |
|-----------------------------|-----------------------------|
| /i:/ as in ‘ sheep ’ | /ɔ:/ as in ‘ horse ’ |
| /u:/ as in ‘ food ’ | /ɜ:/ as in ‘ bird ’ |
| /ɑ:/ as in ‘ ask ’ | |

Diphthongs:

- | | |
|-------------------|--------------------|
| (a) Glides to /ɪ/ | /eɪ/ as in ‘face’ |
| | /aɪ/ as in ‘five’ |
| | /ɔɪ/ as in ‘voice’ |
| (b) Glides to /ʊ/ | /əʊ/ as in ‘phone’ |
| | /aʊ/ as in ‘cow’ |
| (c) Glides to /ə/ | /ɪə/ as in ‘beard’ |
| | /eə/ as in ‘bear’ |
| | /ʊə/ as in ‘tour’ |

3.4 Syllable Structure**3.4.1 Arabic Syllable Structure**

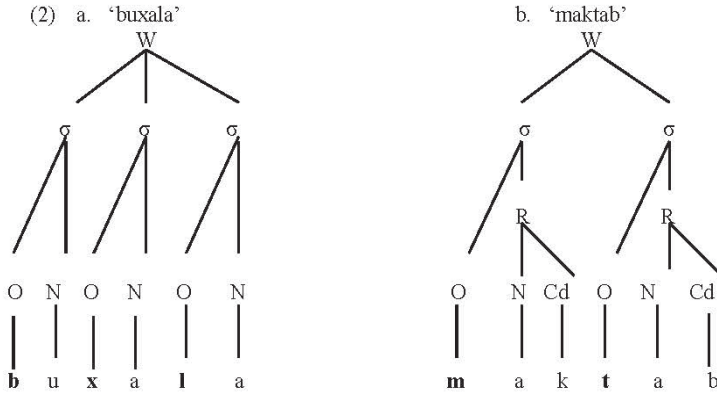
The exact structure of the syllable varies considerably from one language to another. MSA has many restrictions on syllable structures (Watson, 2002). For example, MSA syllables must start with one and only one consonant (Broselow, 1988) and the syllabic structure prevents three consonants or two vowels to appear adjacently. The MSA syllable structure constituents and their restrictions are now discussed.

3.4.1.1 Onset

In MSA, onsets are obligatory in the sense that no syllable can begin with a vowel. Thus MSA does not allow onset-less syllables, Broselow (1984, 256) states that in MSA ‘each syllable must begin with one and only one consonant’. MSA also follows the Maximal Onset Principle, stated by Broselow (1976, 34) as follows: ‘a single consonant followed by a vowel always shares syllable with that vowel’, as shown below (NB. IPA transcriptions are used throughout).

- | | |
|-------------------|----------------|
| (1) a. /muf.ta:h/ | ‘key’ |
| b. /mak.ta.ba/ | ‘library’ |
| c. /sidʒ.dʒa:.da/ | ‘carpet’ |
| d. /fi.himt/ | ‘I understood’ |
| e. /ka.ra:.si/ | ‘chairs’ |

In addition, MSA has a constraint on the syllabic structure which outlaws complex onsets (Broselow, 1992), as in /buxala/ *misers* and /maktab/ *office*. The syllable structure of these words is shown below:



As a consequence, we cannot have words like *blue*, *true*, *black*, *strange* and *spring* in MSA.

Itô (1989, 223) proposes the Onset Principle, which requires onsetless syllables to be avoided:

- (3) Onset Principle:
Avoid σ [V]

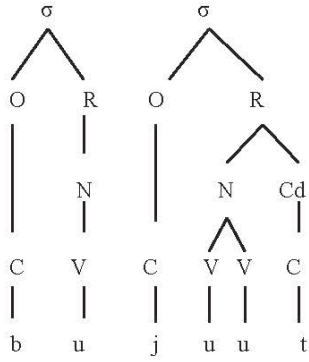
Since in all Arabic dialects, including MSA, onsets are obligatory, this principle can be changed to:

- (4) Onset Principle:
Impossible σ [V]

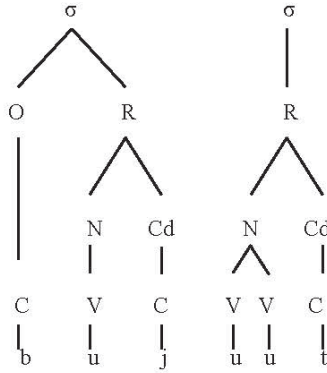
In MSA only the forms in a) are acceptable syllabifications, but not the ones in b) or c):

(5) /bu.ju:t/ 'houses'

a.

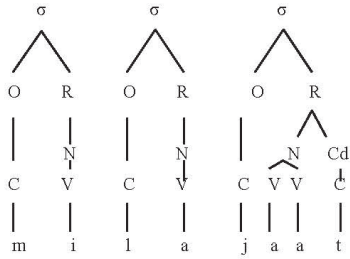


*b.

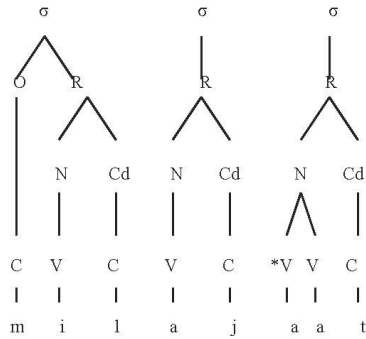


(6) /milaja:t/ 'sheets'

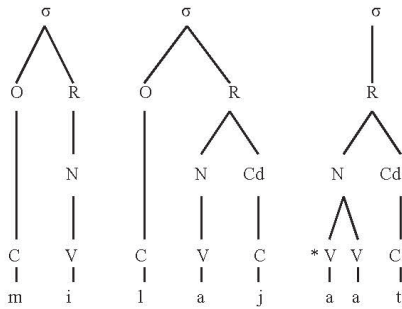
a.



*b.

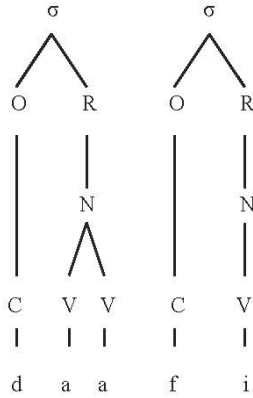


*c.

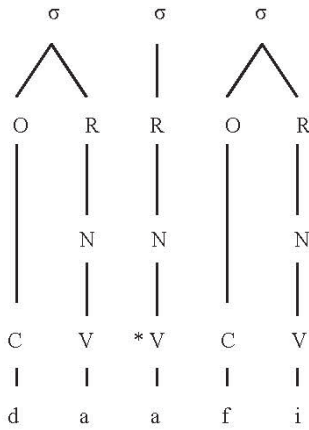


(7) /da:fi/ 'warm'

a)



*b)



Onsetless syllables and complex onsets are banned absolutely in MSA.

MSA Onset Template

O[C], hence *O[V] *O[CC]

3.4.1.2 Nucleus

As in all languages, MSA syllables must have a nucleus which can be as follows:

- simple: it includes only one vowel as in /ma.li.ka/ *queen* and /mux.ta.li.fa/ *different (f. sing.)*
- complex: it includes a long vowel as in /mi:n/ *who* and /hu:t/ *whale*.

There are some restrictions on the MSA nucleus. First, this nucleus cannot be a consonant, such as the syllabic consonants in English. Second, a VV nucleus is not allowed in MSA, where VV is a diphthong, and V: is a long vowel.

MSA Nucleus Parameters:

- V nucleus allowed? (yes)
- VV nucleus allowed?(no) (but V: allowed)
- C nucleus allowed?(no)

MSA Nucleus Template:

N [V] N [V:] hence *N [VV]

3.4.1.3 Coda

MSA coda can have one of the following forms:

- simple: it includes only one consonant as in /mak.tab/ *office* and /jif.ham/ *he understands*.
- complex: it includes two consonants, it only occurs in a final position, as in /ward/ *roses*, /ku.rumb/ *cabbages* and /ka.tabt/ *I wrote*.

The MSA coda thus has some restrictions, since it only allows one consonant in word medial position (Broselow, 1992), and not more than two consonants word finally.

MSA Coda Parameters:

- Coda allowed? (yes)
- Coda clusters allowed? (yes)
- Restrictions: Medial (not more than one consonant)
Final (not more than two consonants)

MSA Coda Template

Cd [C] Cd [CC], hence *Cd [CCC]

3.4.1.4 Rime

The MSA rime can have one of the following forms:

- non-branching: it includes only a nucleus with a short vowel as in /na.ʕam/ *yes*.
- branching as follows:
 - complex nucleus: a long vowel as in CV: syllables: /kara:si/ *chairs* and /redʒ.le:/ *'his legs'*.
 - simple nucleus + simple coda as in CVC syllables: /yih.dʒim/ *he attacks* and /saʕ.tak/ *your (m. sing.) watch*.
 - simple nucleus + complex coda as in CVCC syllables: /ʔibn/ *son* and /ʔism/ *name*.
 - complex nucleus + simple coda as in CV:C syllables: /ʕi:d/ *feast* /mo:z/ *bananas* and /be:t/ *home*.
 - complex nucleus + complex coda as in CV:CC syllables, which commonly occur in Classical Arabic, but less frequently in MSA: /ma:rr/ *passer-by* and /ha:mm/ *important*.

MSA Rime Parameters:

- non-branching? (yes)

Restrictions: simple nucleus with V

- branching? (yes)

Restrictions: CV:, CVC, CVCC, CV:C and CV:CC

MSA Rime Template:

R [VC], as in the CVC pattern

R [VCC], as in the CVCC pattern

R [V], as in the CV

R [V:], as in CV: patterns

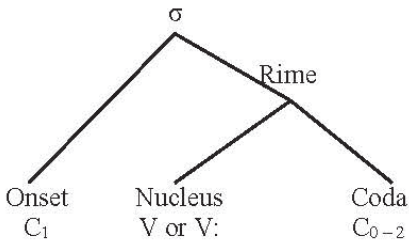
hence *R [VCCC]

The syllable structure parameter settings of MSA are as follows:

VV nucleus allowed?	No (but V: allowed)
C nucleus allowed?	No
Onset clusters allowed?	No
Coda allowed?	Yes
Coda Restrictions?	Yes (not more than two)

For clarity, this is displayed in the following diagram:

(8) MSA Maximal Syllable:



It is expected that syllabification differences between MSA and English lead to errors in main word stress placement by MSA speakers. This will be explained in detail in Chapter 4: Results and Analysis.

3.4.2 Arabic Syllable Types

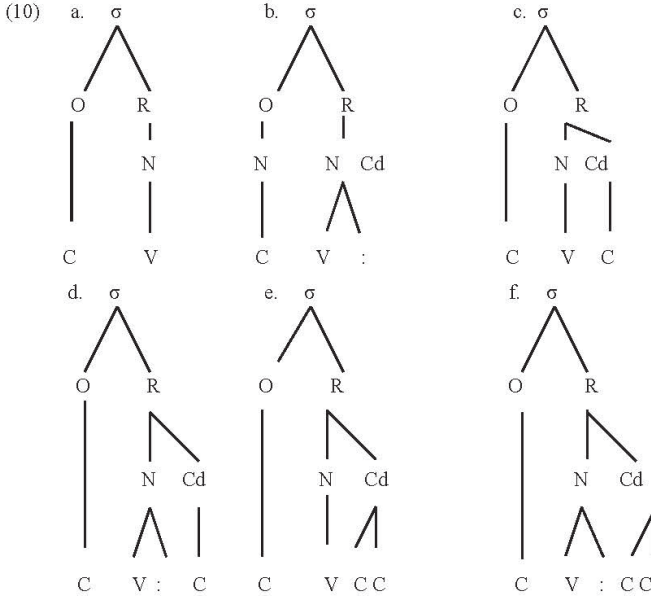
MSA syllable has been studied by many linguists (Brame, 1970; Broselow, 1979; McCarthy, 1979b; Selkirk 1981; among others), who find themselves in total agreement that the language's syllable inventory includes six syllable types: CV, CVC, CV:, CV:C, CVCC (Broselow, 1988, Buell, 1996) and CV:CC (Mitchell, 1960), as follows:

- | | | |
|-----------|----------|----------------------|
| (9) a. CV | /laban/ | 'milk' |
| b. CV: | /sa:kin/ | 'inhabited (m. sg.)' |
| c. CVC | /markaz/ | 'centre' |
| d. CV:C | /mida:n/ | 'square' |
| e. CVCC | /katabt/ | 'I wrote' |
| f. CV:CC | /ma:rr/ | 'passer-by' |

The last three types usually appear at the end of a phonological word. In these last three types, the durations of the consonants and vowels are known to be longer than the other remaining types. The number of vowels and the number of syllables in an Arabic phrase must be equal.

All the syllable structures in (9) exist both in Classical Arabic and in some modern dialects including MSA. CV is a light syllable, CV: and CVC are considered heavy syllables and CV:C and CVCC are superheavy syllables (Broselow, 1992). The first three types are considered by Al-Ani and May (1973) and McCarthy (1979a, b) as unmarked in terms of their distribution, since they occur more frequently than CV:C, CVCC and CV:CC.

The internal structure of the six syllables above can be represented, as follows.



The structures in (10b) and (10c) are very similar – consisting of a simple onset and a branching rime. In (10b) the nucleus is branching with a long vowel without a coda, whereas in (10c) the rime contains a short vowel followed by a consonant.

The above MSA syllable types show the following:

- No syllable begins with a vowel, namely, onsets are obligatory (McCarthy and Prince, 1990).
- A syllable may contain either a short vowel as in (10a, c, e) or a long vowel as in (10b, d, f). But it never contains a diphthong.
- The rime may contain one, two or zero consonants.

MSA grammarians agree that, as in many Semitic languages, the CCA syllable takes one of the following forms: light, heavy and superheavy (Buell, 1996), as I show below.

(11) *light CV* (syllables with a non-branching rime)

/bi/	'in'	(CV)
/kata'bitu/	'she wrote it'	(CV CV CV CV)
/'buxala/	'misers'	(CV CV CV)
/'dawa/	'medicine'	(CV CV)
/'malika/	'queen'	(CV CV CV)

(12) *heavy*

a) CV: (syllables with a branching rime that dominates a long vowel)

/'ma:/'not (neg. particle)'	(CV:)
/'ba:rid/	'cold' (CV: CVC)
/'da:fi/	'warm' (CV: CV)
/'mi'ra:ti/	'his wife' (CV CV: CV)
/'ja:riʕ/	'street' (CV: CVC)

b) CVC (syllables with a branching rime that dominates a vowel + consonant sequence)

/'min/	'from'	(CVC)
/'mar'taba/	'mattress'	(CVC CV CV)
/'jamʕa/	'candle'	(CVC CV)
/'muʕrif/	'supervisor'	(CVC CVC)

(13) *superheavy* (syllables where a heavy rime is followed by a consonant)

a) CVCC

/'nahr/	'river'	(CVCC)
/'ka'tabt/	'I wrote'	(CV CVCC)
/'ku'rumb/	'cabbages'	(CV CVCC)
/'fi'himt/	'I understood'	(CV CVCC)

b) CV:C

/'ba:b/	'door'	(CV:C)
/'saka'ki:n/	'knives'	(CV CV CV:C)
/'sa'ʕi:d/	'happy'	(CV CV:C)
/'bu'ju:t/	'houses'	(CV CV:C)

(14) *Extraheavy* (syllables where a heavy rime (V:) is followed by two consonants)

CV:CC

/'sa:mm/	'poisonous'(CV:CC)
/'ʕa:mm/	'public'(CV:CC)
/'dʒa:ff/	'dry (adj.)' (CV:CC)

3.4.2.1 Light Syllable

The MSA light syllable is composed of a simple peak vowel, obligatorily preceded by a simple consonant onset. This CV syllable cannot be found as a monosyllabic word. This is the result of the minimal word restriction

which requires MSA words to be bimoraic. MSA light syllables are CV (McCarthy and Prince, 1990). The CV type is the most frequent, natural and the least marked, whereas the CVCC is much less natural or more marked (Cairns and Feinstein 1982). The CV syllable is the minimal syllable type in MSA (Blevins, 1995).

3.4.2.2 Heavy Syllable

In MSA, a heavy syllable has a simple consonant onset and a branching rime. This rime incorporates either a one consonant coda (CVC) or a long-vowelled nucleus (CV:). The CV: type has some restrictions on its distribution. It is least frequent word finally, more frequent word medially and most frequent word initially (Watson, 2002). CV and CVC are the most frequent types because there are no restrictions of any kind on their distribution – they can occur in any position in the MSA word. MSA heavy syllables are CV: and CVC (McCarthy and Prince, 1990). The vowel in a CVC syllable must be fully pronounced – it cannot be reduced to another vowel.

3.4.2.3 Superheavy Syllable

MSA superheavy syllables are highly marked: they are limited to the word final position (Buell, 1996; Watson, 2002). Broselow (1992, 10) explains the reason behind MSA superheavy syllable restriction to word-final position by stating that ‘the restriction of superheavy syllables to morpheme-final position derives from the provision that only peripheral syllables may be ‘incomplete’, in accord with the widespread ability of peripheral elements to escape the structural restrictions operating elsewhere in a language by being marked extraprosodic’. The maximal word-internal syllables are heavy CV: and CVC. Superheavy syllables are composed of a heavy syllable plus a consonant: CV:C and CVCC. Prince (1983, 67) states that ‘the superheavy ultima is naturally analyzed into two rimes - VVC = VV+C, VCC = VC+C - since rimes may generally be at most VV or VC’. MSA superheavy syllables always attract main stress (de Lacy, 1998).

3.4.2.4 Extraheavy Syllable

I suggest that MSA syllable types should include an additional extraheavy syllable which is CV:CC. This syllable type is the least frequent, since it is restricted to monosyllabic words. Mitchell (1960, 371) states that ‘CVVCC is, in fact, rare and almost wholly associated with monosyllables’. This explains why many studies do not include this

syllable in the basic repertoire of MSA syllable types – the unmarked types CV, CVC and CV:. The last consonant of the extraheavy syllable is always a geminate, as shown below:

- (15) /dʒa:rr/ ‘pulling’ /xa:mm/ ‘raw’
 /ha:mm/ ‘important’ /Da:rr/ ‘hurting’

The inventory of the possible syllables in CCA is shown below:

Possible	CV CVCC	CV: CV:C	CVC CV:CC
Impossible	*CCV *CVCCC *CCV:CC *VCC	*CCCV *CCV: *VC *VCCC	*CCVC *CCVCC *V:C

3.4.3 English Syllable Structure

This section deals with the structural constituents of the English syllable, onset, nucleus and coda and their restrictions.

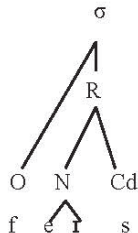
3.4.3.1 Onset

In English, onsets are optional (Hammond, 1999), in the sense that a syllable may or may not begin with a consonant, as shown below:

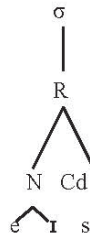
- (16) a. face teach b. ace each
 meat miser eat area
 cake feather ache upset

The syllable structure of some of these words is as follows:

- (17) a. ‘face’



- b. ‘ace’



Harris (1994, 53) states that in English ‘the onset can contain between zero and three positions’. The permissible English onsets, therefore, can take one of the following three forms:

- simple C: one consonant as in *mind* and *rose*.
- complex CC: two consonants as in *play* and *trap*.
- complex sCC: three consonants as in *string* and *spleen*.

English onset templates:

[] [C] [CC] [sCC]

English onset parameters:

- onset (optional)
- onset clusters allowed? (yes)
- restrictions: not more than three consonants

More specifically, the English onset may be (Hammond, 1999):

- absent - a sonorant - an obstruent
- an obstruent followed by a consonant
- or any of the above preceded by an /s/
- the minimal English onset is zero consonants (Harris, 1994).
- the maximal English onset is three consonants (Harris, 1994).

When English words are syllabified, the ‘Onset Maximisation Principle’ should be followed as far as possible (Harris, 1994): in English, maximal formation of onsets takes priority over formation of codas (Harris, 1994). This means that syllables should be divided, so that the maximum number of consonants is assigned to the onset of the syllable on the right, rather than to the coda of the syllable to the left, provided that they do not violate English phonotactic rules (Goldsmith, 1990), as shown in the following examples:

(18) Right Syllabification	Wrong Syllabification
re.cruit /rɪ.'kru:t/	*rec.ruit /rɪk.'ru:t/
con.gress /'kɒŋ.gres/	*cong.res/'kɒŋ.gres/
sur.prise /sə.'praɪz/	*surp.rise /səp.'raɪz/

These are the constraints on English onsets (Gimson, 1970):

- The two sounds /ŋ/ and /ʒ/ cannot occur in the onset of any English syllable.
- The first consonant in a CCV syllable cannot be an affricate, /tʃ, dʒ/ or a sonorant /m, n, ŋ, l, r, w/ or an /h/ (Hammond, 1999).
- English CCCV syllables always begin with /s/ (Hammond, 1999).

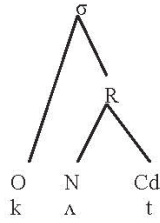
3.4.3.2 Nucleus

The nucleus is the only obligatory constituent of the English syllable (Goldsmith, 1990). The English nucleus can take one of the following forms (Harris, 1994):

- simple (V): only one short vowel as in *bed* and *cut*.
- complex: as in one of the following shapes:
 - (V:): only a long vowel as in *see* and *blue*.
 - (VV): a diphthong as in *cow* and *fly*.
 - (VVV): a triphthong as in *flour* and *fire*.
 - a syllabic consonant: a non-vocalic nucleus. Although English nuclei normally contain vowels, they can accept a sonorant consonant under pressure from the sonority profile of the segmental sequence, such as /l/ in *bottle* and *middle*, and the nasals /m/ and /n/ / as in *rhythm* and *button* respectively.

Correspondingly, the syllable structure is now exemplified:

(19) a. 'cut'



b. 'see'



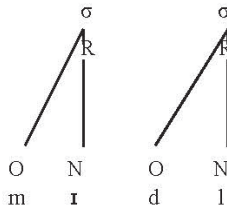
c. 'cow'



d. 'sour'



e. 'middle'



English nucleus parameters:

- V nucleus allowed? (yes)
- V: nucleus allowed? (yes)
- VV nucleus allowed? (yes)
- VVV nucleus allowed? (yes)
- C nucleus allowed? (yes)

English nucleus templates:

[V][V:][VV][VVV][C]

3.4.3.3 Coda

All consonants of English except [h] can appear as a single-consonant coda (Hammond, 1999). Harris (1994, 53) points out that in English ‘the coda part of the rhyme can contain between zero and four positions’. Therefore, the English coda can have one of the following forms:

- Simple: one consonant, as in *fit* and *red*.
- Complex; as in one of the following shapes:
 - CC: two consonants, as in *lift* and *mind*.
 - CCC: three consonants, as in *against* and *next*.
 - CCCs: four consonants, as in *texts* and *sixths*.

English coda parameters:

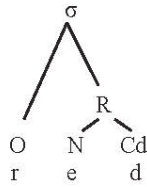
- coda allowed? (yes)
- coda clusters allowed? (yes)
- restrictions: medial (not more than two consonants)
final (not more than four consonants)

English coda templates:

[C] [CC] [CCC] [CCCs]

The minimal English coda is, therefore, one consonant, and the maximal four. The syllable structure is as follows:

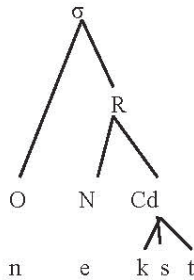
(20) a. 'red'



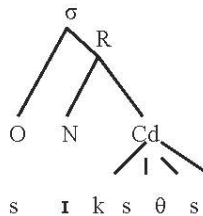
b. 'lift'



c. 'next'



d. 'sixths'



A different set of restrictions apply to coda consonants (Hammond, 1999):

- In one consonant codas, almost any consonant can occur (exceptions: /w, j, h/).
- In two consonant codas, the second must be an obstruent (wax, waft, adze etc.). (NB. nasal stops are not classed as obstruents (Trask, 1996)).

- Any of the above possibilities may be followed by an /s/.
- The minimal English coda is zero.
- The maximal English coda has four consonants, as in ‘texts’.

3.4.3.4 Rime

The English rime can take one of the following forms (Hayes, 1995):

- Non-branching: it only includes a nucleus (V, V: or VV), without coda, as in *banana*, *city*, *bee* and *play*.
- Branching: as follows (Fudge, 1969; Selkirk, 1982; Goldsmith, 1990; Harris, 1994):
 - simple nucleus + simple coda, as in *hut* and *bit*.
 - simple nucleus + complex coda (C₂₋₄), as in *song* and *felt* / *lifts* and *hands* / *tempts* and *contexts*.
 - complex nucleus + simple coda, as in *feet* and *roof*.
 - complex nucleus + complex coda (C₂₋₃), as in *feels*, *joint* and *waste* / *fields* and *points*.

English rime parameters:

-non-branching? (yes)

restrictions: nucleus with V, V: or VV

-branching? (yes)

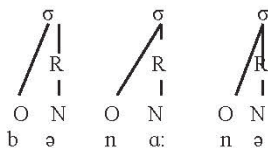
restrictions: VC, VCC, VCCC, VCCCC
 VC, VVC
 V: / VV + CC or CCC

English rime template:

[V][VCC][VCCC] [VCCCC]
 [V:C][VVC]
 [V:CC][V:CCC]
 [VVCC] [VVCCC]

Correspondingly, the structures are as follows:

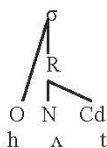
(21) a. 'banana'



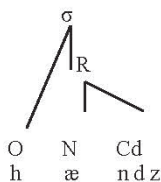
b. 'bee'



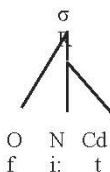
(22) a. 'hut'



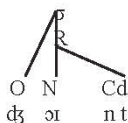
c. 'hands'



(23) a. 'feet'



(24) a. 'joint'



b. 'song'



d. 'tempts'



b. 'roof'



b. 'points'



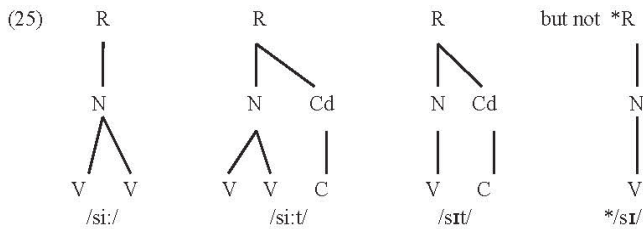
English has certain limitations on the form of heavy syllables.

- Long vowels and diphthongs can occur in both open (*see* /si:/, *pay* /peɪ/) and closed (*team* /ti:m/, *weight* /weɪt/) heavy syllables.
- Short vowels only occur in closed heavy syllables (*fat* /fæt/, *ink* /ɪŋk/).

Heavy syllables have different types of rimes:

- a syllable ending in VC has a branching rime with a non-branching nucleus and coda, as in *sun* /sʌn/ and *got* /gɒt/.
- a syllable ending in VV has a branching nucleus, as in *tree* /tri:/, and *saw* /so:/.
- a syllable ending in VVC has a branching rime with a branching nucleus, as in *feet* /fi:t/ and *fall* /fɔ:l/.

The corresponding rime structures of English heavy syllables are as follows:



In describing the phonotactics of the English syllable, linguists have focussed on restrictions concerning which phonemes may occupy which slots of the syllable. Research shows that in English CVC words, there is a significant connection between the vowel (nucleus) and the following consonant (coda) (Goldsmith, 2011). By contrast, no significant associations are found between the initial consonant (onset) and the nucleus.

3.4.4 English Syllable Types

English syllables are complex, and understanding them paves the way to understanding syllables universally. There are many types of syllable in English. English phonotactics show that the basic configuration or template of an English syllable is (C)V(C), with an optional onset and coda and an obligatory nucleus. It is therefore, the nucleus, that is the essential part of the rime and of the whole syllable.

English can thus have a syllable that does not have a coda and therefore ending in a vowel, having an open syllable with the (C)V- structure, and a syllable with a coda and therefore ending in a consonant, a closed syllable - of the type (C)VC-. In English open and closed syllables are clearly related to weight – open syllables can be heavy (CVV) or light (CV) and

closed syllables are always heavy (CVC, VC, VCC etc.):

- (26) a. open heavy syllable CVV
- b. closed heavy syllable VCC
- c. light syllable CV (always open)

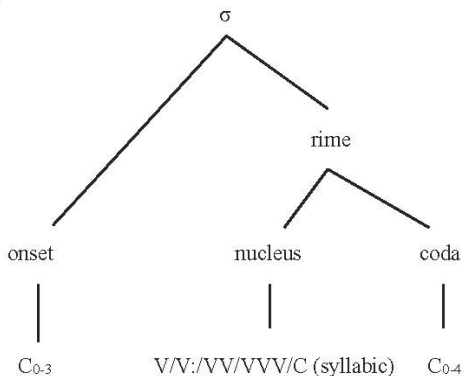
In English word phonotactics are based on syllable phonotactics. This means that only clusters which can begin a syllable can begin a word and only a possible cluster at the end of a syllable can end a word. A word like 'instruct' can be divided into well-formed syllables /in.struct/ because the word final and initial syllables consist of possible constraints in English.

English has the following syllable structure parameter settings:

VV/V: nucleus allowed?	Yes
C nucleus allowed?	Yes
Onset clusters allowed?	Yes
Coda allowed?	Yes
Coda restrictions?	Yes (not more than four)

Structurally, the English syllable can be described as having the maximal length CCCVCCCC, as in 'strengths', and the minimal length V, as in the first syllable in 'e.ver'. It follows that no English syllable or word begins with more than three consonants and ends with more than four consonants (Harris, 1994), where the first and last consonants must be /s/, as in 'strengths'. For clarity this is displayed in the following diagram:

(27) English Maximal Syllable:

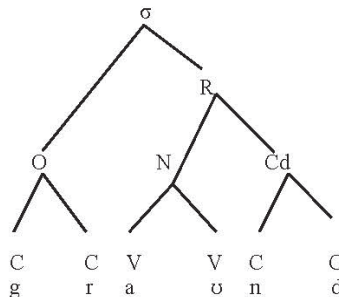


The following inventory illustrates all the possible English syllables:

- (28) Possible V CV CCV CCCV
 e.ver to cri.ti.cise stra.te.gic
 e.və/ /tə/ /krɪ.tɪ.saɪz/ /stræ.ti:.dʒɪk/
- VC CVC CCVC CCCVC
 at hot skin strap
 /ət/ /hɒt/ /skɪn/ /stræp/
- VCC CVCC CCVCC CCCVCC
 apt desk trains strand
 /æpt/ /desk/ /treɪnz/ strænd/
- VCC CCVCCC CCVCCC CCCVCCC
 ants desks sphinx strangle
 /ænts/ /desks/ /sfɪŋks/ /stræŋgl/
- VCCCs CVCCCs CCVCCCs CCCVCCCs
 angsts tempts twelfths strengths
 /æŋsts/ /tempt/ /twelfθs/ strengθs/
- Impossible *CCCCV*VCCCC *VVCCCC
 *VVCCCC*CCCCV

In English, onsets, nuclei and codas may have more than one constituent, and each constituent occupies a single slot. Therefore, a diphthong or a long vowel in a complex (branching) nucleus will occupy two slots. Similarly, each consonant in a complex onset or coda will occupy a single slot. This is shown in the English syllable *ground* /graʊnd/, in which all three elements branch:

(29)

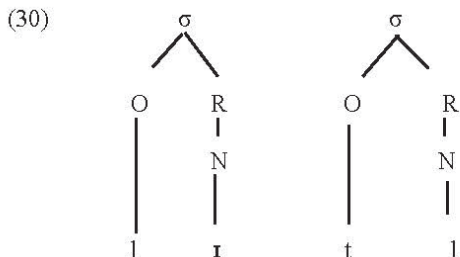


There is one exception to the rule that a syllable must have a vowel as its

nucleus. This occurs when a certain vowel-like consonants - /l/, /r/ or a nasal- act as the centre of the syllable, as in the following examples.

little /l/ button /n/
 middle /l/ literal /r-l/
 rhythm /m/ Hungary /r/

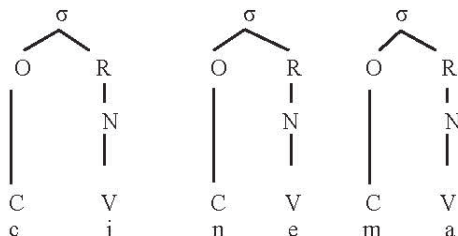
This is shown in the English word ‘little’ where the final [l] is syllabic.



3.4.4.1 Light Syllable

An English light syllable is a syllable with neither a long nucleus nor a coda (Blevins, 1995) as in ‘camera’ and ‘salary’. This syllable is referred to as CV and is considered as an open syllable, as shown below in a tree representation of the English word ‘cinema’.

(31) English Light Syllable:



There are many words in English that have light syllables as part of their syllabic structure, as shown below.

(32) a. 'colony 'negative
 'comedy 'minimal
 'cavity 'positive

- b. gra'mmatical 'ceremony
- pho'tographer pa'rameter
- 'relevant capa'bility

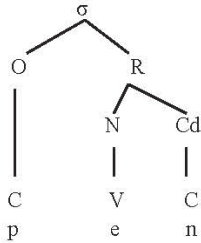
The examples in (32) have light syllables, with one of them in every word receiving stress. However, the location of stress in English depends on the distribution of heavy syllables and their rime structures as explained in section (3.4.5) which compares MSA and English syllable structures.

3.4.4.2 Heavy Syllable

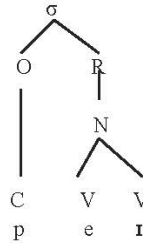
The definition of a heavy syllable is language-specific in the sense that it varies from one language to another (Hayes, 1995). In English, a heavy syllable is a syllable with a branching nucleus or a branching rime. A branching nucleus means the syllable has a long vowel as [i:] in 'in'crease' or a diphthong as [aɪ] in 're'ply'. This syllable referred to as CVV or CV: and is considered as an open syllable. A branching rime means the syllable has a coda, as [t] in 'hat' and [n] in 'a'genda'. This syllable is referred to as (VC, CVC, CVCC etc.) is considered a closed syllable. The two types of English heavy syllable are shown below in a tree representation of the English words 'pen', 'pay' and 'pea'.

(33) English Heavy Syllable:

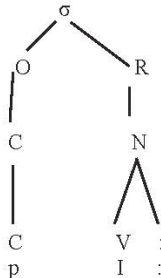
a. branching rime



b. branching nucleus (CVC) (diphthong)



c. branching nucleus (long vowel)



English has many words that include a heavy syllable in different positions, as shown in the examples:

- (34) a. res'pect a'bandon b. 'way' play
 re'member re'minder' say 'stay
 de'termine de'pendant be'have pro'vide
- c. 'see de'crease
 'we 'teacher
 'bee' sheep

The examples in (34a) have a heavy syllable with a branching rime, whereas the ones in (34b and c) have a heavy syllable with a branching nucleus - a diphthong and a long vowel, respectively. All these examples show that a heavy syllable has a relationship with stress placement in English.

3.4.5 Comparison of MSA and English Syllable Structures and Implications for L2 Acquisition

In this section, the similarities and differences between MSA and English syllable structures are compared and the previous description is translated into parameter settings, following Fikkert (1994). This explains the distance between MSA and English syllable structures.

The similarities and differences between MSA and English syllable structures are summarised in Table 3.

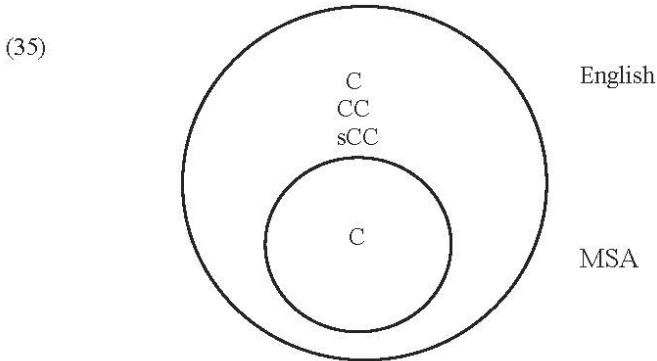
Table 3: MSA and English Syllable Structures

Constituent:	Onset	Nucleus	Coda	Rime
Language:				
MSA	C	V V:	C CC	VC VCC V:C V:CC
English	C CC sCC	V V: VV VVV (mostly word finally) C (syllabic)	C CC CCC CCCs	V V: VC VCC VCCC VCCCs V:C V:CC V:CCC VVC VVCC VVCCC

Each syllable constituent is now discussed in detail.

ONSET:

The differences between English and MSA onsets are represented graphically in (35):



With respect to onsets, English allows the possible onset that MSA does and some more (i.e. the MSA onset is a subset of English onsets). More specifically, English allows a complex CC onset and an extrametrical element that is adjoined to the left of a well formed onset. This description can be expressed in terms of parameter settings, following Fikkert (1994, 108) who has suggested the following three settings for the onset parameter:

(36) Onset Parameter:

- a. Number of onsets is equal to 1 $On = 1$
- b. Number of onsets is equal to or smaller than 1 $On \leq 1$
- c. Number of onsets is equal to or smaller than 2 $On \leq 2$
where $c \rightarrow b \rightarrow a$ and means 'implies'

The default onset parameter setting would be **a**, since both MSA and English have the 'one consonant' onset parameter setting. Using L1 positive transfer of onset parameter setting, the Arabic learners will not find difficulty in producing 'the one consonant' English onset. The learners, however, will have difficulty in producing the two different English onsets (CC and sCC) and will have to find some strategies of L2 syllable repair in order to transfer these English onsets into acceptable MSA onsets. Broselow (1984) states that:

- (37) Errors involving consonant clusters generally occur when these clusters must be analyzed as belonging to syllable structures which are not permitted in the native language, and the mispronunciation of the clusters represents an attempt by the language learner to bring the second language forms into conformity with the first language restrictions defining possible syllables.

Epenthesis is the L2 syllable repair strategy used by the MSA speakers to deal with the English onset CC and sCC. They tend to insert epenthetic vowel [i] between the first and the second consonants of the English onset 'CC'. They also tend to insert a glottal stop plus epenthetic vowel /ʔi/ before the first consonant of this type of onsets in order to form an acceptable MSA syllable /CVC/. The first consonant will be the coda of the first syllable and the second consonant the onset of the second syllable, as shown below.

- (38) Errors in English Onsets by MSA Speakers

(CC Onset)

English 'CC' OnsetError

'play */bi'lai/

'slide */si'laid/, /ʔis'laid/

'floor */fi'loor/, /ʔif'loor/

'criticise */kiriti'saiz/

When faced with the English onset 'sCC', the MSA speakers insert a /ʔi/ before the first consonant 's' forming a MSA syllable /CVC/ 'ʔis/, and then they break the 'CC' cluster by inserting [i] between the 'CC', as shown below.

- (39) Errors in English Onsets by MSA Speakers

(sCC Onset)

English 'sCC' Onset Error

street */ʔisti'ri:t/, /sit'ri:t/

spring */ʔisbi'ring/

spleen */ʔisbi'leen/

splash */ʔisbi'lash/

As shown in (38) and (39), epenthesis lead to resyllabification of the English words and change of main word stress location.

Finally, with respect to onsetless English words such as 'award', 'institute' and 'observe', the MSA speakers tend to insert a /ʔ/ before the vowel, since onsetless syllables are impossible in MSA, as shown below.

(40) *English Onsetless word Error*

'institute */?'instit'ju:t/

a'ward */?'a'ward/

'applicant */?'appli'cant/

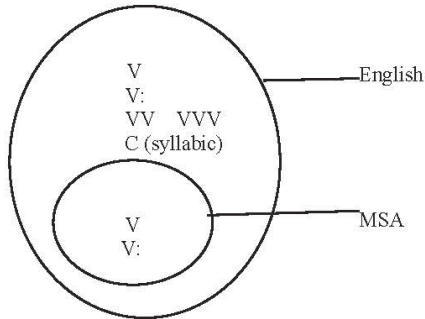
The MSA speakers, therefore, have to realize the following differences between English and MSA onsets:

- (a) Onsets are optional in English but obligatory in MSA.
- (b) MSA onset is a subset of English onsets.
- (c) MSA onset must begin with one and only one consonant, whereas English can have complex onsets ('CC' or 'sCC') and simple onset ('C').
- (d) In English 'onset maximization principle' should be followed as far as possible, whereas, MSA only allows a single consonant onset.

NUCLEUS:

The differences between English and MSA nuclei are represented graphically in (41):

(41)



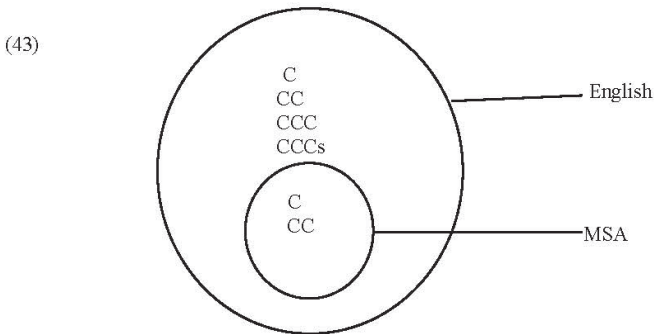
MSA nuclei are a subset of English nuclei. Both languages allow binary branching. However, an important difference between MSA and English nuclei is that in English the nucleus can be occupied by a long vowel (V:), a diphthong (VV) or a triphthong (VVV), whereas MSA does not, have diphthong or triphthongs, so the binary branching can only involve a long vowel. English also allows a syllabic nucleus as /l/ in 'bottle', /m/ in 'rhythm' and /n/ in 'button', whereas MSA does not allow this nucleus. Fikkert (1994, 108) suggests the following parameter:

(42) Branching Nucleus Parameter:
The nucleus can be branching [No, Yes].

The default nucleus parameter setting would be (V) and (V:), since both MSA and English have two nuclei. Therefore, the Arabic learners will not find difficulty in producing the English nuclei (V) and (V:), if they positively transfer the L1 MSA nucleus parameter settings into the English nucleus parameter settings. However, the learners will find difficulty in producing the three different English nuclei (VV, VVV and syllabic C). Therefore, they are expected to produce the English VV and VVV nuclei as a V: nucleus and insert an epenthetic vowel [i] before the syllabic nucleus to form a CVC syllable as in ‘middle’, /midd*l*e/ and ‘rhythm’ /rhyth*m*/.

CODA:

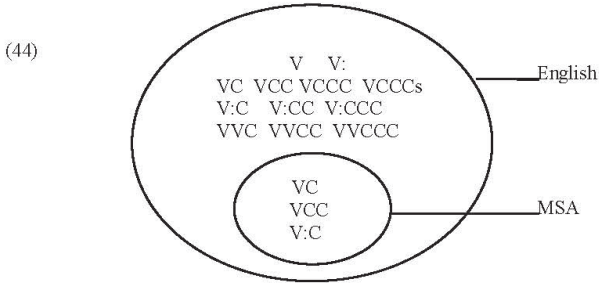
The difference between English and MSA codas are represented graphically in (43):



As in the case of onsets and nuclei, the MSA codas are a subset of English codas in the sense that English allows all the possible codas that MSA does and some more. In addition to C and CC codas, English has the complex codas CCC and CCCs as in ‘strength’ and ‘tempts’. Therefore, it is expected that the Arabic learners will find difficulty in producing the English codas CCC and CCCs and will tend to break these consonant clusters by inserting an [i] before the final C in a CCC coda /CC*i*C/ as in ‘strength’ /streng*i*th/ and between the CC and Cs in a CCCs coda /CC*i*Cs/ as in ‘tempts’ /temp*i*ts/. This changes these English codas to similar MSA codas.

RIME:

The differences between English and MSA rimes are represented graphically in (44):



As in the case of onsets, nuclei and codas, MSA rimes are a subset of English rimes. English allows all the possible MSA rimes and some more. In addition to VC, VCC, V:C and VVC and the complex rimes, English has the rimes V, V:, VCC and the complex rimes VCCC, VCCCs, V:CCC, VVCC and VVCC. Following Fikkert (1994), we add the following maximal rime parameter:

(45) Maximal Rime parameter:

- The maximal number of rime consonants is =1
 - The maximal number of rime consonants is ≤ 2
 - The maximal number of rime consonants is ≤ 3
 - The maximal number of rime consonants is ≤ 4
- where $d \rightarrow c \rightarrow b \rightarrow a$ and means 'implies'

The English setting would be **d** and the MSA setting would be **b**. Therefore, it is expected that the Arabic learners of L2 English will find difficulty in producing the English complex rimes which end in C_{3-4} , since MSA only allows rimes with a maximum of two consonants. They, therefore, will tend to insert an [i] before the final C in a CCC coda /CCiC/ and between the CC and Cs in a CCCs coda /CCiCs/ in order to form acceptable rimes in MSA.

The relationship between rime structure and main stress placement in MSA and English is now explained.

Table 4: Rime Structure and Main Stress in MSA (based on Langendoen (1968, 102) and McCarthy (1979b, 447))

		Stress		
		Antepenultimate	Penultimate	Final
Rime Structure	Final superheavy or heavy CV:			✓
	Penultimate heavy		✓	
	Penultimate light	✓ or	✓	
whichever is separated by an even number of light syllables from the preceding heavy syllable or the beginning of the word if no heavy syllable (zero is counted as even).				

Table 5: Rime Structure and Main Stress in English (based on Roca and Johnson, 1999)

STRESS				
RIME STRUCTURE		Antepenultimate	Penultimate	Final
	NOUNS			
	Penultimate light	✓		
	Penultimate heavy		✓	
	VERBS			
	Final light		✓	
Final heavy			✓	

As shown in Table 4 and 5, syllable weight (rime structure) is an important factor in determining main stress placement in both MSA and English, since both languages are quantity sensitive. They are both similar in some points. First, if the penultimate syllable is heavy in MSA words and English nouns only, it is stressed. Second, if the final syllable is heavy CV: or superheavy CV:C/CVCC in MSA and heavy in English verbs only, it is stressed. Using positive transfer, the Arabic learners will not find difficulty in stressing English nouns having a stressed heavy penult and

English verbs having a stressed heavy final syllable, if they realise the relationship between lexical class, rime structure and main stress placement in English.

Having examined the MSA and English syllable structures and syllable types, I now turn to an examination and comparison of the stress systems in both languages and explain implications for L2 English stress acquisition.

3.5 Word Stress

This section deals with the stress patterns of Modern Standard Arabic (MSA), MSA stress and syllable structure, MSA stress and syllable weight and Arabic word stress rules. It also explains English word stress rules.

3.5.1 Arabic Word Stress

3.5.1.1 The Stress Patterns of Arabic

Watson (2011) describes the stress facts of MSA, as shown below.

- (46) a) Stress is on the last syllable, if it is superheavy or final CV:.
 b) Otherwise, stress is on the penult, if it is heavy.
 c) Otherwise, stress is on the antepenult if the penult is light.

The stress pattern in (46) sheds light on some points that are indicative of the type and order of stress assignment rules in MSA. First, a final syllable does not attract stress unless it is superheavy as in /ka'tabt/ 'I wrote' and /bu'ju:t/ 'houses' or heavy as in /?a'bu:/ 'his father'. Second, syllable weight distinction is asymmetric word-internally and word-finally. Hayes (1995) explains this point by stating that syllable quantity is crucial in analysing the MSA stress system – in non-final position, the weight distinction is the ordinary one, opposing light CV syllables to all heavier syllables, whereas in final position, it is again binary but on a different basis: the syllable types CV:C, CVCC and CVV attract stress, while CVC and CV do not. This is viewed as a case of consonant extrametricality, which reduces heavy CVC to light CV<C> in final position while retaining final CV:, CVC<C>, CV:<C> as heavy.

3.5.1.2 Arabic Stress and Syllable Structure

There are six syllable types in MSA syllable inventory:

- (47) a. CV(light) /**bi**/ 'in'
 b. CV: (heavy) /**ma**:/ 'not (neg. particle)'
 c. CVC (heavy) /**min**/ 'from'
 d. CV:C (superheavy) /**ba:b**/'door'
 e. CVCC (superheavy) /**nahr**/ 'river'
 f. CV:CC (extraheavy) /**ʕa:mm**/ 'public'

Most syllables can receive main stress as in (48):

(48) I Stress on a Light Penult:

- a. 'hi.na 'here'
 b. 'sa.ma 'sky'
 c. 'ya.da 'lunch'
 d. 'da.wa 'medicine'

II Stress on a Light Antepenult:

- a. 'ka.ta.ba 'he wrote'
 b. 'ma.li.ka' queen'
 c. 'bu.xa.la' misers'
 d. 'fu.ra.ka 'partners'

III Stress on a Heavy Penult:

- a. 'mak.tab'an office'
 b. 'ka:tib' 'a writer'
 c. 'na:mat' 'she slept'
 d. 'nim.ra 'number'

IV Stress on a Final Superheavy:

- a. ka.'tabt 'I wrote'
 b. da.'xalt 'I went in'
 d. fi.'himit 'I understood'

V Stress on a Final (CV):

- a. ?a.'bu: 'his father'
 c. ?a.'xu: 'his brother'
 d. da.ra.'bu: 'they hit him'

The lists of words in (48) show two crucial factors. First, syllable weight has a considerable effect on stress placement in MSA, since heaviness seems to attract stress. Second, stress never goes beyond the antepenultimate syllable which means that it is always inside a three syllable window. This shows that main word stress in MSA falls into one of three categories: ultimate, penultimate and antepenultimate stress.

3.5.1.3 Arabic Stress and Syllable Weight

Modern Standard Arabic, Classical Arabic and all dialects of Arabic are said to have been quantity sensitive (Kenstowicz, 1994) in the sense that syllable weight played a major role in stress assignment. McCarthy (1979a, 443) states that ‘it is this distinction between heavy and light syllables that affects the placement of stress’. MSA is a quantity sensitive language in the sense that it is syllable weight - heavy or superheavy - that determines where to place main stress (Buell, 1996).

The relationship between syllable weight and stress assignment in MSA can be seen in (49):

- (49) a. /ʔa'dʒa:za/ ‘holiday’ b. /fa'ransa/ ‘France’
 /ki'ta:bi/ ‘my book’ /mu'handis/ ‘an engineer (m.sing)’
 /ha'di:qa/ ‘garden’ /ʔu'rubbi/ ‘European (m.sing)’
 c. /malika/ ‘queen’
 /'Talaba/ ‘students’
 /'buxala/ ‘misers’

In (49a and b), all the MSA words have a penultimate syllable with a branching rime –v: in (49a) and -vc in (49b). This shows that the heavy penultimate syllable is the reason behind their stress. In (49c), all the MSA words have a penultimate syllable with a non-branching rime -CV, i.e. a light penult. As a consequence, the antepenultimate syllable is stressed rather than the penultimate, following the MSA stress pattern 'CVCVCV(C). This illustrates the relationship between syllable weight and stress in MSA.

A heavy syllable in MSA does not always attract stress. For example, a heavy antepenult in MSA is not stressed, as shown below.

- (50) /zaw'baʕa/ ‘storm’ /kah'raba/ ‘electricity’
 /tak'mila/ ‘completion’ /mu'kila/ ‘problem’
 /sil'sila/ ‘chain’ /mak'nasa/ ‘broom’

All MSA words in (50) have a heavy antepenultimate syllable. However, this syllable is not stressed in spite of its weight. This is due to the lack of syllable extrametricality in MSA. In addition, in MSA, a final -CVC does not attract stress as shown in the following examples.

(51) a. (light CV + heavy CVC)
 /'wa.lad/'boy' /'ku.war/ 'balls'
 /'ka.tab/ 'he wrote' /'la.ban/'milk'
 /'mu.dun/ 'cities'

b. (light CV + heavy CVC/CV: + heavy CVC)
 /mu.'han.dis/'engineer (m.sing)'/mu.'maθ.θil/ 'actor (m.sing)'
 /mu.'dar.ris/ 'teacher (m.sing)' /ji.'fah.him/'to explain'

c. (heavy CVC/CV: + heavy CVC)
 /'yik.tib/ 'he writes'/mar.kib/ 'ship'
 /'mad.xal/'entrance' /'jih.ɟim/ 'he attacks'

The MSA words in all the sets in (51) have a final heavy CVC syllable. However, this syllable does not attract stress. This is due to extrametricality which requires the last consonant of MSA words to be completely invisible to the rules which assign stress. This process, in turn, alters the final syllable from heavy CVC to light CV<C>. Then stress lands on another suitable syllable according to MSA stress rules. Two points can be noticed. First, extrametricality does not apply to a final long vowel. Second, a heavy syllable makes a foot on its own.

A type of MSA syllable can attract stress even after marking the last consonant extrametrical: superheavy syllable – CV:C or CVCC. Extrametricality changes this superheavy syllable CV:C/CVCC into a heavy ultimate CV: or CVC, which still attracts stress according to MSA stress rules. In addition, final CV: is counted as heavy in MSA, although it is treated as light in Classical Arabic. As a consequence, in MSA a final CV: attracts stress, as in /ʔa'bu:/ 'his father' and kata'bu:/ 'they wrote it'.

McCarthy (1979b, 446) explains that in MSA 'there are two binary syllable weight distinctions, light versus heavy word-internally, and light and heavy versus superheavy word-finally'. The relationship between syllable weight and stress in MSA is pointed out by Hayes (1995, 68), who states that syllable quantity is crucial in analysing MSA stress system:

(52) In nonfinal position, the weight distinction is ordinary, opposing light CV syllables to all heavier syllable. In final position, the opposition is again binary but on a different basis: the syllable types CV:C, CVCC and CV: attract stress, while CVC and CV do not.

Hayes (ibid) analyses this 'as a case of consonant extrametricality: this demotes heavy CVC to light CV<C> in final position while retaining final CV:, CVC<C>, CV:<C> as heavy'.

To sum up, syllable weight is regarded as a very important factor in determining stress placement in MSA. This shows that a heavy syllable in a particular position in a MSA word attracts stress and in the absence of such a syllable, some positionally defined light syllable will be stressed.

3.5.1.4 Arabic Word Stress Rules

- (1) Arabic words are stressed on the last syllable when they end in:
 - a) a long vowel or a long vowel plus a consonant:
/saka'ki:n/ 'knives' /ki'ta:b/ 'book'
 - b) a vowel plus two consonants:
/ʔa'kalt/ 'I ate' /ka'tabt/ 'I wrote'
- (2) Words having the syllabic structure CVCVCV(C) are stressed on the first syllable (the antepenultimate):
/'kataba/ 'he wrote' /'buxala/ 'misers'
- (3) Words that do not fall in the previous rules are stressed on the penultimate syllable:
/muʃ'kila/ 'problem' /mar'taba/ 'mattress'
- (4) Arabic stress never precedes the antepenultimate syllable.

3.5.2 English Word Stress

This section provides background information about English stress. It explains English word stress rules.

3.5.2.1 Stress in English

Learning the stressing of English words is difficult for foreign learners of English. In English, stress can be anywhere in the word and the number of stressed syllables is not limited to one: in 'clarity' the first syllable is stressed, in 'pe'nultimate' the second one, in 'combi'nation' stress is on the first and the third syllables, in 'mis, re ,pre'sent' on the first, the second and the fourth etc.

English stress shift is not always controlled or affected by a change in morphological structure, as illustrated below:

- (53) a. 'love, 'lover, 'lovely, 'loveliness
pro'duce, pro'ducer, pro'ductive, pro'duction
- b. 'politics, po'litical, poli'tician
 'origin, o'iginal, origi'nality

In the morphologically related words in (53a), main stress does not shift, but remains on the same stressed syllable in the stem, although the morphological structure is changed. By contrast, in the examples in (53b), stress moves from one syllable in the stem to another syllable in the derivative due to a change in morphological structure. English is a free stressed language in the sense that stress does not always fall on a definitive syllable, but on any syllable depending on certain factors (Kager, 2007). English has a mixture of rhythmic and morphological stress systems. It is rhythmic in one level and mainly morphological on another level. Hayes (1995, 32) states that ‘English has a rhythmic stress system in stems (Level I) but mostly morphological stress for productive affixes (Level II)’.

3.5.2.2 English Word Stress Rules

- (1) Two-syllable words have one stressed syllable either the first or the second:
'water'doctorbe'ginfor'geta'ttract
- (2) Words ending in a long vowel (-CV:) or a diphthong (-CVV) are often stressed on the first syllable:
'igloo 'beautify 'interview 'multiply 'holiday
- (3) Words ending in a long vowel or a diphthong plus a consonant (-CVVC) are often stressed on the first syllable:
'substitute 'criticise 'photograph 'product 'applicant
- (4) Words ending in a vowel plus two consonants (-CVCC) are often stressed on the first syllable:
'scientist'management'evident'occupant'impact
- (5) Three-syllable words having the pattern CVCVCV(C) are often stressed on the second syllable:
pa'cific pho'nemic te'rrific so'licit de'molish
- (6) Words having no long vowel or diphthong are often stressed on the antepenultimate syllable or on the penultimate when followed by two consonants:
'calendar 'messenger 'minister a'gendain 'centive
- (7) Some English words of four or more syllables may have the stress on the pre-antepenultimate syllable:
'necessary 'category 'helicopter 'aristocrat 'demonstrator

3.6 Chapter Summary

This chapter explains English and Modern Standard Arabic sound systems (consonants, consonant clusters and vowels), syllable structures and main word stress rules. It also compares them and explains their implications for L2 English sound production and syllable acquisition. Arabic has thirty-two consonant sounds, whereas English has twenty-four. The subjects are expected to substitute their own Arabic sounds (i.e. L1 negative transfer) for the unfamiliar English ones, producing incorrect English sounds. Therefore, the subjects will find difficulty in pronouncing some English consonants such as /p/, /v/, /ŋ/, dark /t/, syllabic consonants and consonant doubling. Regarding consonant clusters, English permits much longer initial consonant clusters than Arabic. In addition, initial three-element clusters do not occur in Arabic. Therefore, the subjects will also have trouble with two-element clusters beginning with /p/, /s/, /g/, /θ/, consonant + /j/, /dw/ and all three-element clusters. The subjects are expected to insert a vowel between the elements of medial and final clusters. Regarding vowels, Arabic has three short vowels and five long vowels, whereas English has twelve pure vowels (monophthongs: seven short vowels and five long vowels) and eight diphthongs. Therefore, the subjects will confuse most of the English vowels and diphthongs with each other or substitute Arabic vowels for English ones. Arabic and English syllable structure constituents and their phonotactic constraints are also compared and show that Arabic onsets, nuclei and codas are subsets of corresponding English syllable constituents. Therefore, Arabic speakers will attempt to apply the Arabic syllable structure assignment rules to English strings. This syllable structure transfer explains certain errors of Arabic speakers learning English. Finally, Arabic and English word stress rules are explained and the subjects are expected to apply Arabic stress rules (i.e. L1 negative transfer) instead of English stress rules, producing incorrect English stress patterns. They will stress the last syllable of English words ending in V:, V:C and VCC and the first syllable of words having the syllabic pattern CVCVCV(C).

The next chapter deals with the subjects' errors in English pronunciation regarding consonants, consonant clusters, vowels and main word stress due to L1 interference in the light of three theories of L2 acquisition: Contrastive Analysis (CA), Error Analysis (EA) and Markedness Theory.

CHAPTER FOUR

RESULTS

4.0 Introduction

This chapter deals with the subjects' errors in English pronunciation regarding consonants, consonant clusters, vowels and main word stress due to L1 interference in the light of three theories of L2 acquisition: Contrastive Analysis (CA), Error Analysis (EA) and Markedness Theory. The results obtained are specific to the three groups of Arab subjects: Egyptians, Libyans and Saudi Arabians. The recorded data were analysed in the light of English and Arabic sounds and main word stress placement rules. All the interlingual errors found were then singled out and tables showing the correct and incorrect pronunciation and forms of main word stress were drawn up. This research has two hypotheses. First, the subjects substitute their own Arabic sounds (i.e. L1 negative transfer) for the unfamiliar English ones, producing incorrect English sounds. Second, the subjects apply Arabic stress rules (i.e. L1 negative transfer) instead of English ones, producing incorrect English stress patterns. These hypotheses were confirmed, albeit to different degrees due to sounds and stress patterns (word class), as shown in the results in this chapter.

The subjects' errors in English sounds and main word stress are also analysed in the light of the various factors that contribute to L1 interference pointed out by James (1980, 146) in Chapter 1 and are restated, as follows. These factors will be considered alongside transfer of L1 sounds and word stress rules as possible explanations for the subjects' incorrect sounds and word stress patterns.

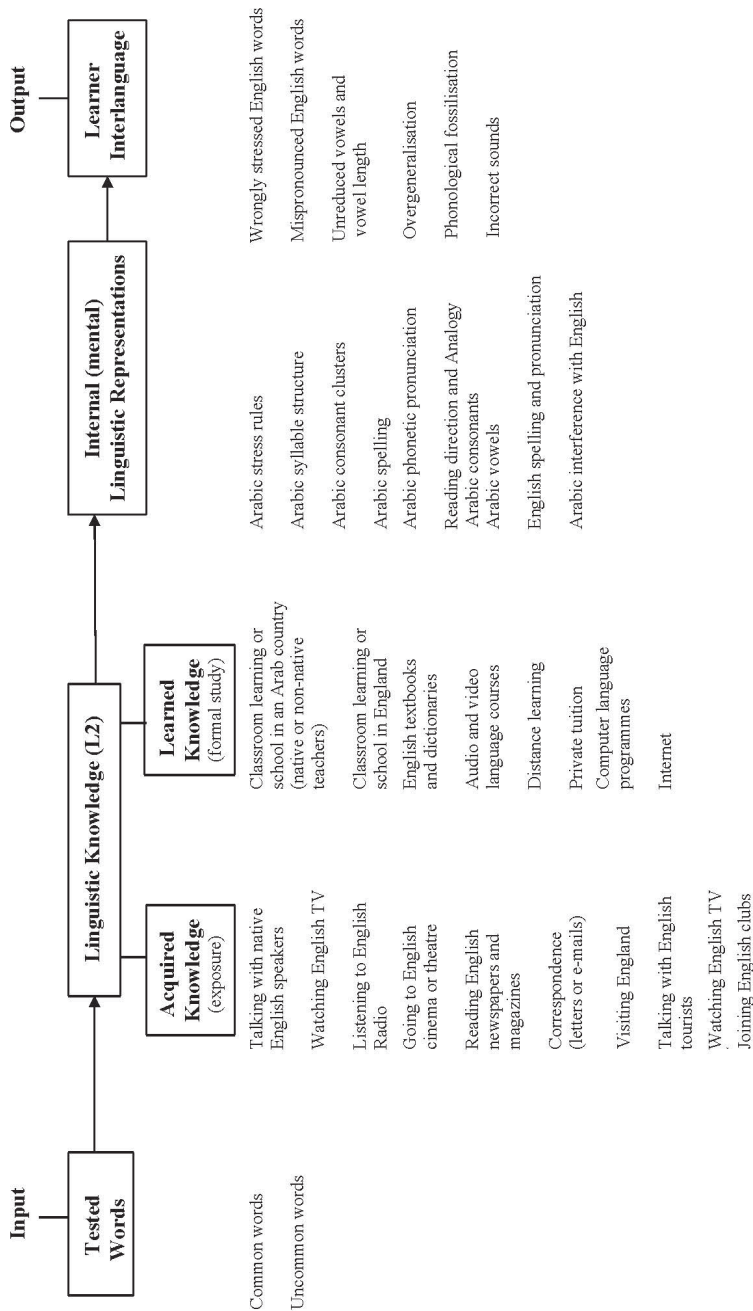
- (a) *Amount and nature of L2 input*: Interference occurs when the L2 learner's input is very limited in both 'quantity' and 'scope'. This phenomenon can be manifested especially when L2 is learned in an L1 environment (schools).
- (b) *Level of linguistic analysis*: Most research has been done at the levels of morphology and syntax rather than at the phonological

and lexical level. It is because of these two levels that ‘interference’ as a linguistic term has been included in the literature.

- (c) *Linguistic distance between L1 and L2*: Related linguistic systems induce the interference phenomenon to manifest itself. Hence, since the two languages are different, L2 learners have a tendency to transfer the features from L1 into L2.
- (d) *L2 learning stage*: Taylor (1975) pointed out that interference phenomenon is more frequent among beginners than among advanced learners during the L2 learning process.
- (e) *ask focus*: Interference is common among L2 learners if the focus of L2 is on grammatical forms rather than on ‘communicative effectiveness’.

I have prepared the following diagram to display how the English sounds and main word stress errors are made by the subjects, showing how Arabic and English sounds and stress rules interfere resulting in the subjects’ segmental and suprasegmental errors.

A MODEL FOR ANALYSING THE SUBJECTS' ERRORS IN ENGLISH SOUNDS AND WORD STRESS



Based on Khalifa's (2017), this model includes four sections: input, L2 linguistic knowledge, internal (mental) linguistic representations and output. The input includes the items which can be divided on the basis of familiarity into common and uncommon words. The L2 linguistic knowledge can be acquired through exposure to L2 and/or learned through formal L2 study. The internal linguistic representations include the subjects' L1 phonological rules and structures such as Arabic pronunciation, sounds, main word stress rules, syllable structure and the subjects' current level of L2 English and its phonological rules. Finally, the output represents the subjects' interlanguage and includes their L2 English sounds and main word stress patterns which reflect their L2 pronunciation and stress learning strategies. The following factors in the model are also expected to show an influence on the subjects' interlanguage.

- (a) *Familiarity*: The more common the item and its correct stressing in the subjects' spoken English, the fewer the English sounds and word stress errors they make.
- (b) *Exposure*: The more the subjects' exposure to native spoken English, the fewer their sound and stress errors. Their exposure to L2 written English through reading English newspapers and magazines and correspondence plays a role in their understanding of the meaning of the words but not necessarily in their pronunciation.
- (c) *Formal Study*: The subjects' formal study of L2 spoken English is expected to affect their interlanguage. For example, factors such as classroom learning or school in England, audio and video English language courses and learning in Arab countries with native or competent non-native teachers of English will improve the subjects' spoken English and lead to fewer sound and stress errors.
- (d) *Linguistic Representations*: The subjects' L1 Arabic pronunciation and main word stress rules are expected to affect their interlanguage by applying these rules to the items (i.e. L1 negative or positive transfer). The subjects may also overgeneralise some of the L2 English pronunciation and stress rules, producing incorrect sounds and stress patterns.

4.1 The Study

The subjects were assigned one task. It was a production test that had two subparts. In the first subpart, the subject was asked to read aloud a list of

English words into a tape recorder. Criteria for selecting the words will be described below. The second subpart was a description of a picture in which the subject described one page of a stimulus picture as a method of collecting spontaneous production data. All the subjects' descriptions were tape recorded. Later, a native English speaking judge phonetically transcribed the subjects' production of the target words and their descriptions of the picture focusing on the subjects' sounds and main word stress errors. These production tests were also analysed and transcribed by me, the results were compared with the judge's results and agreement was obtained between us on the majority of the items. Most of the disagreements were as to whether the subject assigned (a) a primary or secondary stress or (b) double main stresses to compounds.

4.1.1 Experimental Items

I limited the study to consonants, vowels and main word stress. The first part of the production test consisted of three word groups (total 511 words, 25 classes), each testing different aspects of English consonants, vowels and main word stress rules. The first word group (319 words, 10 classes) tested errors in English consonants, the second word group (102 words, 7 classes) tested errors in English vowels and the third word group (90 words, 8 classes) tested errors in main word stress. The classes of words given to all the subjects are now presented, followed by predictions of how these words will be pronounced and stressed by the subjects.

(A) Segmental Errors:

Word Group I: Consonants (319 words)

All the Group I words have different English consonants in different positions. They test the subjects' pronunciation errors in English plosives, fricatives, affricates, nasals, laterals, semi-vowels, consonant clusters, letters pronounced in an unexpected way, silent letters, consonant doubling and syllabic consonants. Some of these consonants do not occur in Arabic. Thus, I would predict that Arabic speakers would have difficulty with these English consonants and would substitute their own Arabic consonant sounds for the unfamiliar English ones (i.e. L1 negative transfer), producing incorrect English consonants. This word group tests errors in both English consonants and consonant clusters and consists of ten word classes.

Class 1: (Plosives) (20 words)

All the class one words test the subjects' pronunciation errors in English voiceless and voiced plosives /p/, /b/, /t/, /d/, /k/ and /g/ in initial, medial and final positions. Arabic does not have the sound /p/. Therefore, I would predict that this sound would be difficult for Arabic speakers. The class one words are given in (1):

(1) park, spark, help, slept, wept, bark, symbol, job, tie, sty, part, die, handle, hard, kill, monarch, gill, forget, bag

Class 2: (Fricatives) (39 words)

All the class two words test the subjects' pronunciation errors in English voiceless and voiced fricatives /θ/, /ð/, /f/, /v/, /s/, /z/, /ʃ/, /ʒ/ and /h/ in initial, medial and final positions. Arabic does not have the sounds /θ/, /ð/, /v/ and /ʒ/. Therefore, I would predict that these sounds would be difficult for Arabic speakers. The class two words are given in (2):

(2) thumb, method, bath, months, baths, sixth, south, southern, southerly, then, leather, bathe, clothes, bathes, smooths, fine, rifle, off, vine, rival, of, sharp, version, ash, pleasure, treasure, rouge, seal, person, bus, cats, birds, watches, zeal, busy, buzz, head, behind, haphazard

Class 3: (Affricates) (8 words)

All the class three words test the subjects' pronunciation errors in English voiceless and voiced affricatives /tʃ/ and /dʒ/ in initial, medial and final positions. The sounds /tʃ/ and /dʒ/ occur in Arabic. Therefore, I would predict that these sounds would not be difficult for Arabic speakers. The class three words are given in (3):

(3) chapter, purchase, church, cello, gem, soldier, judge, lounge

Class 4: (Nasals) (12 words)

All the class four words test the subjects' pronunciation errors in English nasals /m/, /n/ and /ŋ/ in initial, medial and final positions. The nasal sound /ŋ/ does not occur in Arabic. Therefore, I would predict that this sound would be difficult for Arabic speakers. The class four words are given in (4):

(4) man, number, farm, name, hand, bean, thing, singer, singing, longer, thank, wings

Class 5: (Laterals) (15 words)

All the class five words test the subjects' pronunciation errors in English laterals /t/ and /l/ in initial, medial and final positions. These laterals occur in Arabic. Therefore, I would predict that these sounds would not be difficult for Arabic speakers. The class five words are given in (5):

(5) rubbish, airport, river, far, far from, far from, right, light, leaf, look, polite, help, eel, well

Class 6: (Semi-vowels) (6 words)

All the class six words test the subjects' pronunciation errors in English semi-vowels in initial, medial and final positions. These semi-vowels occur in Arabic. Therefore, I would predict that these sounds would not be difficult for Arabic speakers. The class six words are given in (6):

(6) year, beyond, few, wine, when, which

Class 7: Orthography and Pronunciation**(7 a): (Letter Sound Mismatch) (11 words)**

All the class (7a) words test the subjects' pronunciation errors in the English sounds which are not represented in the spelling. There is a mismatch between English orthography and pronunciation, whereas Arabic spelling is simple and virtually phonetic. Therefore, I would predict that these letters would be difficult for Arabic speakers. The class (7a) words are given in (7):

(7) enough, hiccough, suite, ewe, cello, cognac, soldier, lounge, lieutenant, phlegm, gnaw

(7 b): (Silent Letters) (24 words)

All the class (7b) words test the subjects' pronunciation errors in English silent letters. There is a match between Arabic orthography and pronunciation and a single letter represents a single sound. Therefore, I would predict that these silent letters would be difficult for Arabic speakers. The class (7b) words are given in (8):

(8) psalm, corps, subtle, plumb, nestle, fasten, handkerchief, handsome, knight, knave, feign, gnarled, alms, salmon, colonel, folklore, heir, annihilate, wrath, sword, plough, borough, solemn, damn

(7 c): (Consonant Doubling) (22 words)

All the class (7c) words test the subjects' pronunciation errors in English consonant doubling (gemination). This gemination is common in Arabic. Therefore, I would predict that consonant doubling would be difficult for Arabic speakers. The class (7c) words are given in (9):

(9) stubborn, account, address, odd, affair, suggest, allow, collect, accommodation, announcer, inn, support, correct, discuss, attack, attempt, butt, puzzle, buzz, midday, misspelled, dissatisfied

(7 d): (Syllabic Consonants) (16 words)

All the class (7d) words test the subjects' pronunciation errors in English syllabic consonants. Arabic makes no use of syllabic consonants. Therefore, I would predict that the pronunciation of syllabic consonants would be difficult for Arabic speakers. The class (7d) words are given in (10):

(10) middle, tunnel, little, panel, rhythm, button, threaten, eleven, Britain, cousin, Hungary, hungry, national, literal, visionary, veteran

Errors in Consonant Clusters (146 words)**Class 8: (Initial Consonant Clusters) (44 words)**

All the class eight words test the subjects' pronunciation errors in English initial two-element and three-element consonant clusters. English permits much longer initial consonant clusters than Arabic. In addition, initial three-element clusters do not occur in Arabic. Therefore, I would predict that these consonant clusters would be difficult for Arabic speakers. The class eight words are given in (11):

(11) plane, black, clean, glass, fleet, sleep, pray, train, creep, brain, drive, great, freeze, throw, shrink, pure, beauty, tube, duty, cure, mute, news, sue, view, lewd, huge, few, twin, dwarf, queen, thwack, swing, spare, stay, scare, smile, snake, sphere, spleen, spring, string, scream, stew, square

Class 9: (Medial Consonant Clusters) (11 words)

All the class nine words test the subjects' pronunciation errors in English medial consonant clusters of more than two consonants within words and in connected speech. Arabic does not permit more than two consonants

word-medially. Therefore, I would predict that English medial sequences of three or four consonants would be difficult for Arabic speakers. The class nine words are given in (12):

(12) transport, transplant, landscape, handmark, grandmother, grandson, long skirt, strange dream, bent screw, next spring, She tempts strangers

Class 10: (Final Consonant Clusters) (91 words)

(10 a): (Clusters of two consonants) (52 words):

All the class (10 a) words test the subjects' pronunciation errors in English final two-element consonant clusters. Arabic permits some two consonant clusters word-finally. Therefore, I would predict that Arabic speakers would find varying degrees of difficulty with final two-element clusters. The class (10 a) words are given in (13):

(13) grabbed, begged, seemed, cleaned, filled, wronged, proved, bathed, raised, helped, marked, coughed, pronounced, published, cabs, seeds, flags, arms, pins, songs, loves, smoothes, steals, leaps, seats, backs, laughs, eighth, width, warmth, month, length, fifth, wealth, depth, wasp, grasp, task, risk, lamp, triumph, faint, dance, rank, bulb, silk, help, belt, film, shelf, else, valve

(10 b): (Clusters of three consonants) (34 words)

All the class (10 b) words test the subjects' pronunciation errors in English final three-element consonant clusters. Arabic does not permit three-element consonant clusters word finally. Therefore, I would predict that these clusters would be difficult for Arabic speakers. The class (10 b) words are given in (14):

(14) bronzed, filmed, delved, judged, changed, lapsed, taxed, midst, jumped, triumphed, touched, sensed, linked, amongst, helped, milked, pulsed, grasped, hands, builds, elms, shelves, scripts, facts, camps, nymphs, thanks, lifts, lisps, lists, tasks, helps, halts, milks

(10 c): (Clusters of four consonants) (5 words)

All the class (10 c) words test the subjects' pronunciation errors in English final four-element consonant clusters. Arabic does not permit four-element consonant clusters word finally. Therefore, I would predict that these clusters would be difficult for Arabic speakers. The class (10 c) words are given in (15):

(15) contexts, tempts, glimpsed, drenched, changed

Word Group II: (Vowels) (102 words):

All the Group II words have different English vowels. They test the subjects' pronunciation errors in English short and long vowels, diphthongs, easily confused vowels, intrusive vowels, vowel reduction to schwa and vowel length. Some of these English vowels do not occur in Arabic. Thus, I would predict that Arabic speakers would have difficulty with these English vowels and would substitute their own Arabic vowel sounds for the unfamiliar English ones (i.e. L1 negative transfer), producing incorrect English vowels. This word group consists of seven word classes.

Class 11: (Short Vowels) (18 words)

All the class eleven words test the subjects' pronunciation errors in English short vowels /ɪ/, /e/, /æ/, /ʊ/, /ʌ/, /ʊ/ and /ə/. English has a greater number of vowels than Arabic. Therefore, I would predict that some of these short vowels would be difficult for Arabic speakers. The class eleven words are given in (16):

(16) heavy, sit, deaf, set, pad, rash, gone, wash, wood, look, rub, hut, attempt, about, polite, postman, breakfast, sailor

Class 12: (Long Vowels) (12 words)

All the class twelve words test the subjects' pronunciation errors in English long vowels /i:/, /u:/, /ɑ:/, /ɔ:/ and /ɜ:/. English and Arabic have two different vowel structures or patterns. Therefore, I would predict that some of these long vowels would be difficult for Arabic speakers. The class twelve words are given in (17):

(17) field, leaf, through, food, boot, cigar, heart, board, cork, fur, word, work

Class 13: (Diphthongs) (16 words)

All the class thirteen words test the subjects' pronunciation errors in English diphthongs /eɪ/, /aɪ/, /ɔɪ/, /əʊ/, /ɪə/, /eə/ and /ʊə/. Arabic has no diphthongs. Therefore, I would predict that some of these diphthongs would be difficult for Arabic speakers. The class twelve words are given in (18):

(18) raid, fate, bite, ripe, boil, point, grow, stove, crown, mouth, beer, beard, bear, stare, tour, moor

Class 14: (Easily Confused Vowels) (56 words)

The poor mastery of English vowels is the most noticeable feature in the English speech of Arabic speakers. Therefore, English vowels were tested twice using different lists of words.

(14 a): (Short Vowels) (14 words)

All the class (14 a) words test the subjects' pronunciation errors in English short vowels /ɪ/ v. /e/, /ʌ/ v. /ʊ/, /ɒ/ v. /ɔ:/, /ɔ:/ v. /ʌ/ and /ʊ/ v. /ɒ/. I would predict that some of these short vowels would be difficult for Arabic speakers. The class (14 a) words are given in (19).

(19) miss, mess, bitter, better, luck, lock, cot, caught, gone, gun, put, pot, look, lock

(14 b): (Long Vowels) (20 words)

All the class (14 b) words test the subjects' pronunciation errors in English long vowels /i:/ v. /ɪ/, /ɜ:/ v. /ɑ:/, /ɜ:/ v. /ɔ:/, /ɑ:/ v. /ʌ/, /ɔ:/ v. /əʊ/ and /u:/ v. /ʊ/. I would predict that some of these long vowels would be difficult for Arabic speakers. The class (14 b) words are given in (20):

(20) sheep, ship, hurt, heart, dirt, dart, worm, warm, word, ward, staff, stuff, task, tusk, ball, phone, food, good, fool, stood

(14 c): (Diphthongs) (22 words)

All the class (14 c) words test the subjects' pronunciation errors in English long vowels /eɪ/ v. /e/, /eɪ/ v. /aɪ/, /eɪ/ v. /æ/, /aɪ/ v. /ɪ/, /eə/ v. /ɪə/, /eə/ v. /i:/, /ɪə/ v. /ɜ:/ and /əʊ/ v. /ɔ:/. I would predict that some of these diphthongs would be difficult for Arabic speakers. The class (14 c) words are given in (21):

(21) sail, sell, vain, vine, pain, pine, hate, hat, fain, fan, fine, fin, bite, bit, bear, beer, chair, sheep, beard, bird, boat, bought

Class 15: (Intrusive Vowels) (5 words)

All the class fifteen words test the subjects' pronunciation errors by inserting an extra vowel into some English consonant combinations. I

would predict that some of these consonant clusters would be difficult for Arabic speakers. The class fifteen words are given in (22):

(22) spring, swing, worked, changed, grandfather

Class 16: (Vowel Reduction to Schwa) (10 words)

All the class sixteen words test the subjects' pronunciation errors in reducing the vowels of English function words to schwa /ə/. Function words in Arabic do not have two forms and unstressed vowels keep their full value. Therefore, I would predict that schwa would be difficult for Arabic speakers. The class sixteen words are given in (23):

(23) Here they are, They are coming, Shoot at him, Stop at the next house, There is nothing to do,

What do you see?, What is he waiting for?, He is waiting for pay. Read as much as you should, How should I know?.

Class 17: (Vowel Length) (22 words)

All the class seventeen words test the subjects' pronunciation errors in vowel length. In Arabic, vowels vary in length regardless of the following consonant. Therefore, I would predict that vowel length would be difficult for Arabic speakers. The class seventeen words are given in (24):

(24) cap, cab, seat, seed, dock, dog, leaf, leave, belief, believe, vacation, occasion, faith, bathe, tooth, smooth, loose, lose, cease, seize, catch, cadge

(B) Suprasegmental Errors:

Word Group III: (Errors in Word Stress) (90 words)

All the Group III words have stress patterns which are different from Arabic. Thus, I would predict that Arabic speakers would have difficulty with this word group and would apply Arabic stress rules (i.e. L1 negative transfer), producing incorrect English main word stress patterns. This word group tests both simple and compound main stress and consists of eight word classes.

- Simple Word Stress (78 words)

Class 18: (unstressed final V: or VV) (10 words)

All the class eighteen words end in an unstressed long vowel or diphthong. They all have main stress on either the first or second syllable from the left. Arabic stress rules require a final CV: to receive main stress. Final stress is the unmarked stress pattern for Arabic words ending in a long vowel. Therefore, I would predict that these words would be difficult for Arabic speakers, if they are transferring their L1 rules. The class eighteen words are given in (25):

(25) 'multiply, 'holiday, 'igloo, 'beautify, 'identify, 'castaway, 'carboy, 'cargo, 'whitlow, 'bungalow

Class 19: (unstressed final –CVVC) (12 words)

All the class nineteen words end in an unstressed final –CVVC. They all have main stress on the first syllable. In Arabic, a final –CV:C receives main stress (i.e. unmarked stress pattern). Thus, I would predict that these words would be difficult for the Arabic speakers, if they are transferring their L1 settings. The class nineteen words are in (26):

(26) 'prosecute, 'substitute, 'gratitude, 'multitude, 'criticise, 'exercise, 'demonstrate, 'captivate, 'carbide, 'carmine, 'telegraph, 'telescope

Class 20: (unstressed final –CVCC) (16 words)

All the class twenty words end in an unstressed final –CVCC. They all have main stress on either the first or second syllable from the left. In Arabic, a final –CVCC receives main stress (i.e. unmarked stress pattern). Thus, I would predict that these words would be difficult for the Arabic speakers, if they are transferring their L1 rules. The class twenty words are given in (27).

(27) 'manifest, 'scientist, 'product, 'punishment, 'applicant, 'difficult, 'concept, 'evident, 'impact, 'impotent, 'management, ad'vertisement, con'versant, a'ppellant, 'specialist, 'occupant

Class 21: (the CV'CVCV(C) syllabic pattern) (4 words)

All the class twenty one words have the syllabic pattern CV'CVCV(C) with main stress on the penultimate syllable. Three words also end in the suffix -ic which draws main stress to the immediately preceding syllable.

In Arabic, words with the syllabic pattern CVCVCV(C) receive main stress on the antepenultimate syllable (i.e. unmarked stress pattern). Thus, it would be predicted that Arabic speakers would have difficulty with these words and would stress the first syllable. The class twenty one words are given in (28).

(28) pa'cific, te'rific, de'posit, so'licit

Class 22: (stressed antepenult) (12 words)

All the class twenty two words have unstressed heavy penultimate syllable and have main stress on the antepenult. It is a characteristic of Arabic that a heavy penult receives main stress (i.e. unmarked stress pattern). Thus, I would predict that Arabic speakers would have difficulty with these words and would wrongly stress the heavy penultimate syllable. The class twenty two words are given in (29):

(29) 'silently, 'messenger, 'orchestra, 'barrister, 'cucumber, 'calendar, 'currency, 'helicopter, 'cylinder, 'protestant, 'passenger, 'thermostat

Class 23: (stressed preantepenult) (12 words)

All the class twenty three words have main stress on the preantepenultimate syllable. In Arabic, stress never precedes the antepenultimate syllable (i.e. always inside the three syllable window). Thus, it would be predicted that Arabic speakers would have difficulty with these words and would stress the antepenultimate syllable. The class twenty three words are given in (30):

(30) 'necessary, 'mercenary, 'category, 'demonstrator, 'characterise, 'speculator, 'legislative, 'imaginary, 'matrimony, 'propagator, 'accuracy, 'adequacy

Class 24: (stress contrasts) (12 words)

All the class twenty four words show that English main word stress can be used in a contrastive way. In English, some pairs of two-syllable words with identical spelling can be used as either a noun or a verb. Nouns are stressed on the first syllable, whereas verbs on the second. Arabic rarely uses contrastive stress (i.e. marked stress pattern), and instead uses word order to show strong contrast. Thus, I would predict that Arabic speakers would have difficulty with these words and would wrongly stress them either as nouns or as verbs. The class twenty four words are given in (31):

(31) we pro'test, our 'protest, we ob'ject, our 'object, we pre'sent, our 'present, to ex'port, our 'export, to pe'rmit, a 'permit, to pro'gress, our 'progress

Class 25: (compound stress) (12 words)

All the class twenty five words are compounds with main stress on their first element. Arabic has at least two main stress patterns of compounds: compounds with main stress on the first element and compounds with two main stresses one placed on each element. In Arabic compounds with main stress on their first element are marked. Thus, I would predict that Arabic speakers would have difficulty with these English compounds and would either place two main stresses on both elements of the compound or one main stress on the second element. The class twenty five words are given in (32):

(32) 'apple tree, 'flowerpot, 'blacksmith, 'greengrocer, 'birthday, 'sheepdog, 'greenhouse, 'midnight, 'make-up, 'setback, 'workshop, 'classroom

4.1.2 Description of a Picture

The second part of the test, which reflects Arabs' errors in English sounds and main word stress rules while describing a picture, consisted of one page of stimulus large picture to be described by all the subjects.

4.1.3 The Subjects

The subjects of the study were 45 adult Arabic speakers (40 males and 5 females): fifteen Egyptians, fifteen Saudi Arabians and fifteen Libyans. All the subjects are native speakers of Arabic and speak L2 English. Their ages range between 27 and 40 years. The subjects had studied L2 English for a range of 6 to 8 years. Particular care was taken to ensure that all the subjects were native Arabic speakers.

4.2 Results

The presentation of the results is divided into two sections. The first section deals with the subjects' errors in English sounds and main word stress in the lists of words. The second section includes their segmental and suprasegmental errors while describing the picture which reflects their naturally occurring English Language. The subjects' results while reading

the lists of words were as shown in the results in this chapter. The subjects' errors are now presented.

4.2.1 Results of the Production Test

The results of the subjects' errors in English consonant and vowel sounds and main word stress are presented in the following order: (a) the subjects' overall performance in each word group (b) the results of each word class in each word group and the reasons behind the errors and (c) summary of the subjects' overall error patterns in each word group.

4.2.2 Sound and Stress Error Totals

The subjects had to perform a production test by reading aloud a list of words into a tape recorder. There was no training session. Let us now turn to look at the subjects' performance in more detail. Table 2 presents a breakdown of the sound and stress errors that the subjects made by class. Here the numbers indicate the number of subjects who made a sound or stress error on a particular item.

Table 1: Sound and Stress Production Errors Totals by Word

Class	No. of Errors	Class	No. of Errors	Class	No. of Errors	Class	No. of Errors
<i>Class 1:</i> park die hard kill monarch	24 0 5 0 33	<i>Class 2:</i> method months south southern southerly leather clothes rival	10 25 0 36 0 24 42 3	of sharp version treasure rouge birds	35 0 39 11 21 19	<i>Class 3:</i> chapter church purchase cello judge loung gem soldier	24 24 22 32 2 16 16 15
Class Total	62			Class Total	265	Class Total	151
<i>Class 4:</i> singing thing singer longer thank	30 33 3 0 0	<i>Class 5:</i> rubbish far from airport help well	5 23 20 20 20	<i>Class 6:</i> wine when which	0 3 3	<i>Class 7 a:</i> hieccough ewe cognac lieutenant phlegm	40 40 39 44 41
Class Total	66	Class Total	88	Class Total	6	Class Total	204

<i>Class 7 b:</i> psalm corps fasten colonel heir plough	38 44 39 44 44 38	<i>Class 7 c:</i> stubborn account affair collect correct	26 17 17 36 28	<i>Class 7 d:</i> middle rhythm button Hungary literal	27 36 36 9 44	<i>Class 8:</i> plane sleep pray great pure sue	34 30 32 34 28 41
Class Total	247	Class Total	124	Class Total	152		
lewd dwarf thwack swing spare stay smile spring string scream	33 10 12 41 38 36 38 35 34 38	<i>Class 9:</i> transport landscape long skirt strange dream bent screw next spring She temptstrangers.	38 34 17 16 14 37 27	<i>Class 10 a:</i> begged wronged proved bathed helped marked published seeds arms	11 14 10 16 13 12 9 43 40	songs smoothes warmth month length wasp lamp bulb silk valve	44 40 7 8 8 3 33 3 3 12
Class Total	514	Class Total	183	Class Total	40	Class Total	329

<i>Class 10 b:</i> bronzed changed lapsed sensed linked amongst milked hands elms	13 14 17 18 15 28 15 39 35	thanks lisps lists tasks helps	9 12 12 11 10	<i>Class 10 c:</i> contexts temptis	32 24	<i>Class 11:</i> sit set deaf pad gone look wood hut breakfast	5 3 6 2 14 6 2 4 34
<i>Class 12:</i> field through food boot heart board work word	3 16 2 2 11 3 33 2	<i>Class 13:</i> fate raid bite grow stove beard bear tour	248	<i>Class Total</i> <i>Class 14 a:</i> miss luck caught gone gun put look	56	<i>Class Total</i> <i>Class 14 b:</i> sheep hurt heart worm warm staff phone	76 4 22 17 23 14 10 4
<i>Class Total</i>	72	<i>Class Total</i>	107	<i>Class Total</i>	102	<i>Class Total</i>	94

<i>Class 14 c:</i> sail vain hate bite bear beard boat	3 14 10 8 27 23 41	<i>Class 15:</i> spring changed grandfather	28 19 16	<i>Class 16:</i> They are coming. Stop at the next house.	35 37	<i>Class 17:</i> cap belief loose	30 43 40
Class Total	126	Class Total	63	Class Total	72	Class Total	113
<i>Class 18:</i> 'multiply 'igloo 'beautify 'cargo	26 20 43 23	<i>Class 19:</i> 'substitute 'gratitude 'criticise 'telescope	43 42 40 44	<i>Class 20:</i> 'scientist 'product 'advertisement 'conversant	43 42 27 22	<i>Class 21:</i> pa'cific te'rific de'posit	15 13 11
Class Total	112	Class Total	169	Class Total	134	Class Total	39
<i>Class 22:</i> 'silently 'calendar 'cylinder 'protestant	22 23 13 31	<i>Class 23:</i> 'necessary 'accuracy 'category 'demonstrator	27 43 40 28	<i>Class 24:</i> we pre'sent our 'present to pe'rmit a 'permit	33 0 25 0	<i>Class 25:</i> 'blacksmith 'greengrocer 'sheepdog 'greenhouse	38 41 42 38
Class Total	89	Class Total	138	Class Total	58	Class Total	159

4.2.4 Ranking of Sound and Stress Errors Patterns

Table 3 indicates which classes of words caused greater difficulty for the subjects. The higher the score, the greater the number of errors for a particular class. The percentage of errors is calculated by dividing the total number of tokens by the number of errors.

Table 2: Degree of Difficulty by Word Class; all the Subjects

	No. of Errors	% of Errors
Word Group I:		
English Consonants:	2695	18.77
Total number of tokens (319 x 45 subjects) = 14355		
Class 1 (Plosives):	62	6.89
Total number of tokens (20 x 45 subjects) = 900		
Class 2 (Fricatives):	265	15.09
Total number of tokens (39 x 45 subjects) = 1755		
Class 3 (Affricates):	151	41.94
Total number of tokens (8 x 45 subjects) = 360		
Class 4 (Nasals):	66	12.22
Total number of tokens (12 x 45 subjects) = 540		
Class 5 (Laterals):	88	13.04
Total number of tokens (15 x 45 subjects) = 675		
Class 6 (Semi-vowles):	6	2.22
Total number of tokens (6 x 45 subjects) = 270		
Class 7 (Orthography and Pronunciation):	727	22.13
Total number of tokens (73 x 45 subjects) = 3285		
Class 7 a (Letter Sound Mismatch):	204	41.21
Total number of tokens (11 x 45 subjects) = 495		
Class 7 b (Silent Letters):	247	22. 87
Total number of tokens (24 x 45 subjects) = 1080		
Class 7 c (Consonant Doubling):	124	12.53
Total number of tokens (22 x 45 subjects) = 990		
Class 7 d (Syllabic Consonants):	152	21.11
Total number of tokens (16 x 45 subjects) = 720		

Errors in Consonant Clusters:		
Class 8 (Initial Consonant Clusters):	514	25.95
Total number of tokens (44 x 45 subjects) =	1980	
Class 9 (Medial Consonant Clusters):	183	36.97
Total number of tokens (11 x 45 subjects) =	495	
Class 10 (Final Consonant Clusters):	633	15.46
Total number of tokens (91 x 45 subjects) =	4095	
Class 10 a (Two-element Clusters):	329	14.06
Total number of tokens (52 x 45 subjects) =	2340	
Class 10 b (Three-element Clusters):	248	16.20
Total number of tokens (34 x 45 subjects) =	1530	
Class 10 c (Four-element Clusters):	56	24.89
Total number of tokens (5 x 45 subjects) =	225	
Word Group II:		
English Vowels:	825	17.97
Total number of tokens (102 x 45 subjects) =	4590	
Class 11 (Short Vowels):	76	9.38
Total number of tokens (18 x 45 subjects) =	810	
Class 12 (Long Vowels):	72	13.33
Total number of tokens (12 x 45 subjects) =	540	
Class 13 (Diphthongs):	107	14.86
Total number of tokens (16 x 45 subjects) =	720	
Class 14 (Easily Confused Vowels):	322	12.78
Total number of tokens (56 x 45 subjects) =	2520	
Class 14 a (Short Vowels):	102	16.19
Total number of tokens (14 x 45 subjects) =	630	
Class 14 b (Long Vowels):	94	10.44
Total number of tokens (20 x 45 subjects) =	900	
Class 14 c (Diphthongs):	126	12.73
Total number of tokens (22 x 45 subjects) =	990	
Class 15 (Intrusive Vowels):	63	28
Total number of tokens (5 x 45 subjects) =	225	

Class 16 (Vowel Reduction to Schwa):	72	16
Total number of tokens (10 x 45 subjects) = 450		
Class 17 (Vowel Length):	113	11.41
Total number of tokens (22 x 45 subjects) = 990		
Word Group III:		
English Stress:	2695	66.54
Total number of tokens (90 x 45 subjects) = 4050		
Class 18 (unstressed final V; or VV):	112	24.89
Total number of tokens (10 x 45 subjects) = 450		
Class 19 (unstressed final -CVVC):	169	31.29
Total number of tokens (12 x 45 subjects) = 540		
Class 20 (unstressed final -CVCC):	134	18.61
Total number of tokens (16 x 45 subjects) = 720		
Class 21 (the syllabic pattern CV'CVCV(C)):	39	21.67
Total number of tokens (4 x 45 subjects) = 180		
Class 22 (unstressed heavy penult):	89	16.48
Total number of tokens (12 x 45 subjects) = 540		
Class 23 (stressed preantepenult):	138	25.56
Total number of tokens (12 x 45 subjects) = 540		
Class 24 (contrastive stress):	58	10.74
Total number of tokens (12 x 45 subjects) = 540		
Class 25 (compound stress):	159	29.44
Total number of tokens (12 x 45 subjects) = 540		

4.3 Arabs' Errors in the Lists of Words

4.3.1 Word Group I: Errors in Consonants

4.3.1.1 The Subjects' Overall Performance in Word Group I

This section shows the total number and percentage of all the subjects' errors in English consonants in Word Group I, by word class, as in Table 3.

Table 3: The Subjects' Errors in English Consonants, Word Group I, by Word Class

Word Class	No. of Errors	% of Errors
English Consonants:		
Class 1: Plosives	62	6.89
Class 2: Fricatives	265	15.09
Class 3: Affricates	151	41.94
Class 4: Nasals	66	12.22
Class 5: Laterals	88	13.04
Class 6: Semi-vowels	6	2.22
Class 7: Orthography and Pronunciation		
(7 a): Letter Sound Mismatch	204	41.21
(7 b): Silent Letters	247	22.87
(7 c): Consonant Doubling	124	12.53
(7 d): Syllabic Consonants	152	21.11
English Consonant Clusters:		
Class 8: Initial Consonant Clusters	514	25.95
Class 9: Medial Consonant Clusters	183	36.97
Class 10: Final Consonant Clusters		
(10 a): Clusters of two Consonants	329	14.06
(10 b): Clusters of three Consonants	248	16.20
(10 c): Clusters of four Consonants	56	24.89
Total	2695	18.77

The subjects' total number and percentage of errors in pronouncing English consonants in Word Group I, by word class show the following. First, the subjects found different degrees of difficulty in producing English consonants. Second, the subjects' performance is best in pronouncing English semi-vowels (2.22%) and worst in pronouncing English affricates (41.94%) and words testing the English letter sound mismatch (41.21%). Third, the subjects' production of English consonants confirms this research hypothesis that the subjects substitute their own Arabic sounds (i.e. L1 negative transfer) for the unfamiliar English ones, producing incorrect English sounds.

4.3.1.2 Errors in Vowels

4.3.1.2.1 Class 1: Plosives

Many subjects produced the initial English voiceless, plosive /p/ as /b/ or unaspirated. They pronounced 'pin' /p^hɪn/ as /bɪn/ or /pɪn/. But they found no difficulty in pronouncing the sound /p/ followed by /t/ as in 'wept' /wept/. In addition, in connected speech while describing the picture, they used /p/ and /b/ randomly (i.e. L1 negative transfer and hypercorrection): * *In this bicture some beople are brobably blaying in some blace on the peach.*

Although the sounds /t/ and /d/ differ in their places of articulation: alveolar in English but dental in Arabic, they constituted no difficulty for the subjects except for some Libyans who pronounced final /d/ as /t/ as in 'hard' */hɑ:t/. The sounds /k/ and /g/ did not pose any problems for the subjects, except when /k/ is spelled 'ch' as in 'monarch'. The subjects' errors in English plosives are shown in Table 4.

Table 4: Arabs' Errors in English Plosives

Sound	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/p/	park	/p ^h ɑ:k/	/b/ unaspirated /p/	/bɑ: k/ /pɑ: k/	20 4	44.44 8.89
/d/	die hard	/daɪ/ /hɑ:d/	- /t/	- /hɑ:t/	0 5	0 11.11
/k/	kill monarch	/k ^h ɪ / /mɒnərk/	- /ʃ/	- /mɒnəʃ/	0 33	0 73.33
				Total	62	6.89

In the light of the foregoing comparison between English and Arabic consonants in Chapter 3, the following explanation of the subjects' erroneous pronunciation in English plosives is given as follows:

/p/ and /b/ The sound /p/ posed a problem for the subjects, because it does not occur in Modern Standard Arabic (MSA). As a result, the subjects substituted their MSA /b/ for English /p/ due to L1 negative transfer or pronounced English initial /p/ unaspirated. Aspiration is the little puff of air that sometimes follows a speech sound. It does not occur in all English sounds: only voiceless stops and the affricate /tʃ/ exhibit aspiration word-initially (Hammond, 1999).

/k/ Many subjects pronounced the word 'monarch' /mɒnək/ as /mɒnəf/ by mispronouncing the voiceless plosive /k/ as /f/, since they overgeneralised the same pronunciation in words such as 'machine', 'brochure' and 'chef'. These subjects are not aware that the consonant digraph (ch) has three different sounds /k/ 'school', /ʃ/ 'machinery' and /tʃ/ 'choose', the most common of which is the /tʃ/ as in 'chimney' and 'much'. The 'ch' words with the /k/ sound are derived from classical Greek, and the word 'monarch' comes from the Greek language. This is also because Arabic spelling is virtually phonetic (Smith, 1987), and Arabs, therefore, tend to pronounce English words phonetically.

Several writers have expressed their views on Arabs' errors in English plosives. Kenworthy (1987) and Baker (1982) mention that Arabs tend to produce English /p/ unaspirated which to English ears sounds like /b/. Furthermore, O'Connor (1967) states that Arabs confuse /p/ and /b/, /b/ being used for both. Regarding /d/, Baker (1982) states that some Arab learners tend to pronounce final /d/ as /t/. Finally, Smith (1987) mentions that /g/ and /k/ are often confused, especially by those Arabs whose dialects do not include the phoneme /g/. The findings in Table 1 support the views of Kenworthy (1987) and Baker (1982) regarding initial unaspirated /p/. Regarding final /d/, only five Libyans pronounced it as /t/ in slight support of Baker (1982). Finally, none of the subjects confused /g/ with /k/ which contradicts the view of Smith (1987).

4.3.1.2.2 Class 2: Fricatives

Some subjects pronounced the sound /θ/ as /s/ (Egyptians) or /t/ or as two separate sounds /t/ + /h/ (Libyans). Regarding /θs/ and /ðz/, some subjects inserted a vowel between the two elements as in */bɑ:θɪs/ for 'baths' and */smu:ðɪz/ for 'smoothes'. Furthermore, many subjects found it difficult to pronounce 'th' when it changes from /θ/ to /ð/ in words like 'north' /nɔ:θ/, 'northern' /nɔ:ðən/ and 'northerly' /nɔ:ðəlɪ/ as shown in Table 5.

Table 5: Arabs' Errors in English Fricatives

Sound	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/ə/	method	/meəd/	/s/ /t/ /t/ + /h/	/mesəd/ /metəd/ /met-həd/	2 6 2	4.44 13.33 4.44
/es/	months	/mʌnθs/	/eis/ /eɪz/ /ɪs/ /ə/	/mʌneɪs/ /mʌneɪz/ /mʌnts/ /mʌne/	12 2 2 9	26.67 4.44 4.44 20.00
/ə/ → /ð/	south southern southerly	/saʊθ/ /sʌðən/ /sʌðəli/	/ə/	/saʊθ/ /saʊθən/ /saʊθəli/	0 36 0	0 80.00 0
/ð/	leather	/leðə/	/ə/ /z/	/leə/ /lezə/	22 2	48.89 4.44
/ðz/	clothes	/kləʊðz/	/ðɪz/ /eɪs/ /es/ /ð/	/kləʊðɪz/ /kləʊeɪs/ /kləʊes/ /kləʊð/	16 20 4 2	35.56 44.44 8.89 4.44
/v/	rival of	/raɪvl/ /bɪv/	/f/	/raɪfl/ /bɪf/	3 35	6.67 77.78
/ʃ/	sharp version	/ʃɑ:ɪp/ /vɜ:ʒn/	- /ʒ/ /z/ /s/	- /vɜ:ʒn/ /vɜ:zn/ /vɜ:sn/	0 33 3 3	0 73.33 6.67 6.67

/ʒ/	treasure	/treʒəl/	/ʃ/ /z/ /s/ /dʒ/ /g/ /f/	/treʃəl/ /trezəl/ /tresəl/ /ruːdʒ/ /ruːg/ /ruːf/	4 3 4 6 7 8	8.89 6.67 8.89 13.33 15.56 17.78
v.ed + /z/	rouge	/ruːʒ/	/s/	/bʒːds/	19	42.22
	birds	/bɜːdz/		Total	265	15.09

The explanation of the subjects' errors in English fricatives is given as follows:

/θ/ and /ð/ Although the sounds */θ/* and */ð/* exist in Modern Standard Arabic, Egyptians replace them with Arabic */s/* and */z/* in their spoken Arabic. Some subjects, therefore, pronounced English */θ/* and */ð/* as */s/* and */z/* respectively (Egyptians) or as two separate sounds */t/* + */h/* (Libyans). In addition, both */θ/* and */ð/* have two separate letters in Arabic which made it difficult for the subjects to know when they should pronounce English 'th' as */θ/* or */ð/*. Moreover, in English, the pronunciation of 'th' can be changed from */θ/* in the root to */ð/* in the derivations as in 'south', 'southern' and 'southerly'. In Arabic, */θ/* or */ð/* are the same both in the root and derivations as in */maθəal/* 'he acted', */mumaθəil/* 'actor', */tilmi:ð/* 'a pupil' and */talami:ð/* 'pupils'. As a result, the subjects found difficulty in changing the pronunciation of 'th' from */θ/* to */ð/* in English words.

/v/ The voiced fricative sound */v/* presented a problem to the subjects, because it does not occur in Modern Standard Arabic but only in borrowed words such as */vi:za/* 'visa' and */tilivizyo:n/* 'television'. As a consequence, the subjects pronounced English */v/* as */f/*.

/ʒ/ This sound does not occur in Modern Standard Arabic but only in borrowed words and in names of foreign origins such as */ʒiba/* 'skirt' and */ʒo:rʒ/* 'George'. Consequently, some subjects pronounced English */ʒ/* as */g/* or */ʃ/*.

According to O'Connor (1967) and Smith (1987), Arabs tend to pronounce */v/* as */f/*. But Baker (1982) mentions that Arabs pronounce */v/* as */f/* or */b/*. Regarding */θ/* and */ð/*, Kenworthy (1987) states that most Arabs substitute */s/* and */z/* for */θ/* and */ð/* respectively. Some writers such as Baker (1982) state that Arabs confuse */θ/* with */s/* or */t/* and */ð/* with */z/* or */d/*. Finally, O'Connor (1967) and Baker (1982) state that Arabs pronounce */ʒ/* as */ʃ/* or */z/*.

In Table 5, although three subjects pronounced */v/* as */f/*, this error was not as common as O'Connor (1967), Smith (1987) and Baker (1982) considered it to be. In addition, none of the subjects pronounced */v/* as */b/* which contradicts Baker (1982). Regarding */θ/* and */ð/*, only two Egyptians pronounced them as */s/* and */z/* respectively which does not support Kenworthy (1987) and Baker (1982). Six Libyans pronounced */θ/* as */t/* which slightly supports Baker (1982), but none of the subjects pronounced

/ð/ as /d/ which conflicts with Baker (1982). Unlike the previous studies, this research finds that two Libyans pronounced /ə/ as two separate sounds /t/ + /h/, and twenty two subjects pronounced /ð/ as /ə/. Furthermore, thirty six subjects did not change the pronunciation of ‘th’ from /ə/ to /ð/ in words such as ‘south’ and ‘southern’. The results also show that some subjects confused /z/ with /ʃ/ which supports O’Connor (1967).

4.3.1.2. 3 Class 3: Affricates

Many subjects found difficulty in pronouncing the affricate sounds /tʃ/ and /dʒ/. They pronounced /tʃ/ as /ʃ/ and /dʒ/ as /g/ as shown in Table 6.

Table 6: Arabs’ Errors in English Affricates

Sound	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/tʃ/	chapter	/tʃæptə/	/ʃ/	/ʃæptə/	24	53.33
	church	/tʃɜːtʃ/	/ʃ/	/ʃɜːʃ/	24	53.33
	purchase	/pɜːtʃəs/	/k/	/pɜːkəs/	22	48.89
	cello	/tʃeləʊ/	/c/	/seləʊ/	32	71.11
/dʒ/	judge	/dʒʌdʒ/	/d/ + /z/	/d-ʒʌd-ʒ/	2	4.44
	lounge	/laʊndʒ/	/g/	/laʊng/	16	35.56
	gem	/dʒem/	/g/	/gem/	16	35.56
	soldier	/səʊldʒə/	/d/	/səʊldə/	15	33.33
				Total	151	41.94

The explanation of the subjects’ erroneous pronunciation is given as follows:

/tʃ/ This sound occurs in English as a distinct phoneme but as a sequence of /t/ + /ʃ/ in MSA. The subjects, therefore, pronounced it as /ʃ/ or /k/. In addition, many subjects mispronounced the /tʃ/ in ‘cello’ as /s/, since Arabic is virtually phonetic: there is one to one correspondence between English letters and sounds. Therefore, Arabs tend to pronounce English words phonetically.

/dʒ/ This sound occurs in Standard Arabic but not in all dialects. In addition, /dʒ/ can be represented by different letters in English, such as ‘j’, ‘dg’, ‘g’ and ‘ge’. As a result, the subjects pronounced English /dʒ/ as /g/, /d/ or as two separate sounds /d/ + /z/.

Kenworthy (1987) mentions that it may not be difficult for Arabs to achieve the sound /tʃ/, whereas Baker (1982) states that Arabs pronounce /tʃ/ as /f/. Regarding /dʒ/, Kenworthy (1987) states that Arabs confuse /dʒ/ with /ʒ/ or /tʃ/. Table 6 shows that twenty four subjects pronounced /tʃ/ as /f/ which supports Baker (1982). In addition, twenty two subjects pronounced /tʃ/ as /k/. This does not support the view of Kenworthy (1987). Regarding /dʒ/, two subjects pronounced /dʒ/ as two separate letters /d/ + /ʒ/ and sixteen subjects as /g/. This does not support Kenworthy (1987).

4.3.1.2.4 Class 4: Nasals

The subjects found no difficulty in pronouncing the sounds /m/ and /n/. But they had a problem with the sound /ŋ/ as they pronounced it as two separate phonemes /n/ + /g/ or /n/ + /k/ as in ‘sing’ */sɪŋg/ and ‘thing’ */θɪŋk/ respectively. In addition, no problem was found in pronouncing the sound /ŋ/ followed by the sound /k/ as in ‘bank’ /bæŋk/ as shown in Table 7.

Table 7: Arabs’ Errors in English Nasals

Sound	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/ŋ/	singing	/sɪŋŋ/	/ŋg/	/sɪŋŋg/	30	66.67
		/θɪŋ/	/ŋg/	/θɪŋg/	30	66.67
	singer longer thank	/sɪŋə/	/ŋk/	/θɪŋk/	3	6.67
		/lɒŋgə/	/ndʒ/	/sɪndʒə/	3	6.67
		/θæŋk/	-	-	0	0
			-	-	0	0
Total					66	12.22

The explanation of the subjects’ erroneous pronunciation is given as follows:

/ŋ/ The sound /ŋ/ does not occur independently in Arabic but can exist as an allophone of /n/ before a velar /k/ or /g/. The subjects, therefore, found no difficulty in pronouncing English words such as ‘longer’ /lɒŋgər/ and ‘thank’ /θæŋk/. Furthermore, when English /ŋ/ occurred after a vowel or word-finally, they pronounced it as two separate phonemes /n/ + /g/ as in ‘thing’ */θɪŋg/ and ‘singing’ */sɪŋŋg/.

According to Kenworthy (1987), Arabs tend to pronounce the /g/ in ‘sing’ as a separate sound instead of /ŋ/. Smith (1987) mentions that Arabs usually pronounce /ŋ/ as /n/, /ŋg/ or /nk/, whereas O’Connor (1967) and Baker (1982) state that Arabs tend to replace /ŋ/ by /ŋk/ or /ŋg/. Thirty subjects pronounced /ŋ/ as /ŋg/ and three subjects as /nk/ which supports the views of Kenworthy (1987) and Smith (1987). But it does not agree with Smith (1987) that Arabs pronounce /ŋ/ as /n/ and O’Connor (1967) and Baker (1982) that Arabs pronounce /ŋ/ as /ŋk/ or /ŋg/.

4.3.1.2.5 Class 5: Laterals

Some subjects strongly trilled the English sound /r/ and most of them pronounced the RP /r/ where it should be silent as in ‘four girls’ */fɔːr gɜːrlz/. Moreover, the English sound dark /ɹ/ posed a problem for the Arab subjects. As a result, they commonly used their clear /l/ in English words like ‘old’ and ‘ball’ as shown in Table 8.

Table 8: Arabs’ Errors in English Laterals

Sound	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/r/	rubbish	/rʌbɪʃ/	strongly trilled	/rʌbɪʃ/	5	11.11
RP /r/	far from airport	/fɑːfrəm/ /eəpɔːt/	pronounced where silent	/fɑːr frəm/ /eəpɔːrt/	23 20	51.11 44.44
dark /ɹ/	help well	/help/ /wel/	clear /l/ clear /l/	/help/ /wel/	20 20	44.44 44.44
				Total	88	13.04

The explanation of the subjects’ erroneous pronunciation is given as follows:

/r/ Some subjects strongly trilled English /r/. This is because English has only one /r/ which is a post-alveolar fricative, whereas Arabic has two r-phonemes which are either an alveolar flap or an alveolar trill. The trill /r/ is characterised by a rapid succession of taps by the tip of the tongue on the alveolar ridge. In addition, the subjects pronounced the English /r/ where it should be silent as in ‘far from’ and ‘teacher’. This is because Arabic /r/ is pronounced before consonants and word finally, whereas RP /r/ is pronounced only when followed by a vowel.

/l/ Some subjects used their clear /l/ in all English words. This is because Arabic has two lateral /l/ phonemes: dark /L/ which occurs only contiguous to /T, D, S, ð, r, L/ as in /ToLLa:b/ ‘students’ and in

/ʔaLLa:h/ ‘God’ and clear /l/ which occurs in all other positions as in /qalam/ ‘pen’. English has one lateral /l/ phoneme with two allophones: dark /l/ which occurs post-vocally as in ‘field’ and ‘well’ and clear /l/ which occurs pre-vocally as in ‘leaf’.

O’Connor (1967) states that /l/ occurs in both its clear and dark forms in Arabic, but they are distributed differently and Arabs may sometimes interchange them in English. Regarding /r/, Baker (1982) says that Arabs strongly trill the English /r/ and pronounce it where normally silent. The findings in Table 8 support Baker (1982) as five subjects strongly trilled the English /r/ and forty three subjects pronounced /r/ where it should be silent. Regarding /l/, forty subjects pronounced dark /l/ as clear /l/ which partially supports O’Connor (1967).

4.3.1.2.6 Class 6: Semi-vowels

The English semi-vowels /j/ and /w/ constituted no difficulty for the subjects except for /w/ followed by /h/ as in ‘whale’ which they pronounced as */hweil/ as in Table 9.

Table 9: Arabs’ Errors in English Semi-vowels

Sound	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/w/	wine	/wain/	-	-	0	0
	when	/wen/	/hw/	/hwen/	3	6.67
	which	/witʃ/	/hw/	/hwitʃ/	3	6.67
				Total	6	2.22

The explanation of the subjects’ erroneous pronunciation is given as follows:

Baker (1982) mentions that Arab learners tend to pronounce /w/ as /v/. No difficulty was found in pronouncing /w/ except when followed by /h/ as six subjects pronounced /wh/ as /hw/ in words like ‘which’ */hwitʃ/. This does not support Baker (1982).

4.3.1.2.7 Class 7: Orthography and Pronunciation

4.3.1.2.7.1 Class 7a: Letter Sound Mismatch

The subjects found difficulty in pronouncing sounds which are not represented in the spelling such as /tʃ/ in ‘cello’ or /dʒ/ in ‘soldier’. They also found it difficult to pronounce a combination of the same letters

which represents a different sound such as ‘gh’ in ‘enough’ and ‘hiccough’ as shown in Table 10.

Table 10: Arabs’ Errors in Letter Sound Mismatch

Letter(s)	Tested Word	Correct Pronunciation	Incorrect Pronunciation	No. of Errors	% of Errors
ough	hiccough	/hɪkʌp/	/hɪkʌf/	40	88.89
ew	ewe	/ju:/	/ewi:/	40	88.89
g	cognac	/kɒnjæk/	/kɒgnæk/	39	86.67
eu	lieutenant	/leftənənt/	/lu:tenənt/	44	97.78
ph/g	phlegm	/flem/	/flegm/	41	91.11
			Total	204	41.21

The explanation of the subjects’ erroneous pronunciation is given as follows:

According to Smith (1987), Arabic spelling is simple and virtually phonetic: a sound is represented by a letter. Arabs tend, therefore, to pronounce English words phonetically. In addition, they tend to misread letters within words by making right to left eye movements, e.g. ‘form’ for ‘from’. Forty subjects pronounced ‘hiccough’ /hɪkʌp/ as */hɪkʌf/ and thirty nine subjects pronounced ‘cognac’ /kɒnjæk/ as */kɒgnæk/. Six subjects also pronounced ‘when’ as */hwen/. This supports Smith (1987).

4.3.1.2.7.2 Class 7 b: Silent Letters

English letters which have no sound in words such as ‘plumb’ and ‘sword’ posed a problem for the subjects as shown in Table 11.

Table 11: Arabs’ Errors in English Silent Letters

Letter(s)	Tested	Correct Pronunciation	Incorrect Pronunciation	No. of Errors	% of Errors
p/l	psalm	/sa:m/	/psa:lm/	38	84.44
rps	corps	/kɔ:/	/kɔ:ps/	44	97.78
t	fasten	/fa:sn/	/fa:stn/	39	86.67
l	colonel	/kɜ:nl/	/kɒlənɪl/	44	97.78
h	heir	/eə/	/heə/	44	97.78
ough	plough	/plɑʊ/	/plʌf/	38	84.44
			Total	247	22.87

The explanation of the subjects' erroneous pronunciation is given as follows:

The subjects pronounced English words phonetically. This is because the spelling of Arabic is simple and phonetic and adheres very much to the convention 'one sound – one letter'. English spelling is an unreliable guide to the pronunciation as is clear in the following points:

- Different letters may represent a single sound:
all warm chalk autumn draw
- A single letter may represent different sounds:
hate fall village many
- A combination of letters may represent a single sound:
Sheep character photo deal
- Some letters have no sound in certain words:
wheel climb island corps
- Some sounds are not represented in the spelling:
suite soldier lieutenant hiccough

Smith (1987) mentions that among the features of Arabic which give rise to an 'Arabic accent' in English is a general reluctance to omit consonants once the written form is known, e.g. */klembɪd/ for 'climbed'. Thirty one subjects pronounced 'psalm' /sɑ:m/ as */psɑ:lm/ and forty one subjects pronounced 'corps' /kɔ:/ as */kɔ:ps/. This confirms the view of Smith (1987).

4.3.1.2.7.3 Class 7 c: Consonant Doubling

The subjects doubled the pronunciation of English double consonants especially in written texts. But they had no problem with words such as 'midday' or 'dissatisfied' which should be doubled in English as shown in Table 12.

Table 12: Arabs' Errors in English Consonant Doubling

Consonant	Tested Word	Correct Pronunciation	Incorrect Pronunciation	No. of Errors	% of Errors
b	stubborn	/stʌbən/	/stɒb-bɔ:n/	26	57.78
c	account	/əkaʊnt/	/æk-kaʊnt/	17	37.78
f	affair	/əfeə/	/æf-feə/	17	37.78
l	collect	/kəlekt/	/kɒl-lekt/	36	80.00
r	correct	/kərekt/	/kɒr-rekt/	28	62.22
			Total	124	12.53

The explanation of the subjects' erroneous pronunciation is given as follows:

Many subjects doubled the pronunciation of English double consonants. This is because in Arabic, the 'pronunciation' of consonants is often doubled to affect a change in meaning. This doubling is affected by lengthening the consonant (i.e. gemination) rather than trying to pronounce it twice as in /kut-tab/ 'Quran school', /ʕal-lama/ 'he taught', /mumæ-ɔil/ 'actor' and /mudar-ris/ 'teacher'.

It is a feature of English to have much 'orthographic' doubling of consonants as in 'matter' and 'correct'. But these tend to be pronounced as a single consonant sound as in 'matter' /mætə/ and 'correct' /kɒrɛkt/. Kharma and Hajjaj (1997) state that although English has much orthographic doubling of consonants, these tend to be pronounced as a single consonant, e.g. /ɪmbærəs/ 'embarrass'. But Arabs tend to double the pronunciation of English double consonants. Twenty six subjects pronounced 'stubborn' /stʌbən/ as */stɒb-bɔ:n/ and thirty six subjects pronounced 'collect' /kələkt/ as */kɒl-lekt/. This substantiates the views of Kharma and Hajjaj (1997).

4.3.1.2.7.4 Class 7 d: Syllabic Consonants

Many subjects found difficulty in pronouncing syllabic consonants (i.e. consonants which constitute syllables by themselves) in such words as 'little' and 'rhythm'. As a result, they used an intrusive vowel as shown in Table 13.

Table 13: Arabs' Errors in English Syllabic Consonants

Syllabic Consonant	Tested Word	Correct Pronunciation	Incorrect Pronunciation	No. of Errors	% of Errors
/l/	middle	/mɪdl/	/mɪdɪl/	27	60.00
/ŋ/	rhythm	/rɪðŋ/	/rɪðɪŋ/	36	80.00
/ŋ/	button	/bʌtŋ/	/bʌtɒŋ/	36	80.00
/r/	Hungary	/hʌŋgɪ/	/hʌŋgɛɪ/	9	20.00
/r/ + /l/	literal	/lɪtrɪl/	/lɪtɛrəl/	44	97.78
			Total	152	21.11

The explanation of the subjects' erroneous pronunciation is given as follows:

In English, certain types of consonant sounds (/l, m, n, r, ŋ/) can form syllables on their own. In contrast, Arabic makes no use of syllabic consonants. The subjects, therefore, used an intrusive vowel before English syllabic consonants as follows: */midɪ/ for /mɪd/ 'middle' and */eretɪ/ for /eret/ 'threaten'.

According to Kharma and Hajjaj (1997), English makes much use of /l/, /m/ and /n/ as syllabic consonants. Arabs tend to use an intrusive vowel here: /'bɒtɪ/ *bottle* becomes */'bɒtɪ/. Twenty seven subjects pronounced 'middle' /mɪd/ as */mɪdɪ/ and thirty six subjects pronounced 'button' /bʌtɪ/ as */bʌtɪn/. This supports the views of Kharma and Hajjaj (1997).

4.3.1.3 Errors in Consonant Clusters

4.3.1.3.1 Class 8: Initial Consonant Clusters

The subjects had little difficulty with initial two-element consonant clusters. They had trouble only with clusters beginning with the sounds /p/, /s/, /g/, /θ/, consonant + /j/ and the consonant cluster /dw/. Furthermore, all three-element consonant clusters presented a problem to the subjects. As a result, they inserted either a short vowel or a glottal stop and a short vowel before any consonant cluster beginning with the sound /s/ as shown in Table 14.

Table 14: Arabs' Errors in English Initial Consonant Clusters

Type of Cluster	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
Two- element clusters: <i>Cons. + /l/</i> <i>/pl/</i>	plane	<i>/p^hleɪn/</i>	<i>/bl/</i>	<i>/bleɪn/</i> <i>/pleɪn/</i>	24	53.33
			unaspirated <i>/p/</i>			
<i>/sl/</i>	sleep	<i>/sli:p/</i>	<i>/isl/</i>	<i>/islɪ:p/</i> <i>/ɪslɪ:p/</i>	20	44.44
			<i>/ɪsl/</i>			
<i>/pr/</i>	Pray	<i>/p^hreɪ/</i>	unaspirated <i>/br/</i>	<i>/breɪ/</i> <i>/preɪ/</i>	24	53.33
			<i>/p/</i>			
<i>/gr/</i>	great	<i>/greɪt/</i>	<i>/igr/</i>	<i>/igrɛɪt/</i> <i>/ɪgrɛɪt/</i>	27	60.00
			<i>/ɪgr/</i>			
<i>/pj/</i>	pure	<i>/p^hjuə/</i>	unaspirated <i>/p/</i>	<i>/pjəʊ/</i> <i>/bjəʊ/</i>	22	48.89
			<i>/bj/</i>			
<i>/s/</i>	sue	<i>/sju:/</i>	<i>/s/</i>	<i>/su:/</i>	41	91.11
			<i>/l/</i>			
<i>Con. + /w/</i> <i>/dw/</i>	lewd dwarf	<i>/ljɜ:d/</i> <i>/dwɔ:f/</i>	<i>/l/</i>	<i>/leɪwɜ:d/</i> <i>/dɔ:f/</i>	33	73.33
			<i>/d/</i>			
<i>/θw/</i>	thwack	<i>/θwæk/</i>	<i>/sw/</i>	<i>/swæk/</i> <i>/twæk/</i>	8	17.78
			<i>/tw/</i>			

/sw/		/swɪŋ/	/ɪsw/ /ʔɪswɪŋ/	/ɪswɪŋ/ /ʔɪswɪŋ/	33 8	73.33 17.78
/s/ + cons. /sp/	spare	/speə/	/ɪsp/ /ʔɪsp/	/ɪspeə/ /ʔɪspeə/	32 6	71.11 13.33
/st/	stay	/steɪ/	/ɪst/ /ʔɪst/	/ɪsteɪ/ /ʔɪsteɪ/	31 5	68.89 11.11
/sm/	smile	/smaɪl/	/ɪsm/ /ʔɪsm/	/ɪsmal/ /ʔɪsmal/	31 7	68.89 15.56
Three- element clusters: /spr/	spring	/sprɪŋ/	/ɪspr/ /ʔɪspr/	/ɪsprɪŋ/ /ʔɪsprɪŋ/	29 6	64.44 13.33
/str/	string	/strɪŋ/	/ɪstr/ /ʔɪstr/	/ɪstrɪŋ/ /ʔɪstrɪŋ/	28 6	62.22 13.33
/skr/	scream	/skri:m/	/ɪskr/ /ʔɪskr/	/ɪskri:m/ /ʔɪskri:m/	32 6	71.11 13.33
				Total	514	25.95

According to the comparison between English and Arabic consonant clusters in Chapter 3 the reasons for the subjects' errors can be as follows:

- 1) English permits much longer initial, medial and final consonant clusters than Arabic. As a result, the subjects found difficulty in pronouncing English consonant sequences.
- 2) *Initial two-element clusters:*
 Many subjects had trouble with clusters beginning with /p/, /s/, /g/, /θ/ and consonant + /j/. The subjects substituted their native /b/ for /p/ and /s/ for /θ/, since /p/ does not occur in Arabic and Egyptians pronounce Arabic /θ/ as /s/. In addition, Arabic spelling is virtually phonetic, the subjects, therefore, did not pronounce the sound /j/ in words like 'pure' and 'lewd'. As consonant clusters occur in Arabic mainly word medially or finally, the subjects inserted /i/ or /ʔi/ before clusters with /s/ or /g/ to move them away from the initial position. This is common in Arabic words such as /ʔistamar/ 'he continued' and /ʔisʔal/ 'ask'. The differences between syllable structures of the first language (L1) and the second language (L2) can be sources of L2 errors and lead to syllable repair strategies which bring the L2 syllable structure into conformity with the L1.
- 3) *Initial three-element clusters:*
 Since initial three-element clusters do not occur in Arabic, they constituted great difficulty to the subjects. Consequently, many subjects inserted /i/ or /ʔi/ before clusters beginning with /s/.

According to O'Connor (1967) sequences of three or more consonants do not occur in many forms of Arabic. In addition, Smith (1987) mentions that the range of consonant clusters occurring in English is much wider than in Arabic. Initial two-segment clusters not occurring in Arabic include: *pr, pl, gr, gl, thr, thw, sp*. The range of final clusters is also much smaller in Arabic. Of the 78 three-segment clusters and 14 four-segment clusters occurring finally in English, *none* occur in Arabic. In all the above cases, Arabs tend to insert short vowels to 'assist' pronunciation.

Twenty four subjects pronounced 'plane' as */blem/, ten subjects with unaspirated /p/ and thirty three subjects inserted a short vowel before 'swing'. In addition, twenty seven subjects inserted a short vowel before 'great'. This supports Smith (1987) regarding Arabs' difficulties with initial two-element clusters beginning with /p/, /g/ and /s/. Unlike Smith (1987), this research found the following: some Arabs also inserted a glottal stop and a short vowel /ʔi/ before words beginning with /g/ and /s/ but not before /θ/, some Arabs pronounced /θ/ as /s/ or /t/ (Libyans) and

some Arabs also had problems with the clusters ‘consonant + /j/’ and /dw/.

4.3.1.3.2 Class 9: Medial Consonant Clusters

English medial consonant clusters of more than two consonants posed great difficulty to the subjects. As a consequence, they broke the consonant cluster by inserting a short vowel between the second and third consonants as shown in Table 15.

Table 15: Arabs’ Errors in English Medial Consonant Clusters

Type of cluster	Tested word(s)	Correct Pronunciation	Incorrect Pronunciation	No. of Errors	% of Errors
Within a word: Three consonants Four consonants	transport	/trænsɒ:t/	/trænsɒ:t/	38	84.44
	landscape	/lændskeɪp/	/lændiskeɪp/	34	75.56
In connected speech: Three consonants Four consonants Five consonants Six consonants Seven consonants	long skirt	/lɒŋ skɜ:t/	/lɒŋgɪskɜ:t/	17	37.78
	strange	/streɪndʒ	/streɪndʒ	16	35.56
	dream	dri:m/	dri:m/	14	31.11
	bent	/bent skru:/	/bentɪ skru:/	37	82.22
	screw	/nekst sprɪŋ/	/nekstɪ sprɪŋ/	27	60.00
	next	/ʃi: tempts	/ʃi: temptɪs		
	spring	she			
she	tempts				
tempts	strangers	streɪndʒəz/	streɪndʒəz/		
			Total	183	36.97

The explanation of the subjects’ erroneous pronunciation is given as follows:

Since Arabic does not permit more than two consonants word-medially, English medial sequences of three or four consonants presented a great difficulty to the subjects. In addition, Arabic permits only two consonants in close transition: /CC/ /katabat kitab/ ‘she wrote a book’ and to avoid a sequence of more than two consonants, a short (epenthetic) vowel occurs between the second and third consonants: /CC-i-C/ /baʕdi ma na:m/ ‘after

he has slept', /fi'himti dars/ 'I understood a lesson' and /'binti ?uxti/ 'my sister's daughter'. As a result, they transferred their native habit of inserting a short vowel between the second and third consonant when pronouncing these clusters within words and in connected speech. This substantiates the view of O'Connor (1967).

4.3.1.3.3 Class 10: Final Consonant Clusters

4.3.1.3.3.1 Class 10 a: Two-element Clusters

The subjects encountered some difficulty with final two-element consonant clusters. They, therefore, inserted a vowel between the two elements to break the consonant cluster, substituted one sound for another or occasionally both together as shown in Table 16.

Table 16: Arabs' Errors in English Final Two-element Consonant Clusters

Type of Cluster	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors					
<i>V.ed</i> cons. + /d/ /gd/	begged	/begd/	/gɪd/	/begɪd/	11	24.44					
			/ŋd/	wronged			/rɒŋd/	/ŋɪd/	/rɒŋɪd/	14	31.11
			/vd	proved			/pru:vd/	/vɪd/	/pru:vɪd/	10	22.22
			/ðd/	bathed			/beɪðd/	/ðɪd/	/beɪðɪd/	4	8.89
/θɪd/	/beɪθɪd/	10			22.22						
/tɪd/	/bertɪd/	2			4.44						
<i>V.less</i> cons. + /t/ /pt/	helped	/helpt/	/pɪd/	/helpɪd/	8	17.78					
			/bɪd/	/helbɪd/			3	6.67			
			/pd/	/helpd/			2	4.44			
/kt/	marked	/mɑ:kt/	/kɪd/	/mɑ:kɪd/	10	22.22					
			/kd/	/mɑ:kd/			2	4.44			
/ʃt/	published	/pʌblɪʃt/	/ʃɪd/	/pʌblɪʃɪd/	7	15.56					
			/ʃd/	/pʌblɪʃd/			2	4.44			

<i>V.ed</i> <i>cons.</i> +/z/ /dz/	seeds	/si:dz/	/ds/	/si:ds/	40	88.89
			/dɪs/	/si:di:s/		
/mz/	arms	/ɑ:mz/	/ms/	/ɑ:ms/	37	82.22
			/mɪs/	/ɑ:mɪs/		
/ŋz/	songs	/sɒŋz/	/ŋgs/	/sɒŋgs/	41	91.11
			/ŋgɪs/	/sɒŋgɪs/		
/ðz/	smoothes	/smu:ðz/	/ðs/	/smu:ðs/	29	64.44
			/ðɪz/	/smu:ðɪz/		
			/θɪs/	/smu:θɪs/		
<i>Cons.</i> + /θ/ /mθ/	warmth	/wɔ:mθ/	/mt/	/wɔ:mt/	4	8.89
			/mɪθ/	/wɔ:mɪθ/		
/nθ/	month	/mʌnθ/	/nt/	/mʌnt/	8	17.78
/ŋθ/	length	/leŋθ/	/ngt/	/lengt/	3	6.67
			/ngɪθ/	/lengɪθ/		
/s/ + <i>cons.</i> /sp/	wasp	/wɒsp/	/sb/	/wɒsb/	3	6.67
/mp/	lamp	/læmp/	/mb/	/læmb/	33	73.33
/l/ + <i>cons.</i> /lb/	bulb	/bʌlb/	/ʌb/	/bʌʌb/	3	6.67
/lk/	silk	/sɪlk/	/lɪk/	/slɪk/	3	6.67
/lv/	valve	/vælv/	/lf/	/vælf/	12	26.67
				Total	329	14.06

Although Arabic permits two consonants word-finally, this kind of English cluster presented some difficulty to the subjects. They, therefore, inserted a short vowel between the two elements. Unlike the previous studies, Table 16 reveals that the Arab subjects found varying degrees of difficulty with final two-element clusters.

4.3.1.3.3.2 Class 10 b: Three-element Clusters

All three-element consonant clusters occurring word-finally presented great difficulty to the subjects. They inserted a short vowel between the last two consonants as in Table 17.

Table 17: Arabs' Errors in English Final Three-element Consonant Clusters

Type of Cluster	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
Three-element clusters: <i>Ending in /d/</i> <i>/nzd/</i>	bronzed	/brɒnzɪd/	/nzɪd/	/brɒnzɪd/	13	28.89
	changed	/tʃeɪndʒɪd/	/ndʒɪd/	/tʃeɪndʒɪd/	14	31.11
	lapsed	/læpsɪt/	/psɪt/	/læpsɪt/	7	15.56
			/psɪd/	/læpsɪd/	10	22.22
	sensed	/sensɪt/	/nsɪd/	/sensɪd/	18	40.00
	linked	/lɪŋkt/	/ŋkɪd/	/lɪŋkɪd/	15	33.33
	amongst	/əmʌŋst/	/ŋgəst/	/əmʌŋgɪst/	28	62.22
<i>Ending in /z/</i> <i>/ndz/</i>	milked	/mɪlkt/	/lkɪd/	/mɪlkɪd/	15	33.33
	hands	/hændz/	/ndɪz/	/hændɪz/	2	4.44
			/ndɪs/	/hændɪs/	37	82.22
	elms	/elmz/	/lmɪz/	/elmɪz/	5	11.11
			/lmɪs/	/elmɪs/	30	66.67
	thanks	/θæŋks/	/ŋkɪs/	/θæŋkɪs/	9	20.00
	lisps	/lɪspz/	/sbɪs/	/lɪspɪs/	12	26.67
	lists	/lɪstz/	/stɪs/	/lɪstɪs/	12	26.67
	tasks	/tɑːskz/	/skɪs/	/tɑːskɪs/	11	24.44
	helps	/helps/	/lpɪs/	/helpɪs/	10	22.22
			Total	248	16.20	

Many Arab subjects inserted a short vowel between the last two consonants to assist the pronunciation of final three-element clusters. This supports the view of O'Connor (1967) and Smith (1987).

4.3.1.3.3.3 Class 10 c: Four-element clusters

The subjects found great difficulty with final four-element consonant clusters. As a result, they had a tendency to insert a short vowel either between the first and second consonants or between the second and the third as in Table 18.

Table 18: Arabs' Errors in English Final Four-element Consonant Clusters

Type of Cluster	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/ksts/	contexts	/kɔnteksts/	/kɪsts/	/kɔntekɪsts/	32	71.11
/mpts/	tempt	/tempt/	/mɪpts/	/tempɪts/	24	53.33
				Total	56	24.89

The explanation of the subjects' erroneous pronunciation is given as follows:

The subjects encountered great difficulty in pronouncing them, since final three and four element clusters do not occur in Arabic. They, therefore, broke the cluster by inserting a short vowel especially between the second and third consonants. This substantiates the views of O'Connor (1967) and Smith (1987).

4.3.1.4 Summary of the Subjects' Overall Consonant Error Patterns:

Word Group I

The results in Word Group I reveal that many subjects have not yet mastered English consonants. The summary of the subjects' overall consonant error patterns in this word group is now shown.

Word Group I: Consonants (319 words)

Result: Arabic speakers had difficulty with some English consonants and substituted their own Arabic consonant sounds for the unfamiliar English ones (i.e. L1 negative transfer), producing incorrect English consonants.

- Class 1: (Plosives) (20 words)

Result: The English voiceless plosive /p/ was difficult for Arabic speakers and was pronounced as /b/ or unaspirated /p/.

- Class 2: (Fricatives) (39 words)

Result: The English fricative sounds /θ/, /ð/, /v/ and /ʒ/ were difficult for Arabic speakers and were pronounced as /s/, /z/, /f/ and /g/ respectively.

- Class 3: (Affricates) (8 words)

Result: The English affricate sounds /tʃ/ and /dʒ/ were difficult for Arabic speakers and were pronounced as /f/ and /g/ respectively.

- Class 4: (Nasals) (12 words)

Result: The English nasal sound /ŋ/ was difficult for Arabic speakers and was pronounced as /ng/.

- Class 5: (Laterals) (15 words)

Result: The English lateral sounds /r/ and /l/ were not very difficult for Arabic speakers.

- Class 6: (Semi-vowels) (6 words)

Result: The English semi-vowels /j/ and /w/ were not very difficult for Arabic speakers.

- Class 7: Orthography and Pronunciation**- (7 a) (Letter Sound Mismatch) (11 words)**

Result: These English words were difficult for Arabic speakers, since there is a mismatch between English orthography and pronunciation, whereas Arabic spelling is simple and virtually phonetic.

- (7 b) (Silent Letters) (24 words)

Result: These English words were difficult for Arabic speakers, since there is a match between Arabic orthography and pronunciation, and a single letter represents a single sound.

- (7 c) (Consonant Doubling) (22 words)

Result: These English words were difficult for Arabic speakers, since gemination is common in Arabic.

- (7 d) (Syllabic Consonants) (16 words)

Result: These English words were difficult for Arabic speakers, since Arabic makes no use of syllabic consonants.

Errors in Consonant Clusters (146 words)

- Class 8: (Initial Consonant Clusters) (44 words)

Result: These English initial consonant clusters were difficult for Arabic speakers, since English permits much longer initial consonant clusters than Arabic and initial three-element clusters do not occur in Arabic.

- Class 9: (Medial Consonant Clusters) (11 words)

Result: These English medial consonant clusters were difficult for Arabic speakers, since Arabic does not permit more than two consonants word-medially.

- Class 10: (Final Consonant Clusters) (91 words)

- (10 a) (Clusters of two consonants) (52 words):

Result: Arabic speakers found varying degrees of difficulty with final two consonant clusters, since Arabic permits some two consonant clusters word-finally.

- (10 b) (Clusters of three consonants) (34 words)

Result: These English final three consonant clusters were difficult for Arabic speakers, since Arabic does not permit three-element consonant clusters word finally.

- (10 c) (Clusters of four consonants) (5 words)

Result: These English final four consonant clusters were difficult for Arabic speakers, since Arabic does not permit four-element consonant clusters word finally.

4.3.1.5 Word Group II: Errors in Vowels

4.3.1.5.1 The Subjects' Overall Performance in Word Group II

This section shows the total number and percentage of all the subjects' errors in English vowels in Word Group II, by word class, as in Table 19.

Table 19: The Subjects' Errors in English Vowels, Word Group I, by Word Class

Word Class	No. of Errors	% of Errors
Class 11: Short Vowels	76	9.38
Class 12: Long Vowels	72	13.33
Class 13: Diphthongs	107	14.86
Class 14: Easily Confused Vowels		
(14 a): Short Vowels	102	16.19
(14 b): Long Vowels	94	10.44
(14 c): Diphthongs	126	12.73
Class 15: Intrusive Vowels	63	16.19
Class 16: Vowel Reduction to Schwa	72	16
Class 17: Vowel Length	113	11.41
Total	825	17.97

The subjects' total number and percentage of errors in pronouncing English vowels in Word Group II, by word class show the following. First, the subjects found different degrees of difficulty in producing English vowels. Second, the subjects' performance is best in pronouncing English short vowels (9.38%) and worst in using intrusive vowels to break consonant clusters as a syllable repair strategy (28%). Third, the subjects' production of English vowels confirms this research hypothesis that the subjects substitute their own Arabic sounds (i.e. L1 negative transfer) for the unfamiliar English ones, producing incorrect English sounds.

4.3.1.6 Errors in Vowels

4.3.1.6.1 Class 11: Short Vowels

The subjects confused most of the short vowels with each other, for example, /ɪ/ with /e/, /æ/ with /ɑ:/, /ʊ/ with /ɒ/ etc. In addition, they replaced /ə/, which occurs only in unstressed positions in English, with /a/ as in 'sailor' */seɪlə/ as shown in Table 20.

Table 20: Arabs' Errors in English Short Vowels

Sound	Tested word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/ɪ/	sit	/sɪt/	/e/	/set/	5	11.11
/e/	set	/set/	/ɪ/	/sɪt/	3	6.67
	deaf	/def/	/i:/	/di:f/	6	13.33
/æ/	pad	/pæd/	/ɑ:/	/pɑ:d/	2	4.44
/ɒ/	gone	/ɡɒn/	/ʌ/	/gʌn/	14	31.11
/ʊ/	look	/lʊk/	/ɒ/	/lɒk/	6	13.33
	wood	/wʊd/	/u:/	/wu:d/	2	4.44
/ʌ/	hut	/hʌt/	/ʊ/	/hʊt/	4	8.89
/ə/	breakfast	/brekfəst/	/a/	/brekfast/	34	75.56
				Total	76	9.38

It is noticeable that the subjects have poor mastery of English short vowels, since in Arabic it is the consonants and long vowels which give meaning. English has a greater number of short vowels (7) than Arabic (3); hence some of these English short vowels do not occur in Arabic. In addition, each English short vowel can be represented by different letters which is very confusing to the Arab subjects and lead to errors. For example, /ɪ/ can be represented by 'i', 'y', 'e', 'ie' and 'a', /ʌ/ by 'u', 'o', 'ou', 'oo' and 'oe' and /ɒ/ by 'o', 'a', 'ou', 'ow' and 'au'. Therefore, some subjects substituted their own Arabic short vowel sounds for the unfamiliar English ones (i.e. L1 negative transfer). Arabic is also phonetic and some subjects pronounced some words like 'deaf', 'wood' and 'look' in a phonetic way. They considered the letters 'ea' and 'oo' to correspond to the vowel sounds /i:/ and /u:/ respectively.

Several writers such as O'Connor (1967) mention that Arabs confuse /ɪ/ with /e/. In addition, Kenworthy (1987) and Baker (1982) state that Arab learners also confuse /æ/ with /ʌ/ and /ɑ:/. The Arab subjects confused /ɪ/ with /e/ and /æ/ with /ɑ:/. This confirms the views of O'Connor (1967), Kenworthy (1987) and Baker (1982). Unlike the previous studies, this research found that some Arab subjects mispronounced /ɪ/ as /aɪ/ or /i:/, /e/ as /i:/, /æ/ as /eɪ/ or /e/, /ɒ/ as /ʌ/, /ʊ/ as /ɒ/ or /u:/, /ʌ/ as /ɒ/ or /ʊ/ and /ə/ as /a/.

4.3.1.6.2 Class 12: Long Vowels

The subjects found some difficulty in pronouncing English long vowels. They confused /i:/ with /ɪ/, /u:/ with /ɔ:/ and /ɜ:/ with /ɔ:/ or Arabic /e:/ as

in Table 21.

Table 21: Arabs' Errors in English Long Vowels

Sound	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/i:/	field	/fi:ld/	/ɪ/	/fild/	3	6.67
/u:/	through	/θru:/	/ɔ:/	/θrɔ:/	16	35.56
	food	/fu:d/	/ʊ/	/fʊd/	2	4.44
	boot	/bu:t/	/ʊə/	/buət/	2	4.44
/ɑ:/	heart	/hɑ:t/	/ɜ:/	/hɜ:t/	11	24.44
/ɔ:/	board	/bɔ:d/	/ɒ/	/brɒd/	3	6.67
/ɜ:/	work	/wɜ:k/	/ɔ:/	/wɔ:k/	33	73.33
	word	/wɜ:d/	/e:/	/we:d/	2	4.44
				Total	72	13.33

English and Arabic has the same number of long vowels. However, each English long vowel can be represented by different letters which is very confusing to the Arab subjects and lead to errors. For example, /i:/ can be represented by 'ie', 'ei', 'ey', 'ee', 'ea' and 'e', / and /ɔ:/ by 'or', 'aw', 'ou', 'au', 'a' and 'ore' and /u:/ by 'oo', 'o', 'ou', 'u' and 'ew', hence some of these English short vowels do not occur in Arabic. Therefore, some subjects substituted their own Arabic short vowel sounds for the unfamiliar English ones. Arabic is also phonetic and some subjects pronounced some words like 'deaf', 'wood' and 'look' in a phonetic way. They considered the letters 'ea' and 'oo' to correspond to the vowel sounds /i:/ and /u:/ respectively.

Smith (1987) says that Arabs confuse /ɒ/ with /ɔ:/. O'Connor (1967) also mentions that Arabs do not always make /ɑ:/ long and therefore confuse it with /ʌ/ or /ɒ/. Furthermore, he says that they replace /ɜ:/ by /ʌ/ or /e/ followed by Arabic /ɾ/. Some Arab subjects confused /ɔ:/ with /ɒ/. This agrees with Smith (1987). Unlike the previous studies, this research found that some subjects mispronounced /i:/ as /ɪ/ or /e/, /u:/ as /ɔ:/, /ʊ/ or /ʊə/, /ɑ:/ as /ɜ:/ or /ə/ and /ɜ:/ as /ɔ:/ or Arabic /e:/. This does not agree with O'Connor (1967).

4.3.1.6.3 Class 13: Diphthongs

Some English diphthongs presented problems to the subjects. As a result, they confused /eɪ/ with /æ/ or Arabic /e:/, /əʊ/ with /ɔ:/ or Arabic /o:/, /eə/ with /ɪə/ or Arabic /e:/ and /ʊə/ with Arabic /u:/. But they found no

difficulty with /ɔɪ/ and /aʊ/ as in ‘point’ and ‘mouth’ respectively as in Table 22.

Table 22: Arabs’ Errors in English Diphthongs

Sound	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/eɪ/	fate	/feɪt/	/æ/	/fæt/	13	28.89
	raid	/reɪd/	/e:/	/fe:t/	2	4.44
			/aɪ/	/raɪd/	6	13.33
/aɪ/	bite	/baɪt/	/ɪ/	/bɪt/	17	37.78
/əʊ/	grow	/grəʊ/	/ɔ:/	/grɔ:/	3	6.67
	stove	/stəʊv/	/o:/	/sto:v/	5	11.11
/ɪə/	beard	/bɪəd/	/ɜ:/	/bɜ:d/	8	17.78
			/i:/	/bi:d/	6	13.33
/eə/	bear	/beə/	/ɪə/	/bɪə/	28	62.22
			/e:/	/be:r/	8	17.78
/ʊə/	tour	/tʊə/	/aʊə/	/taʊə/	5	11.11
			/u:/	/tu:r/	6	13.33
				Total	107	14.86

The explanation of the subjects’ erroneous pronunciation is given as follows:

English has eight diphthongs, whereas Arabic has none. Therefore, some Arab subjects found difficulty in pronouncing English diphthongs. In addition, each English diphthong can be represented by different letters which is very confusing to the Arab subjects and lead to errors. For example, /eɪ/ can be represented by ‘a’, ‘ai’, ‘ay’, ‘ei’, ‘ey’ and ‘ea’, /aɪ/ by ‘i’, ‘y’, ‘igh’, ‘eigh’, ‘ie’, ‘ye’, ‘ei’ and ‘ai’ and ‘əʊ’ by ‘o’, ‘oo’, ‘oe’, ‘ou’ and ‘ow’. The subjects found no difficulty with /ɔɪ/ and /aʊ/ as iArabic has no diphthongs but it has similar phonetic combinations which consist of a vowel + a consonant such as /ay/ as in /kay/ ‘in order to’ and /say-ya:ra/ ‘car’ and /aw/ as in /ʔaw/ ‘or’ and /ʔawla:d/ ‘boys’. In addition, the main difference between Arabic long vowels and English diphthongs is that the former are long without any glide and the latter need the glide to be pronounced correctly. The subjects, therefore, pronounced some English diphthongs without glide.

Some writers, such as Kenworthy (1987), state that Arabs find the ‘caught/coat’ contrast extremely troublesome (/ɔ:/ vs. /əʊ/). Arabs, therefore, tend to use their Arabic /o/ sound for both. She also says that

Arabic has no diphthongs, but these seem rarely to cause problems. But Smith (1987) and Baker (1982) mention that Arab learners confuse /eɪ/ with /e/ or /aɪ/ and /əʊ/ with /ɒ/, /ɔ:/ or /ɜ:/. Furthermore, Baker (1982) states that Arabs confuse /eə/ with /i:/. The results in Table 22 support the views of Smith (1987) and Baker (1982) that Arabs confuse /eɪ/ with /aɪ/. In addition, they also agree with the previous authors and Kenworthy (1987) that Arabs confuse /əʊ/ with /ɔ:/. Unlike the previous studies, this research found that some Arab subjects pronounced /eɪ/ as /æ/, /e:/ or /i:/, /aɪ/ as /ɪ/, /ɪə/ as /ɜ:/, /eə/ as /ɪə/ and /ʊə/ as /aʊə/ or /u:/. This conflicts with the view of Kenworthy (1987) that Arabs rarely have problems with English diphthongs and with Baker (1982) that Arabs pronounce /eə/ as /i:/.

4.3.1.6.4 Class 14: Easily Confused Vowels

Due to the great difficulty which English vowels present to Arabs, these vowels were tested twice using different lists of words. This, in turn, played a role in confirming the previous results and adding some new findings as well, as shown in Table 23.

Table 23: Arabs' Errors in English Easily Confused Vowels

Sound (s)	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
<i>Class 14 a:</i> <i>Short Vowels:</i> /ɪ//e/	miss	/mɪs/	/e/	/mes/	15	33.33
/ʌ//ɒ/	luck	/lʌk/	/ɒ/	/lɒk/	16	35.56
/ɒ//ɔ:/	caught	/kɔ:t/	/ɒ/	/kɒt/	11	24.44
/ɒ//ʌ/	gone	/gɒn/	/ʌ/	/gʌn/	29	64.44
	gun	/gʌn/	/ɒ/	/gɒn/	5	11.11
/ʊ//ɒ/	put	/pʊt/	/ɒ/	/pɒt/	13	28.89
	look	/lʊk/	/ɒ/	/lɒk/	13	28.89
<i>Class 14 b:</i> <i>Long Vowels:</i> /i://ɪ/	sheep	/ʃi:p/	/ɪ/	/ʃɪp/	4	8.89
/ɜ://ɪɑ:/	hurt	/hɜ:t/	/ɑ:/	/hɑ:t/	22	48.89
	heart	/hɑ:t/	/ɜ:/	/hɜ:t/	17	37.78
/ɜ://ɔ:/	worm	/wɜ:m/	/ɔ:/	/wɔ:m/	23	51.11
	warm	/wɔ:m/	/ɑ:/	/wɑ:m/	14	31.11
/ɑ://ʌ/	staff	/stɑ:f/	/ʌ/	/stʌf/	10	22.22
/ɔ://əʊ/	phone	/fəʊn/	/ɔ:/	/fɔ:n/	4	8.89

<i>Class 14 c: Diphthongs:</i>						
/eɪ/ / e/	sail	/seɪl/	/e/	/sel/	3	6.67
/eɪ/ / aɪ/	vain	/veɪn/	/aɪ/	/vaɪn/	14	31.11
/eɪ / /æ/	hate	/heɪt/	/æ /	/hæt/	10	22.22
/aɪ/ /ɪ/	bite	/baɪt/	/ɪ/	/bɪt/	8	17.78
/eə/ / ɪə/	bear	/beə/	/ɪə/	/bɪə/	27	60.00
/ɪə/ / ɜ:/	beard	/bɪəd/	/ɜ:/	/bɜ:d/	23	51.11
/əʊ/ / ɔ:/	boat	/bəʊt/	/ɔ:/	/bɔ:t/	41	91.11
				Total	322	12.78

The explanation of the subjects' erroneous pronunciation is given as follows:

The results in Table 23 confirm the Arab subjects' poor mastery of English vowels and match the previous findings regarding Arabs' errors in English short vowels (Table 20), long vowels (Table 21) and diphthongs (Table 22). In addition, it was found that the Arab subjects confused /ɑ:/ with /ʌ/ and /eɪ/ with /e/.

4.3.1.6.5 Class 15: Intrusive Vowels

The subjects had a tendency to insert an extra vowel into some English consonant combinations. This commonly occurs in pronouncing many English verbs such as 'hanged' */hæŋɡɪd/ as in Table 24.

Table 24: Arabs' Errors by Using Intrusive Vowels

Sound	Tested Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/spr/	spring	/sprɪŋ/	/ɪspr/	/ɪsprɪŋ/	20	44.44
			/ʔɪspr/	/ʔɪsprɪŋ/	8	17.78
/ndʒd/	changed	/tʃeɪndʒd/	/ndʒɪd/	/tʃeɪndʒɪd/	19	42.22
/ndf/	grandfather	/grændfɑ:ðə/	/ndɪf/	/grændɪfɑ:ðə/	16	35.56
				Total	63	28

The explanation of the subjects' erroneous pronunciation is given as follows:

English permits much longer initial, medial and final consonant clusters than Arabic. As a result, many subjects found difficulties in pronouncing English consonant sequences. Kharma and Hajjaj (1997) mention that Arabs often introduce an extra vowel into some English words. The findings in Table 24 support the view of Kharma and Hajjaj (1997).

4.3.1.6.6 Class 16: Vowel Reduction to Schwa

Arabs find no problem in pronouncing function words such as, ‘to’, ‘are’ and ‘for’, when the full form is used in connected speech. But they find great difficulty in pronouncing the weak form of the same words which includes vowel reduction in unstressed syllables to schwa /ə/ as in Table 25.

Table 25: Arabs’ Errors in Vowel Reduction to Schwa

Function Word	Full Form	Weak form	Error	No. of Errors	% of Errors
are	/ɑ:/ Here they are. /hɪə ðeɪ ɑ:/	/ə/ They are coming. /ðeɪ ə kʌmɪŋ/	/ɑ:/ They are coming. /ðeɪ ɑ: kʌmɪŋ/	35	77.78
at	/æt/ Shoot at him. /ʃu:t æt hɪm/	/ət/ Stop at the next house. /stɒp ət ðə nekstəʊs/	/æt/ Stop at the next house. /stɒp æt ðə nekstəʊs/	37	82.22
			Total	72	16

The explanation of the subjects’ erroneous pronunciation is given as follows:

In English, function words such as ‘at’, ‘for’ and ‘does’ can have full and weak forms. In their weak form, the vowel is reduced to schwa /ə/ in connected speech. Unlike English, the vowels of function words in Arabic keep their ‘full value’ whether in stressed or unstressed positions. As a result, the subjects found great difficulty in reducing the vowels of English function words to schwa in unstressed positions.

Kenworthy (1987) points out that function words in Arabic do not have two forms – vowels in words in unstressed position keep their ‘full’ value, unlike vowels in unstressed words in English which are reduced to ‘schwa’. This can give rise to the following errors: (a) use of full forms of pronouns and (b) use of full forms of auxiliary verbs when the weak form should be used. The results in Table 25 confirm the view of Kenworthy (1987).

4.3.1.6.7 Class 17: Vowel Length

Vowel length in English presented a problem to the subjects. They had a tendency to make all long vowels equally long regardless of the voicing of the following consonants. For example, they would make the vowel in the word ‘lose’ /lu:z/ as long as that in the word ‘loose’ /lu:s/ as shown in Table 26.

Table 26: Arabs’ Errors in English Vowel Length

Vowel	Vowel + v.less consonant <i>(Vowel becomes shorter)</i>	Vowel + v.ed consonant <i>(Vowel becomes longer)</i>	Error <i>(The same length)</i>	No. of Errors	% of Errors
/æ/	cap /kæp/	cab /kæb/	both as ‘cap’	30	66.67
/i:/	belief /bili:f/	believe /bili:v/	both as ‘belief’	43	95.56
/u:/	loose /lu:s/	lose /lu:z/	both as ‘loose’	40	88.89
			Total	113	11.41

The explanation of the subjects’ erroneous pronunciation is given as follows:

The majority of the subjects made all English long vowels equally long and all short vowels equally short. This is because in Arabic, vowels vary in length regardless of the following consonant. In addition, this length can differentiate between the meaning of some words such as /ʕa:d/ ‘came back’ and /ʕadd/ ‘counted’. In English, vowel length depends on the voicing of the following consonant. Vowels are regularly longer before syllable-final voiced consonants than before voiceless consonants.

Kharma and Hajjaj (1997) mention that Arab learners find difficulty in determining the length of the vowel preceding final voiced or voiceless consonants as in /serf/ ‘safe’ and /serv/ ‘save’. On the contrary, Nasr (1963) states that length in English does not constitute a phonological problem for the Arab student. The findings in Table 26 support the view of Kharma and Hajjaj (1997) but not that of Nasr (1963).

4.3.1.7 Summary of the Subjects' Overall Vowel Errors Patterns: Word Group II

The results in Word Group II reveal that many subjects have not yet mastered English vowels. The summary of the subjects' overall vowel error patterns in this word group is now shown.

Word Group II: (Vowels) (102 words):

Result: Arabic speakers had difficulty with some English vowels and substituted their own Arabic vowel sounds for the unfamiliar English ones (i.e. L1 negative transfer), producing incorrect English vowels.

- Class 11: (Short Vowels) (18 words)

Result: Some of the English short vowels were difficult for Arabic speakers, since English has a greater number of vowels than Arabic.

- Class 12: (Long Vowels) (12 words)

Result: Some of the English long vowels were difficult for Arabic speakers, since English and Arabic have two different vowel structures or patterns.

- Class 13: (Diphthongs) (16 words)

Result: Some of the English diphthongs were difficult for Arabic speakers, since Arabic has no diphthongs.

- Class 14: (Easily Confused Vowels) (56 words)

The poor mastery of English vowels is the most noticeable feature in the English speech of Arabic speakers. Therefore, English vowels were tested twice using different lists of words.

- (14 a): (Short Vowels) (14 words)

Result: Some of the English short vowels were difficult for Arabic Speakers.

- (14 b): (Long Vowels) (20 words)

Result: Some of the English long vowels were difficult for Arabic Speakers.

- (14 c): (Diphthongs) (22 words)

Result: Some of the English diphthongs were difficult for Arabic Speakers.

- Class 15: (Intrusive Vowels) (5 words)

Result: Some of these consonant clusters were difficult for Arabic speakers and they used an intrusive vowel as a cluster breaker.

Class 16: (Vowel Reduction to Schwa) (10 words)

Result: Reducing the vowels of English function words to schwa /ə/ was difficult for Arabic speakers, since function words in Arabic do not have two forms and unstressed vowels keep their full value.

- Class 17: (Vowel Length) (22 words)

Result: Vowel length was difficult for Arabic speakers, since Arabic vowels vary in length regardless of the following consonant.

4.3.1.8 Word Group III: Errors in Word Stress

4.3.1.8.1 The Subjects' Overall Performance in Word Group III

This section shows the total number and percentage of all the subjects' errors in English main word stress in Word Group III, by word class, as in Table 27.

Table 27: The Subjects' Errors in Main Word Stress, Word Group III, by Word Class

Word Class	No. of Errors	% of Errors
Class 18: Unstressed Final V: or VV	112	24.89
Class 19: Unstressed Final -CVVC	169	31.29
Class 20: Unstressed Final -CVCC	134	18.61
Class 21: the CV'CVCV(C) pattern	39	21.67
Class 22: Unstressed Heavy Penult	89	16.48
Class 23: Stressed Preantepenult	138	25.56
Class 24: Stress Contrasts	58	10.74
Class 25: Compound Word Stress	159	29.44
Total	898	66.54

The subjects' total number and percentage of errors in English main word stress in Word Group III, by word class show the following. First, the majority of the subjects found difficulty in assigning main stress to

English words. Second, the subjects' performance is best in stress contrasts (10.74%) and worst in stressing English words ending in a superheavy CVVC syllable (31.29%). Third, the subjects' production of English main word stress confirms this research hypothesis that the subjects apply Arabic stress rules instead of English stress rules, producing incorrect English stress patterns. This shows that the incorrectly produced items are attributed to L1 Arabic negative transfer.

An item analysis shows the frequency of main word stress errors by the subjects. If the tested word is common, the subjects just repeat what they have learnt or heard before. But if it is uncommon, they try to guess its stressing from the spelling. How familiar the item is to them is very important: the more common the spoken form and correct stressing of the item, the fewer errors the subjects make in English stress placement. The same applies to a native English speaker when he comes across a new or unfamiliar English word (e.g. scientific word), he will often mispronounce or wrongly stress it. It was expected that the subjects would make fewer errors while producing the following items: (a) commonly used or favourite words and (b) key words in their field of specialisation.

4.3.1.9 Simple Word Stress

4.3.1.9.1 Class 18: Unstressed Final V: or VV

The subjects had a tendency to wrongly stress the last syllable of English words ending in a long vowel or a diphthong as in Table 28.

Table 28: Arabs' Errors in Unstressed Final V: or VV

Tested Word	Correct Stress	Incorrect Stress	No. of Errors	% of Errors
multiply	/ˈmʌltɪplai/	/mʌltrɪ'blaɪ/	26	57.78
igloo	/ɪgloo:/	/ɪg'lu:/	20	44.44
beautify	/ˈbju:tɪfaɪ/	/bju:trɪ'faɪ/	43	95.56
cargo	/ˈkɑ:gəʊ/	/kɑ:'gəʊ/	23	51.11
		Total	112	24.89

A comparison between English and Arabic word stress rules in Chapter 3 reveals that the majority of the subjects stressed English words according to the stress rules of Arabic (i.e. L1 negative transfer). Many subjects stressed the last syllable of English words ending in unstressed final V: or VV, since Arabic stress rules require a final heavy CV: to receive main stress. Final stress is the unmarked stress pattern for Arabic words ending

in a long vowel as in /ʔa'bu:/ 'his father', /ʔa.'xu:/ 'his brother', /da.ra.'bu:/ 'they hit him', /kata'bu:/ 'they wrote it (s.m.)', /ʔakal'ti:/ 'you ate it (s.m.)' and /rasa'mu:/ 'they drew it (s.m.)'.

According to Smith (1987), Arabic speakers have problems grasping the unpredictable nature of English word stress. Unlike the previous studies, the results in Table 28 show that twenty subjects pronounced 'igloo' as */ɪg'lu:/ and forty three subjects pronounced 'beautify' as */bju:t'fai/.

4.3.1.9.2 Class 19: Unstressed Final CVVC

Many subjects wrongly stressed the last syllable of English words ending in a long vowel or a diphthong plus a consonant such as 'multitude' and 'exercise', as in Table 29.

Table 29: Arabs' Errors in Unstressed Final CVVC

Tested Word	Correct Stress	Incorrect Stress	No. of Errors	% of Errors
substitute	/sʌbstɪtʃu:t/	/sʌbstɪtʃu:t/	43	95.56
gratitude	/ˈgrætɪtʃu:d/	/grætɪtʃu:d/	42	93.33
criticise	/ˈkrɪtɪsaɪz/	/krɪtɪsaɪz/	40	88.89
telescope	/ˈtelɪskəʊp/	/telɪs'kəʊp/	44	97.78
		Total	169	31.29

The subjects stressed the last syllable of English words ending in an unstressed -CVVC, since in Arabic, a final superheavy -CVVC receives main stress (i.e. L1 negative transfer). Final stress is the unmarked stress pattern for Arabic words ending in a long vowel plus a consonant as in /sa.ka.'kiin/ 'knives', /ta.la.'miið/ 'pupils', /ɣo.'la:f/ 'cover', /ʔaL.'La:h/ 'God', /mə.h'ðu:ð/ 'lucky' /mu.fta:h/ 'key', /bu.'ju:t/ 'houses', /sa.'ʕi:d/ 'happy', /ki.'ta:b/ 'book' and /mi.'da:n/ 'square'.

Forty three subjects pronounced 'substitute' as */sʌbstɪtʃu:t/ and forty four subjects pronounced 'telescope' as */telɪs'kəʊp/. This confirms the view of Kenworthy (1987) that Arab learners tend to transfer some of their mother tongue habits to English word stress: in words ending in a diphthong or a long vowel plus a consonant as in 'institute', Arabs tend also to stress the final syllable.

4.3.1.9.3 Class 20: Unstressed Final CVCC

English words ending in a vowel plus two consonants constituted a problem to the subjects. They wrongly stressed the last syllable as in Table 30.

Table 30: Arabs' Errors in Unstressed Final CVCC

Tested Word	Correct stress	Incorrect Stress	No. of Errors	% of Errors
scientist	/ˈsaɪntɪst/	/saɪən'tɪst/	43	95.56
product	/ˈprɒdʌkt/	/brɒ'dʌkt/	42	93.33
advertisement	/əd'vɜːtɪsmənt/	/ædvɜːtaɪz'ment	27	60.00
conversant	/kən'vɜːsnt/	/kənvɜː'sænt/	22	48.89
		Total	134	18.61

The subjects stressed the last syllable of English words ending in an unstressed –CVCC, since Arabic words are stressed on the last syllable when they end in a long vowel plus two consonants (i.e. L1 negative transfer). Final stress is the unmarked stress pattern for Arabic words ending in a superheavy –CVCC, as in /ka.'tʌb/ 'I wrote', /da.'xʌl/ 'I went in' and /fi.'hɪnt/ 'I understood', /?a.'kʌl/ 'you (m.sing) ate', /sa.'fɑːt/ 'I travelled and /Ta.'bʌx/ 'I cooked'.

The results in Table 30 reveal that forty three subjects pronounced 'scientist' as */saɪn'tɪst/ and twenty seven subjects pronounced 'ad'vertisement' as */ædvɜːtaɪz'ment/. This agrees with Kenworthy (1987) that in English words ending in -VCC such as 'expert', Arabs tend to stress the final syllable.

4.3.1.9.4 Class 21: The CV'CVCV(C) Syllabic Pattern

The subjects wrongly stressed the first syllable of English words having the syllabic structure CV'CVCV(C) as shown in Table 31.

Table 31: Arabs' Errors in the CV'CVCV(C) Syllabic Pattern

Tested Word	Correct Stress	Incorrect Stress	No. of Errors	% of Errors
pacific	/pə'sɪfɪk/	/pæsɪfɪk/	15	33.33
terrific	/tə'rɪfɪk/	/tɛrɪfɪk/	13	28.89
deposit	/dɪ'pɒzɪt/	/dɪbɒzɪt /	11	24.44
		Total	39	21.67

The subjects stressed the first syllable of English words having the syllabic pattern CVCV CV(C), since Arabic words having the syllabic structure CVCVCV(C) are stressed on the first syllable (i.e. L1 negative transfer). Antepenultimate stress is the unmarked stress pattern for Arabic words

with the syllabic pattern CVCVCV(C), as in /'ka.ta.ba/ 'he wrote', /'ma.li.ka/ 'queen', /'bu.xa.la/ 'misers', /'fu.ra.ka/ 'partners', /'ka.li.ma/ 'word', /'ka.ta.bat/ 'she wrote', /'ʔa.ka.lat/ 'she ate' and /'ʔa.ba.dan/ 'never'.

Unlike the previous studies, the results in Table 30 reveal that fifteen subjects pronounced 'pa'cific' as */'pæsɪfɪk/ and thirteen subjects pronounced 'so'licit' as */'sɒlɪsɪt/.

4.3.1.9.5 Class 22: Unstressed Heavy Penult

The subjects stressed the penultimate syllable in English words stressed on the antepenultimate such as 'sympathy' as in Table 32.

Table 32: Arabs' Errors in Unstressed Heavy Penult

Tested Word	Correct Stress	Incorrect Stress	No. of Errors	% of Errors
silently	/'saɪləntli/	/sar'lentli/	22	48.89
calendar	/'kælɪndə/	/kə'lɪndə/	23	51.11
cylinder	/'sɪlɪndə/	/sɪ'lɪndə/	13	28.89
protestant	/'prɒtɪstənt/	/brɒ'tɪstənt/	31	68.89
		Total	89	16.48

Many subjects stressed the penultimate syllable of English words having the stress on the antepenult, since it is a characteristic of Arabic that a heavy penult receives main stress (i.e. L1 negative transfer). Penultimate stress is the unmarked stress pattern for Arabic words with a heavy penultimate syllable, as in /mu.'dar.ris/ 'teacher (m.sing)', /mu.'han.dis/ 'engineer (m.sing)', /mu.'maθ.θil/ 'actor (m.sing)', /ji.'fah.him/ 'to explain', /ka.'ra:.si/ 'chairs', /'sa:.kin/ 'inhabited (m. sg.)', /'mar.kaz/ 'centre', /'ʃam.ʕa/ 'candle', /'muʃ.rif/ 'supervisor' and /'ʔu.rub.bi/ 'European (m.sing)'.

4.3.1.9.6 Class 23: Stressed Preantepenult

The subjects had a tendency to stress the antepenultimate syllable in English words stressed on the pre-antepenultimate such as 'secondary' as in Table 33.

Table 33: Arabs' Errors in Stressed Preantepenult

Tested Word	Correct Stress	Incorrect Stress	No. of Errors	% of Errors
necessary	/ˈnesəsəri/	/nəˈsesəri/	27	60.00
accuracy	/ˈækjərəsi/	/ækˈjərəsi/	43	95.56
category	/ˈkætəgəri/	/kæˈteɡəri/	40	88.89
demonstrator	/ˈdemənstreɪtə/	/demənˈstreɪtə/	28	62.22
		Total	138	25.56

Many subjects stressed the antepenultimate syllable of English words having the stress on the preantepenultimate, since Arabic stress never precedes the antepenultimate syllable (i.e. always inside the three syllable window) as in /mux.ˈta.li.fa/ ‘different (f. sing.)’, /ka.ta.ˈbi.tu/ ‘she wrote it’, /ra.sa.ˈmi.tu/ ‘she drew it (m.sing.)’, /ʔad.ˈwi.ya.tu/ ‘his drugs’, /fa.ja.ˈra.tu/ ‘his tree’, /ka.sa.ˈri.tu/ ‘she broke it (m.sing.)’, /fa.ta.ˈhi.tu/ ‘she opened it (m.sing.)’ and /say.ya.ˈra.tu/ ‘his car’.

Unlike the previous studies, Table 32 reveals that forty subjects pronounced ‘category’ as */kæˈteɡəri/ and twenty eight subjects pronounced ‘demonstrator’ as */demənˈstreɪtə/.

4.3.1.9.7 Class 24: Stress Contrasts

The subjects found great difficulty in distinguishing between English words with identical spelling used as either a verb or a noun such as ‘object (n.)/ob’ject (v.)’. The noun is stressed on the first syllable and the verb on the second. However, the subjects wrongly stressed these words either both as nouns or verbs as in Table 34.

Table 34: Arabs' Errors in Stress Contrasts

Tested Word	Correct Stress	Incorrect Stress	No. of Errors	% of Errors
our ‘present’	/aʊə ˈpreznt/	-	0	0
we ‘present’	/wi: ˈprɪznt/	/wi: ˈprɪznt/	33	73.33
a ‘permit’	/ə ˈpɜ:mɪt/	/ə pəˈmɪt/	25	55.56
to ‘permit’	/tə pəˈmɪt/	-	0	0
		Total	58	10.74

In English, some pairs of two-syllable words can be used as either a noun or a verb. Nouns are stressed on the first syllable, whereas verbs on the

second as follows: 'present (n.)/pre'sent (v.), 'object (n.)/ob'ject (v.), 'permit (n.)/perm'it, 'desert (n.)/de'sert (v.), 'contest (n.)/con'test (v.), 'protest (n.)/pro'test (v.), 'insult (n.)/in'sult (v.) and 'subject (n.)/sub'ject (v.). Arabic rarely uses stress to differentiate between pairs of words with identical spelling. In Arabic, contrastive stress is the marked stress pattern and Arabic instead uses word order to show strong contrast. The lowest percentage of errors corresponds to the words 'our 'present' and 'to per'mit', since the subjects commonly use them. Specifically, many subjects are familiar with the English noun 'present' which they use a lot in contexts like 'I will give you a present' and 'the simple present tense'.

Kenworthy (1987) mentions that since Arabic uses word order to show strong contrast, Arab learners will be unfamiliar with the use of stress to show contrast as in English. Furthermore, Smith (1987) states that the idea that stress can alter meaning as in 'con'vict' (verb) and 'convict' (noun) is completely strange. The findings in Table 32 confirms the views of Kenworthy (1987) and Smith (1987).

4.3.1.10 Class 25: Compound Word Stress

English compound nouns stressed on their first element constituted a problem for the subjects. As a consequence, they assigned these words either double stress or stressed the second element as in Table 35.

Table 35: Arabs' Errors in Compound Word Stress

Compound Word	Correct Stress	Incorrect Stress	No. of Errors	% of Errors
blacksmith	/ˈblæksmɪθ/	/ˈblæk'smɪθ/	38	84.44
greengrocer	/ˈɡriːnɡrəʊsə/	/ˈɡriːn'grəʊsə/	41	91.11
sheepdog	/ˈʃiːpdɒɡ/	/ˈʃiːp'dɒɡ/	42	93.33
greenhouse	/ˈɡriːnhaʊs/	/ˈɡriːn'haʊs/	38	84.44
		Total	159	29.44

Arabic has at least two main stress patterns of compounds (Heliel, 1972):

(A) Compounds with main stress on the second word as in
 /fustan 'sahra/ 'a night dress' /Ta:biʃ ba'ri:d/ 'postage stamp'
 /fu:l su'da:ni/'peanuts' /?iʃʃarq il-'awsat/ 'Middle East'

(B) Compounds with two main stresses, one placed on each word as in
 /'janta 'wara?/ 'a paper bag' /ga'wa:z 'safar/ 'passport'
 /'ʕi:d 'mi'la:d/ 'birthday' /ʕa'Si:r la'mu:n/ 'lemon juice'

In English, two major groups can be distinguished (Fudge, 1984):

(A) Compounds with main stress on the first word as in
'night-dress 'mail-bag 'dining-room 'bookseller
'feedback 'paper bag 'credit card 'childbirth

(B) Compounds with two main stresses, one placed on each word as in
'leather 'belts 'good'will 'stone'wall 'week'end
'paper 'bag 'ice 'cream 'fare'well 'town 'hall

While stress pattern (A) is used in both Arabic and English, Arabic tends to have main stress on the second element of the compound and English the first element. Stress pattern (B) is the same in both languages. As a result, some subjects found difficulties in stressing English compounds with main stress on their first element, instead stressing either both elements or the second element of the compound as in Arabic (i.e. L1 negative transfer).

4.3.1.11 Summary of the Subjects' Overall Stress Patterns: Word Group III

The results in Word Group III reveal that many subjects have not yet mastered English main word stress rules and that they stress the items by applying Arabic main word stress rules. The summary of the subjects' overall stress error patterns in this word group is now shown.

• Word Group III: English Main Word Stress (90 words):

Result: The majority of the subjects applied Arabic stress rules (L1 negative transfer), producing the incorrect English main word stress.

(A) Simple Main Word Stress: (78 words):

- Class 18: Unstressed Final V: or VV (10 words)

Result: The majority of the subjects wrongly placed main stress on the final V: or VV, as in Arabic.

- Class 19 Unstressed Final –CVVC (12 words)

Result: The majority of the subjects wrongly placed main stress on the final CVVC, as in Arabic.

- Class 20: Unstressed Final –CVCC (16 words)

Result: The majority of the subjects wrongly placed main stress on the final CVCC, as in Arabic.

- Class 21: the CV'CVCV(C) Syllabic Pattern) (4 words)

Result: Some of the subjects wrongly placed main stress on the initial CV, as in Arabic.

- Class 22: Stressed Antepenult (12 words)

Result: The majority of the subjects wrongly placed main stress on the antepenult, as in Arabic, since it is common in Arabic for a heavy penult to be stressed.

- Class 23: Stressed Preantepenult (12 words)

Result: The majority of the subjects wrongly placed main stress on the antepenult, as in Arabic, since stress in Arabic never precedes the three-syllable window.

- Class 24: Stress Contrasts (12 words)

Result: Some of the subjects found difficulty in English contrastive stress, since it is not common in Arabic which uses word order to show contrast. They wrongly stressed the noun/verb pairs either both as nouns or as verbs.

(B) Class 25: Compound Main Word Stress (12 words)

Result: The majority of the subjects wrongly placed double main stress on both elements or stressed the second element in English compound nouns with main stress on their first element.

4.4 Arabs' Errors while Describing the Picture

The time taken for reading the lists of words (approx. 15 minutes) was longer than the time taken for describing the picture (approx. 5 minutes). As a result, not all the errors found in the reading occurred in the description and some errors were repeated with different percentages. The results are shown in the tables below.

4.4.1 Errors in Consonants

Table 36: Arabs' Errors in English Consonants (the Picture)

Sound	Word	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/p/	picture play	/p ^h ɪktʃə/ /p ^h leɪ/	/b/ unaspirated /p/	/bleɪ/	32	71.11
				/pɪktʃə/		
/v/	cover	/kʌvə/	/f/	/kʌfə/	6	13.33
/ð /	weather	/weðə/	/z/	/wezə/	9	20.00
/z/	houses	/haʊzɪz/	/s/	/haʊsɪz/	8	17.78
/ŋ/	reading	/ri:dɪŋ/	/n/ + /g/	/ri:dɪŋg/	8	17.78
/tʃ/	children	/tʃɪldrən/	/f/	/fɪldrən/	11	24.44
/l/	middle	/mɪdl/	/l/	/mɪdl/	5	11.11
RP /r/	far from	/fɑ: frəm/	pronounced /r/	/fɑ:r frəm/	3	6.67
				Total	92	

4.4.2 Errors in Consonant Clusters

Table 37: Arabs' Errors in English Consonant Clusters (the Picture)

Sound	Example	Correct Pronunciation	Error	Incorrect Pronunciation	No. of Errors	% of Errors
/sl/	sleep	/sli:p/	/ɪsl/ or /?ɪsl/	/ɪsli:p/ or /?ɪsli:p/	3	6.67
/z/	clothes	/kləʊðz/	/ðɪz/	/kləʊðɪz/	5	11.11
/str/	strong	/str /	/ɪstr/ or/?ɪstr/	/ɪstrɒŋ/ or /?ɪstrɒŋ/	3	6.67
				Total	11	

4.4.3 Errors in Vowels

Table 38: Arabs' Errors in English Vowels (the Picture)

Sound	Example	Correct Pronunciation	Error	Incorrect Pronunciation	No of Errors	% of Errors
/ɪ/	sit	/sɪt/	/e/	/set/	4	8.89
/ə/	director	/dɪrektə/	/ɒ/	/dɪrektɒ/	1	2.22
/ʊ/	foot	/fʊt/	/u:/	/fu:t/	3	6.67
/ʊ/	looks	/lʊks/	/ɒ/	/lɒks/	1	2.22
/i:/	beach	/bi:tʃ/	/ɪ/	/bɪtʃ/	2	4.44
/ɔ:/	football	/fʊtbɔ:l/	/ɒ/	/fɒtbɒl/	5	11.11
/ɜ:/	birds	/bɜ:dz/	/e:/	/be:dz/	1	2.22
				Total	17	

4.4.4 Errors in Word Stress

Table 39: Arabs' Errors in English Word Stress (the Picture)

Type of Error	Example	Correct Stress	Incorrect Stress	No. of Errors	% of Errors
Simple words: - ending in -cvcc	entertainment	/entə'teɪnmənt/	/entətəɪn'ment/	1	2.22
	photograph	/'fəʊtəgrɑ:f/	/fəʊtə'grɑ:f/	2	4.44
Compound words:	newspaper	/'nju:zpeɪpə/	/'nju:z'peɪpə/	3	6.67
	cameraman	/'kæməɾəmən/	/'kæməɾə'mæn/	5	11.11
			Total	11	

The findings in Tables 36–39 confirm some of the previous findings from the Arab subjects' reading of the lists of words. In addition, while describing the picture, some errors were repeated with a higher percentage than in reading the lists of words. This indicates that the subjects made more English pronunciation errors in their spontaneous speech than in reading a written text.

4.5 General Discussion

This section includes an analysis of the subjects' grouped performance and errors in English sounds and main word stress in the light of (a) factors affecting L1 interference based on James (1980), (b) results of the previous studies on L2 sounds and word stress acquisition and (c) theories of L2 acquisition in chapter 2 and the predictions based on them. This section also explains the reasons for the subjects' unexpected non-transfer, where the L1 negative transfer is blocked, producing correct English sounds and word stress patterns.

4.5.1 The Subjects' Grouped Performance

The subjects' total performance shows that their errors in English sounds and main word stress are due to L1 Arabic negative transfer. The subjects substituted their own Arabic sounds and stress rules for the unfamiliar English ones, producing incorrect English sounds and word stress patterns. The following table shows all the subjects' total errors in English sounds and main word stress in Word Groups I, II and III.

Table 40: The Subjects' % of Errors in all Word Groups

Word Group	No. of Errors	% of Errors
<i>Word Group I:</i> English Consonants (319 words)	2695	18.77
<i>Word Group II:</i> English Vowels (102 words)	825	17.97
<i>Word Group III:</i> English Word Stress (90 words)	898	66.54

In this research the subjects' total percentage of stress errors (66.54%) in Word Group III which tests English stress different from Arabic was expected to be higher than the percentage in Word Group I, consonants (18.77%) and Word Group II, vowels (17.97). This shows that the subjects have not yet mastered English main word stress rules.

The results may seem unexpected, but they reflect the real situation. Being a teacher of English in Egypt for about 6 years and knowing how Egyptian and Arab teachers of English are prepared and taught, I can confirm that pronunciation is highly neglected especially when it comes to word stress i.e. written English (90%) is taught more than spoken English (10%). It is

very rare for Arab teachers of English to explain English suprasegmental features such as word stress and intonation. This is due to the Egyptian and Arab educational systems which focus on grammar and writing and neglect pronunciation and speaking. Moreover, many of the Egyptian teachers of English are non-specialists: they studied history, philosophy or psychology (taught in Arabic) and were employed when there was a shortage of English language teachers. Hence, I am not surprised that the subjects have difficulty in English sounds in general and main word stress in particular. We have to also bear in mind that the subjects are a product of and taught by this kind of English language teacher. Therefore, the subjects are expected to be as bad as their teachers, since there was no good pronunciation model to be followed. Finally, the subjects did not make many errors in Word Group I testing consonants and Word Group II testing vowels, since many items used in these word groups are commonly used by the subjects.

The subjects' errors in English sounds and main word stress are due to many reasons such as:

- a) Most Arab countries consider English as a 'school subject' rather than a means of communication. In addition, English is taught through Arabic.
- b) Pronunciation is completely neglected as most teachers are neither phonetically trained nor in possession of the skill to teach spoken English. Thus, learners are eye-minded rather than ear-minded.
- c) Examinations test the student's knowledge of facts about the language and his ability to memorise but not his ability to use and understand English.
- d) The lack of discussing pronunciation errors related to interference between Arabic and English.
- e) Arabic and English have different sound and orthography systems, syllable structures, stress patterns and different cultural background.

The obstacles depicted above, have led to a deterioration of the standard of Arabs' spoken English. All Arab learners, therefore, should receive enough oral practice, as it is the key feature of mastering pronunciation.

4.5.2 Unexpected Non-transfer

L1 negative transfer was highly expected in Word Group I which tested English consonants, Word Group II which tested English vowels and

Word Group III which tested English word stress different from Arabic, leading to incorrect English sounds and stress patterns. However, it did not occur in some cases, producing neither sounds nor word stress errors. Similarly, unexpected non-L1 positive transfer occurred in some items and lead to errors in English sound and main word stress by the subjects.

4.5.3 Analysis of Unexpected Non-transfer

Although the main research question is to explain the reasons behind the Arab subjects' errors in English sounds and main word stress, this section explains the facts which play a part in the counterexamples to that analysis. That is analysis of the cases where the subjects have successfully overcome the problem of L1 transfer and have produced accurate stress. The analysis of these cases show that they have the following points in common:

- (a) The subjects have not mastered the rules of English sounds and main word stress and instead learnt the correctly produced items on a word-by-word basis. This shows that they have acquired the correct word stress patterns of these items in a lexical way without computing the L2 English stress parameter settings.
- (b) The subjects' correct stressing of some items was due to applying some rules of analogy of some well known words such as 'demonstrate' for 'demonstrator', 'i'magine' for 'i'maginary' and 'beauty' for 'beautify'.
- (c) Familiarity plays a part in the subjects' sounds and stress production, since most of the correctly stressed items and sounds are words which the subjects are familiar with and their correct English stressing, especially loanwords in Arabic such as 'a'genda, demo'cratic, re'gime and com'puter'.

An item analysis shows the frequency of sounds and main word stress errors by the subjects. If the tested word is common, the subjects just repeat what they have learnt or heard before. But if it is uncommon, they try to guess its pronunciation from the spelling. How familiar the item is to them is very important: the more common the spoken form and correct stressing of the item, the fewer errors the subjects make in English stress placement. The same applies to a native English speaker when he comes across a new or unfamiliar English word (e.g. scientific word), he will often mispronounce or wrongly stress it. It was expected that the subjects would make fewer errors while producing the following items: commonly used or favourite words and key words in their field of specialisation.

4.5.4 Factors Affecting L1 Interference

This section analyses the subjects' errors in English sounds and main word stress based on the factors affecting L1 interference stated in Chapter 1: Introduction, following James (1980), as follows.

(A) Amount and Nature of L2 Input

It is most likely that the subjects' errors in English sounds and main word stress were affected by this factor, since their L2 spoken English input is very limited due to three reasons. First, their lack of exposure to native spoken English for being taught by teachers who focus more on the written than the spoken form due to the demands of the Arab educational systems. Second, many teachers are not specialist teachers of English and teach English through Colloquial Arabic. Third, the lack of discussion of pronunciation errors especially the suprasegmental ones (e.g. stress and intonation) that are related to Arabic interference. The importance of L2 input (comprehensible input) is considered as the only mechanism that results in the L2 learners' increase of linguistic competence following Krashen's (1977) Monitor theory.

(B) Linguistic Distance between L1 and L2

Arabic and English are two languages which belong to two different linguistic families. Arabic is the chief member of the Semitic family of languages, whereas English belongs to the Indo-European family. Therefore, both languages are dissimilar in many sounds and features such as stress rules, and these differences are the major sources of the subjects' transfer errors (i.e. L1 negative transfer). The greater the linguistic distance between two languages, the higher the number of expected errors by the L2 speakers. The subjects' incorrect English sounds and stress patterns are mainly due to transferring their L1 Arabic sounds and main word stress rules to the tested English words.

(C) Task Focus

It is most likely that the subjects' errors in English sounds and main word stress which were due to L1 interference were related to their focus on grammatical forms (written English) rather than on 'communicative effectiveness' (spoken English). This shows that the cognitive load plays a part in the subjects' correct sounds and stressing of the items.

(D) L2 learning Stage

The subjects' were less affected by this factor which shows that beginners are more affected during the L2 learning process by interference than advanced learners, since there was not much difference in the percentage of sounds and stress errors among the three subject samples.

4.5.5 Studies on L2 Stress Production

The analysis section explains the subjects' errors in English sounds and main word stress in the light of a main L2 stress learning strategy followed in the previous studies on L2 stress production: L1 parameter settings (Archibald, 1994). This section explains that some of the subjects' stress errors are based on two other L2 stress learning strategies in the previous L2 stress studies: lexical acquisition of L2 stress (Archibald, 1997) and overgeneralisation of L2 stress rules (Caspers and Van Santon, 2006). Each one of these two L2 strategies is now discussed in detail.

4.5.5.1 Lexical Acquisition of L2 Stress

This section explains that some subjects correctly stressed some items without applying positive transfer of L1 parameter settings. It is based on the L2 English lexical storage of stress instead of stress parameter computation, following Archibald (1997). The subjects who correctly produced some items memorised their stress placement and stored it as part of their lexical entry as shown below.

Class 18: (unstressed final V: or VV)

'identify, 'holiday, 'castaway, 'carboy, 'whitlow

Class 19: (unstressed final -CVVC)

'prosecute, 'demonstrate, 'mutlitude, 'telegraph, 'carbide

Class 20: (unstressed final -CVCC)

'punishment, 'difficult, 'evident, 'applicant, 'concept, 'impact

Class 21: (the CVCVCV(C) pattern)

so'licit

Class 22: (unstressed heavy penult)

'cucumber, 'messenger, 'passenger, 'barrister, 'thermostat

Class 23: (stressed preantepenult)

'mercenary, 'characterise, 'legislative, 'matrimony, i'maginary

Class 24: (contrastive stress)

our 'protest, to pro'test, to ex'port, our 'export, to pro'gress, our 'progress

Class 25: (compound stress)

'apple tree, 'flowerpot, 'workshop, 'classroom, 'birthday

The lexical acquisition of these items shows that the Arabic speakers store the L2 English stress lexically for some items instead of applying stress parameters, producing correct L2 English stress patterns.

4.5.5.2 Overgeneralisation of L2 Stress Rules

This section explains how some subjects incorrectly stressed some items due to their overgeneralisation of L2 stress rules, following Caspers and Van Santen (2006) and Caspers and Kepinska (2011). This shows that the subjects' stress errors are not only due to interlingual factors, as discussed before, but also to intralingual factors as shown below.

Class 18: (unstressed final V: or VV)

Some subjects may have overgeneralised the final stress pattern of some well known English words to them such as 'refu'gee, trai'nee, ta'boo, bam'boo, guaran'tee, refe'ree, su'pply, re'ply and em'ploy' to the items with unstressed final V: or VV in Word Group III, Class 18, such as 'igloo, 'beautify, 'cargo and identify', producing incorrect L2 English final stress patterns.

Class 19: (unstressed final -CVVC)

Some subjects may have overgeneralised the final stress pattern of some well known English words to them such as 'com'plain, maga'zine, trans'late, pro'vide, com'pete, seven'teen, po'lice and di'vine' to the items with unstressed final -CVVC in Word Group III, Class 19, such as

'gratitude, 'substitute, 'criticise, 'telegraph and 'telescope', producing incorrect English final stress patterns.

Class 20: (unstressed final -CVCC)

Some subjects may have overgeneralised the final stress pattern of some well known English words to them such as 'pro'tect, con'sent, re'spond, su'ggest, pre'vent, ex'pect and re'lax' to the items with unstressed final – CVCC in Word Group III, Class 20, such as 'manifest, 'product, 'impotent, 'impact, 'applicant and 'occupant', producing incorrect English final stress pattern.

Class 21: (the CV'CVCV(C) pattern)

Some subjects may have overgeneralised the initial stress pattern of some well known English words to them such as 'medical, 'positive, 'memory, 'visitor, 'family, 'citizen and 'minimum' to the items with the CV'CVCV(C) syllabic pattern in Word Group III, Class 21, such as 'so'licit, te'rrific, and de'posit', producing the incorrect English stress pattern 'CVCVCV(C).

Class 22: (unstressed heavy penult)

Some subjects may have overgeneralised the stressed heavy penult pattern of some well known English words to them such as 'de'fender, a'genda, ro'mantic, re'member, ba'nana, re'corder and com'puter' to the items with unstressed heavy penult in Word Group III, Class 22, such as 'calender, 'protestant, 'barrister and 'cucumber', producing incorrect L2 English stressed heavy penult pattern.

4.5.6 Theories of L2 Acquisition

In the light of three of the six theories of L2 (phonology) acquisition: Contrastive Analysis, Error Analysis and Markedness Theory, discussed in chapter 2, predictions are made with respect to the current study. These predictions will be tested in this section, to find out whether or not they are confirmed and if the findings provide any evidence for any of the three L2 theories below.

4.5.6.1 Contrastive Analysis Hypothesis (CAH)

This section explains the reasons for the subjects' errors in English sounds and main word stress based on the differences between Arabic and English

stress rules (i.e. interlingual reasons). The results of the tested English sounds and stress patterns provide strong evidence for theories of L2 acquisition such as Contrastive Analysis Hypothesis (CAH) (Lado, 1957). According to the CAH, it was predicted that English sounds and main word stress patterns that are different from corresponding Arabic ones will cause learning difficulties for the Arabic speakers, whereas the similar sounds and stress patterns will not. The subjects' errors are due to L1 negative transfer. The results of the tested sounds and stress patterns confirmed this CAH prediction.

Some subjects made errors in English consonant sounds which are different from Arabic ones such as /p/, /v/, /ŋ/, dark /t/, syllabic consonants and consonant doubling. They also had trouble with two-element clusters beginning with /p/, /s/, /g/, /θ/, consonant + /j/, /dw/ and all three-element clusters. In addition, they inserted a vowel between the elements of medial and final clusters. Regarding vowels, the subjects confused most of the English vowels and diphthongs with each other or substituted Arabic vowels for English ones. The findings also showed that the subjects had difficulty with stressing the items ending in V:/VV, CVVC and CVCC, the CV'CVCV(C) pattern, stress contrasts, stressed preantepenult, unstressed heavy penult and compounds. By contrast, the items with sounds and stress similar to Arabic were not problematic for most of the subjects. Many subjects found difficulty in acquiring the English stress rules which are different from those in Arabic and are tested by the items in Word Groups III. Therefore, these subjects applied their different Arabic stress rules to the items (i.e. L1 negative transfer) as indicated by their high percentage of stress errors (66.54% in Word Group III). The subjects who made no errors in some English sounds and main word stress positively transferred their similar Arabic sounds and word stress rules to the items producing them correctly, as shown by their low percentage of errors in English consonants (18.77) and vowels (17.97%). The results are in line with the Contrastive Analysis Hypothesis.

4.5.6.2 Error Analysis (EA)

This section explains the reasons for the subjects' errors in English sounds and main word stress based on not only the differences between the Arabic and English sounds and stress rules (i.e. interlingual factors) but also due to intralingual factors. The findings also provide evidence for Error Analysis (EA) (Corder, 1967). According to EA, it was predicted that the sounds and main word stress errors made by the subjects are due to interlingual (i.e. due to L1 negative transfer) and intralingual factors (i.e.

due to other factors such as individual differences). The results of the tested English sounds and stress patterns confirmed this prediction, since they show that the subjects' errors in English sounds and main word stress are due to not only interlingual reasons (i.e. L1 Arabic negative transfer) but also to intralingual reasons such as hypercorrection, simplification, overgeneralisation of L2 rules, false concepts, fossilisation, lack of practice, limited exposure to native spoken English and poor teaching materials.

4.5.6.3 Markedness Theory

This section explains the reasons for the subjects' errors in English sounds and main word stress based not only on the differences between Arabic and English sounds and word stress rules (i.e. CAH), but also due to the degree of difficulty of the different sounds and word stress rules (i.e. typological markedness). The Markedness Differential Hypothesis (MDH) explains the reasons for sounds and stress errors which occur in an area of difference between Arabic and English sounds and stress rules. Table 41 shows the scale of markedness of sounds and stress production errors in all word classes by all the subjects.

Table 41: Scale of Markedness of Sounds and Stress Production Errors by Word Class; all the Subjects

	<i>No. of Errors</i>	<i>% of Errors</i>	<i>More Marked Most Difficult</i>
Class 3 (affricates):	1514	1.94	↓ <i>Less Marked Least Difficult</i>
Class 9 (medial consonant clusters):	183	36.97	
Class 19 (unstressed final -CVVC):	169	31.29	
Class 25 (compound stress):	159	29.44	
Class 15 (Intrusive Vowels):	63	28	
Class 8 (initial consonant clusters):	514	25.95	
Class 23 (stressed preantepenult):	138	25.56	
Class 18 (unstressed final V: or VV):	112	24.89	
Class 7 (orthography and pronunciation):	727	22.13	
Class 21 (the CV'CVCV(C) pattern):	39	21.67	
Class 20 (unstressed final -CVCC):	134	18.61	
Class 22 (unstressed heavy penult):	89	16.48	
Class 16 (vowel reduction to schwa)	72	16	
Class 10 (final consonant clusters):	633	15.46	
Class 2 (fricatives):	265	15.09	
Class 13 (diphthongs):	107	14.86	
Class 12 (long Vowels):	72	13.33	
Class 5 (laterals):	88	13.04	
Class 14 (easily confused vowels):	322	12.78	
Class 4 (nasals):	66	12.22	
Class 17 (vowel length):	113	11.41	
Class 24 (contrastive stress):	58	10.74	
Class 11 (short vowels):	76	9.38	
Class 1 (plosives):	62	6.89	
Class 6 (semi-vowles):	6	2.22	

4.5.6.3.1 The Markedness Differential Hypothesis (MDH)

The results of Word Group I: English consonants, Word Group II: English vowels and Word Group III: English word stress provide evidence for Eckman's (1977) Markedness Differential Hypothesis (MDH) which is a reformulation of the CAH that incorporates the notion of typological markedness. According to the MDH, it was predicted that English sounds and main word stress patterns that are both different and more marked than corresponding L1 Arabic sounds and main word stress patterns will cause learning difficulties for the Arabic speakers. The results of the tested items confirmed this MDH prediction. Table 42 shows the ranking of sounds and word stress production errors by word class.

Table 42: Ranking of Sounds and Word Stress Production Errors by Word Class

	<i>No. of Errors</i>	<i>% of Errors</i>
<i>Word Group III: English Word Stress:</i>	2695	66.54
Class 19 (Unstressed Final -CVVC):	169	31.29
Class 25 (Compound Stress):	159	29.44
Class 23 (Stressed Preantepenult):	138	25.56
Class 18 (Unstressed Final V: or VV):	112	24.89
Class 21 (the CV'CVCV(C) Pattern):	39	21.67
Class 20 (Unstressed Final -CVCC):	134	18.61
Class 22 (Unstressed Heavy penult):	89	16.48
Class 24 (Contrastive Stress):	58	10.74
<i>Word Group I: English Consonants:</i>	2695	18.77
Class 3 (Affricates):	151	41.94
Class 9 (Medial Consonant Clusters):	183	36.97
Class 8 (Initial Consonant Clusters):	514	25.95
Class 7 (Orthography and Pronunciation):	727	22.13
Class 10 (Final Consonant Clusters):	633	15.46
Class 2 (Fricatives):	265	15.09
Class 5 (Laterals):	88	13.04
Class 4 (Nasals):	66	12.22
Class 1 (Plosives):	62	6.89
Class 6 (Semi-vowles):	6	2.22
<i>Word Group II: English Vowels:</i>	825	17.97
Class 15 (Intrusive Vowels):	63	28
Class 16 (Vowel Reduction to Schwa)	72	16
Class 17 (Vowel Length):	113	11.41
Class 13 (Diphthongs):	107	14.86
Class 12 (Long Vowels):	72	13.33
Class 14 (Easily Confused Vowels):	322	12.78
Class 11 (Short Vowels):	76	9.38

4.6 Chapter Summary

This chapter presents the subjects' errors in English sounds and main word stress and the reasons behind them. It includes four sections. The first section showed the results of the production test as the subjects' errors in English consonants and the reasons behind them.

The second was their errors in English vowels and the reasons behind them. The third was their errors in English main word stress and the

reasons behind them. The fourth section was a general discussion which analysed the subjects' errors in the light of the results of the previous studies on L2 stress production and three theories of L2 acquisition: Contrastive Analysis, Error Analysis and Markedness Theory.

The subjects found difficulty in pronouncing some English consonants such as /p/, /v/, /ŋ/, dark /t/, syllabic consonants and consonant doubling. They also had trouble with two-element clusters beginning with /p/, /s/, /g/, /θ/, consonant + /j/, /dw/ and all three-element clusters. In addition, they inserted a vowel between the elements of medial and final clusters. Regarding vowels, the subjects confused most of the English vowels and diphthongs with each other or substituted Arabic vowels for English ones. Finally, they stressed the last syllable of English words ending in V:, V:C and VCC and the first syllable of words having the syllabic pattern CVCVCV(C).

The findings had evidence for these theories of L2 acquisition: Contrastive Analysis Hypothesis (CAH) and Error Analysis (EA) and for the results of studies on L2 stress such as lexical acquisition of stress and overgeneralisation of L2 stress rules. Finally, the analysis of cases of unexpected non-transfer showed that they were not due to rule based learning but instead lexically learnt item by item.

The next chapter presents a summary of the findings, some teaching suggestions, limitations of the study and suggestions for further research.

CHAPTER FIVE

TEACHING SUGGESTIONS

This book analyses Arabs' errors in English pronunciation regarding consonants, consonant clusters, vowels and main word stress due to L1 interference in the light of three theories of L2 acquisition: Contrastive Analysis (CA), Error Analysis (EA) and Markedness Theory. This research has two hypotheses. First, the subjects substitute their own Arabic sounds (i.e. L1 negative transfer) for the unfamiliar English ones, producing incorrect English sounds. Second, the subjects apply Arabic stress rules (i.e. L1 negative transfer) instead of English ones, producing incorrect English stress patterns. These hypotheses were confirmed, albeit to different degrees due to sounds and stress patterns (word class), as shown in the results. This chapter presents some teaching suggestions to help Arabic speakers to avoid these errors.

5.1 Teaching Suggestions

5.1.1 Suggestions for Teaching Consonants

In view of the results, the following recommendations are suggested for teaching and correcting Arabs' pronunciation of English consonants.

- (1) Teachers can prepare consonant sound exercises in the light of English consonant sound errors due to negative transfer. This helps learners to suppress L1 negative transfer and learn English consonant sound rules. Considering the markedness factors, Arabic teachers should pay more attention to the marked English consonant sound patterns (less common) which are more difficult to acquire than unmarked ones (more common), according to the following scale of markedness.
 - (a) Affricates
 - (b) Fricatives
 - (c) Laterals
 - (d) Nasals
 - (e) Plosives
 - (f) Semi-vowels

- (2) Teachers can use ‘minimal pair drills’. A minimal pair is two words which differ in meaning when only one sound is changed. For example:

p/b **park/bark**; **pear/bear**

f/v **fine/vine**; **fan/van**

- (3) Teachers can use ‘tongue twisters’. A tongue twister is a sequence of words which is difficult to pronounce quickly and correctly, as follows.

- Peter Piper picked a peck of pickled peppers.
- She sells sea shells on the sea shore.
- Picky people pick Peter Pan Peanut-Butter.
- A big black bug bit a big black dog on his big black nose!
- Six slimy snails sailed silently.
- The great Greek grape growers grow great Greek grapes.
- This is the sixth zebra snoozing thoroughly.

- (4) Teachers can give a physical demonstration of how to make the consonant sounds. For example, to teach /θ/ or /ð/ say: ‘This is the tip of my tongue. These are my teeth. Put the tip of your tongue between your teeth.’

- (5) For difficulties with aspiration of /p, t, k/, the following techniques can be used:

- Teachers can ask their students to pronounce the sound /h/ immediately after these three sounds. To facilitate this, teachers can use ‘help-words’ beginning with ‘h’ for the main words beginning with /p, t, k/. For example, to pronounce ‘part’ teachers can tell their students to make /p/ and then say ‘heart’ and so on:

MAIN WORD	HELP-WORD
part	heart
ten	hen
cot	hot

- To demonstrate the presence of a puff of air, teachers can hold a lighted match or a thin piece of paper in front of the mouth while pronouncing words beginning with /p, t, k/. If aspiration is present, the match will flicker or the paper move.

- (6) In teaching /θ/, teachers can use the symbol itself as a memory clue. For example, teachers can draw an enlarged symbol to represent the

open mouth, and the crossbar to represent the tongue protruding between the teeth.

- (7) Regarding silent letters, teachers can draw their students' attention to the gap between English orthography and pronunciation. Furthermore, they should advise them not to pronounce all English words phonetically.
- (8) Regarding consonant doubling, teachers can train their students not to double the pronunciation of English double consonants except for a few words such as 'middy'; 'dissatisfied'; 'bookcase' etc.
- (9) Regarding syllabic consonants, teachers can explain to their students that some English consonants (such as /l/, /m/, /n/ and /r/) can constitute syllables by themselves. Furthermore, they should train them to pronounce words including such consonants such as 'middle'; 'rhythm'; 'button'; 'Hungary' etc.
- (10) Teachers can use the 'pencil trick' to distinguish between the points of articulation for /n/ and /ŋ/. Students are asked to place a pencil sideways across the mouth and pronounce the two sounds. The tip of the tongue will touch the pencil if the /n/ is pronounced correctly and it will be down behind the front teeth without touching the pencil when the /ŋ/ is produced accurately.
- (11) Regarding dark /ɹ/, teachers can train their students to pronounce /l/ with the back of the tongue raised towards the soft palate when it is followed by a consonant or occurs word-finally as in 'belt' or 'bell'. In addition, the learner must try to say a (u) vowel whilst the mouth is in the right position.
- (12) Regarding the RP /r/, teachers can train their students not to pronounce final /r/ unless it is followed by a word beginning with a vowel, and also not to pronounce /r/ within words if it is followed by another consonant.
- (13) Teachers can provide auditory or visual associations for the consonant sounds. For example, a buzzing bee demonstrates the pronunciation of /z/ and a hissing snake demonstrates /s/.

- (14) Teachers can use authentic English rhymes and songs such as:
- Whether the weather be hot,
Whether the weather be cold,
Whatever the weather,
We'll weather the weather,
Whether we like it or not.
- (15) To understand voicing, learners touch their throats to feel for vibration or no-vibration while producing voiced or voiceless consonants respectively.
- (16) Teachers can demonstrate the sound /p/ by showing lip movement and then practising the voiceless /p/ before illustrating the contrast between /p/ and /b/.
- (17) Teachers can train those learners who confuse /θ/ and /ð/ to pronounce /θ/ as a voiceless sound, a hissing sound made with strong breath and /ð/ as a voiced sound, a buzzing sound made with weak breath.
- (18) Teachers can specifically drill the sound /ð/ in its most common words, e.g. the, this, these, that, those, them, with etc.
- (19) Teachers can train Arabic speakers to pronounce 'th' /θ/ as one sound instead of two separate sounds /t/ + /h/ or the single sound /t/.
- (20) Arabic speakers can learn to produce /θ/ as a separate phoneme from /s/ and /ð/ as a separate phoneme from /z/. In addition, teachers can train them to pronounce /θ/ and /ð/ with the tip of the tongue between the upper and lower teeth and to pronounce /s/ and /z/ with the tongue behind the teeth.
- (21) With Arabic speakers who pronounce /θ/ as /s/ or /ð/ as /z/ and /θ/ as /t/, teachers can make use of contrasts like the following:
- s/θ **sing/thing**; sick/**thick**; mouse/**mouth**; moss/**moth**
z/ð **zeal/these**; breeze/**breath**; pleasing/**breathing**
- (22) In teaching /v/, teachers can train their students to produce /v/ as a voiced buzzing sound. In addition, they can train them to pronounce /v/ with less force of breath than /f/.

- (23) In teaching /ʃ/ and /ʒ/, teachers can train their students to pronounce /ʃ/ as a voiceless, hissing sound and /ʒ/ as a voiced, buzzing sound. They can also tell them that /ʒ/ never occurs initial position. In addition, teachers can make use of contrasts such as ‘pressure/treasure’, ‘vacation/ occasion’ etc.
- (24) Teachers can train learners to pronounce the sound /tʃ/ as one element instead of /t/ + /ʃ/. In addition, they can teach it with reference to its most common spelling ‘ch’ particularly in initial position.
- (25) Teachers can train learners to pronounce the sound /dʒ/ as one element instead of /d/ + /ʒ/ in all positions. In addition, the sound can be drilled with reference to the spellings ‘g’, ‘j’, ‘dg’ and ‘di’.
- (26) Regarding difficulty with /ŋ/, teachers can use the following:
- Descriptions of actions in the present continuous tense:
I am eating now. I am reading now.
 - Practise of ‘wh’ questions:
Teacher: Where are you going?
Student: I am going to the cinema.
 - Contrast of minimal pairs:
ŋk/ŋ think/thing; sink/sing; wink/wing.
n/ŋ win/wing; thin/thing; ban/bang.
- (27) In teaching /r/, teachers can train their students to curl the tip of the tongue backwards and upwards in the mouth so that it is quite close to the highest part of the palate, but not so close to cause friction as the air streams out. In addition, they can explain to them that /r/ is not a buzzing sound. This can be achieved by using help-sounds such as /j/ or /i:/ which are similar in their articulation to the English sound /r/. First, the students can get ready to pronounce /j/ or /i:/, then curl the tip of the tongue slightly upwards without moving the sides of the tongue.
- (28) Regarding difficulty with /w/, teachers can use the following:
- Practice of ‘wh’ questions:
Where do you live?
When did you leave?
 - Practice telling the time:
Teacher: What is the time?
Student: It is a quarter past four.

5.1.2 Suggestions for Teaching Consonant Clusters

In view of the results, the following recommendations are suggested for teaching and correcting Arabs' pronunciation of English consonant clusters:

- (1) Teachers can prepare consonant clusters exercises in the light of English consonant cluster errors due to negative transfer. This helps learners to suppress L1 negative transfer and learn English consonant cluster rules. Considering the markedness factors, Arabic teachers should pay more attention to the marked English consonant cluster patterns (less common) which are more difficult to acquire than unmarked ones (more common), according to the following scale of markedness.

- (a) Medial Consonant Clusters
- (b) Initial Consonant Clusters
- (c) Final Consonant Clusters

- (2) Teachers can train their students not to insert a short vowel or a glottal stop and a short vowel before each cluster.
- (3) In teaching English initial clusters including /s/ + consonant, teachers can train their students to begin by uttering a long /s/ (i.e. ssss...), then stop this /s/ by closing the lips in preparation for the following /p/ or /m/, or by raising the tip of the tongue to the alveolar ridge in preparation for the following /t/, /n/ or /l/, or by raising the back of the tongue to the velum in preparation for /k/.

- (4) To help those students who find difficulty with final two- and three-element clusters, teachers can start with practising an identical sequence in the form of help-phrases and gradually decreasing the time between the two elements:

HELP-PHRASES	MAIN WORD
publish two books	published
wrong direction	wronged

- (5) To help those students who find difficulty with final three-element clusters containing a medial /t/ or /k/, teachers can explain to them that these medial sounds are often reduced to a single lengthened consonant in words such as 'asks' and 'lists' or is sometimes omitted, resulting in pronunciations such as the following:

asks	/æ:s:/
facts	/fæks/

- (6) Teachers can train their students to pronounce the -s suffix according to the following phonological rule:
- When a noun or verb ends in a voiceless sound that is not a sibilant /s, z, ʃ, ʒ, t, d/, the -s suffix is pronounced /s/:
cats /kæts/ stops /stɒps/
 - When a noun or verb ends in a voiced sound that is not a sibilant, the -s suffix is pronounced /z/:
seeds /si:dz/ sees /si:z/
 - When a noun or verb ends in a sibilant, the -s suffix is pronounced /z/:
glasses /glæsəz/ rises /raɪzəz/
- (7) Teachers can train their students to pronounce the -ed suffixes according to the following phonological rule:
- When a verb ends in a voiceless sound other than /t/, the -ed suffix is pronounced /t/:
marked /mɑ:kt/ published /pʌblɪft/
 - When a verb ends in a voiced sound other than /d/, the -ed suffix is pronounced /d/:
proved /pru:vd/ played /pleɪd/
 - When a verb ends in the sound /d/ or /t/, the -ed suffix is pronounced /əd/:
needed /ni:dəd/ rested /restəd/

5.1.3 Suggestions for Teaching Vowels

In view of the results, the following recommendations are suggested for teaching and correcting Arabs' pronunciation of English vowels.

- Teachers can prepare vowel sound exercises in the light of English vowel sound errors due to negative transfer. This helps learners to suppress L1 negative transfer and learn English vowel sound rules. Considering the markedness factors, Arabic teachers should pay more attention to the marked English consonant sound patterns (less common) which are more difficult to acquire than unmarked ones (more common), according to the following scale of markedness.

- (a) Vowel Reduction to Schwa
 - (b) Vowel Length
 - (c) Diphthongs
 - (d) Long Vowels
 - (e) Easily Confused Vowels
 - (f) Short Vowels
- (2) Teachers can use ‘minimal pair drills’:
- i/e pin/pen; tin/ten
 - ɔ:/ɒ cord/cod; short/shot
- (3) Teachers can give a physical demonstration of how to make the vowel sound. For example, rounding the lips and lowering the jaw for /ɔ:/.
- (4) With learners who find difficulty with the English vowels /i:/, /ɪ/, /e/ and /æ/, teachers can make sure that the learner’s tongue is in the right position, neither too close nor too far away from the roof of the mouth.
- (5) In teaching /ə/, teachers can emphasise the spread position of the lips. To achieve this, they can ask their students to smile while pronouncing this sound.
- (6) In teaching /ə/, teachers can remind their students that it is the sound one makes when one is suddenly hit in the stomach.
- (7) In teaching /ɑ:/, teachers can remind their students that it is the sound doctors ask patients to make when they want them to open their mouths wide for throat examinations.
- (8) Teachers can pay special attention to those English diphthongs that do not occur in Arabic, and drill them both in words and in connected speech.
- (9) Teachers can train their students to glide from one vowel to another while pronouncing the English diphthongs. For example, students should not use the following:
- Arabic /o:/ as in /fo:z/ ‘victory’ for English /əʊ/ as in /stəʊv/ ‘stove’.
 - Arabic /u:/ as in /du:r/ ‘houses’ for English /ʊə/ as in /tʊə/ ‘tour’.
- (10) In teaching /əʊ/, teachers can train their students to begin with the lips in neutral position to pronounce /ə/, then slight rounding and closing as for /ʊ/.

(11) Teachers can try to help their students with some of the spelling patterns in English. For example, the addition of a final ‘e’ to words usually means the following:

- a change from /æ/ to /eɪ/
hat/hate bath/bathe
- a change from /ɪ/ to /aɪ/
sit/site fin/fine
- a change from /ʌ/ to /juː/
tun/tune cut/cute

(12) Teachers can train their students to predict where English vowels and diphthongs are reduced to /ə/ in unstressed positions. In addition, they can emphasise that this vowel can be spelled in different ways but the pronunciation remains the same. In practising /ə/, the following exercises can be useful:

- Words including a short unstressed ‘a’ in different positions:
Initial: **att**end, **ag**ain, **al**one etc.
Medial: character, breakfast, emphasis etc.
Final: banana, phenomena, agenda etc.
- Compound words ending in ‘-man’:
policeman, postman, fisherman etc.
- Words ending in ‘-ar’:
particular, familiar, collar etc.
- Words ending in ‘-er’:
letter, danger, clever etc.
- Words ending in ‘-or’:
actor, sailor, professor etc.
- Words ending in:
‘-able’ reasonable, capable, sociable etc.
‘-ance’ balance, clearance, substance etc.
‘-ant’ pleasant, infant, distant etc.
‘-ent’ different, prominent, president etc.
- Adjectives ending in ‘-ate’:
accurate, adequate, desperate etc.
- Words including unstressed ‘o’ in different positions:
carrot, potato, position etc.
- Words including unstressed ‘u’ in different positions:
support, autumn, suggest, suffice, etc.
- Words including ‘-ough’ which is pronounced /ə/:
thorough, borough etc.
- Words ending in ‘-ous’:

- famous, enormous, cautious etc.
- The weak forms of function words such as:
 Conjunctions: but, than, and etc.
 Indefinite adjectives: such, some, any etc.
 Personal pronouns: her, them, you etc.
 Prepositions: at, for, to, etc.
 Articles: a, an, the
 Auxiliary verbs: can, was, have, does etc.
- (13) To explain the contrast between /i:/ and /ɪ/, and between /u:/ and /ʊ/, teachers can make use of muscular tension. For example, they can ask their students to clench their fists when practising tense vowels (/i:/, /u:/ etc.) and to open and relax them when producing lax sounds (/ɪ/, /ʊ/, etc).
- (14) To enable Arab learners to pronounce correctly the weak forms of English function words, Teachers can use exercises including the words in both their strong and weak forms as follows:
- | WORD | STRONG FORM | WEAK FORM |
|--------------|--|-----------------------------------|
| for | /fɔ:/ What is he waiting for ? | /fə/ It's for you. |
| are | /ɑ:/ Here they are | /ə/ Where are you going? |
| could | /kʊd/ I would stay if I could . | /kəd/ Could you do it now? |
- (15) Learners can bear in mind that a long vowel followed by a consonant should be longer than the same vowel followed by a voiceless consonant.
- (16) Learners can stretch rubber bands to illustrate length of vowels.

5.1.4 Suggestions for Teaching Word Stress

In view of the results, the following recommendations are suggested for teaching English word stress to Arab learners:

- (1) Teachers can prepare stress exercises in the light of English stress errors due to negative transfer. This helps learners to suppress L1 negative transfer and learn English stress rules. Considering the markedness factors, Arabic teachers should pay more attention to the marked English stress patterns (less common) which are more difficult to acquire than unmarked ones (more common), according to the following scale of markedness.

(a) Unstressed Final -CVVC

Many English words ending in CVVC have initial stress:
'prosecute 'multitude 'capitalise 'telescope 'telegaph

(b) Compounds With Initial Stress

It is very common for compound nouns to have stress on the first element:

'blackbird 'chairman 'greenhouse 'hotdog 'sunset 'teamwork

(c) Stressed Preantepenult

Many English words have preantepenult stress:
'category 'territory 'adequacy 'mercenary

(d) Unstressed Final V: or VV

A large class of English words ending in V: or VV have initial stress:

'igloo 'tepee 'cuckoo 'certify 'cowboy

(e) The CV'CVCV(C) Syllabic Pattern

Many English words with the CV'CVCV(C) syllabic pattern have penult stress:

pa'cific ter'rific pho'nemic so'licit de'posit

(f) Unstressed Final -CVCC

Many English words ending in CVCC are stressed on the first syllable:

'manifest 'scientist 'impotent 'argument 'applicant

(g) Unstressed Heavy Penult

Many English words have antepenult stress although the penult is heavy:

'minister 'calendar 'passenger 'character

(h) Contrastive Stress

In English words which can be used as either a verb or a noun, stress tends to fall on the first syllable of the noun but on the second syllable of the verb. This can be practised in separate contexts, as follows:

- Stress shift in words:

NOUN	VERB
'contrast	con'trast
'desert	de'sert
'present	pre'sent
'subject	sub'ject

- Contextual practice:

The 'desert is hot and dry.

Rats de'sert the sinking ship.

This book is a 'present from my brother.

I have to pre'sent a paper at the meeting.

- (2) Teachers can explain to their students the following relationship between syllable weight (rime structure) and main stress in English, as follows:

- (a) In many English nouns and suffixed adjectives, the penult is stressed if it is heavy and the antepenult is stressed if the penult is light:

a'genda de'fender com'puter pro'tective diag'nostic
'marathon 'manager 'memory 'medical gra'mmatical

- (b) In many English verbs and unsuffixed adjectives, the final syllable is stressed, if it is heavy and the penult is stressed if the final syllable is light:

pro'vide pre'vail pro'tect ro'bust po'lite
de'liver de'velop de'molish 'solid 'oral

- (3) The cases of unexpected non-transfer in Chapter 4: Results and Analysis indicate a major role for item-by-item learning (lexical acquisition), familiarity and analogy, teachers should focus on stress position when they introduce important/high frequency vocabulary items and correct their stress errors early to avoid fossilisation.
- (4) Teachers can explain to their students that correct stressing of English words is as important as correct pronunciation of consonant and vowel sounds. Furthermore, Arabic learners should memorise new English words with their stress patterns because English word stress does not have orthographic representation.
- (5) Teachers can make use of transfer facilitative effect (i.e. positive transfer) while teaching students English items with stress similar to Arabic.

- (6) Teachers can point out some common rules of English stress such as:
- Many common nouns and adjectives have stress on the first syllable:
'water, 'woman, 'pretty, 'ugly, 'table
 - Many suffixes cause the syllable before them to be stressed:
-iar fa'miliar -ible 'terrible
-ic a'tomic -ify 'beautify
-ity co'mmunity -ive pro'gressive
 - It is very common for compound nouns to have stress on the first element:
'blackbird 'chairman 'greenhouse
'hotdog 'sunset 'teamwork
- (7) Teachers can train their students to use English Dictionaries with pronunciation guidance, such as the *Oxford Advanced Learner's Dictionary* and the *Longman Dictionary of Contemporary English*, both for classwork and homework. Furthermore, students should be encouraged to prepare their own dictionaries or word lists with the stress correctly marked.
- (8) Teachers can demonstrate what we mean by a stress pattern in English through the pronunciation of the names of class members, place names, names of famous people and well-known landmarks. After naming each item, teachers can establish the correct stress pattern, then shift the stress to the wrong syllable and back again to the correct one.
- (9) To facilitate English stress rules for Arab learners, teachers can arrange groups of English words according to stress patterns. Students can then be asked to add more words in the appropriate group once the model has been practised:
- Two-syllable Words: Primary stress on the second syllable:
a'broad be'cause com'pare de'cay
 - Three-syllable Words: Primary stress on the first syllable:
'accident 'beautiful 'calculate 'delicate
 - Three-syllable Words: Primary stress on the second syllable:
ad'vantage col'lection de'cisionen 'courage
 - Three-syllable Words: Primary stress on the third syllable:
disap'pear engi'neer repre'sent under'stand

- (10) Teachers can prepare stress exercises in the light of errors in English word stress due to MT (Arabic) interference. The following points can be taken into consideration.
- Teachers can train students to often stress the first syllable of English words ending in a long vowel or a diphthong such as:
'igloo i'dentify 'beautify 'cargo 'holiday
 - Teachers can train students to often stress the first syllable of English words ending in a long vowel or diphthong plus a consonant such as:
'multitude 'capitalise 'criticise 'telegraph 'telescope
 - Teachers can train students to often stress the first syllable of English words ending in a vowel plus two consonants such as:
'scientist 'punishment 'product 'concept 'applicant
 - Teachers can train students to often stress the second syllable of English words having the syllabic structure CVCVCV(C):
pa'cific ter'rific de'posit so'licit ho'rrific
 - Teachers can train students not to stress the penultimate syllable in English words stressed on the antepenult such as:
'silently 'barrister 'messenger 'calendar 'passenger
 - Teachers can train students not to stress the antepenultimate syllable in English words stressed on the pre-antepenult such as:
'accuracy 'category 'matrimony 'mercenary 'necessary
- (11) Learners can be asked to identify the stressed syllables using sequences of nonsense syllables (e.g. la la LA la la LA la).
- (12) Learners can indicate the correct stress patterns of words by clapping, using louder claps for the stressed syllables.
- (13) Working in pairs, one learner can read a scripted dialogue while the other learner marks the stress patterns on a printed copy.
- (14) Learners can give a short talk to the class on topics related to the lesson. They are assessed on correct production and on evidence of self-monitoring of word stress.
- (15) Teachers can pronounce a list of words using both correct and incorrect word stress and ask the students to identify the correct versions.

5.2 General Recommendations

- (1) The importance of the teacher's pronunciation cannot be over emphasised. The Arab teacher of English who wants his students to produce the foreign language words accurately should first ensure that his pronunciation is not defective. Besides correct, accurate and clear pronunciation, the teacher of English should have knowledge of the sound system of both English as a target language and the mother tongue (Arabic) so that he can find examples of comparison, and be able to predict and remedy the areas of difficulty of his students' pronunciation.

Unless the teacher's production of English phonemes is correct, his students may develop wrong habits which become difficult to eradicate. Leeson (1979, 15) mentions that 'Where there are phonological defects of a marked degree, it is difficult to accept that such a person can be truly fluent'. Malmberg (1963, 109) also states that 'Without a thorough knowledge of the phonetics of the two languages concerned, the language teacher will never succeed in teaching his pupils a perfect pronunciation of the new language'.

- (2) Teachers can try to persuade Arab learners of the importance of good pronunciation for ease of communication and try also to increase their motivation and concern for good pronunciation. In addition, teachers should try to increase learners' exposure to authentic spoken English.
- (3) Teachers can draw learners' attention to the pronunciation problems arising from mother tongue interference and methods of surmounting them. For example, pronouncing English initial /p/ unaspirated or as /b/ or pronouncing English /v/ as /f/.
- (4) Predictable pronunciation errors should receive the teachers' immediate and full attention, including intensive remedial work if necessary because it is difficult to eradicate wrong pronunciation later on. The initial stage of learning is crucial for picking up correct stress, intonation and pronunciation of the foreign language.
- (5) Teachers can lead students to repeat correct models of pronunciation with understanding rather than imitating parrot fashion.

- (6) Teachers can listen carefully for students' acceptable reproduction of sounds and for detection and correction of new errors.
- (7) Teaching materials can include remedial tasks for dealing with predicted errors arising from MT (Arabic) interference. Teachers can teach the sound in relation to its most common spellings. For example, the sound /s/ can be represented as follows:

s sit, sun, bus
 ss class, lesson, dress
 se horse, house, worse
 c bicycle, exercise, cinema
 ce policeman, face, office

Similarly, the sound /i/ can be represented as follows:

i fish, finger, hill
 y baby, easy, family
 e begin, market, pocket

- (8) Teachers can use visual aids such as diagrams and charts that clarify the articulatory processes involved in making sounds. This can help students gain greater accuracy in pronunciation. For example, the face diagram can be used to illustrate sounds such as:

/ə, ð/	with the tongue between the teeth
/p, b, m/	with the lips completely closed
clear /l/	with the front of the tongue relatively high
dark /l/	with the back of the tongue relatively high

- (9) Students can use mirrors to see the shape of the lips and the mouth and tongue placement.
- (10) Teachers can test their students' perception of English sounds by using a tape-based activity including different exercises such as: 'Write the word you hear'; 'Which sound?'; 'Same or different?' and 'Odd one out?'
- (11) After listening to the recorded voices of native speakers of English pronouncing groups of words and phrases, students can form an idea of the auditory image of the printed text. Then the students can record their own voices and compare their pronunciation with that of the native voice.

- (12) Teachers can make use of dictation. This can help in listening and spelling.
- (13) Teachers can train their students to pronounce the difficult English sounds in different positions: initially, medially and finally.
- (14) Teachers can correct pronunciation errors immediately because it is difficult to eradicate incorrect pronunciation later on (fossilisation).
- (15) Teachers can develop students' acquisition of the phonetic habits of the new language (English) and protect these habits against interference from the habits of the native language (Arabic).
- (16) Teachers can encourage students to use single sounds in words and in connected speech.
- (17) Teachers can explain to students the difference between the various English sounds and between English sounds and Arabic sounds.

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APPENDIX A

LIST OF WORDS

Word Group I

Pronounce the following words:

(Class 1)

park	spark	help
slept	wept	
bark	symbol	job
tie	sty	part
die	handle	hard
kill	skill	monarch
gill	forget	bag

(Class 4)

man	number	farm
name	hand	bean
thing	singer	singing
longer	thank	wings

(Class 2)

thumb	method	bath
months	baths	sixth
south	southern	southerly
then	leather	bathe
clothes	bathes	smoothes
fine	rifle	off
vine	rival	of
sharp	version	ash
pleasure	treasure	rouge
seal	person	bus
cats	birds	watches
zeal	busy	buzz
head	behind	haphazard

(Class 5)

rubbish	airport	river
far	far from	far away
right	light	
leaf	look	polite
help	eel	well

(Class 6)

year	beyond	few
wine	when	which

(Class 3)

chapter	purchase	church	cello
gem	soldier	judge	lounge

(Class 7)

(Class 7 a)

enough
hiccough
suite
ewe
cello
cognac
soldier
lounge
lieutenant
phlegm
gnaw



(Class 7 b)

psalm	alms
corps	salmon
subtle	colonel
plumb	folklore
nestle	heir
fasten	annihilate
handkerchief	wrath
handsome	sword
knight	plough
knave	borough
feign	solemn
gnarled	damn

(Class 7 c)

stubborn	support
account	correct
address	discuss
odd	attack
affair	attempt
suggest	butt
allow	puzzle
collect	buzz
accommodation	midday
announcer	misspelled
inn	dissatisfied

(Class 7 d)

middle	Britain
tunnel	cousin
little	Hungary
panel	hungry
rhythm	national
button	literal
threaten	visionary
eleven	veteran

(Class 8)

plane	pray	pure	news	twin	spare	spleen
black	train	beauty	sue	dwarf	stay	spring
clean	creep	tube	view	queen	scare	string
glass	brain	duty	lewd	thwack	smile	scream
fleet	drive	cure	huge	swing	snake	stew
sleep	great	mute	few		sphere	square

(Class 9)

transport	long skirt
transplant	strange dream
landscape	bent screw
landmark	next spring
grandmother	She tempis strangers
grandson	

(Class 10)

(Class 10 a)

grabbed	wronged
begged	proved
seemed	bathed
cleaned	raised
filled	

helped
marked
coughed
pronounced
published

cabs	songs
seeds	loves
flags	smoothes
arms	steals
pins	

leaps
seats
backs
laughs

eighth	length
width	fifth
warmth	wealth
month	depth

wasp
grasp
task
risk

lamp
triumph
faint
dance
rank

(Class 10 b)

bulb	film
silk	shelf
help	else
belt	valve

bronzed
filmed
delved
judged
changed

lapsed	linked
taxed	amongst
midst	helped
jumped	milked
triumphed	pulsed
touched	grasped
sensed	

hands
builds
elms
shelves

scripts	lisps
facts	lists
camps	tasks
nymphs	helps
thanks	halts
lifts	milks

(Class 10 c)

contexts
tempts
glimpsed
drenched
changed

Word Group II

Pronounce the following words:

(Class 11)

heavy	sit	deaf	set
pad	rash	gone	wash
wood	look	rub	hut
attempt	about	polite	postman
breakfast	sailor		

(Class 14 b)

sheep	ship		
hurt	heart	dirt	dart
worm	warm	word	ward
staff	stuff	task	tusk
ball	phone		
food	good	fool	stood

(Class 12)

field	leaf	
through	food	boot
cigar	heart	
board	cork	
fur	cork	

(Class 14 c)

sail	sell		
vain	vine	pain	pine
hate	hat	fain	fan
fine	fin	bite	bit
bear	beet		
chair	sheep		
beard	bird		
boat	bought		

(Class 13)

raid	fate	bite	ripe
boil	point	grow	stove
crown	mouth	beer	beard
bear	stare	tour	moor

(Class 15)

spring	swing	
worked	changed	grandfather

(Class 14 a)

miss	mess	bitter	better
luck	lock		
cot	caught		
gone	gun		
put	pot	look	lock

(Class 16)

Here they are.	They are coming.
Shoot at him.	Stop at the next house.
There is nothing to do.	What do you see?
What is he waiting for?	He is waiting for his pay.
Read as much as you can.	How should I know.

(Class 17)

cap	cab	seat	seed
dock	dog	leaf	leave
belief	believe	vacation	occasion
faith	bathe	tooth	smooth
loose	lose	cease	seize
catch	cadge		

Word Group III

Pronounce the following words:

(Class 18)

multiply	holiday	igloo
beautify	identify	castaway
carboy	cargo	whitlow
bungalow		

(Class 23)

necessary	mercenary	category
demonstrator	laboratory	speculator
characterise	matrimony	legislative
imaginary	accuracy	adequacy

(Class 19)

prosecute	substitute	gratitude	multitude
criticise	exercise	demonstrate	captivate
carbide	carmine	telegraph	telescope

(Class 24)

we protest	our protest
we object	our object
we present	our present
to export	an export
to permit	a permit
to progress	a progress

(Class 20)

manifest	scientist	punishment	applicant
product	difficult	concept	impact
evident	impotent	management	advertisement
conversant	appellant	specialist	occupant

(Class 21)

pacific	terrific	deposit	solicit
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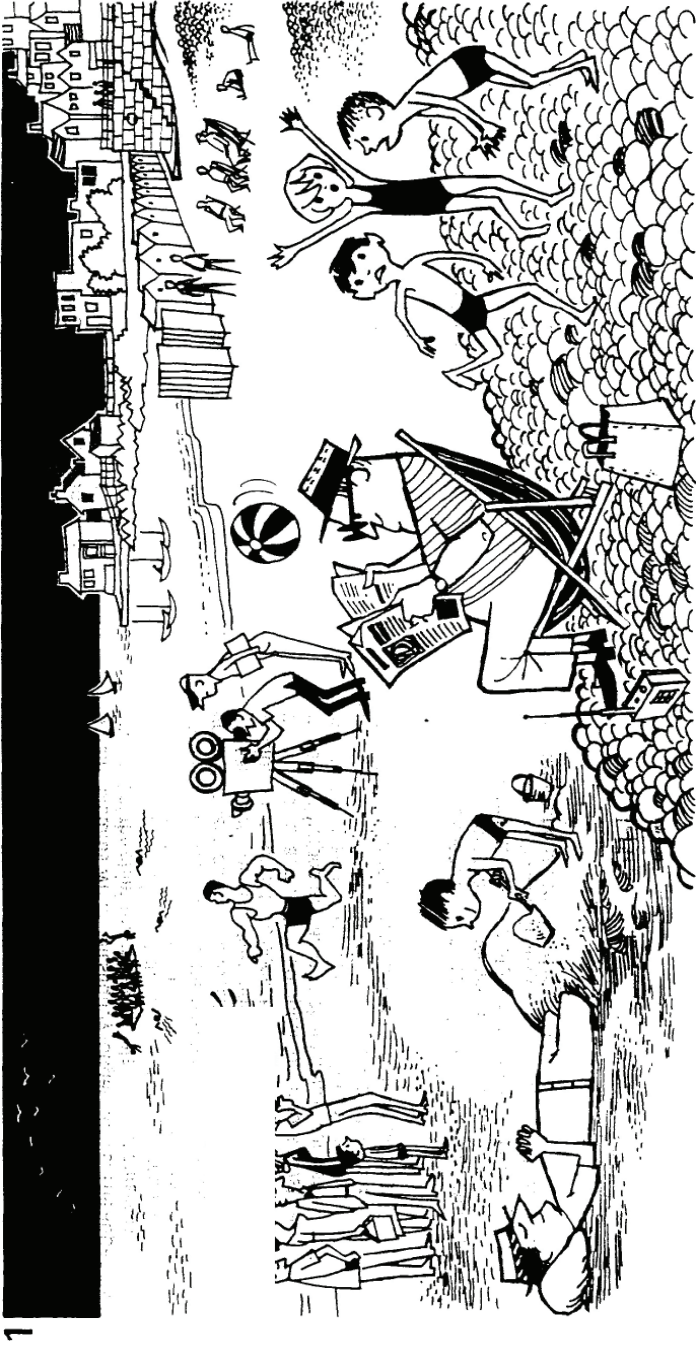
(Class 25)

apple tree	flowerpot	blacksmith
greengrocer	birthday	sheepdog
workshop	midnight	make-up
setback	greenhouse	classroom

(Class 22)

silently	messenger	orchestra	barrister
cucumber	calendar	currency	helicopter
cylinder	protestant	passenger	thermostat

Describe this picture in five minutes:



1

APPENDIX B

FACTORS AFFECTING PRONUNCIATION MASTERY AND ARAB LEARNERS OF ENGLISH

Difficulties in speaking often refer to pronunciation. Pronunciation includes the articulation of individual sounds and the distinctive features of sounds like voicing and aspiration and stress and intonation. Correct pronunciation is a means of achieving a confident grasp of the spoken language and can help in normal communication, particularly intelligibility (Derwing and Munro, 2005). Although native speakers cannot explain their language patterns and rules, they are able to indicate which ones are permitted. Second language learners need to develop these same intuitions.

Research has contributed some important data on factors that can influence the learning and teaching of pronunciation skills. Being able to correctly perceive and produce the spoken form is only one of these. Ellis (1985), Graham (1994), Pennington (1994) and Kenworthy (1987) discuss the following factors:

- (1) **The native language:** Most researchers agree that interference from the learner's native language (NL) influences his pronunciation of the target language (TL). This is reflected in his foreign accent which carries some of his native sound characteristics and stress rules. The greater the differences between the (NL) and the (TL), the greater the likelihood of pronunciation errors occurring at both segmental and suprasegmental level.
- (2) **Amount of exposure:** The amount of the learner's exposure to English is a necessary factor for the development of his pronunciation skills. A learner living in a non-English-speaking country using and practising his English will make more progress than one living in an English-speaking country and not practising it.

- (3) **Age:** There is a debate over the impact of age on learning pronunciation. Most researchers, however, agree that pronunciation is more difficult for adults than for children and that adults probably will not achieve native-like pronunciation. Usually, if the learner began to speak the second language before the age of six, there will be *little or no accent*. If the learner began to speak between the ages of seven and 11, the learner is likely to have a *slight accent*. If the learner began to speak after the age of 12, then there is *almost always an accent*.
- (4) **Phonetic ability:** Having a ‘good ear’ for foreign languages is very important for pronunciation mastery. Researchers have shown that some people have greater ability to discriminate between and mimic sounds than others.
- (5) **Prior pronunciation instruction:** Previous pronunciation instruction may affect learners’ achievement of current efforts. More advanced learners may have developed some habitual pronunciation errors that should be identified and corrected.
- (6) **Aptitude:** Some researchers believe all learners have the same capacity to learn a second language because they have learned a first language. Others assert that the ability to recognise and make foreign sounds may be unequally developed in different learners.
- (7) **Attitude and identity:** Non-linguistic factors related to an individual’s personality and learning goals can influence achievement in pronunciation. Learners who show positive feelings towards the speakers of the new language tend to develop more accurate native-like accents. In addition, a person’s ‘sense of identity’ is a strong determiner of the acquisition of accurate pronunciation of a foreign language.
- (8) **Concern and motivation:** Strength of concern for pronunciation is a kind of ‘achievement motivation’. Learners who are concerned and motivated will achieve more than those who are not. A young doctor who knows he will be more respected and possibly promoted if his pronunciation improves is likely to pay more attention to direct pronunciation instruction.

One or more of these factors may affect the pronunciation accuracy of the Arab learners. The key is to be aware of their existence so that they may be borne in mind when setting realistic and effective pronunciation goals

and development plans for them. Teaching and training can have an effect on some of these factors but not all, as follows.

- **The native language:** Having a good knowledge of the sound systems and stress rules of both the (NL) and the (TL) can enable the teacher and learner to pay particular attention to those errors due to interference (i.e. L1 negative transfer).
- **Age:** Obviously, we cannot change the Arab learner's age. However, the sooner, the better for the Arab learner to learn L2 English taking into consideration the Critical Period Hypothesis (CPH).
- **Amount of exposure:** We can increase the Arab learner's exposure to English to a certain degree as follows:
 - a) Having classroom contact with native speakers of English.
 - b) Forming an after-school English Club to enable learners to practise English in a social context.
 - c) Encouraging education exchange programmes between Arabic and English speaking countries.
 - d) Using teaching materials recorded by native speakers of English.
 - e) Occasionally teaching other subjects through English.
- **Phonetic ability:** We cannot change the raw phonetic ability of the Arab learners. But we can help them utilise this ability to the full by giving them a better chance to distinguish between and imitate the foreign language sounds.
- **Prior pronunciation instruction:** We can provide good pronunciation instruction for the Arab learners from the outset to avoid pronunciation errors and correct persistent ones before becoming fossilised.
- **Aptitude:** We can try to develop the Arab learner's ability for recognition and production of the foreign language sounds.
- **Attitude and identity:** We can try to encourage the Arab learner to have positive feelings towards the speakers of English, their customs and culture. Above all, we can explain to him that mastering English pronunciation does not mean losing his Arab identity.
- **Concern and motivation:** We can try to increase the Arab learner's motivation and concern for good pronunciation as follows.
 - a) by persuading him of the need for good pronunciation as a means of easy communication;

- b) by showing interest in his pronunciation and progress in it;
- c) by emphasising that intelligibility and communicative efficiency are the main goals and a 'native-like' accent is desirable.

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