AN INTRODUCTION TO ISSUES IN
General Linguistics

Georgios P. Georgiou

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PREFACE

An introduction to Issues in General Linguistics aims to show how the language system works, to cultivate a correct attitude towards language, and to familiarize readers with the science of linguistics and issues related to it. Specifically, the first chapter is a must-read by people who have little contact with linguistics in order to gain a better understanding of the way that the language system operates, as well as to familiarize them with language features. Furthermore, readers will be able to observe the main objectives and principles of linguistics, and differentiate the different levels of linguistic analysis. Chapter 2 aims to debunk myths about language by dissolving misperceptions about the language system and the science of linguistics. Chapter 3 deals with the way that humans perceive and produce language. This chapter also includes brief sections about issues surrounding pronunciation and language production. Chapter 4 discusses issues surrounding language learning, and it connects linguistics with education. Chapter 5 contains sections that discuss social phenomena related to linguistics, such as linguistic reborrowing, the language of young people, and revived or artificial languages. Chapter 6 presents two main speech models.

I tried to avoid excessive wordiness since it often creates feelings of boredom in readers. Instead, the book only focuses on essential linguistic issues, trying to explain them as briefly as possible without losing its scientific character. The first two chapters are significant as they develop an understanding of the language system mechanism and eliminate misconceptions. The other chapters contain brief sections that discuss intertemporal and timely issues in linguistics. All linguistic phenomena are accompanied by examples so that the reader can understand how they are embedded in real linguistic contexts.

The book discusses linguistic issues scientifically; that is, it neither adopts personal convictions nor uses unsubstantial arguments; instead, it employs findings that have emerged from research. The language of the book is simple so that it can be understood by a wide range of readers, even if they do not have any previous knowledge in linguistics. Therefore, *Issues in Linguistics* is aimed at linguists, philologists, language scholars,

tutors, and anyone who loves linguistics or even general readers who are curious to explore the science of linguistics.

The Author of the book

Dr George Georgiou

CHAPTER 1

INTRODUCTION TO LINGUISTICS

1.1. What is language?

In general terms, *language* is a system that describes the ability of humans to develop, acquire, maintain, and use complex communication codes. Several definitions of language have been proposed with each one linked to a different school of thought. However, a complete definition might never be expressed since language is a complex system, whereas the science that studies language, linguistics, is linked with other sciences, such as psychology and the cognitive sciences. The notable American linguist, Noam Chomsky (1957: 13), defines language as follows:

"Language is a set (finite or infinite) of sentences, each finite in length, and constructed out of a finite set of elements".

Hadumod Bussmann gives a relatively complete and comprehensive definition of language in the *Routledge Dictionary of Language and Linguistics* (Bussmann, 1999: 627):

"Vehicle for the expression or exchanging of thoughts, concepts, knowledge, and information as well as the fixing and transmission of experience and knowledge. It is based on cognitive processes, subject to societal factors and subject to historical change and development. In this definition, language refers to a specific form of expression that is restricted to humans, and differs from all other possible languages, such as animal communication and artificial languages through creativity, the ability to make conceptional abstractions, and the possibility of metalinguistic reflection".

As expressed above, language is used for human communication. *Communication* is the procedure in which messages of any kind are transferred. Members of a community are people who communicate with each other using one or more languages, which are based on specific rules.

1.1.1. Speech, Language, and Speaking

A distinction between *Speech*, *Language*, and *Speaking* can provide a better understanding of the human communication code.

Speech (langage) is the ability of humans to communicate orally with other humans. Speech is a universal feature that characterizes all humans in the same way.

Language (langue) is a specific system of signs that allows humans to communicate with each other. Languages (e.g., English, Chinese, and Zulu) differ with each other in terms of their grammatical rules.

The differences between speech and language are the following: (a) speech is the inherent ability for communication, while language is the result of that ability; (b) speech is created in the brain, while language is developed through social coexistence; and (c) speech is a natural ability, while language is acquired through teaching.

Speaking (parole) is the information that emerges from the use of language; e.g., words we produce, read, or listen to. This information differs from speaker to speaker. The relationship between the three terms is depicted in the equations below:

$$speaking = language + speech$$
$$speech = language - speaking$$

1.2. Language as a communication code

Some essential elements are necessary to achieve communication. These elements constitute the *communication model* that is illustrated in the figure below:
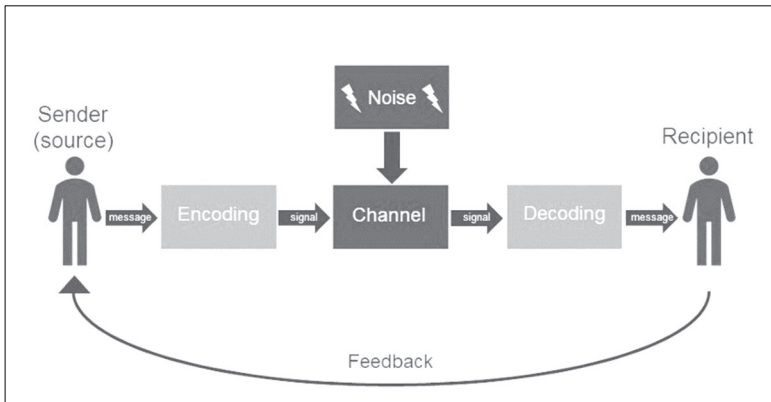
Fig. 1-1: Communication cycle model by Claude Elwood Shannon and Warren Weaver

According to the model, there is a *sender* (or a speaker in the case of language) who provides a message to a *recipient* (or a listener) through a *channel*. Nevertheless, successful communication does not only involve sending a message. The message should be in a recognizable form and have a specific meaning to be understood. Therefore, a *code* is needed for the speaker to encode the signal and the listener to decode it. The choice for the combination of form and meaning is called *encoding*, while the recognition of this combination is called *decoding*. So, we could say that code is a finite (or limited) system, which allows us to combine forms and meanings in order for the message to be understood by someone who knows the same code. Such a system consists of a sum of units and a sum of rules. In particular, the language code consists of *linguistic signs* (or just *words*) and *rules* for the use of linguistic signs in order for the listeners to be able to decode the signals.

Due to differences in each person's experiences and the knowledge, both speakers and listeners do not know precisely the same code. For example, the word "car" might recall a beautiful thought for a racing car driver who loves cars or a terrible thought for someone who has experienced a serious car crash. Therefore, as a consequence, the message of the speaker and that of the listener will be different. However, there is a constant meaning core, which is the same for all speakers; due to this core, excellent communication can be still achieved.

During communication, a *channel* is a medium for the transfer of a message. In the case of language, it can be mainly transferred through

oral or written form. Finally, as we can see from the figure above, *noise* might interfere with the reception of the signal (e.g., noise from traffic).

1.3. The Sign

To examine how signs work, we have to consider the general theory of signs, which is called *semiotics*. Semiotics is based on the theory of the famous Swiss linguist, *Ferdinand de Saussure* (1857–1913). A sign, which might be an object, a sound, or a word, etc., does not have a specific meaning unless we attribute one to it. For instance, in traffic lights, the green color does not mean in itself that "vehicles have to proceed", but it is a meaning that was predetermined by humans to follow a common highway code. So, a sign has two components: (a) *a material form*: something that we can see, hear, touch, smell, or taste; and (b) a *concept*: a comprehensible construction which is linked with experience. The material form is called the *signifier*, while the concept is called the *signified*.

1.3.1. Types of Signs

There are three types of signs: (a) icons, (b) indices (or indexes), and (c) symbols. In *icons*, the signifier is similar to the signified; they recognizably look, sound, feel, taste, or smell the same as the signified (the signifier resembles whatever it depicts). For instance, a picture of one's face is an icon of them. In *indices*, the signifier is directly linked in some way with the signified. For example, dark clouds are an index of impending rain. In *symbols*, the signifier is not similar to the signified. For example, the connection of a red traffic light with the instruction to stop is just arbitrary (there is not any logical relationship between the signifier and the signified; someone has decided this relationship).

1.3.2. The Linguistic Sign

As we have seen in a previous section, *words* are also called *linguistic signs*. Linguistic signs connect a sound-image (since words can be only seen or heard) with a concept. The sound-image is the *signifier*, while the concept is the *signified*. Let us take the example of the word "tree". The word's signified refers to the concept of "a plant that consists of a stem and branches" (this is how we define "tree" in general terms). The signifier of the word is a row of segments that gives the sound-image /t/ /r/ /iː/. These two components are illustrated in the figure below:
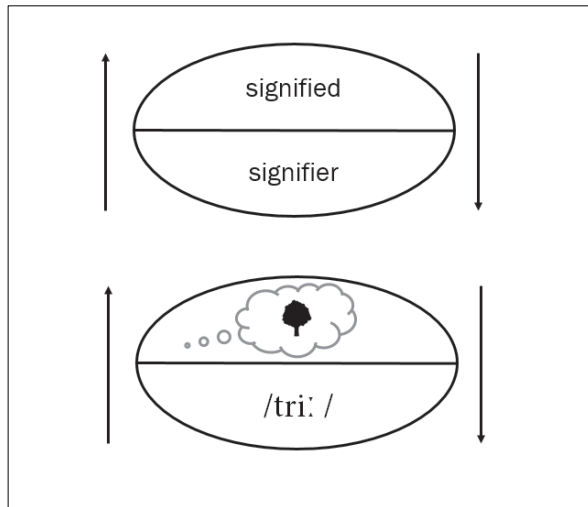
Fig. 1-2: The signified and the signifier of the word "tree"

1.3.3. Characteristics of the linguistic sign

One of the most important characteristics of the linguistic sign is its *double entity*. According to Saussure, both signified and signifier cannot be separated; that is, a sign cannot exist with the absence of one of these components. Usually, they are described as the content and the form of the sign, respectively. Another characteristic of the linguistic sign is its *conventionality*. The relationship between signified and signifier is arbitrary since there is no logical connection between a specific concept and a sound-image and, thus, this relationship cannot be explained. Such a connection exists because someone has agreed or decided to connect the two components. Furthermore, *linearity* is another feature of the linguistic sign. That is, the signified consists of segments that are pronounced consecutively and, therefore, are understood as a sequence of elements that form a speech "chain". Finally, the combination of the linguistic sign components is *unique* as there are no words that have the same signified and signifier. However, some words share the same signifier but not the same signified. Namely, they are heard in the same way but have a different meaning: these words are called *homophones* or *homographs* [e.g., "ate-eight" or "bar (a business that sells alcoholic drinks)-bar" (a cuboid piece of any solid commodity)]. However, some words share the same signified but have a different signifier: e.g., "autumn-fall" semester

(different sound-image but identical meaning: they both mean the academic semester that usually starts in September/October).

1.4. Features of Language

People often use many communication codes, such as traffic signs, mathematical symbols, and music notes, etc. However, language code is a unique and a more sophisticated communication system compared to other ones. It consists of particular features that are common in all languages and are essential to understand how the language system works.

1.4.1. Arbitrariness

Arbitrariness is one of the most important characteristics of languages. Words and rules are not a result of a general principle or a "natural" process but, instead, someone agreed with someone else (these people are still unknown to us) to match of a particular word with a certain concept. For example, there is no explanation for why a "house" is called /haʊs/ rather than something else. Arbitrariness is also related to the rules of a language: there is not a sensible justification for why we say "how are you" instead of "how is you". Furthermore, by looking at words in several languages, we can see that each one has a different combination of form and meaning (e.g., eye: English: /aɪ/, Spanish: /ˈoxo/ Greek: /ˈmati/) as well as different grammatical rules:

Mia	*ómorfi*	*méra*
Article	Adjective	Noun

Um	*dia*	*bonito*
Article	Noun	Adjective

The sentences above come from Greek and Portuguese, respectively. Both of them mean "a beautiful day"; however, the position of the adjective that describes the noun differs in each case. So, the rules of each language are not determined in the same manner, and there is no logical explanation for this. Another important fact is that arbitrariness is common among speakers. An individual speaker cannot change the signifier or the signified of a word because making such a change would lead to difficulties when communicating with other speakers. Moreover, even if a speaker links, for example, the word "child" with a prudent child, while

another speaker links it with an imprudent child, they will still be able to communicate with each other since the general idea of "young being" remains common between them.

Ferdinand de Saussure divided arbitrariness into two subcategories: the *absolute* and the *relative*. For example, the number "twenty" is absolutely arbitrary, whereas "twenty-one" is relatively arbitrary; the former cannot be analyzed and, hence, cannot be associated with other words, whereas the latter is derived from the word "twenty".

Moreover, some people assume that the paradigms of *onomatopoeic* words (words that supposed to imitate sounds) and interjections prove that Saussure's theory about the arbitrariness of the linguistic sign is incorrect. However, if we look at different languages, the same dog barks using different sound continua:

English	'woof'
Japanese	'wan'
Greek	'γαv'
Icelandic	'voff'
Persian	'haap'

Of course, the dog does not bark differently. It is the way that this barking is perceived by the speakers of each language and the historical context in which the words have been developed that form these differences. So, we cannot talk about words that were created due to the imitation of a sound. If that were true, we would have identical or similar words for the sound of barking in all languages; indeed, the English "woof" and the Persian "haap" differ significantly acoustically.

1.4.2. Variability

A linguistic sign does not remain constant over time as linguistic conventions change. If we refer to older forms of language, we can find examples in which a linguistic sign has altered its signifier. In Ancient Greek, the word water was "ὕδωρ" /ˈiðor/ and, during the Middle Ages, the word became "νερό" /neˈro/. Furthermore, some words may acquire additional meaning due, for instance, to technological advances: e.g., "run" = 1. to move rapidly, 2. to start a computer program; or "window" = 1. an opening in the wall, 2. a display rectangle in a computer program.

New words may emerge from the processes of derivation and composition (or compounding). In derivation, a new word is created with

the addition of an affix in an existing word: "*dis*-infect", "taxabil-*ity*". In composition, two words are linked to create a new word: "inter-net", "ear-phones". Also, the phenomenon of word borrowing can add more words to a language's vocabulary. For example, in the 20th century, English borrowed "paparazzi" from Italian, "Tamagotchi" from Japanese, "pogrom" from Russian, and "Taoiseach" from Irish-Gaelic.

Linguistic variability is not only related to synchronies found in different periods but also to the same synchronies in different geographical locations. For instance, the Greek language spoken in Cyprus (Cypriot Greek) differs in terms of phonology, morphology, syntax, and semantics from the Greek language spoken on the mainland. The same applies to different varieties of Arabic (e.g., Levantine Arabic, and Moroccan Arabic). Even in a single country, there are other varieties (dialects or idioms) that differ from the standard language.

In sum, linguistic variability is a natural phenomenon in languages, which signifies their evolution. Linguistic signs are used in everyday communication by billions of speakers and, consequently, they do change.

1.4.3. Double articulation, language economy, and productivity

Another essential feature of language is its *double articulation*. Two central units contribute to the creation of a linguistic message. The first unit is the *first articulation* that contains meaningful units with lexical (e.g., "door", "play") or grammatical (e.g., "door-*s*", "play-*ed*") values. The second unit is the *second articulation* that contains meaningless individual units, phonemes, which, upon combination, form the first articulation units (e.g., /d/-/ɔ:/-/r/).

One of the advantages of the double articulation is that it allows us to create an infinite number of first articulation units (e.g., lexemes, morphemes) by only using a finite number of units (e.g., phonemes) that are found in the second articulation. Therefore, even though phonemes can rarely exceed the number of 50 in a language, we can create infinite words and sentences, if we combine them. This feature is called the *economy of language*. Economy of language is related to arbitrariness in which a linguistic sign has two independent and arbitrarily related components: the signifier and the signified.

A consequence of language economy is language *productivity*: the ability of humans to create and understand sentences. According to Noam Chomsky, humans can create an infinite number of sentences. Even

children, who do not receive much linguistic input in their native language, can create a great number of sentences that they have never heard before.

1.4.4. Language Universals

Every child has the ability to produce language forms from a very young age. These forms might be ungrammatical or incomplete at the early stages of language development while they are being refined as the child learns the distinct lexicon and structure of their native language. According to Chomsky, despite the external differences between the world's languages, there are more profound similarities for native speakers on a cognito-psychological basis that begin to take shape when children listen to the input provided by their parents. Parents' speech does not help children learn the language, but it does help the biological process of language learning to begin. Thus, there are *language universals* or a universal grammar that allows children to acquire a particular language.
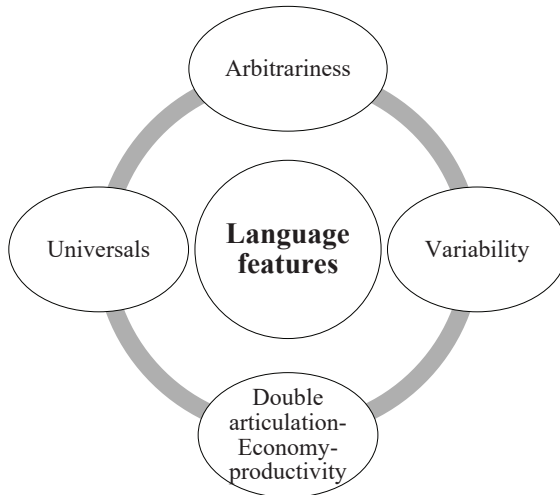
Fig. 1-3: The four features of language

There are three main categories of language universals: (a) the *substantive*, which contains categories that are necessary for the analysis of a human language (e.g., noun, verb, and number); (b) the *formal*, which includes abstract orders for linguistic analysis (e.g., the type of rules that have to be specified for linguistic analysis); and (c) the *implicational*,

which contains features that can be formulated as relationships (e.g., if there is subject-noun agreement with respect to gender, there will be also an adjective-noun agreement).

1.5. The science of Linguistics

Linguistics is the scientific investigation of language as a universal phenomenon as well as the investigation of individual languages. It aims to answer questions about the nature of language, its structure, and its relationship with the human mind and society. Also, through the examination of linguistic structures (i.e., the ways in which expression is organized and meaning is formed for communication), it aims to examine the possibility of the formulation of standard rules for all languages. In order to achieve the latter, it employs empirical data, establishes linguistic principles, and uses appropriate methodological tools. It is important to add that linguists focus on the description and interpretation of linguistic phenomena without intervening, evaluating, or having a prescriptive view; linguistics is a *descriptive* rather than a *prescriptive* science.

Today, the scientific study of language might take place in an interdisciplinary manner; namely, linguistics borrows theories and methodological tools from other sciences, such as psychology (psycholinguistics), philosophy (philosophy of language), anthropology (linguistic anthropology), philology (orthography), law (forensic linguistics), medicine (clinical linguistics), biology (cognitive linguistics), sociology (sociolinguistics), informatics (computational linguistics), and mathematics (quantitative linguistics). Also, the science of linguistics is often divided into *general/theoretical linguistics*, which studies the structure and the functions of language to formulate theories, and *applied linguistics*, which applies general/theoretical linguistic theories to provide solutions to real-life problems.

1.5.1. Linguistics and Philology

Many sciences, such as *linguistics* and *philology*, deal with language issues; nevertheless, this does not imply that they all follow the same approach. Linguistics is interested in the examination of grammatical system functions using a descriptive approach. In contrast, philology mostly follows a prescriptive approach, indicating "correct" or "wrong" forms of either an oral or written language.

Students come into contact with traditional grammar textbooks from a very young age during school courses. These grammar books

indicate which forms are "correct" or "incorrect"; "incorrect" forms are those which do not obey the rules of formal grammar. However, this approach is problematic since it only gives a minimal overview of the language system and fails to consider the evolution of language and the mechanisms that create several linguistic forms. So, misinterpretations about how the language system works are rational since all language forms spin around the "correct"/"incorrect" relationship. In conclusion, there is a clear difference between linguistics and traditional school grammar: the latter refers to *what should be said*, whereas the former analyses and records *what actually was said*.

1.6. Levels of Linguistic Analysis

Every language in the world consists of rules; meanings are formed when words are linked to each other in a predetermined way. Therefore, language does not work randomly. In the pictures below, we can see an insect called a "santle":
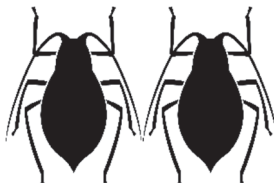
Picture 1   Picture 2

-Picture 1 presents a santle.
-Picture 2 presents _____.

Ten English native speakers were asked what Picture 2 represented. All speakers said that "Picture 2 represents 'santles'". This response indicates that speakers know the rules of their native language. Of course, there is no insect called "santle" and this word does not even exist in the English vocabulary; however, the speakers employed a well-known rule in English: plural nouns are formed by the addition of an –s ending. This rule has never been taught to the native English speakers. In general, native speakers are often not aware of the grammatical rules in their mother tongue. For instance, it does not take any time for them to think about how to form a verb in the past tense when they want to talk about something that happened in the past.

In linguistics, grammar is a sum of rules that native speakers acquire subconsciously, which leads to the formation of particular

sentences. Also, grammar is the description and presentation of language rules by researchers. It should not be confused with traditional grammar taught at schools, which has a prescriptive character. It is important to remember that linguistics does not criticize any linguistic form; instead, it explains why one linguistic form is preferred instead of another. Language can be divided into five—or six for some researchers—main levels: *phonetics/phonology*, *morphology*, *syntax*, *semantics*, and *pragmatics.*

1.6.1. Phonetics

Phonetics [from Greek "foní" (=voice)] deals with the scientific investigation of all sounds of human speech and communication. In particular, it investigates the functions of *phones* (i.e., any speech sound/gesture regardless of whether it can change the meaning of words; see "phonemes" in Section 1.6.2. for comparison) and non-language sounds. Phonetics has three main subfields which study the following: (a) speech sound production (*articulatory phonetics*), (b) speech sound perception (*auditory phonetics*), and (c) acoustic aspects of speech sounds (*acoustic phonetics*).

Pronunciation is the ability of humans to produce sounds. However, humans can produce more sounds than those found in a specific language or languages. It is important to say that each human pronounces these sounds instinctively; nevertheless, most of the time, there is mutual intelligibility among native speakers of a particular language.
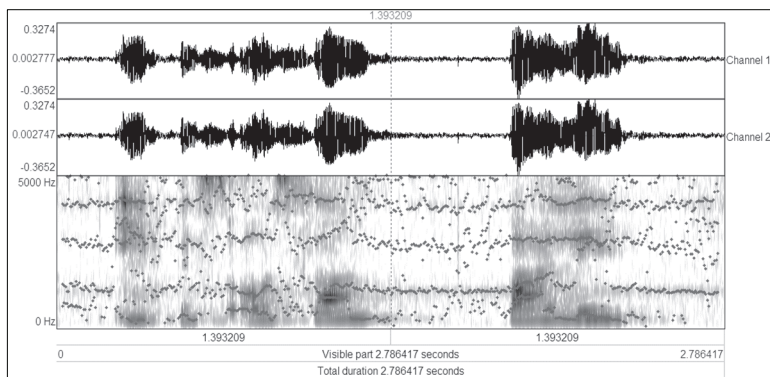
Fig. 1-4: Waveform and Spectrogram in a Praat script for the analysis of acoustic characteristics of sounds (e.g., formant frequencies and duration)

1.6.1.1. Pronunciation and Orthography

There is a complicated relationship between *pronunciation* and *orthography*. The latter rarely depicts the real pronunciation of sounds because the written word does not evolve as rapidly as the spoken word. Furthermore, the designers of the various writing systems did not consider the representation of pronunciation in the written word to a great extent. In the case of English, a grapheme (the written representation of a sound: i.e., a letter) might depict the actual pronunciation of a sound (e.g., "m" as /m/), or it might correspond to two or more different sounds [e.g., "a" as /æ/ (c**a**t) or /ɑ:/ (st**a**r)]. To solve problems surrounding the written representation of sounds, linguists have created *phonetic writing* in which each sound is represented by a single phonetic symbol. The *International Phonetic Alphabet* (IPA) was created in 1888, and it consists of 107 letters mostly deriving from Latin (e.g., [p], [t]) and Greek (e.g., [θ], [ɛ]), or modifications thereof. Also, there are 52 diacritics and 4 prosodic marks. IPA is a vital tool for scientists since it helps depict the exact pronunciation of a word, and it simplifies the spelling of words which are written in alphabets that are "difficult" for many people, such as Chinese and Arabic: e.g., Chinese 树 (=tree) → /ʃu/ (shù).

International Phonetic Alphabet (IPA)	Bilabial	Labio-dental	Dental	Alveolar	Post-alveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k g	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	N		
Trill	ʙ			r					R		
Tap or flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

ɪntəˈnæʃn̩l fəˈnɛtɪk ˈælfəˌbɛt

Fig. 1-5: Example of the International Phonetic Alphabet (Omniglot)

1.6.2. Phonology

Phonology [from Greek "foní" (=voice) and "lóγos" (=speech)] deals with the study of the *phonemes* of a particular language at levels beneath a word (e.g., syllable, onset, articulatory gestures, articulatory features, and mora) or at any level in which the structure of a sound transmits linguistic meaning. Phonemes (opposed to phones) are sounds that, if swapped with other sounds, change the meaning of the word: e.g., /θʌm/ (thumb) vs. /dʌm/ (dumb). Words that are differentiated in only one element (here, phonemes) are called *minimal pairs*. In general, phonology examines how sounds function in a particular language.

There is a big difference between phonetics and phonology. Let us take some examples from English words to understand this difference. Two speakers can pronounce the English word "pin" as [pʰɪn] and [pɪn]; in the first case, the /p/ is aspirated, whereas in the second it is plain. However, in this example, we do not have two different linguistic signs (words) but the same sign. In fact, [pʰ] and [p] are two different sounds of an abstract unit called phoneme (here, /p/). Phonemes cannot be heard; they are units created for linguistic analysis. The sounds [pʰ] and [p], which could be roughly described as "subcategories" of the phoneme /p/, are called *allophones*. Allophones cannot form minimal pairs since they depict different representations of the same phoneme. In contrast, two phonemes might form minimal pairs. For example, the phonemes /p/ and /d/ create the minimal pair /pɪn/ - /dɪn/, which consists of two different words.

In sum, phonetics takes all the characteristics of sounds (even smaller ones that are not perceivable through hearing) into account in order to understand how they are articulated, while phonology only considers characteristics that have a clear importance. The phonological transliteration of a word is included in slashes (/word/), while the phonetic transliteration is included in brackets ([word]).

1.6.3. Morphology

Morphology [from Greek "morfí" (=shape, form) + "lóγos" (= speech)] studies the different forms of words during speech. In particular, it studies conjugations and the ways that words are created, such as derivation and composition.

So, what forms are studied in morphology? As we saw before, words might have more than one meaning. Also, they might have different forms: for instance, the word "day" also has the form "days", and the verb

"visit" also has the form "visited". If we look for words in the dictionary, there is always a particular form for them, which is called a *lexical* form; in languages that mark grammatical cases, the lexical forms of adjectives and nouns are in the singular number and the nominative case.

Words can be analyzed in smaller units: "un-like", "dog-s", "receiv-ed", and "do-ing". These units are the smallest meaningful components of language, which are called *morphemes*. A morpheme can stand by itself and function independently as a word: e.g., "town", "girl", and "happy". In this case, the morpheme is considered to be a *root*; it is a word without an embedded morpheme: e.g., "town-s" ("town": root), "girl-ish" ("girl": root), and "un-happy" ("happy": root). A root might be a lexical unit (e.g., "love" as in "love-ly") or not (e.g., "rupt" as in "cor-rupt"). The word "unbreakable" consists of three morphemes: "un-", "break" (root) and "-able". In the last example, the morphemes "un-" and "-able" cannot stand alone (they do not have a meaning by themselves) and, therefore, they have to be combined with roots in order to shape the meaning of a word. Morphemes that can stand alone are called *free* morphemes, whereas those that cannot stand alone are called *bound* morphemes.

Free morphemes can be divided into *lexical* and *functional* morphemes. Lexical morphemes are ordinary words (nouns, verbs, and adverbs) that carry information about the content of the message (e.g., "dog", "house", "work", "invite", "drink", and "today"); these words can be easily used during communication. Functional morphemes are a language's functional words, such as prepositions (e.g., "to", "in"), conjunctions (e.g., "and", "because"), articles (e.g., "the", "a/an"), and pronouns (e.g., "it", "theirs") that modify the meaning of a word.

Subcategories of bound morphemes are *derivational* and *inflectional* morphemes. Derivational morphemes can change the semantic meaning of a word or the part of speech: e.g., "like" → "dis-like" ("like" ≠ "dislike"), "happy" → "happ-iness" (the adjective "happy" can become a noun, "happiness"). Inflectional morphemes modify a noun's number, gender, and case or a verb's number, person, mood, aspect, and tense: e.g., "boy" → "boy-s" (SING. → PLUR.); "wait" → "wait-ed" (present simple → past simple).

Root should not be confused with *stem*. As we saw before, a root is a morpheme by itself and cannot be separated into smaller meaningful parts. A stem consists minimally of a root, but it might take the form of a root plus derivational morphemes; inflectional morphemes may be added to a stem. For instance, in the word, "dislike", "like" is a root and a stem

together, while "dislike" is a stem, which might take the forms "dislike-s" or "dislike-d", etc.

The morphemes that can be attached to a word stem to create new words or word forms are named *affixes*. The three most common affixes are *prefixes*, *suffixes*, and *infixes*. Prefixes are placed before the stem of the word: e.g., "*dis*-appear", "*inter*-language", and "*down*-town". Suffixes are placed after the word stem: e.g., "mov-*able*", "like-*ly*", and "help-*ful*". Infixes are rare in several languages, including English, and they are placed inside the word stem: e.g., "cup-*s*-ful", "narc-*o*-lepsy", and "passer-*s*-by".
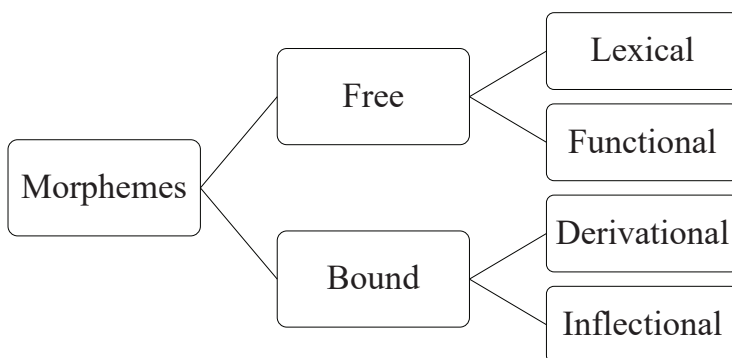
Fig. 1-6: Main subdivisions of morphemes

1.6.3.1. Allomorph

Allomorph is one of the main terms that someone might come across when studying morphology. It refers to the different forms of a morpheme that do not differentiate meaning, and they are used as supplements (i.e., the presence of one of them excludes the presence of another). Often, it is easy to predict which allomorph to use because there are particular rules. What are the plural allomorphs of the following English words: "bus" (/bʌs/), "cat" (/kæt/), and "pen" (/pen/)? The answer is "bus-*es*" (/bʌs-əz/) because "bus" ends in /s/, "cat-*s*" (/kæt-s/) because "cat" ends in a voiceless sound, and "pen-*s*" (/pen-z/) because "pen" ends in a voiced sound. Therefore, the plural in English has three allomorphs. In the above examples, the allomorphs depend on phonological processes that have particular rules. However, some allomorphs are predetermined and, therefore, do not depend on any rule. For instance, "child" becomes "children" in the plural

as a remnant of an older form of language, or the plural of some words—mostly loan-words from Latin and Greek—have kept their conjugation from their "original" language: e.g., "vertebra" → "vertebrae" and "criterion" → "criteria".

1.6.3.2. Free variation, zero, and discontinued morpheme

It is important to note that some morphemes are found in *free variation*: that is, two or more morphemes can be used freely according to the speaker's choice. For example, the plural of the word "curriculum" is either "curriculums" or "curricula". Free variation exists because language systems evolve. Two variations might co-exist in a particular period, but one of them might displace the other and become dominant.

Changes in *zero morphemes* are not visible. For example, both the singular and the plural forms of the noun "sheep" are the same ("sheep" and "sheep"). Similarly, both the present simple and the past simple tenses of the verb "hit" are the same ("hit" and "hit").

Plural	Past Tense
sheep + ø	hit + ø
tiger + s	visit + ed

A *discontinued morpheme* is a rare type in which a morpheme occupies two positions in a sentence. In the sentence, "*turn* the light *on*", we can see that the preposition "on", which is an essential constituent of the phrasal verb "turn on", is located in another position, and not next to the form "turn".

1.6.4. Syntax

While morphology deals with the structure of words, *syntax* [from Greek "sin" (= together) + "táksi" (= arrangement)] is interested in the relationship between words and the way they are combined to create larger meaningful units, such as phrases and sentences. In some theories, e.g., transformational grammar (Noam Chomsky), syntax is related to grammar. However, in other theories, it is seen as equal to other levels of linguistic analysis.

Syntaxeme refers to the minimal semantico-syntactical element of a language. We can detect syntaxemes according to their (a) categorical semantics in the world, (b) morphological form, and (c) function in a sentence.

The lecturer delivers a lecture

In the above sentence, we can replace "lecturer" with "student" or "professor" and still keep the meaning of the sentence. However, if we replace "lecturer" with "house" or "window", the sentence becomes ungrammatical. This is because, in the second case, we have used words from different *categorical semantic classes* (specifically, we have used inanimate words). Categorical semantic class refers to words that share a semantic feature: e.g., inanimate nouns (including humans and animals, etc.) vs. animate nouns (including objects), static verbs (e.g., "know" and "like") vs. dynamic verbs (e.g., "run" and "move").

The mother brings her son <u>to school</u>.
Laziness leads the researcher <u>to trouble</u>.

In the above sentences, the two syntaxemes "to school" and "to trouble" have the same morphological form, but they differ in meaning. Thus, categorical semantic class is a non-morphological category because syntaxemes may have similar morphological forms but different meanings.

According to their function, syntaxemes can be (a) *free*: not depend on the context as in the case of news titles; (b) *conventional:* constitute a component of a sentence, e.g., as a grammatical subject ("<u>Life</u> is beautiful"), a predicate ("Life <u>is beautiful</u>"), or a modifier ("Life is beautiful <u>for everyone</u>"); and (c) *bound*: constitute components of a phrase (verb, noun, and adverb, etc.)

1.6.4.1. Lexical (syntactic) categories

In order to investigate the syntax of a sentence/phrase, we need to formulate rules for a sum of words that have similar syntactical behavior rather than for every single word.

The driver gave me a cigarette

In the above sentence, we can identify two words that have the same syntactical behavior, "the" and "a". Specifically, they both belong to the same part of speech: they are articles. In linguistics, *lexical (or syntactic) categories* is preferred instead of the term, *part of speech*; these words do not just correspond to lexemes, but they also add grammatical value: e.g., they may indicate the number, the gender, or the case of a noun.

Therefore, the identification of lexical categories is important in syntax. It has to be added that lexical categories differ from language to language; for example, Russian and Sanskrit lack articles. Also, some languages do not make distinctions between lexical categories. For example, in Greek, nouns differ from verbs since the former have the characteristics of number, gender, and case, whereas the latter have the characteristics of number, mood, voice, aspect, and tense: e.g., "(i) αγάpi" (= the love); singular, feminine, and nominative vs. "αγαpó" (= I love); singular, indicative, active voice, continuous aspect, and present simple. Nevertheless, in English, the word "love" might refer to two different lexical categories (noun and verb).

The elements of lexical categories might have a *lexical* or a *grammatical* meaning. Lexical categories theoretically include infinite words that could be nouns, verbs, or adjectives, etc. Thus, these categories are called *open classes*. Lexical categories also include a number of words such as conjunctions and prepositions, etc., which accept new "members" infrequently; therefore, these categories are called *closed classes*. The words included in closed classes are not necessarily independent morphemes (e.g., "to" and "of"), especially for inflectional languages. For instance, in Spanish, gender is divided into masculine and feminine, and it appears only as a morpheme at the end of words: e.g., "un-*a* person-*a* hermos-*a*" (=a beautiful person). These grammatical features can also help us understand the relationship between the noun and the verb:

Student wita nauczyciela
Nauczyciel wita studenta

The examples above come from Polish, a highly inflectional language. The first sentence means "the student greets the teacher". The nominative case of the subject "student" shows the subject (here, student) who acts (here, greets), while the accusative case of the word "nauczyciela" shows the object that the action goes to (here, the teacher). The second sentence means "the teacher greets the student". So, here, the subject is the teacher who greets the student (object). To that end, grammatical cases are essential to understand "who" acts, and to "whom" or "what".

Moreover, these categories have an impact on the semantics of words. For instance, in Greek, the category of aspect is crucial for the meaning of a word and, consequently, the meaning of a sentence. For instance, "épe-*z*-a" (έπαιζα) means "I was playing", while "épe-*ks*-a" (έπαιξα) means "I played". In this case, the differentiation in aspect

changes the tense of the verb; in the first case, it is past continuous, while in the second case, it is past simple.
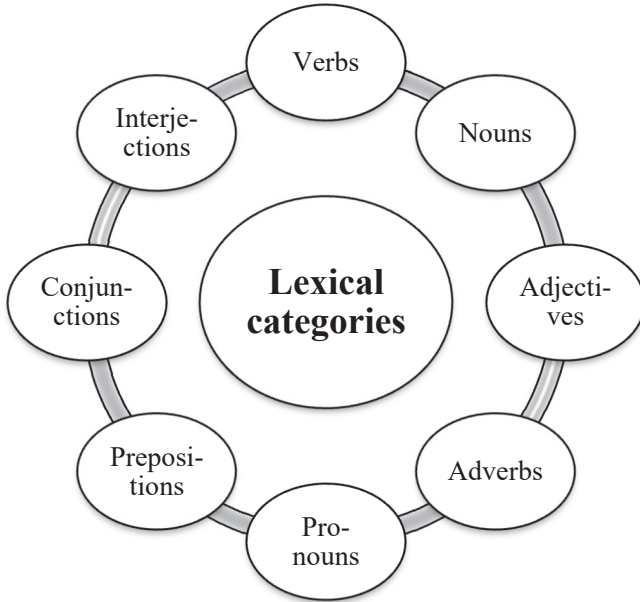
Fig. 1-7: The lexical categories of English

1.6.4.2. Phrase

A *phrase* is a group of words that works as a constituent in a sentence's syntax. A phrase is not a sentence because it is not a complete idea with a subject, a verb, and a predicate (e.g., "best friend" and "for twenty years"). Its function is to add additional meaning to the sentence. The majority of the phrases contain a keyword, which is the central constituent of the phrase. This keyword is the *head* of the phrase, and it might stand alone or accompanied by other elements: the *dependents*. In the phrase, "boiling hot water", the head is the noun "water". According to the distribution and their syntactical function, we can place a phrase in one of the following categories:

- ▪ *Noun phrases* (NF): their head is a noun, and they function as nouns, e.g., "*This house* is located in a small village."

- *Verb phrases* (VP): their head is a verb, and they function as verbs, e.g., "The teacher *is writing* the answer."
- *Prepositional phrases* (PP): they have a noun as their head, but they are introduced with a preposition that functions as an adverb, e.g., "Please turn *towards the right* at the intersection".

In a single phrase, we might find all of the types of phrases mentioned above:

The teacher	gave the book	to the student
NF	VP	PP

In English, there are as well other types of phrases, such as the following:

- *Gerund phrases* (GF): noun phrases that start with a gerund: e.g., "Taking my dog for a walk is fun".
- *Infinitive phrases* (IP): noun phrases that begin with an infinitive verb, e.g., "To donate time or money is an honorable thing."
- *Applausive phrases* (AP): restate and define a noun, e.g., "A cheetah, the fastest land animal, can run 70 m/h."
- *Participle phrases* (PaP): begin with a past or present participle, e.g., "Washed with my clothes, my cell phone no longer worked."
- *Absolute phrases* (AbP): they have a subject but not an action verb, so they cannot stand alone as complete sentences, e.g., "Picnic basket in hand, she set off for her date."

1.6.4.3. Sentence and utterance

A *sentence* is an abstract group of linked words that convey a complete meaning or thought, and it is autonomous in both semantic and syntactic levels. It can stand alone in speech, in contrast to a phrase.

Utterance is not synonymous to *sentence*. An utterance is a unit of speech that usually applies to spoken language rather than the written one. As it is a part of oral communication, an utterance consists of paralinguistic features, such as facial expressions, laughter, eye contact, and gestures, as well as prosodic features, such as pitch, intonation, and stress. So, in this sense, utterance is unique; if we repeat the same sentence twice, we will get two different utterances that create the same denotation. A commonplace occurrence in utterances is that before and after their production, there is a pause that corresponds to the speech of a speaker. However, a sentence is an abstract structural pattern that belongs to

language. We can better understand the differences between a sentence and an utterance by looking at the examples below:

–Where are my keys? – In the drawer.
–What is your favorite food? –Roasted beef.

The utterances "in the drawer" and "roasted beef" do not have a complete meaning for someone who does not know the previous linguistic context. Therefore, they cannot be analyzed as a part of a sentence; utterances are not autonomous from a communicative perspective since they depend on other components of their context.

1.6.4.4. Grammaticality

Chomsky explains that, in order to have grammatically correct sentences, we have to follow particular rules. In that sense, there are *grammatical* and *ungrammatical* sentences.

Every morning she goes to work
Every morning she go to work*

English native speakers would agree that the first sentence is grammatically correct, whereas the second one is incorrect. However, it is not only the absence of grammaticality that makes a sentence incorrect. One well-known example comes from Chomsky:

Colorless green ideas sleep furiously

Although the above sentence is grammatically correct, it cannot be accepted because it violates semantic rules (i.e., its meaning is not understandable). So, Chomsky points out that syntax is independent of semantics, but this is not to say that it does not contribute to the formation of the meaning of a sentence.

The structure of a sentence is *hierarchical* as some components are more or less important for meaning; this importance is only from the perspective of syntax (and not, for example, that of semantics). In a sentence, some components can be omitted without making it ungrammatical:

Helen woke up very early

If we omit "very early", the sentence will remain grammatical but, of course, with a different meaning than its previous version. Another important fact is the existence of *structural ambiguity* in some sentences: that is, sentences can be explained in two ways. Let us see an example:

Many students and teachers attended the conference

The ambiguity in this sentence is as follows: does the word "many" refer to both students and teachers "[many (students and teachers)]" or does it refer only to the students and not to the teachers? "[(many students) and (teachers)]". Finally, the intonation in the speakers' pronunciation defines the meaning in ambiguous sentences.

1.6.4.5. Types of sentences

To understand the different types of sentences, it is crucial to explain the term *clause.* A clause is a group of words that includes a subject and a verb, and it can be *dependent* or *independent*. Dependent clauses cannot stand alone in a sentence and they must be linked with another sentence with subordinating conjunctions (e.g., because, after, and since) or relative pronouns (e.g., which, what, and where) to express a complete thought. An independent clause can stand alone and express a complete idea. Now, a *simple sentence,* as seen in example [1], contains a syntactical core with its complements and corresponds to the independent clause: e.g.,

[1] *I will play football*

Apart from the simple sentences, there are also sentences with an extended length: e.g.,

[2] *I will play football, and I will visit my friend*
[3] *I will play football after work*
[4] *I will play football, and I will visit my friend after evening*

In example [2], two simple sentences were connected with the coordinated conjunction "and", which makes them syntactically equal. The sentence that emerges is called a *compound sentence*. Such a sentence can be formed when two independent clauses are connected with a conjunction (e.g., and, but, or, etc.), a semicolon, or a comma. In example [3], we can see an independent clause ("I will play football") and a dependent one ("after work"). This combination creates *complex* sentences. Finally, in

example [4], there are two independent clauses and a dependent one; sentences of this type are called *compound-complex sentences*.

Phrase: a group of words without the subject-verb component

Utterance: a unit of speech bounded by silence; it is what we really produce in oral speech

Sentence: an abstract group of words that expresses a complete meaning
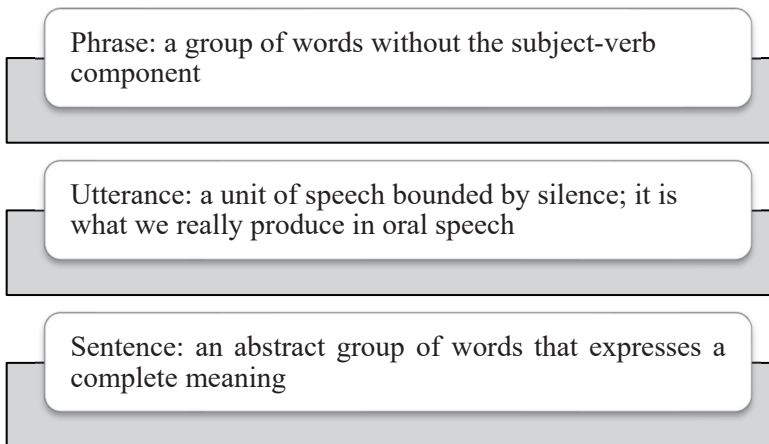
Fig. 1-8: A brief definition of phrase, utterance, and sentence

1.6.5. Semantics

The level of *semantics* [from Greek "simadikós" (=significant)] deals with the units of the first articulation, and it focuses on meaning rather than form. Semantics may refer to the meaning of a word or the meaning of a whole sentence.

1.6.5.1. Semantic Analysis

Signifieds can be analyzed in smaller distinctive units. Those units, analogously to phonemes, morphemes, and syntaxemes, are called *sememes*. In other words, a sememe is a bundle of semantic features that carry a particular meaning. For example, we could define "house" as [the building] [that consists of a floor and one or more stories] [in which humans live]. Now, if we replace the feature "in which humans live" with "where goods or services are sold", we have a new word: "shop". *Seme* is the smallest unit of meaning that refers to a single characteristic of a sememe. For example, in the Russian word "knig-u" (книгу = book), there are three semes in the "–u": singular number, feminine gender, and accusative case.

1.6.5.2. Types of meaning

Primary and Secondary Meaning

Primary meaning is the first meaning that comes in mind after hearing a particular word; this meaning is literal. For instance, the word "wing" primarily refers to the "part of the bird that helps it fly". The secondary meanings of the word, which are used figuratively, contain "the part of the aircraft" and "the raised part of the body of a vehicle"; they can be described as peripheral. However, there are primary word meanings that are widely used in speech figuratively, such as the adjective "giant", which does not have a literal meaning, but it primarily means "something enormous".

Literal and Figurative

Literal meaning is the "usual" meaning of the word: that is, a consistent meaning outside of the context. For instance, in the sentence, "The car crashed into the building", the word "crashed" is used in literal terms, meaning that the car has violently hit the building. However, its figurative meaning conveys a more complicated meaning, which deviates from the conventionally accepted definition: e.g., "The application crashed" where, of course, the computer application did not crash in literal terms and, instead, the application was shut down due to a malfunction in the software/hardware (a figurative "crash").

Denotation and Connotation

Denotation is the central meaning of a word as found in a dictionary. *Connotation* is an additional meaning of a word that shows emotions or attitudes towards the person or the thing that they refer to. So, denotation is neutral in the sense of meaning, while connotation may show a positive or a negative attitude. For example, we can refer to equines as "horses" or "coursers". The former word does not imply something good or bad for horses, whereas the latter word connotes "agile" horses. Similarly, both the words "cheap" and "inexpensive" mean that something has a low price. However, "inexpensive" denotes the consistent meaning of the word (a thing that has a low price), while "cheap" connotes that while the specific thing has a low price, it might also have a low level of quality.

Denotation is an actual neutral form that can be found in a dictionary as the "basic" form of a word. The connotation of a word

depends on many factors, such as the educational background, societal culture, social class, and age of the speaker.

1.6.5.3. Relationship of form and meaning

Synonyms/Antonyms

Synonym is a word that has the same or nearly the same meaning as another word. Those that are the same share the same denotational sememe, such as the articles "a" and "an", and those that have close meaning share a broader denotational and connotational sememe that overlaps in a semantic field, e.g., "home" vs "house".

     Antonyms are words that have the opposite meaning. They are divided into three categories: (a) gradable antonyms: two meanings in a continuous spectrum, e.g., young ≠ old; (b) complementary antonyms: two meanings in a non-continuum spectrum, e.g., mortal ≠ immortal; and (c) relational antonyms: words that do not have exact opposites, e.g., teacher ≠ pupil.

Polysemes

A *polyseme* is a word with different semantic meanings that constitute an extension of each other. Examples: "nose": 1. Part of a person's face, above the mouth, 2. The front end of an aircraft or vehicle; and "window": 1. An opening in the wall, 2. A framed area on a display screen in computers, 3. An opportunity for action, and 4. An envelope's part that shows the address.

Homonyms

Homonyms are words that sound the same or are spelt in the same manner, but they have a different meaning. Homonyms can be homographs (i.e., written in the same way), e.g., "crane" (=bird) vs. "crane" (=lifting machine), or homophones (heard in the same way but have a different orthography), e.g., "buy" vs. "by" vs. "bye".

Paronyms

Paronyms are words that are pronounced or written similarly, but they differ in meaning: e.g., "collision" vs. "collusion"; "continuous" vs. "contiguous".

Ambiguity

Ambiguity is when a word or a sentence might have more than one meaning. For instance, in the sentence, "They went on the roof of the house, and they were watching the cranes", we are not able to know the exact meaning of the noun "cranes" in the particular context since it might refer to the bird or the lifting machine.

Hypernyms and Hyponyms

A *hypernym* is a word that has a broader semantic field than its *hyponym*. In contrast, a hyponym has a more specific semantic field than its hypernym. For example, the word "animal" contains particular animals, such as "tigers", "lions", "elephants", and "bears". So, "animal" is the hypernym and the list of specific animals is the "hyponym". Moreover, if "countries" is the hypernym, then, "France", "Germany", "Italy", "Russia", and "USA" would be its hyponyms.

1.6.5.4. Semantic analysis of sentences

As we saw in the syntax section, there are syntactically acceptable and unacceptable sentences. The same applies to the semantic level: there are semantically conventional and unconventional sentences.

[1] *My brother wants to be a mother*
[2] *Her dog could read the newspaper*

In the above examples, both sentences are grammatical; they do not violate any grammatical rules. However, they are semantically unacceptable sentences because in [1] a brother cannot become a mother (he can become a father), and in [2] it is not possible for a dog to read (it is not a human). Nevertheless, there are some rare cases in which unconventional sentences are accepted:

[1] *Receive a free gift with every purchase*
[2] *Entra para adentro*
[3] *Kalí epitixía! [Καλή επιτυχία!]*

In [1], the word "free" is a pleonasm since a gift is for free anyway. In [2], the sentence is Spanish and, if translated word-for-word, it means "Go in inside". The "para adentro" ("in inside") is not needed at all.

Example [3] is a common wish for Greek speakers, which is roughly translated as "good luck" but, if it is translated word-for-word, it means "good success". This is a pleonasm since "success" is always positive; therefore, the adjective "good" is redundant. These sentences, although they violate semantic rules, are stereotypical sentences in the language system of the above languages.

1.6.6. Pragmatics

Pragmatics [from Greek "praɣmatikós" (= fit for action; real)] is a subfield of linguistics that studies how context affects meaning. Pragmatics differs from semantics because the latter deals with conventional meaning in a given language, while the former examines not only the dependence of meaning on a speaker's grammar or lexicon but also its dependence on the utterance context, the speaker's pre-existing knowledge, the speaker's intention, and other factors. Pragmatics supports the fact that meaning is related to the time, the place, and the manner, etc., of an utterance, and it investigates how the speaker treats ambiguous meanings. The scenario below shows both semantics and pragmatics in a real-life example:

> "You talk to your friend about your new job. Your friend seems to get bored and starts a new talk about her cat. She continues to talk without looking at you and without responding to what you said before. Finally, you say "it's time to leave" and, even then, she keeps talking alone. So, you leave her house angry about her behavior".

In the above example, your friend shares some information with you. This might refer to the semantic level. However, you get angry because you interpret her actions as a sign of rude behavior since she does not pay any attention to you, and she only speaks about herself. This is what we call pragmatics. So, semantics pays attention to the meaning of an utterance, while pragmatics focuses on its interpretation. The equation below depicts the relationship between semantics and pragmatics:

$$Pragmatics = meaning - Semantics$$

The following is another example from real life: when female Indian caretakers working at cafeterias in one of the biggest airports in London were taking orders from customers, they were using single-word toneless expressions, such as "meat" instead of "meat?". Many English customers complained about their behavior who, according to their

perspective, were being rude. So, although the caretakers did not use any rude words, their tone was misunderstood and interpreted as inappropriate. Perhaps, Indian customers may not have misunderstood the caretakers' words; in other words, their way of expressing themselves was only offensive to English people due to differences between English and Indian culture. We could say that the caretakers' expression was neutral, and it can receive a negative or positive perception depending on the customer's culture.

1.6.6.1. Ambiguity and Meaning

The meaning of a sentence can be ambiguous: that is, it can be interpreted in different ways.

He saw the man with binoculars

The above example shows a sentence with an ambiguous meaning. It might mean that someone saw a man by using binoculars, or someone saw a man who was carrying binoculars. The interpretation of this syntactical ambiguity depends on the perception of the context as well as the speaker's intention. As we discussed in another section, a sentence is an abstract entity that is separated from any non-linguistic context, while an utterance includes both linguistic and non-linguistic contexts. The understanding of the word/sentence meaning relies on whether a speaker uses common expressions, phrasing, or topics, etc. The sentence "She didn't go to the university today" is an example that depicts a general idea rather than a true meaning (Who is "she"? Which university?). On the other hand, if the above sentence is produced by John who talks with his mother, the sentence will acquire a true meaning and become an utterance.

1.6.6.2. Referential use of language

Referential use of language has to do with how signs are used to refer to something. As we saw before, meaning is based on the relationship between the signified and the signifier of a sign. In pragmatics, meaning is divided into two categories: the *semantico-referential* meaning and the *indexical* meaning.

The semantico-referential meaning is not interested in the circumstance of the utterance, but it describes something that is the case in the world. Therefore, it does not depend on the context. For example, in the sentence "John goes to work", the meaning shows that John could go

to work at any time, rather than at a specific time, e.g., "John goes to work at 9 o'clock". In contrast, the indexical meaning depends on the context and, thus, the utterance can be only explained if someone knows the context (e.g., specific place, person, and time). For instance, in the utterance "I go to work", the word "I" is only explainable if we know the person who utters it.

1.6.6.3. Non-referential use of language

Non-referential use of language does not indicate a referential meaning, but it only indicates a specific value of variables that define a context. Non-referential indexes can mark the following contexts:

- Sex indexes: a speaker's sex can be indicated by using affixes or inflexions in a word: e.g., the Greek "kal-ós" [good: masculine adjective), and "kal-í" [good: feminine adjective]
- Deference indexes: words that mark social differences. The use of honorifics, for instance, shows one person's respect to another, politeness, or social distance and the absence of familiarity.
- Affinal taboo index: a type of avoidance speech that enhances sociological distance between members of a society. For example, in Highland East Cushitic languages in southwestern Ethiopia, married women avoid pronouncing words that start with the same syllable as the names of their husbands' parents. Instead of these words, they tend to pronounce similar words (i.e., synonyms) or borrow words from other languages.

1.6.6.4. The six functions of language

The linguist Roman Osipovich Jakobson found that language can function in 6 different ways:

- *Referential*: This relies on context and describes a situation, an object, or a mental state. Descriptions may be definite or include deictic words (i.e., words that cannot be understood without context): "Our business hours are 8 a.m.–9 p.m. from Monday to Friday."
- *Expressive*: This function indicates the speakers' internal state; e.g., they might show the speakers' feelings: "Wow, what a surprise!"

- *Conative:* The addressees are directly engaged; this is usually accompanied by verbs in the imperative mood and/or nouns in the vocative case: e.g., "Gina, take your coat!"
- *Poetic:* The speakers focus on the message for its own sake, and the language is closer to that of poetry. This could be compared with the metaphorical use of language, which is opaque and deviates from the conventional form: e.g., "Alexander the Great" (instead of the conventional "The great Alexander").
- *Phatic*: The expressions of this function do not carry a message, but they aim to construct and maintain communication between two parties, as well as to show that this communication has ended. This function is found in the "hello" and "bye" of phone communication, or in the "then" and "what news?" of everyday conversations; they do not offer essential information.
- *Metalinguistic:* It is the function that describes language itself: e.g., "In English, 'throw' is a verb, isn't it?"

Referential

Metalinguistic

Expressive

Language Functions

Phatic

Conative

Poetic
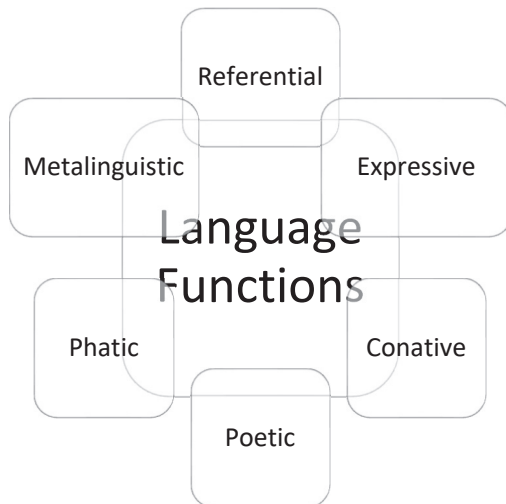
Fig. 1-9: The six functions of language proposed by Jakobson
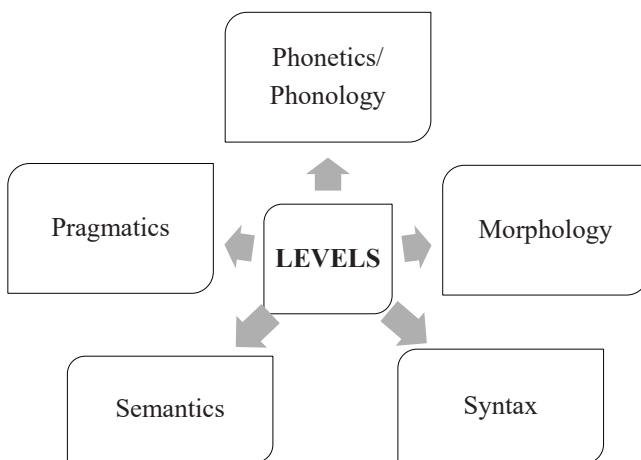
Fig. 1-10: Levels of linguistic analysis

1.7. Principles of Linguistics

Today's linguistic theories are based on principles that are significant for the description of languages. These principles have been formed from Saussure's research.

1.7.1. The priority of the spoken word

Spoken word has more importance for linguists than the written word, which is a subsequent invention that is only learnable by instruction. However, this is not to underestimate the importance of the written word, which constitutes a part of a nation's civilization and contributes to the dissemination of the sciences, but to instead underline the prioritization of research tasks; for instance, linguistics prioritizes the study of the spoken word as a phonetic component of language.

Historically, the spoken word precedes the written one since it was formed long before the invention of writing. Today, many languages do not have a writing system: e.g., the Wu Chinese dialect does not have an alphabet even though it has over 80 million speakers (!). Furthermore, the spoken word has a structural priority over the written one since pronunciation precedes writing; we cannot create the English word "rtgfkdonity" because we are not able to pronounce it (although we are able to write it). Another argument for this priority is the fact that the spoken word is a more

comprehensive manner of communication, and it is used on more occasions than the written word. It has to be added that the written word was invented to keep information (most of the first written monuments were catalogues of tangible assets), and not to facilitate communication between people. Finally, a biological priority of the spoken word over the written one is also evident since the former is acquired by children naturally without any effort, while the latter is learnt through explicit teaching.

1.7.2. Language Synchrony and Diachrony

When conducting linguistic analysis, a language may be examined through two different approaches. The *synchronic* approach [from Greek "sin" (=together) + "xrónos" (=time)] investigates a language at a specific point of time without taking its history into account; usually, this investigation contains the present form of language. However, the *diachronic* approach [from Greek "ðiá" (=thought) + "xrónos" (=time)] examines the development and evolution of language over its history; historical linguistics uses this approach. Both approaches are important for linguistic analysis. However, the diachronic investigation of a language requires the comparison of two or more synchronies; thus, the synchronic approach precedes the diachronic one.

1.7.3. Descriptive Approach

Language has evolved over the passage of time. This evolution might lead to minor or major changes in the language system. It is possible for two or more linguistic forms that describe the same thing to coexist, or for one form to displace another. Moreover, new words may emerge due to a technological advance (e.g., "smartphone", "I google"), or some words may take on additional meanings (e.g., "mouse": a rodent or a computer device). A linguist's job is to observe these changes and describe them, while avoiding any prescriptive intervention.

For example, in the sentence "Today, the market has less people", the formal grammar marks the use of the adjective "less" as incorrect since it cannot be used for countable nouns. Linguistics attempt to describe speakers' tendency to use "less" instead of "fewer" without referring to the terms "correct" or "incorrect". Linguists have to investigate the frequency in which a form appears to make conclusions about the evolution of the language system. Also, they have to provide an explanation for the appearance of a specific linguistic form and to clarify its origin: in which

geographical area is it found, which category of speakers produces it, and in what type of speech does it appear?

1.7.4. The Equality of Languages

All languages are equal: that is, there are no superior or inferior languages but systems that work differently. The vocabulary of each language differs, some languages might have more words in their vocabulary than others (although this criterion might be problematic), but this is not a logical argument for characterizing a language as rich or poor. This is because each language has its own structure, which is shaped by its sociolinguistic context and historical development. For more detailed discussion about the equality of languages, see the chapter on "Debugging the myths about language" and the section, "Myths about language and Linguistics"
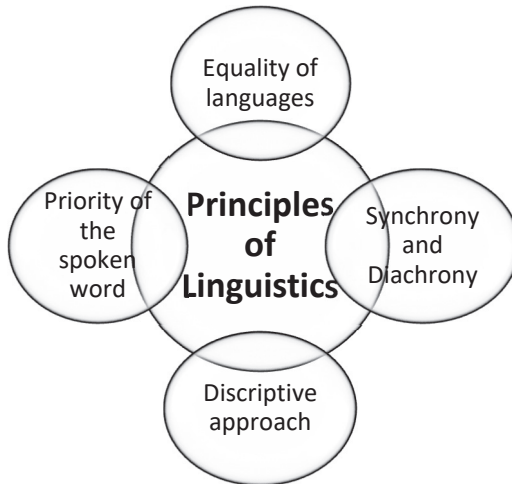
Fig. 1-11: The principles of Linguistics

CHAPTER 2

DEBUGGING THE MYTHS ABOUT LANGUAGE

2.1. Myths about languages and language learning

Myth 1: Some languages are better than others

This is a widespread belief about languages. Most people who adopt this belief tend to value their native language over others. Alternatively, they create criteria that tries to justify the notion that one language has an advantage over another. For example, they set the following quantity criterion: one language is better than another because there are more words in its vocabulary. This is problematic for many reasons. First, it is not possible to count all of a language's words because new words are frequently created. Furthermore, should we include words that come from an ancient form of the language or only modern ones? Even if we choose the latter, what are the boundaries for modern words? Should we count "play", "plays", and "played" as three different words or just as one because they share the same root? Besides, should loan words be included? What about reborrowed words? Are they still "ours"? Also, one might say that words are infinite. We all know that each number (1, 2, 3, 4, 5…) can be written with a word. From the moment that numbers are unlimited, their corresponding words are also unlimited.

Some people believe that a lack of specific functions renders a language less advantageous than another. For example, English lacks case marking, while other languages have this feature. In Hungarian, there are 18 grammatical cases for nouns, while in Greek there are only 4. A language might lack a specific function but might be "stronger" in another aspect. For instance, the English word "shrug" cannot be translated into one Greek word. Conversely, the Greek word "filótimo" (~"dignity") does not have an exact corresponding meaning in English because the word was originally created to depict local Greek values in a different period of time; this means that the act of translation from one language to another can only ever be approximate. Moreover, languages are created according to the needs of society in order to facilitate communication. Ancient Greece

developed the science of medicine, and so all diseases are still named in Greek today. In the Sami language, there are tens of words that describe snow and ice and hundreds of words for reindeers (e.g., "eami": a short, fat female reindeer; "njirru": an unmanageable female reindeer). This is sensible since these words depict everyday life in northern Europe.

Myth 2: There are easy and difficult languages to learn

This is subjective, as it depends on the learner's linguistic repertoire. For example, if someone has explicit knowledge of languages that have case marking or a tense-lax vowel distinction, they will easily be able to identify these aspects in new languages. Also, a native speaker of Italian can easily learn Spanish because most of their words have either the same or similar roots and they both have similar syntactical structures; these commonalities emerge from the fact that both Italian and Spanish descend from Roman languages. However, native speakers of Greek, German, and English, etc., will have difficulties learning Chinese since the latter entirely differs in every aspect (e.g., vocabulary, syntax, and morphology, etc.) from the former languages. Consequently, our existing linguistic knowledge defines whether a foreign language is easy or difficult to learn.

Myth 3: Loan-words destroy languages

The notion that loan-words destroy a language is a widely held belief. However, loan-words do not only destroy a language, but they also enrich its vocabulary. Word borrowing is a very natural procedure that takes place in every language. Borrowing helps a language system to evolve, and it enables speakers to better express themselves. This means that loan-words from one language penetrate another to help speakers describe a new concept that cannot be explained using their native language's existing words. Therefore, if a language does not accept any loan-words, it will remain an underdeveloped system.

Myth 4: Young speakers have a poor vocabulary

Young speakers lack expressiveness and eloquence, even when they are using their native language. In other words, they cannot speak fluently, and their vocabulary is not as developed as that of middle-aged and educated speakers. In fact, young speakers can express themselves well in what we call the "language of young people": i.e., the norms that characterize the language that young people use for their own communication,

which differs from the one that older people use (it has a different vocabulary and syntactical structure). Thus, young people have a rich vocabulary in their own "language" and they often "build" new words for communication. This language dissolves when young people grow up, which is usually at the beginning of the fourth decade of their lives. The fact that they lack expressiveness in the norm language is an issue that has to be solved by the educational authorities.

Myth 5: Children acquire their native language through explicit teaching

The native language is acquired naturally from a very early age without any instruction and only via exposure. Nevertheless, children may produce forms that they have never heard before, such as ungrammatical verbs (e.g., *goed** instead of *went*). An attempt to correct these forms will possibly be ineffective. Braine (1971) provides an example of a conversation between a father and a child, which contains an unsuccessful effort by the father to correct the child's syntax:

> *Child: Want other one spoon, Daddy.*
> *Father: You mean, you want the other spoon.*
> *Child: Yes, I want other one spoon, please Daddy.*
> *Father: Can you say "the other spoon"?*
> *Child: Other…one…spoon.*
> *Father: Say "other".*
> *Child: Other.*
> *Father: "Spoon."*
> *Child: Spoon.*
> *Father: "Other spoon."*
> *Child: Other…spoon. Now give me other one spoon?*

Myth 6: My language failed to be declared a "global language" on the basis of one vote

This is an intertemporal myth that is continuously reproduced for languages other than English, such as German, French, Greek, Hebrew, and Polish, etc. The main concept is that these languages failed to be declared as the USA's official language in a vote that took place in United States Congress; English won this vote, so, now it constitutes the official language of the USA and the lingua franca for many countries in the world (!). Of course, this is not true. First, the constitution of the USA does not recognize any languages as official. Second, the truth is that indeed there

was a vote, probably at the end of the 18th century, where a group of German people who were living in the State of Virginia submitted a report to Congress for the translation of some laws in German. The vote ended with 42 for and 41 against this translation (a difference of one vote!) and, consequently, the petition was rejected.

2.2. Myths about Linguistics and linguists

Myth 1: A linguist speaks many languages

This is one of the statements that linguists hate to hear. A linguist is not necessarily a polyglot because they aim to describe how the language system works and why humans speak a particular language. Therefore, a linguist does not have to know many languages; this is a translator's job. However, if a linguist knows many languages, it could be an advantage as they could observe if their theoretical hypotheses are applicable in several languages and it will allow them to be able to read foreign research papers. Another important fact is that a linguist might be able to learn a foreign language more easily because their knowledge about the common features of or divergences between languages might be helpful for language learning. In conclusion, whether a linguist is monolingual, bilingual, or even polyglot does not affect the quality of their work.

Myth 2: A linguist corrects language errors

A linguist will never correct language errors. They will only try to explain language choices; in other words, they will describe aspects of speech. If they try to correct anyone, then they are violating one of the main principles of linguistics. Prescriptive grammar textbooks, which are usually used in schools, depict specific norms that do not represent the whole system and are not able to keep up with the rapid changes that take place within a language.

Myth 3: Language teachers and linguists do the same job

This is not correct. Language teachers focus on the instruction of a language's grammatical rules. These rules might be related to pronunciation or even orthography. However, linguists focus on "inner" grammar, which is acquired subconsciously. For example, they try to answer the following question: "what mechanisms are triggered during the learning of a rule". In other words, they observe the "how" of the language

system. So, we could say that linguists are interested in a speaker's actual actions, and not what they should be doing.

CHAPTER 3

SPEECH PERCEPTION AND PRODUCTION

3.1. Brief historical overview of L2 speech perception and production

Until the early 50s and 60s, minimal investigation of second language (L2) speech perception and production had taken place. *Contrastive Analysis* was one of the very first approaches that aimed to understand the difficulties that L2 learners faced when learning an L2's sounds. Soon, it was admitted that this approach was fragile because it could not explain the possible difficulties through a simple comparison of the L1 and L2 phoneme inventories. Brière (1966) supported the necessity of a detailed phonetic description of sounds that could eliminate those difficulties. Even then, the hypothesis for the L1–L2 transfer could not explain why some learners achieve the acquisition of certain L2 sounds, while others do not. The absence of the L2 learners' "biography" in these studies constituted a significant disadvantage of this approach.

Remarkable progress was observed during the 70s in the field of L2 speech perception and production. The work conducted during that period set up the foundations for the construction of the field's modern theories and it also brought new protocols, research methods, and data analysis approaches. An initial attempt was made to investigate Japanese learners' difficulty to discriminate challenging English sounds /r/ and /l/. Interestingly, other studies found that infants were able to discriminate a number of contrastive sounds throughout the world's languages.

In the 80s, prominent researchers who carried out studies for cross-language speech perception came to the foreground. They mainly investigated the ability of adults to discriminate phonetic distinctions that do not exist in their mother tongue. Notably, they examined the effects of first language experience on the perception of non-native segments. The effect of laboratory training on the improvement of the perception of non-native sound contrasts was also investigated.

In practice, difficulties in the acquisition of L2 sounds are predicted by production and perception tests, while researchers are working on the

implementation of appropriate training to achieve the highest possible level for both perception and the production of non-native sounds.

3.2. Speech Perception

Speech perception "describes a listener's sensitivity to picking up and categorizing modal events". The multimodality of speech perception is explained as a relation to the involvement of information from the auditory, visual, and haptic systems. In other words, speech perception is defined as the process through which the sounds of a language are heard, interpreted, and understood. After hearing the auditory signal, subjects process the signal using brain mechanisms to extract acoustic cues and phonetic information. The cues belong to different categories. The categorical perception of the acoustic cues helps listeners assimilate a cue to a specific category so that they can discriminate it within a continuum. For example, English native speakers are able to assimilate English sounds /l/ and /r/ to two different categories: that is, they understand that they constitute two different phonemes. However, Japanese native speakers cannot discriminate the difference between these English sounds because their categorical perception is not valid due to the phonological structure of their native language.

3.3. Speech Production

The production of speech is a complicated process. Perceived speech stimuli are cognitively represented and, then, through the help of the vocal tract, meaningful sounds are produced to achieve communicative goals. Most of the time, listeners pronounce the L2's sounds with an accent, which is easily detectable by L1 speakers; the listeners' native language prevents them from pronouncing the L2 sounds just like native speakers.

Humans' anatomical nature allows them to produce speech. There is virtually no "toil" required achieve it; however, internally, a plethora of organs "operate" and "co-operate" to produce sounds. The branch of linguistics which deals with the production of human speech is called *phonetics*. Speech production involves four processes:

- *Initiation* process: the air is expelled from the lungs and moves towards the vocal tract.
- *Phonation* process: the airstream is modified by the vocal folds, determining the voicing of sounds.

- *Articulation* process: the airstream is further modified by the articulators.
- *Oro-nasal* process: the velum determines if the air will pass either from the oral or the nasal cavities.

3.3.1. Initiation

In the *initiation* process, air is expelled from the *lungs*, which are the main organ in the human respiratory system. The airflow is initiated in two directions and, thus, it can be *egressive* (breathing out) or *ingressive* (breathing in).

During the initiation process, there are three different types of airstream mechanisms that result in the production of speech; each of them takes place in a different location.

The first mechanism is the *pulmonic* airflow (which takes place in the lungs). This is the only speech mechanism used in English and most other languages. The air is pushed from the lungs towards the *trachea*, a tube that connects the pharynx and larynx (simply reported as the Adam's apple), before exiting the body through the nasal or oral cavities. The *pharynx* is a chamber that ends in the oral and nasal cavities. The *larynx* is a box of cartilage located in the upper end of the trachea that manipulates pitch and volume.

The second mechanism is *glottalic* airflow (which takes place in the glottis/larynx) where the air is enclosed above the closed glottis. In this case, the larynx might move up the pharynx, thereby creating *egressive glottalic* sounds (common in some North American languages) or it might move down the pharynx creating *ingressive glottalic* sounds (common in some African languages).

The third mechanism is *velaric* airflow (which takes place in the velum); this is created in the oral cavity. Seals are created when the back of the tongue is raised and makes contact with the soft palate. The tip of the tongue or the lips may create an anterior seal that is released before the release of the tongue's dorsum seal. This means that so-called "clicks" are produced, which are found in African languages, such as Zulu.
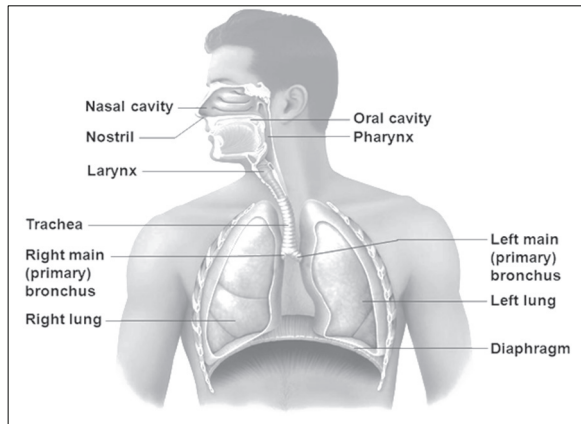
Fig. 3-1: Human speech organs[1]

3.3.2. Phonation

The *phonation* process is responsible for sound *voicing* and takes place in the larynx with the help of the vocal folds. *Vocal folds* are folds of tissue that are located inside the larynx; the space between the folds is called the *glottis*. When the glottis is open, *voiceless* (or unvoiced) sounds (e.g., /p/, /t/, etc.) are produced since vocal folds do not vibrate when the air passes through them. In contrast, when the glottis is closed, *voiced* sounds are produced (e.g., /b/, /z/, etc.) since vocal folds, which have loose contact with each other, start to vibrate.

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[1] Retrieved from https://quizlet.com
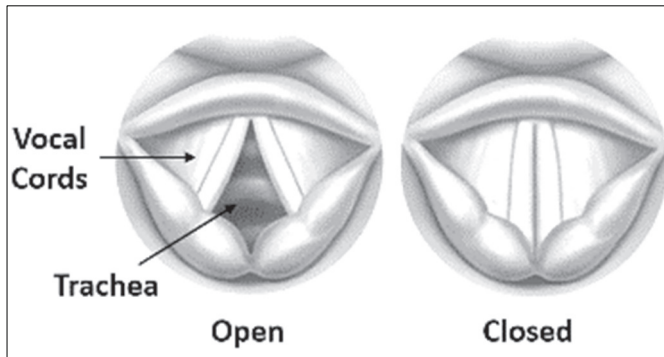
Fig. 3-2: The state of the vocal folds[2]

3.3.3. Articulation

The articulation process is responsible for the modification of sound waves, thereby creating different sounds. The organs involved in the production of speech sounds (e.g., lips, teeth, tongue, alveolar ridge, velum, palate, and uvula) are called *articulators*. Articulators can be *passive* if they do not move towards other articulators during the production of sounds, or *active* if they move towards the passive articulators to create speech sounds. For example, for the production of the English consonant [θ], teeth are passive articulators and the tongue is an active articulator.

During articulation, the *vocal tract* is configured to produce different sounds. The vocal tract is the area that the airflow follows until exiting the human body; it contains the larynx, the pharynx, and the oral and nasal cavities. The vocal tract is divided into two main parts: the *supraglottal* vocal tract (above the glottis) and the *subglottal* vocal tract (below the glottis). The respiratory system below the glottis is responsible for speech production as a source of energy. Any activity in the supraglottal tract determines the quality of the sound.

The *tongue* is located within the oral cavity and shapes the airflow, while the *lips* (upper and lower), which are located at the end of the oral cavity, can change the shape and the length of the vocal tract. Other speech organs are the *hard palate*: that is, the roof of the mouth; the *epiglottis*, a flap in the throat that keeps food from entering the windpipe and the lungs; the *uvula*, a projection of tissues found on the back of the throat; and the *alveolar ridge*, a bony socket for the roots of teeth.

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[2] Retrieved from ramseyvoice.com
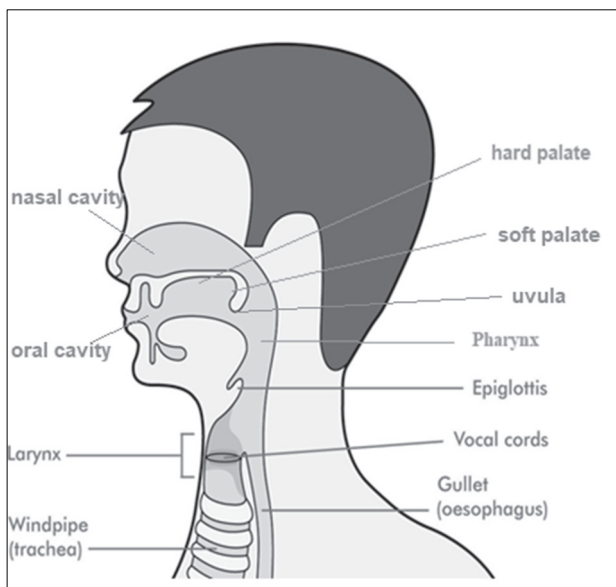
Fig. 3-3: An overview of the vocal tract

3.3.3.1. Consonants and Vowels

Segments are defined as the discrete sounds of a spoken language, and they are divided into two main types: *consonants* and *vowels*.

Consonant Acoustics

Consonants are produced when the articulators constrict the airflow inside the vocal tract. Consonants can be described more accurately than vowels since the airflow's constriction is formed in a particular place in the vocal tract and affects the flow in a particular manner. So, consonants can be described according to the *place of articulation*, the *manner of articulation*, and *voicing*.

      The places of articulation are named from the articulators that form the constriction. The main places of articulation are as follows:

- *Labial* or *bilabial:* produced with the help of one or both lips (e.g., [bæd] "bad").

- *Labiodental:* produced with the help of the lower lip and the upper teeth (e.g., [fæn] "fan").
- *Dental:* produced with the tip (edge) of the tongue and upper front teeth (e.g., [θɪŋ] "thing").
- *Alveolar:* produced with the tip or blade of the tongue and the upper alveoli (e.g., [diːn] "dean").
- *Post-alveolar:* produced with the blade of the tongue and the area behind the upper alveoli (e.g., [ʃɪn] "shin").
- *Retroflex:* produced with the tip of the tongue curled back towards the hard palate (e.g., Swedish [nuːɖ] "nord" = "north").
- *Palatal:* produced with the help of the blade or front part of the tongue and the hard palate (e.g., [jɛs] "yes").
- *Velar:* produced with the back (dorsum) of the tongue and the velum (e.g., [gɛt] "get").
- *Uvular:* produced with the back of the tongue and the uvula (e.g., French [ʁɛste] "reste" = "to stay").
- *Pharyngeal*: produced by retracting the tongue root to the mid or upper pharynx (e.g., Danish [ʕaʊˀn] "ravn" = "raven"),
- *Glottal*: produced using the glottis (e.g., [hæt] "hat").

   The manner of articulation indicates the way that the articulators interfere in the airflow into the vocal tract. Articulators might completely impede the air, impede it to an important degree leaving only a very narrow passage, or impede it to some degree. The most common manners of articulation are as follows:

- *Stops (or plosives):* The airflow is completely impeded, while pressure is suddenly freed when the constriction withdraws (explosion) (e.g., [tɔɪl] "toil").
- *Fricatives:* The articulators get very close with each other and, thus, the air is somehow impeded. This results in the creation of friction (e.g., [zebrə] "zebra").
- *Affricates:* Like stop sounds which are not freed with an explosion but with friction from the articulators (e.g., [ʧɛk] "check").
- *Nasals:* The airflow is completely impeded but the soft palate, which blocks the nasal tract, lowers and, as a consequence, air exits from the nose (e.g., [nəʊz] "nose").
- *Trills:* The articulators vibrate from the airflow; the two articulators have many contacts (e.g., Spanish [ˈpero] "perro" = "dog").
- *Taps:* The vibration of the articulators is not due to the airstream like in trills but due to a muscle contraction; there is a single

contract of the articulators (e.g., Greek [ˈaɾoma] "ároma" = "perfume").

- *Flaps*: They are formed in a similar way to taps. However, the tip of the tongue is slightly turned behind, e.g., Warlpiri [ɽupa] "dupa" = "windbreak").
- *Approximants:* The articulators get close with each other but without friction (e.g., [ɹəʊ] "row"). A subcategory of approximants is *glides (or semivowels)*: that is, consonants which consist of a glide (a quick, smooth movement) towards the following vowel, e.g., [jɒgət] "yoghurt").
- *Laterals:* The air escapes sideways from the tongue, although the tongue blocks the air in the oral cavity (e.g., [ləʊn] "loan").

It is important to say that the place and manner of sound articulation differ in each language. Also, a language cannot have sounds that are articulated in every place and every manner.

Another characteristic of consonants is *voicing*. Consonants can be *voiced* or *voiceless* (or *unvoiced*). Voicing is determined by whether the glottis in the vocal folds is open or closed. An open glottis results in the production of voiceless consonants, while a closed glottis results in the production of voiced ones. In English, the consonantal phonemes /b m w v d ð n z l r ʒ d͡ʒ ŋ j g/ are considered to be voiced consonants, while the phonemes /p f θ t s k h ʃ t͡ʃ x/ are considered to be voiceless consonants.

	MANNER	VOICING	PLACE						
			Bilabial	Labiodental	Interdental	Alveolar	Palatal	Velar	Glottal
Obstruent	Stop	Voiceless	p			t		k	ʔ
		Voiced	b			d		g	
	Fricative	Voiceless		f	θ	s	ʃ		h
		Voiced		v	ð	z	ʒ		
	Affricate	Voiceless					t͡ʃ		
		Voiced					d͡ʒ		
Sonorant	Nasal	Voiced	m			n		ŋ	
	Liquid Lateral	Voiced				l			
	Liquid Rhotic	Voiced					r (ɹ)		
	Glide	Voiced	w					j	(w)

Fig. 3-4: Manner, place, and voicing of English consonants[3]

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[3] Retrieved from www.myenglishteacher.eu

Vowel acoustics

In phonetics, a *vowel* is a sound in a spoken language that is pronounced with an open vocal tract and, therefore, there is no build-up of air pressure above the glottis at any point. During vowel articulation, airflow from the lungs sets the vocal folds in motion. In contrast to consonants, the airflow of vowels does not face any barrier on its way to the oral cavity. Therefore, vowels do not have a place of articulation and they are all articulated in the same way.

Vowel quality can be mainly determined according to three dimensions: *height*, *backness*, and *roundness*. First, *height* refers to the relationship between the highest point of the tongue and the palate. Vowels can be *low* (or open), which means a low raised tongue with a big gap between its highest point and the palate, *mid* (sometimes as *mid-low* or *mid-high*) when the tongue is in intermediate height positions, or *high* (closed) when the tongue is raised close to the palate. Second, *backness* refers to the position of the tongue in the oral cavity when a vowel is produced. *Front* vowels are produced when the tongue is relatively near the front of the mouth (that is, just before teeth), while *back* vowels are produced when the tongue is in the back of the mouth. *Central* vowels are produced when the tongue is in a central position in the mouth. The last dimension is *roundness,* which refers to the shape of the lips. During vowel production, when the lips are pursed forming a round shape, *rounded* vowels are produced, and *unrounded* vowels are produced when the lips are free and form a flattened shape.

A *vowel trapezium* is a tool that demarcates vowels according to their main qualitative features. The figure below presents a vowel trapezium that depicts symbols. These symbols are part of the International Phonetic Alphabet (IPA), and each of them represents a vowel sound. Their position in the trapezium represents the position of the tongue. If the trapezium is read horizontally, the front, central, and back vowels can be identified, while, if read vertically, the close, mid (close-mid, open-mid), and open vowels can be identified.
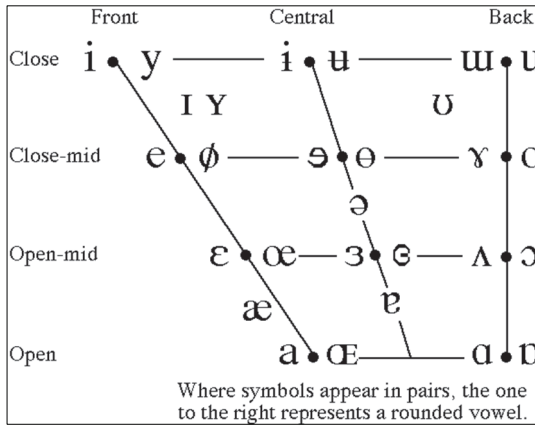
Fig. 3-5: The official IPA Vowel Chart

Formants are the acoustic resonances of the human vocal tract. The most important property of a formant is its frequency, which creates the ability to distinguish vowels with different qualities. Usually, the first formant (F1) and the second formant (F2) are enough to distinguish the acoustic characteristics of vowels: the F1 corresponds to the height of the tongue, the F2 corresponds to the position of the tongue, and the F3 corresponds to the roundness of the lips. In other words, formant frequencies are associated with the position of the high-low and front-back phonetic dimensions (F1: high-low; F2: front-back).
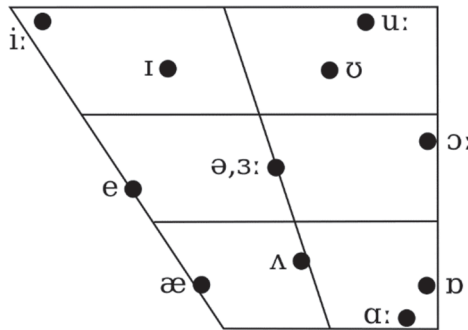
Fig. 3-6: English vowels (Received Pronunciation) (Roach, 2004)

3.3.4. Oro-nasal process

The *velum*, that is, the back roof of the mouth, determines whether the air will pass either from the oral or the nasal cavity. When the velum is lowered, it closes the passage to the oral cavity and the air is expelled from the nasal cavity. Thus, nasal sounds such as [m] and [n], are produced. When the velum is raised, it closes the passage of the nasal cavity and, therefore, the air is expelled from the oral cavity. In this case, oral sounds, such as [p] and [g] are produced.
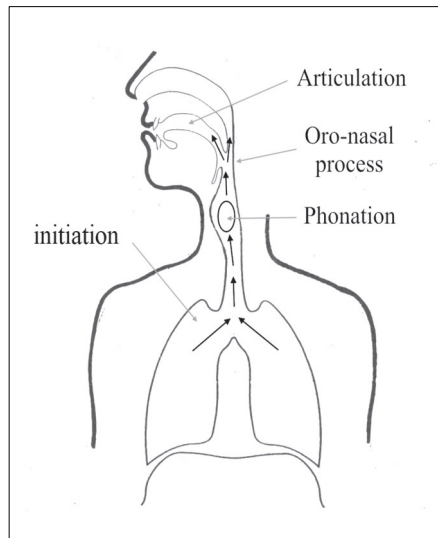
Fig. 3-7: The four processes of speech production

3.4. Is speech only a human privilege?

An interesting question is whether the acquisition of human languages is a unique human privilege. Several scientists have mainly focused on primates (e.g., chimpanzees and gorillas) in the belief that these animals can develop language skills similar to humans under certain conditions.

In many cases, scientists have experimented with chimpanzees that have received extensive language teaching, and have observed their ability at both perceiving and producing language. In the 1930s, Winthrop and Luella Kellogg brought their son up with a chimpanzee named Gua to

examine whether the animal could learn a human language. The surprising thing was that the chimpanzee could understand over 100 words within 16 months, which was more than their son, but this performance remained stagnant because, at a later stage, he could not make grammatical and semantic distinctions. Also, a female chimpanzee named Viki, who was taught human language from another family, could hardly pronounce four words.

The psychologists, Allen and Beatrice Gardner, have concluded that primates are unable to pronounce most of the different sounds that exist in human speech due to their anatomical system. However, they can learn sign languages because of their upper limb capabilities. Psychologists taught a female chimpanzee named Washoe American Sign Language and, by the age of 4, she could produce 85 different signs as well as combine them to create phrases, such as "Give me flower" and "More fruit". The female gorilla Koko, who was trained by Francine Patterson, also showed a notable performance in American Sign Language. According to her trainer, Koko learned hundreds of signs and was able to make language jokes, puns, metaphors, and rhymes as well as talk about an object.

High expectations with respect to animal's ability to learn a human language were created in the early stages of a study involving a chimpanzee called "Nim Chimpsky" from a sarcastic paraphrase of linguist Noam Chomsky's name; Chomsky considers language to be an exclusively human trait. The psychologist, H.S. Terrace noticed that Nim learned 125 signs and 20,000 utterances with two or more meanings. However, hopes were lost when the chimpanzee could not produce more than two meanings, which were not spontaneous like those of children, but were instead mostly imitations and repetitions of the signs shown by his instructors. Still, over time, he was not able to use the language creatively, thereby remaining linguistically stagnant. Terrace concluded that both Nim and the chimpanzees used in other experiments could not talk with each other like humans and no scientific evidence was found that indicated that the chimpanzee parents could teach or pass on their language to their children.

Primates communicate with sensory signals that can indicate their emotional state, the risk that they are subject to, sexual attraction, and so on. Even if they are taught a human language, they cannot learn the same number of words that a human can. Moreover, the production of sounds by animals is limited because each discrete unit constitutes a concept in their communication code, while human speech is characterized by double articulation: the first articulation includes units with a grammatical or lexical meaning, while the second one contains meaningless phonological units that support the first articulation. Double articulation enables

vocabulary development and, thus, also fosters the development of human languages.

3.5. Phonological and phonetic differences between the sounds of different languages may impede communication

Usually, foreign language pronunciation is the most challenging aspect to acquire and, therefore, most learners do not pay attention to the acquisition of that skill. Approximate acquisition of the pronunciation of an unfamiliar language may lead to unexpected misconceptions and misinterpretations.

In the case of vowel sounds, we notice that their number differs among languages; this difference might affect the correct acquisition of L2/foreign language vowels. Let us take the example of Standard Modern Greek (SMG) vowels. SMG has a relatively small vowel system with only 5 vowels (/i e a o u/); in contrast to other languages, such as Danish, Finnish, and English, which have a more extended vowel system. The question that arises is whether Greek speakers can correctly pronounce vowels that do not exist in their native language, or whether they can perceive differences between a foreign vowel and one from their native language.

English Received Pronunciation contains at least 12 different vowels (monophthongs): tense /ɪ ʊ e æ ʌ ɒ ə/, and lax /iː uː ɜː ɔː ɑː/. The monosyllabic words "hit" and "heat" contain the English vowels /ɪ/ and /iː/, respectively, which differ in terms of quality (vowel formants) and quantity (vowel duration). These vowels are not found in the Greek vowel system. According to some studies, this absence pushes native Greek speakers to assimilate these sounds to the closest acoustic vowel category of their native language, which in this case is the Greek phonological category /i/. Therefore, "heat" and "hit" for a Greek speaker might be heard as the same or as very similar words. Similarly, in the English words "hut" (/hʌt/) and "hat" (/hæt/), the vowels /ʌ/ and /æ/ are assimilated to the Greek category /a/ because they do not exist in the Greek vowel system, and, thus, they will be assigned to the sound that has the less phonetic distance from them. This assimilation signifies a non-accurate perception of English sounds, which will possibly lead to an inaccurate production.

The acoustic cues of a non-native language are filtered through the already formed phonological system of the speakers' mother tongue. Most of the recent speech models in the area of L2 acquisition (e.g., the Perceptual Assimilation Model and the Speech Learning Model) agree that *the more the perceived dissimilarity between a native sound and an L2*

sound, the easier it is for learners to discern the acoustical differences between them. Put differently, if a native sound is perceived as similar to a foreign sound, the learners will not be able to discern between their acoustical differences. It is important to note that infants, who are not yet capable of producing language, can distinguish many languages' segmental differences even if they have never had any contact with them. This ability is lost after the first six months of their life because they become attuned to the phonological and phonetic elements of the dominant language in their environment.

The conclusion is that the acoustic differences between the vowel systems of languages may create problems concerning the perception and production of specific non-native vowels. Also, if a learner's native vowel system is smaller in size than the vowel system of an L2/foreign language, there is a greater chance for them to have difficulties in perceiving or producing particular foreign vowels or discriminating between particular vowel contrasts. In conclusion, systematic and methodological teaching of L2/foreign language vowels are both required in order for learners to achieve proper communication without phonological slips.

3.6. Lack of pronunciation may lead to tragedies

In most cases, the learning of non-native pronunciation is degraded, and priority is given to other aspects of language, such as grammar and vocabulary. This is evident from the position that phonology occupies when teaching an L2 or a foreign language as pronunciation is hardly taught at all. Cultivating correct pronunciation in a language beyond its social implications contributes to accurate communication and, consequently, to the mutual understanding of the speakers. Pronunciation is not only linked with the exact production of a language's phones, but it also includes prosodic ("musical") features, such as the *stress* that denotes the emphasis on a particular syllable or word [e.g., in Greek: káno ("I make")/kanó ("canoe")]; the *pitch*, which includes (a) intonation (pitch fluctuations that might show emotion, such as anger and fear); and (b) tone, which involves pitch fluctuations that might differentiate the meaning of words in some languages (e.g., Mandarin Chinese: [má] = mother, whereas [màá] = horse); *intensity* of voice (e.g., a loud voice); and *timing* (duration, tempo, rhythm, and pausa).

On February 19, 1989, it seemed that Boeing 747's Flight 66 would be a routine flight to transport goods from Singapore to Hong Kong. This, however, was to be thwarted 30 minutes in when the plane crashed 12 kilometers outside the Malaysian capital, Kuala Lumpur,

killing all of its crew members. The relationship of this fatal accident to language is because it occurred following a misinterpretation of pronunciation. The airport communication officer instructed the commander of the aircraft to go down to 2400 meters (exact instructions in English: "to descend 'two four zero zero'"). The pilot interpreted the arithmetic "two" as the preposition "to", resulting in the perception of the instruction as "descend to 'four zero zero'". So, he dropped the aircraft to 400 meters and, consequently, the plane crashed.

Although the English words "to" and "two" are homophones, that is, they are pronounced in the same manner, they are written differently; however, the differentiation of their prosodic features could make them distinct even in the spoken word. For example, if the pilot perceived the emphasis given by the officer on the word "two", he would be able to realize that it was arithmetic rather than a preposition; the rest of the numbers were also pronounced with a particular emphasis on speech ("four", "zero", "zero").

Incorrect use of non-native pronunciation may result in small-scale misconceptions and misunderstandings. Nevertheless, it might also result in fatal accidents like in the above case. The conclusion is that every element of pronunciation, either at the segmental or the prosodic level, constitutes an essential component of language that must be taken into account. The probability of an airplane crash from a pronunciation error might be lower than the probability of winning the lottery; however, this should not be an inhibiting factor for the recognition of the importance of L2/foreign language pronunciation. This is because there are other benefits from such learning, such as the eradication of errors at the morphological, syntactical, and semantic levels; better understanding of our speech by native speakers of a foreign language; and the more accurate use of language.

In the restaurant:
Customer: Can I have some soup?
Waiter: Ok, I am bringing it to you right now!

Waiter: Here it is!

Customer: What is this?? I asked for soup!
Waiter: But you said /səʊp/ and not /suːp/!

3.7. Factors affecting the acquisition of L2 sounds

Many factors are claimed to affect L2 sound acquisition. These factors are mainly linked with the learners' linguistic, social, biological, psychological, and idiosyncratic characteristics. Each factor contributes to the learners' L2 phonological acquisition to a different degree. Some of the most important factors are briefly discussed below.

3.7.1. Phonetic Training

Many studies underline the positive effect of phonetic training on the production of L2 sounds. Aliaga-Garcia and Mora (2009) pointed out that Catalan/Spanish learners of English pronounced L2 sound contrasts more accurately after receiving production training. Hattori and Iverson (2009), who examined the perception and production of /l/ and /r/ contrast, reported that the production of both English segments by Japanese native speakers was improved after receiving phonetic training. Furthermore, Alshangiti and Evans (2014) compared the effectiveness of vowel production training in immersion and non-immersion settings for Arabic learners of English by stating that both groups of Arabic speakers showed a significant improvement in the production of English vowels after completing training. Ali (2013), who investigated the production of English vowels by Sudanese learners of English, found that L2 learners

made certain important production errors. Those errors were connected with the participants' limited knowledge of English and the interference of their L1 vowel system with the L2 system. The author concluded that Sudanese learners of English who received pronunciation training exhibited better results for vowel production than others who had never received any type of production training.

Wong (2013) investigated the effect of high-variability phonetic training on the production of the English contrast /ɪ/-/iː/ by Cantonese learners of English as a Foreign Language (EFL). The HVPT approach is described by many studies as beneficial for both production and perception of non-native contrasts. Seventeen male and female native speakers of Hong-Kong Cantonese performed a 20-session phonetic training. The results revealed a general improvement for both spectral characteristics (F1, F2) and the duration of L2 productions. Bongaerts, Summeren, Planken, and Schils (1997) found that 5 late learners of English could obtain native-like pronunciation after gaining phonetic training. Moreover, Moyer (1999) investigated the effect of training on the production of L2 German segments by native speakers of English, indicating that training brought their productions closer to those of German speakers.

Laboratory training is considered to be one of the main factors that can also significantly improve the perception of non-native sounds. Several studies reveal this positive effect. For example, Flege (1989) reported that Chinese learners of English could better discriminate the final /t/ - /d/ contrast after receiving training. Aliaga-Garcia and Mora (2009) indicated that training made a significant improvement to the discrimination of a number of non-native contrasts by Spanish/Catalan speakers of English. Linebaugh and Roche (2015) applied production training to investigate its effect on the problematic English contrasts produced by native Arabic speakers. The results showed that training in L2 productions lead to a great improvement in contrast perception, thereby providing strong evidence about the link between perception and production.

What is more, according to Okuno (2013), training proved beneficial for the improvement of the perception accuracy of vowel duration by English learners of Japanese. Derwing, Munro, and Webie (1998) applied an intensive perception training that lasted 12 weeks for the better realization of unfamiliar phonetic contrasts by learners of English as an L2. The results indicated that perception training improved the perception of these contrasts. Likewise, Al Bandawi and Salim (2014) trained Arab learners of English to correctly perceive contrastive vowels pairs in their L2 and pointed out the improvement in the learners' perceptual skills after

training. Lastly, Best and Tyler (2007) added that there are a lot of studies which indicate that the discrimination of unfamiliar L2 contrasts by adults was improved when intensive laboratory training took place. Therefore, adults' perceptual skills could be improved even if they were not exposed to the L2 during their childhood.

3.7.2. AOL

The Critical Period Hypothesis is one of the most cited hypotheses on the influence of age on L2 acquisition; this constitutes one of long-standing debates in the linguistic world. According to Lenneberg (1967), a person between 12–15 years old is not able to fully control an L2 due to the loss of their brain neural plasticity. Scovel (2000) also supported the existence of a critical period in L2 learning, defining the age of 12 as the end of this period.

Flege examined the effect of age of exposure in the L2, which is usually referred as AOL, on the acquisition of L2 sounds. As discussed in a previous section, one of the postulates of SLM is that mechanisms and processes used in L1 sound learning remain intact across the lifespan and can be applied when learning an L2. Thus, Flege supports that there is not any age barrier which prevents adults from acquiring L2 sounds. In addition, Tsukada et al. (2004) examined two groups of Korean children who were L2 learners of English. In this first group, the mean age of the children was 10 years, while in the second one it was 15. Both of the groups shared the same length of residence (LOR) in the foreign country. The results showed that there were no differences between the "pre-" and the "post-period" children in the perception of English vowels; therefore, a critical period did not account for child-adult differences or at least it was not completed at the age of 12. Another important study by Flege et al. (1995b) indicated that bilingual children over 12 years old can achieve native-like pronunciation. In particular, they investigated the English pronunciation of Italian/English bilingual children over 12 years old, concluding that they had no differences compared to English native children.

Many studies (e.g., Tsukada et al., 2004) reveal that the earlier someone is exposed to an L2 the better their acquisition of the target language. Tsukada et al. (2004) found that South Korean children could more accurately discriminate vowels than South Korean adults because of a combination of factors rather than the existence of a critical period. Furthermore, Snow (1987) argued that children can learn an L2 easily and quickly to effortlessly reach the level of a native speaker, while adults

have difficulties when learning an L2; their learning is slow and requires significant effort.

3.7.3. L1/L2 Use, LOR, and Quality and Quantity Input

Three other factors that can be associated with one another and probably have an impact on the acquisition of L2 sounds are language use, the LOR, and the quality and quantity of input. First, Flege et al. (1995b) investigated the effect of L1–L2 use on the acquisition of L2 sounds by native Italian immigrants in Canada. The subjects of the study were asked to state how often they use their L1 and L2 at work, in their social life, and at home. The findings showed that the language use factor reported a significant percentage (15%) of variance in L2 accent ratings. Similarly, Flege, Frieda, and Nozawa (1997) re-examined two groups of Italian/English bilinguals who shared an identical (low) AOL in Canada. The first group used its L1 frequently while the second one rarely used it. The results provided by Flege et al. (1997) showed that bilinguals, who use their L1 more frequently, had a stronger foreign accent than other bilinguals who rarely used it.

Piske et al. (2001) pointed out that accurate L2 pronunciation cannot only be cultivated by a low AOL and frequent L2 use. They examined two groups of Italian/English late bilinguals (high AOL) where the first group rarely used its L1 while the other used it frequently. The results showed that the group that used its L1 more frequently had more accented pronunciation than the other group; this was compatible with Flege et al.'s (1997) results when they investigated immigrants with a low AOL. Nevertheless, the authors added that it is not only the frequent L2 use and the low AOL that help learners acquire the L2 pronunciation because there are also other factors involved. Piske et al. (2002) underlined the importance of input quality and quantity that L2 learners perceive for the development of a native-like pronunciation. They stated that the Italian/English bilinguals who frequently used their L1 were likely exposed to more Italian-accented English speech compared to the others who rarely used their L1. Similarly, Flege and Liu (2001) also highlighted the significance of high quality and quantity input: if an L2 learner perceives high quality input devoid of accent speech, they may acquire and produce L2 sounds in a better way.

The importance of the effect of LOR in L2 performance creates conflict between many studies. For instance, Flege and Liu (2001) argued that LOR positively correlated with L2 sound acquisition. In previous studies, Flege and Fletcher (1992) and Flege et al. (1995b) also assumed

that LOR was an important factor for correct pronunciation. However, Piske et al. (2001) pointed out that additional years of residence do not contribute to a better performance with respect to pronunciation. Nevertheless, there are some reasonable explanations for all of the conflicting results in the studies mentioned above. First, according to Piske (2007), some of the studies focused on experienced L2 learners whereas others focused on inexperienced ones. Second, LOR helps learners to better acquire an L2 only if they come in contact with its native speakers (Flege & Liu, 2001).

In conclusion, frequent L2 use, a long LOR, and a high quality and quantity of L2 input contribute to less accented speech. In order to achieve accurate non-native language pronunciation, learners should be exposed from a young age to the non-native language. Also, schools have to create appropriate learning environments to motivate the use of foreign languages as much as possible (Piske, 2007).

3.7.4. Formal Instruction

There is evidence that formal instruction in the L2 may affect L2 sound perception and production. Formal instruction refers to L2 instruction that takes place in an official institution (e.g., school).

Flege and Fletcher (1992) reported the influence of the "formal instruction in English" factor on the pronunciation of Spanish learners of English. They concluded that the more years of formal instruction, the better the pronunciation of the foreign language. However, foreign accent ratings accounted for only 5% of the variance, denoting that other factors may have more influence on the foreign accent. In contrast, Suter (1976) found that formal instruction in an L2 did not improve the pronunciation of non-native learners of English (e.g., Japanese, Thai, and Persian). Piske et al. (2001) tried to explain why L2 formal instruction does not improve sound perception and production in an L2. They underlined that pronunciation is not paid much attention in classrooms whereas morpho-syntactic phenomena receive more emphasis than any other grammatical pattern. Best and Tyler (2007) claimed that, on many occasions, L2 is uttered by accented teachers or even by teachers with L2 dialectal backgrounds, thereby providing incorrect phonetic details to the L2 learners.

Several studies examine the effect of phonetic instruction on the learners' pronunciation skills. Even though laboratory training seems to be beneficial for the perception and production of L2 sounds, it must not be related to phonetic instruction (Kissling, 2012). Phonetic instruction is a part of formal instruction in the classroom and it is less time-intensive and

more explicit. Kissling (2012) added that addressing perception is rare in classroom, although some emphasis is placed on pronunciation in certain foreign classes. Furthermore, studies have shown that phonetic instruction improves learners' pronunciation in many languages because the learners focus on particular acoustic features; thus, they become more sensitive to the sounds' acoustic features. For instance, Champagne-Muzar, Schneiderman, and Bourdages (1993), who investigated the effect of phonetic instruction on L2 English pronunciation by native speakers of French, indicated the learners' success in both perception and production tasks after having phonetic instruction. In contrast, Yule, Hoffman and Damico (1987) stated that learners could not correctly identify L2 phonemes even after they received formal phonetic instruction.

Other researchers relate the formal instruction not only to the L2 stimuli provided in the classroom but with the general interaction between L2 learners and native speakers in the school environment. MacKay, Flege, Piske, and Schirru's (2001) results about the effect of formal instruction on L2 sound acquisition linked the latter with the quantity of L2 input. They noted that the success of early bilinguals compared to late bilinguals in both perception and production correlated with the amount of L2 phonetic input that the former gained during their formal instruction; early bilingual children attend school and they possibly interact with L2 speakers: that is, they spend time in an L2 dominant environment where they can receive a large amount of L2 input. In contrast, adults usually work in an environment where they probably use a lingua franca for communication instead of an L2. So, children surpass adults since they receive qualitative and quantitative L2 input from both inside and outside the classroom.

3.7.5. Language Attitude

Gardner (1985) defines attitude as "an evaluative reaction to some referent or attitude object, inferred on the basis of the individual's beliefs or opinions about the referent". In other words, an attitude contains the convictions of a person regarding a stimulus, which are combined with specific behavior. Language attitude did not constitute an important parameter for L2 learning in the past but the 70s was a starting point for change. He defines attitude as "an organization of beliefs around an object or situation making people respond with a preferential way". Attitude is learnable; therefore, learners can learn to like a language by eliminating their negative emotions. First, language attitude is formed from a cognitive

element which emanates from the perceived situation, then feelings are created and, finally, the behavioral component takes place.

Leinonen (2014) supports the notion that there are three types of attitudes related to language: a) attitudes towards a language community or languages in general (social factors); b) attitudes towards the language itself, including issues surrounding how it is structured and how it sounds (language factors); and c) attitudes towards the learning situation, which is linked to the teaching environment (educational factors).

In many cases, people who have lived a long time in a foreign country create strong bonds with their new homeland; that is, they speak the L2, they socialize with native speakers and others, and they start to feel disconnected from their mother tongue and the cultural background of their home country. As an effort to regain their bonds with their original background—or even L1—they may develop a negative attitude towards the L2. However, some people protect their L1 right from the beginning by not allowing any L2 element to penetrate their L1. A negative evaluation of the foreign language community could also lead to an underestimation of the foreign language.

A negative attitude towards language may arise if learners consider an L2 difficult to learn. This is more evident for learners whose L1 differs to a great degree from their L2, due to differences in its writing system, phonology, morphology, and syntax, etc. Most of the time, L2 learners evaluate the L2 negatively because it makes them feel nervous when speaking. This nervousness occurs because L2 speakers make grammatical and pronunciation errors due to their limited knowledge of the L2.

In addition, for those who have attended L2 formal instruction, a bad educational experience could have changed their way of thinking about a specific language. For example, a teacher's attitude towards the L2 is usually revealed by the way they teach it. A non-positive attitude to language may lead to an anxious style of teaching which will likely be teacher-centered, boring, and anti-pedagogical, thereby making the students develop negative behavior towards the L2 lesson. In addition, an un-differentiated language lesson (i.e., a lesson that does not benefit all types of students) creates negative feelings for some students because they are not able to actively participate in the lesson, which means they will not show any progress. Furthermore, most L2 curricula are obsolete and, in many cases, based exclusively on the instruction of grammatical phenomena; this means that the students become bored and cultivate feelings of hatred towards the L2. Also, the opinion of parents regarding the L2 could affect the learners' attitudes towards the language. Their

personal bad experience in the L2 may mean that they transfer this attitude to their children.

Smith (1971) discussed a study conducted by Diana Batley which examined the correlation between a negative attitude towards a language and a student's likelihood of stopping their foreign language study. The author compared a group of individuals who continued their foreign language study with a group who dropped out. The conclusions indicated that students who dropped out showed a significantly negative attitude towards the foreign language. Zhang (2009) mentioned that a positive attitude towards a foreign language by the learners leads to more accurate pronunciation. In contrast, foreign learners who demonstrate a negative attitude towards an unfamiliar language will produce accented speech sounds.

Oroujlou and Vahedi (2011) reported that attitude is often confused with motivation. The authors define "attitude" as a set of beliefs, while "motivation" is a reason for doing something. One could say that motivation presupposes a positive attitude as positive feelings toward a language can motivate a learner to learn an L2 more easily. This study concentrated on descriptive and analytical approaches in order to observe the role of motivation and attitude in language learning. They found that learners characterized by motivation and a positive attitude toward the language had better proficiency and efficiency in the L2. Even though attitude and motivation are two different parameters, many studies argue they correlate with each other. Leinonen (2014) points out that Gardner was one of the first researchers who provided evidence about the effect of positive language attitudes on L2 motivation and the improvement of learning outcomes. Dörnyei, Csizér, and Németh (2006) also support the idea that language attitudes have an impact on motivation.

However, many studies indicate that attitude does not have a positive effect on L2 proficiency. For instance, Macnamara (1973: 37) pointed out that "a child suddenly transported from Toronto to Berlin will learn German, no matter what he thinks of German". Moreover, Genesee and Hamayan (1980) found no relationship between language attitude and proficiency in French for 6-year-old Canadian children. In addition, Cooper and Fishman (1977) concluded that a positive attitude towards English did not contribute to a better knowledge of English in Israelis.

3.7.6. Talent

Some people learn languages easier than others. In other words, they have a special talent which makes them able to achieve a native speaker's level

of speech even if they start to learn a language at a later stage of their life (Piske, 2007). Flege et al. (1999) reported that a variable called "sound processing ability" was responsible for the development of the appropriate pronunciation observed in some individuals. This variable includes mimicry, musical ability, and the ability to remember the exact pronunciation of some words in an unfamiliar language. Piske (2007) adds that teachers are unable to cultivate such abilities as their development and the way in which they can be fostered is still unknown.

3.7.7. Gender

Flege et al. (1995) examined the effect of gender on the accuracy of L2 pronunciation using AOL to determine the differences across males and females; females with an AOL for more than 12 years had a more accented pronunciation than males, while males with an AOL for more than 16 years had more accented pronunciation than females. In general, most studies reveal that males and females do not have significant differences in the pronunciation of an L2 (Piske et al., 2001; Flege & Fletcher, 1992). Although there are studies that indicate higher accent ratings for females (e.g., Thompson, 1991), this does not imply to the adaptation of a pedagogical strategy which aims to reduce these ratings (Piske, 2007).

3.7.8. Motivation

Some studies support that motivation impels students to learn an L2 (Dörnyei, 2003; Schumann, 1976). Flege et al. (1995b) noted that motivation can contribute to better sound perception and production to a small degree. After investigating Italian/English bilinguals, they found that AOL was the dominant variant for learning the L2's pronunciation at 59%, while the motivation variant only reached 3%, implying that it did not constitute a significant factor for the adequate acquisition of the L2 sounds. Moreover, Piske et al. (2001) argue that all the factors that are associated with motivation do not lead to the establishment of a native-like pronunciation, so even highly motivated students in a classroom cannot achieve an accented-free pronunciation.

3.7.9. Mother Tongue

A learner's L1 background is the last factor that will be discussed. It is reasonable for a classroom to consist of pupils who have different L1s. A few studies underline the importance of the L1 background for the

acquisition and production of L2 sounds. Purcell and Suter (1980) point out that Japanese and Thai speakers produced English with a stronger foreign accent than Arabic and Persian speakers. Flege and Fletcher (1992) pointed out that Spanish and Chinese native speakers, with approximately the same time spent living in a foreign country, differed in their English pronunciation. Chinese speakers had a detectable foreign accent while Spanish speakers did not. So, L2 learners transfer phonetic cues from their L1 into the target language. Although learners' L1 plays a role in L2 acquisition, students usually receive the same training in L2 acquisition. Piske (2007) pointed out that students should be divided according to their L1 and receive the appropriate training based on the similarities and differences between their L1 and their L2.

The conclusion arising is that some factors seem to have a significant influence on the acquisition of L2 sounds while others do not. The greatest influence is found in the AOL, the combination of LOR, the quality and quantity input, the use of L1/L2, and the training in production and perception.

As the findings indicate, it is necessary to introduce a policy that has been increasingly adopted by several countries for foreign languages courses during preschool or primary education (Piske, 2007). Still, this alone is not enough. Pupils have to be exposed to high-quality input during these courses. Thus, foreign language courses should be taught by teachers who are native speakers of the target language to provide high-quality input (Piske, 2007). Quantity is also important for the accurate perception and production of L2 sounds. Therefore, learners have to be placed in an appropriate learning context where they will receive a large amount of foreign language input on a frequent basis. It is also important for students to be encouraged by their teacher to use the foreign language.

Wesche (2002) argues that one of the most successful foreign language teaching policies is the "early immersion" program which has been introduced with great success in many countries, such as the USA, Canada, and Finland. The most critical aspect of the program is that main subjects (e.g., mathematics and science) should not be taught in the immigrants' L1 but in the L2 instead. According to Wesche (2002), the above policy leads students to develop superior foreign language skills while not prohibiting them from developing their L1. Wesche (2002) points out that the success of early immersion programs depends on the students' immersion at an early age, their long-term exposure to L2 input, and their motivation in activities that mobilize metacognitive strategies for the L2. However, Wesche observes that there is a lack of high-quality input due to the limited number of native speakers who teach early

immersion programs; this agrees with Flege's conclusions about the significance of high-quality input when trying to achieve less accented pronunciation.

CHAPTER 4

LANGUAGE LEARNING AND EDUCATION

4.1. Why learn a second language?

Nowadays, modern societies consist of different ethnic groups who live and are educated together. Multiculturalism has rapidly expanded in the world, creating not only an assemblage of cultures but also a mosaic of different languages spoken in each country. Even societies that were described as monolingual in the past have transformed into multilingual communities today. The key question is whether immigrants should learn the dominant language of the country they live in.

Fully learning a second language (L2) carries a plethora of benefits for learners, especially for young ones who acquire it through schooling. First of all, apart from achieving success in L2 courses, they have the opportunity to increase their academic competence in other lessons (e.g., mathematics and history) due to their knowledge of the target language's structure and vocabulary. Furthermore, through L2 learning, children are able to enhance skills, such as reading, listening, problem-solving, thinking, and creativeness, as well as developing an understanding of how language works. In addition, the acquisition of an L2 reinforces children's cognitive development.

From another perspective, L2 learning may increase the chance of being accepted into a college, as well increasing an individual's general competence. Studies point out that it is likely that learners with an excellent L2 proficiency will get better grades in college, which reduces the risk of dropping out. Moreover, knowledge of an L2 improves career opportunities because nowadays jobs require a high degree of competence in other languages. Both academic and career success correlate with an individual's level of personal satisfaction, as well as the development of a high degree of self-esteem, since they will be able to achieve their goals and succeed in society.

Furthermore, young students become more familiar with the culture of the country they live in through the L2, as it enables them to acquire an inter-cultural competence; thus, children will supplant egocentricity

in favor of reciprocity. In this way, they will learn to respect "others" and become more tolerant of the differences between people. Undoubtedly, L2 knowledge contributes to the extinction of every prejudice between native and non-native speakers, as well as boosting skills and values, such as collaboration and solidarity.

In conclusion, many pedagogical, cognitive, and social implications make learning an L2 a non-negotiable goal. The role of the formal institutions is to help learners obtain proficiency in their chosen L2.

4.2. Is it possible to learn how to pronounce a second language?

When learning an L2, pronunciation might be a difficult task to deal with, at least for the majority of learners. The logical question that arises is whether pronunciation can be acquired to the extent that a non-native speaker's accent does not differ much from a native's.

Some researchers believe that not all learners can acquire L2/foreign language pronunciation. Supporters of this theory ("Critical Period Hypothesis") argue that, after a specific age, the learning pronunciation becomes difficult or even impossible. Usually, this limit is set at the age of 12–15 years, while others estimate it to be as low as 6 years old. This position is based on biological theories which argue that brain plasticity deteriorates after a particular age and, therefore, the ability to acquire accurate pronunciation in a non-native language is limited.

However, some of the modern linguistic speech models, such as the *Speech Learning Model* and the *Perceptual Assimilation Model*, reject this notion by assuming that people can create phonetic/phonological categories in an L2 or a foreign language during their entire lifespan. No age limit prevents the acquisition of pronunciation; however, it is obvious that children acquire a language beyond their mother tongue more easily than adults. According to these models, this adult difficulty is not due to biological changes and, in particular, to the removal of cerebral plasticity, but it is instead based on the accumulation of data from the native language: the greater phonetic and phonological input that someone receives in their mother tongue, the more difficult it is—but not impossible—to adapt to the acoustic cues of a non-native language. A combination of a wide range of linguistic, social, psychological, pedagogical, and other factors is required to acquire the pronunciation of an L2/foreign language. Some of the most important factors are the age at which someone begins to learn the target language, the quantity and the quality of the input that someone receives in the non-native language, the frequency of non-native

language use, the attitude towards the non-native language and the motivation to acquire it, the instruction of pronunciation in the classroom, the phonetic training, the interaction with individuals (or groups) who are native speakers of the target language, and personal aptitude or linguistic intelligence.

In conclusion, modern linguistic models of speech acquisition support the argument that pronunciation is learnable. They disagree with most biological theories, and instead supporting a possible refinement of adult leaner's phonological system, which would allow the acquisition of non-native pronunciation. There are many cases of people who can speak a non-native language without a foreign accent. These events cannot be ignored or considered to be exceptions to the rule; instead, they should be seen as evidence that an accent is learnable at any stage of human life, if the conditions allow it.

4.3. The definition of language mistakes and errors from the perspective of linguistics

Mistakes and *errors* are defined as deviations from a linguistic norm, which takes the form of a rule. Linguistics distinguishes between the terms "mistakes" and "errors". Mistakes are performance errors that emerge from the failure of a native or non-native speaker to correctly utilize a known system. Native speakers can notice a language mistake and correct it quickly. Mistakes might include unconventional grammatical structures and language slips. However, errors that are systematic (they are repeated) are usually due to the L2 learners. Errors are not recognizable by the learners of a language, and they emerge from limited grammatical knowledge. Errors might be related to pronunciation, spelling, or grammar.

Looking at "traditional" grammar textbooks and dictionaries, we can see that they point out "correct" (and "incorrect") linguistic forms. Of course, all of these handbooks only present a static image of language that does not reflect the rapid development of the spoken word. Not all language changes are recorded on paper, and all of the recorded rules are norms that have been valid during a particular period.

Gradually, a linguistic norm that is recorded in dictionaries and grammar textbooks "is enclosed in a steel shield" and is treated as the only linguistic form. Usually, those who use linguistic forms that diverge from the forms found in formal grammar textbooks (in both spoken and written words) are stigmatized as "uneducated", or they are "corrected" by people who strictly follow the rules recorded in these manuals: the so-called "grammar Nazis".

It should be noted that linguistics is not a prescriptive but a descriptive science. That is, it does not criticize those who make mistakes or errors, and does not indicate the "correct" form; instead, it aims to study and interpret the reasons why speakers choose to use a particular linguistic form. Language is constructed by its speakers and, to that end, it can incorporate elements, which in a previous period constituted deviations of the linguistic norm, into its system.

However, the question is whether a teacher should accept any deviation without indicating "correct" and "incorrect" linguistic forms. The teacher is not a linguist and has to teach the language norm. Nevertheless, this teaching should not be done within the strict regulatory frameworks indicated by grammar textbooks. It should be understood that various language mechanisms, which constitute the basis for language development, often transform unacceptable forms into acceptable ones. For example, the past tense of the English verb "dive" is "dived". However, in the last two centuries, the form "dove" has also been used in American and Canadian English. Where did this form come from? As the Merriam-Webster dictionary indicates, "blame 'drive' for this". The form "dove" was formed in proportion to "drive → drove". So, the irregular form "dove" (which now constitutes a regular one) was created by the linguistic mechanism of *analogy* according to which linguistic forms are formed analogously to some others. Analogy, along with other mechanisms, such as *reinforcement* and *folk-etymology*, is a powerful gear that can develop a language by replacing existing types with new ones. However, there are also individual errors that do not fall into a language integration process triggered by a mechanism but emerge due to a speaker's inadequate knowledge of a language (e.g., "I goes to school").

Teachers are not linguists; however, they should explain the use of different linguistic forms to their students. For instance, in the case of doublets (e.g., shadow-shade; chief-chef), they should clarify which of the two forms is preferable. This preference can be based on the amount of usage or the status of a particular form in the social environment. Additionally, it is advisable to use descriptive grammar textbooks and dictionaries rather than traditional prescriptive ones, which have a regulatory character that directs users to the use of a single form.

Those who insist on linguistic corrections of linguistic forms that deviate from official manuals, but which are frequently used by speakers, do not know how language works or that the spoken word is a living "organism" that continually undergoes rapid variations. Most of the time, rampant conservatism, selfishness, ignorance, and misconceptions leave no room for a scientific perspective. We have to consider that non-

scientific manuals have the power to perpetuate mistaken notions of how the language system works.

> Language forms that deviate from conventional grammar but are widely used by people are not considered to be errors from the perspective of linguistics. They are probably driven by a language mechanism, and they might constitute a future addition to the existing conventional grammar.

4.4. Should educators correct or not the language "errors"?

One crucial difference between the sciences of linguistics and education is that the former has a descriptive character, whereas the latter has a prescriptive one. In particular, in the case of language errors, linguists describe and interpret their nature, as well as to determine the reasons for their existence, while educators are often expected to correct them and indicate an "adequate" form to be used instead.

As we saw in the previous section, mechanisms that the whole language system is based on, such as analogy, reinforcement, and folk etymology, may transform unacceptable forms into acceptable ones. For instance, the mechanism of analogy creates the form *underwhelm*, which depicts the action of describing something that is unimpressive in a humorous way. The word is formed analogously to the word *overwhelm* (prefix change). However, it has to be underlined that, intertemporally, language changes are derived from initially unacceptable forms, which ultimately evolve the language. Many forms started as errors, then they coexisted with other forms and, finally, they managed to dominate over the other forms to become accepted as a norm. An example of the "rationalization" of an error is found in the word "apron", which is derived from Latin. In the French language from the Middle Ages, it is "naperon" and then later, "napron". Because the boundaries between the article (a) and the initial consonant of the word (n)—"a napron"—were not clearly discriminated during oral communication, people would hear "an apron",

which was a "logical" structure since it constituted a grammatically correct form. Therefore, gradually, the form "an apron" was incorporated into the norm. The coexistence of one form with another, or the domination of one form over others, is not a random fact but emanates from cultural-historical, social, and psychological factors amongst others.

The question that arises is what attitude should educators adopt regarding non-accepted forms when errors, as we saw above, constitute a fair and a creative part of language evolution? In a pedagogical setting, things seem to be different. First of all, educators should indicate errors without making them an aphorism. They have to correct individual errors that occur due to insufficient knowledge of the language (e.g., *your beautiful** instead of *you are beautiful*), and even try to find out what led the learners to use ungrammatical forms. Furthermore, a different approach has to be followed for forms that coexist in a language system. For example, there are two almost identical words to describe a person who provides advice to others: *adviser* and *advisor*. In essence, the coexistence of these two forms does not stigmatize either of them as "incorrect", unlike in the previous case where the phrase was ungrammatical. On this occasion, educators should not evaluate one form as being more "prestigious" than the other, but they do have to establish particular criteria to indicate why one should be used over another, such as the quantity of use or the contexts in which it is preferred for use. In the previous example, the form *adviser* is older than *advisor*, and it is used five times more than the latter in the press in all English-speaking countries. The aforementioned pedagogical effort can be reinforced with the use of descriptive grammar manuals instead of prescriptive ones, which are dominant in schools. Descriptive grammar textbooks provide a spherical view of the language system instead of a lopsided one because they allow learners to see all the possible forms of a word, as well as their frequency of use, their origin, and their contextual use, etc.

In conclusion, the correction of language errors is necessary for educators to achieve teaching coherence. They have to correct errors that derive from insufficient knowledge of the language but they also have to follow a different policy for errors driven by a language mechanism. These errors should be considered as undergoing language developments rather than language slips. Therefore, teachers may choose to use particular words that correspond to specific criteria to ensure that all students consistently use the same linguistic forms.

4.5. Should a language's grammar be taught?

Grammar is considered to be an integral part of native and non-native language teaching; it exists in every language curriculum. The term grammar refers to the rules of language at each structural level (phonology, morphology, syntax, semantics), whereas, in the educational context, the term describes the use of specific morphosyntactical rules for the formation of acceptable grammatical utterances in a prescriptive manner according to what is defined as a standard language. The acquisition of first language grammar takes place naturally before schooling through a child's contact with linguistic input so that children can adequately communicate with other speakers. So, what is the need for grammar teaching when people who have never received formal education can adequately communicate with others?

It should be understood that it is not enough to communicate orally or in writing in a language that has been naturally acquired. Innovative use of language requires the employment of linguistic knowledge and metacognition; in addition, further knowledge is required to use it appropriately with regard to the conventions of each communicative context. In addition, learners should understand that language is flexible, thereby eradicating the notion of a strictly structured system, which forms an undisputed norm.

Through the teaching of grammar, learners become familiar with the functions of basic linguistic levels (phonology, syntax, morphology, semantics, and pragmatics) and perceive inter-structural relations (e.g., how morphology is related to syntax). Also, grammar contributes to the development of metalinguistic skills: for example, students learn to describe and analyze a sentence's syntactical structure (e.g., *John plays*: *John* is the subject of the verb *play*). Upon acquiring linguistic and metalinguistic skills, students will be able to use language creatively, eliminate prejudices about the language system, create a positive attitude towards the subject, and increase their academic performance. Also, in many countries, because of the existence of bidialectal linguistic contexts with the coexistence of a high (often a standard) variety, which is learnt at school and used in more formal circumstances, and a low variety, which is often used in native dialect conversations, grammar teaching is even more important. The vocabulary and the morphosyntactical structures of a standard language have to be taught for dialectal speakers to be able to efficiently communicate with speakers of the standard language. However, such teaching should be managed appropriately so that students do not feel

inferior because of their native dialect, particularly considering that bidialectal speakers often underestimate their native low variety.

Besides, the teaching of grammar should not be strictly prescriptive. It should be made clear to the students that language is characterized by variations as well as free choices. For instance, we often find doublet verbs in Greek—e.g., "ponáo" (πονάω) and "ponó" (πονώ) (they both mean "I feel pain")—which are used according to the style, the communication circumstance, and the preference of the language user without being labeled as errors. The existence of doublet forms indicates the necessity of clarifying the contexts in which they are found. Language is thus understood as a systematic set of rules characterized by elasticity.

Systematic grammar teaching is required for the selection of the appropriate vocabulary, style, and grammatical structure. Unlike structural levels of language, these skills are not cultivated naturally but only through school teaching. For example, the style of an official speech or text is different from that of unofficial ones; the same applies to their vocabulary. Also, in scientific language, the use of passive voice is preferred while, in daily speech, the active voice is preferable. Moreover, the speakers' different social characteristics force them to tailor their vocabulary and speaking style depending on who they are conversing with (for example, a person will speak differently to someone with a low educational level than to someone with a high one). Therefore, systematic grammar teaching allows students to produce and understand types of spoken and written word that differ in style, vocabulary, rhetorical structure, and grammatical conventions. Grammar offers an understanding of the structural and functional elements of language.

All of the above are concerned with the benefits that arise from learning spoken word grammar. However, users can also benefit from written word grammar. One of the benefits of teaching grammar in the written form is that it improves orthography. There are homophones (words that are heard as the same but they differ in orthography) in several languages; for instance, in Greek, there is "vázo" ("βάζ-ω" = I put) versus "vázo" ("βάζ-ο" = vase). These pairs consist of words belonging to different lexical categories; the first word of the pair is a verb, while the second is a noun. Teachers may provide specific spelling rules that contribute to the recognition of the word's lexical category: e.g., Greek verbs end in the suffix "–ω". However, in some cases, the realization of a lexical category is achieved through the recognition of the sentence's syntactical context. Thus, in order to improve spelling skills, it is important to possess an understanding of a language's grammar.

Punctuation is also an important element when trying to understand a text's meaning. Teaching punctuation means that a language user will be able to better understand a written text's meaning, and they will be able to use punctuation marks correctly. For example, in the sentences, "Toilet for disabled seniors" and "Toilet for disabled, seniors", we have two different meanings determined by the use of the comma. In the first case, the toilet can only be used by disabled seniors (and not, for example, disabled young people) but in the second, the toilet can be used by disabled people of every age and seniors who are not disabled.

Consequently, a knowledge of grammar is not of secondary importance, but it is an essential aspect of language teaching.

Teaching grammar is necessary for the creative use of language, the adaptation of speech to the communicative context (selection of the appropriate vocabulary, style, and grammatical structure), the improvement of spelling, the correct use of punctuation, and the correct use of the written word.

4.6. Language Transfer, Error Analysis, and Inter-language

When learning an L2, students transfer structures from their native language to the second language. This transfer can either be positive or negative. "Individuals tend to transfer the forms and meaning and the distribution of forms and meanings of their native language and culture to the foreign language and culture" (Lado, 1957: 2). "This notion of 'transfer' means carrying over the habits of his mother-tongue into the second language" (Corder, 1974: 158).

4.6.1. Positive Transfer

This occurs when the L1 is similar to the L2. Learners have no difficulty in acquiring the L2 because their knowledge of their mother tongue is positively transferred onto the L2. Thus, the L1 facilitates learning the L2.

4.6.2. Negative Transfer ("Interference")

This is problematic because of the L1's interference with the L2; this occurs when the L1 is different from the L2 and it, therefore, impedes L2 learning. There are four main types of negative transfer:

- *Misinterpretation:* These types of errors occur when L1 structures influence the interpretation of L2 messages, e.g., misinterpreting L2 sounds due to L1 interference.
- *Production:* These types of errors can be classified into the following six categories:
  1. *Substitutions:* e.g., the English /p/ is pronounced as /b/ by speakers of several Arabic dialects.
  2. *Calques:* (effect from L1 structures) "palec srodkowy" (Polish) → "a finger middle" (incorrect word order by a Polish student of English).
  3. *Under-differentiation*: Greek learners of English using "borrow" and "lend" as equivalents as they are a single word in the Greek.
  4. *Over-differentiation:* (transfer distinctions from one language to another) English students of Greek transfer the English /ɪ/-/iː/ distinction when producing the Greek vowel /i/.
  5. *Hypercorrection:* e.g., excessive articulation of nasal vowels by an English student of Polish.
  6. Alterations of structures: e.g., omissions, additions, and miss-orderings.
- *Overproduction:* students produce a given L2 structure with a much greater occurrence than native speakers. They overuse certain words or structures when they perceive them to be correct, e.g., the use of "yes" instead of "of course", "definitely", "sure", or "certainly".
- *Underproduction:* (or avoidance) learners produce hardly any or no examples of L2 structures. They often avoid complex L2 structures, e.g., the present perfect tense.

4.6.3. Error Analysis

Error Analysis was developed to shed light on the source of L2 learners' errors (where do they come from?). It differentiates *errors* from *mistakes*. Error analysis shows that the majority of L2 errors do not emerge from the interference of the learners' L1; these errors are called *intra-lingual* errors

since they occur within the language. The following are types of intra-lingual errors:

- *Overgeneralization/Developmental Errors:* when a speaker applies a grammatical rule in cases where it does not apply, e.g., "tooths" instead of "teeth")
- *Simplifications*: Learners produce simpler linguistic forms than those found in the target language, e.g., *omissions*: "He waited < > the bus"; *additions*: "Students are do their homework".
- *Induced:* Errors caused by misleading teaching examples. Sometimes teachers explain a rule without highlighting the exceptions or the intended message that they want to convey.
- *Underproduction (or Avoidance):* These errors occur when a learner fails to apply certain target language rules just because they are thought of as too difficult.
- *Overproduction:* Beginners frequently repeat a particular structure.

4.6.4. Inter-Language

This term was developed by Selinker (1972). L2 learners develop rules from various inputs and gradually adapt these rules to the direction of the language they are learning (not the grammatical system of the target language, but a system "on the way" to that of the target language). L1 interference was not totally rejected but it was redefined as one factor among many others in the cognitive process that is responsible for L2 learning. According to Selinker (1972), there are five main processes that work in inter-language:

- *Transfer:* learners transfer structures from their L1 to the L2.
- *Overgeneralization:* The process of extending the application of a rule to items that are excluded from it in the language norm, e.g., "I comed" (instead of "I came").
- *Transfer of training:* A rule enters the learners' system as a result of instruction.
- *Strategies of L2 learning:* Learners develop strategies to learn the teaching material.
- *Strategies of L2 communication:* Learners develop strategies to communicate with L2 native speakers.

CHAPTER 5

LANGUAGE AND SOCIETY

5.1. Even languages die

Languages could be compared with living organisms, which are born and then die. Some languages were born thousands of years ago and are still alive, such as Persian, Arabic, and Greek, while others did not manage to survive over the years and completely vanished from the linguistic map.

Official statistics report the existence of fewer than 7000 languages around the world, half of which are estimated to disappear by the 22nd century. Therefore, it is not a surprise that today there are languages with a single native speaker. This situation keeps these languages alive; however, their disappearance is just a matter of time. For example, Tinigua in Colombia, Yaghan in Argentina, and East Sutherland Gaelic in Scotland are languages which had only one officially recorded native speaker in 2019. Statistics also show that one language disappears every two weeks. In 2016, among the languages that disappeared with the death of their last native speaker were Mandan and Wichita in the USA, Gugu Thaypan in Australia, and Nuchatlaht in Canada

The fact that a language is not standardized, that is, it does not have a written record as it is only used via the spoken word, raises further concerns about its "survival". In such cases, when the last speaker dies, the language variety is irretrievably lost. However, if there are dictionaries or grammar textbooks for a "dead" language, there are also hopes for revival. Careful and detailed linguistic planning, as well as policies, need to be undertaken by responsible entities to revive a language. Hebrew is a typical example of the resurrection of a dead language. Although the language was not spoken at all, it managed to come back to life thanks to linguists studying its ancient texts.

The "death" of a language does not only involve the disappearance of a linguistic system but also disappearance of the culture within which the language evolved, and which reflects the morals, customs, expressions, and cultural elements of a particular society. The scientific community

dealing with the revival of language varieties may collect linguistic inputs in the form of audio or video files from its remaining speakers, or from grammar books and dictionaries if a variety has no living speakers. There are cases in which the community of a threatened language has taken measures to protect their language, such as the Maoris in New Zealand who set up kindergartens to teach their language. These kindergartens employed older people who knew the language and could teach it to the children.

The competent entities of each country should protect all the linguistic varieties spoken within their geographical borders. From a linguistic point of view, different languages can provide information not only for understanding the individual elements of a particular language variety but also for possible investigations into how the language system works in general.

The big
languages
English and
French

Regional
languages (UN)

Arabic, Chinese,
English, French,
German, Russian,
Spanish

National languages

Around 80 languages
serve over 180 nation
states

Official languages within nation
states

and other "safe" languages

Around 600 languages
worldwide

Local vernacular dialects

The remainder of the world's
6000+ languages
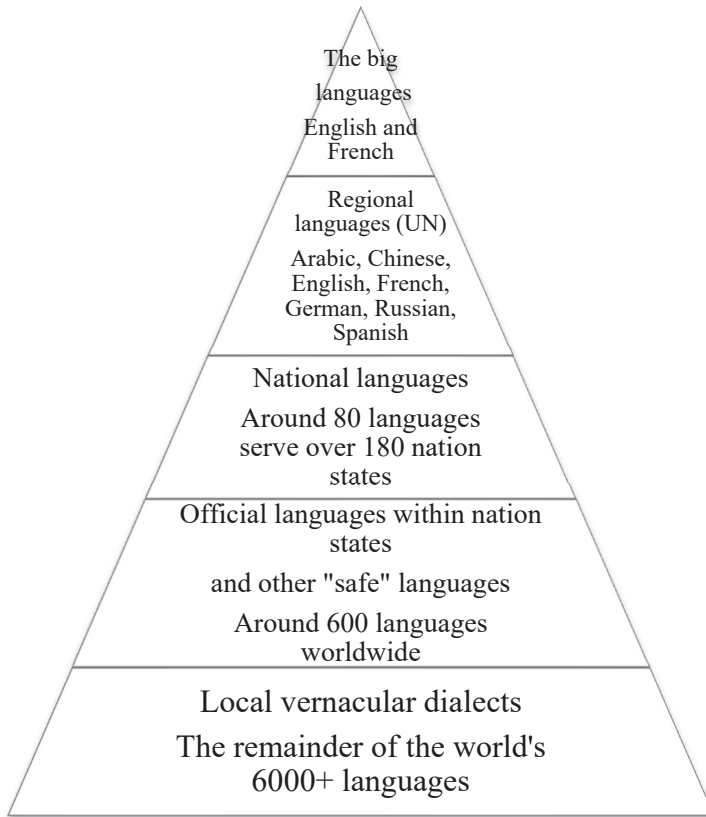
Fig. 5-1: The world's language hierarchy (Graddol, 1997)

5.2. Languages that have been revived:
The case of Hebrew

The Hebrew language belongs to the Semitic family of languages (like Arabic and Aramaic), and it is the official language of the State of Israel with over 9 million native speakers. The Semitic languages have similar vocabularies and grammatical structures. The alphabet used for the written form of Hebrew is the Jewish script, which is a variation of the Aramaic alphabet.

5.2.1. The History of Hebrew

In antiquity, it was one of the most popular languages in the kingdoms of Jerusalem and Judea. By the 6th century B.C., a period when the Persians expelled the Jews from Jerusalem, the oral use of biblical Jewish began to decline and be replaced by other Jewish dialects, including a local Aramaic dialect (the language of Jesus Christ). In 70 A.D., the displacement of the Jews of Jerusalem by the Roman Empire resulted in the gradual disappearance of the Jewish oral language; however, the written form remained. Other factors that contributed to this disappearance is the fact that Aramaic was the official language of the Middle East and Ancient Greek was very popular during that era. It is worth noting that many Jews knew Ancient Greek, and there were some cases in which they translated literary works from the Greek into their language.

5.2.2. From Extinction to Revival

Hebrew fell into disuse as early as the 1st century AD. One outstanding fact about Hebrew is that it managed to revive after 18 centuries of oral inactivity in the 19th century, and today it is the native language of millions of speakers. It should be noted that even though Hebrew was not used in everyday oral speech, every Jew still knew how to write it. Praying and reading the Bible in Hebrew was an unchangeable fact for every Jew. Therefore, Jews knew the written form of Hebrew, although the language was not used orally. Jews would only speak in Hebrew when they wanted to communicate with other Jews if both sides were native speakers of a different language. Similarly, nowadays, Greeks and Catholics can read but not speak Ancient Greek and Latin, respectively.

The "National Revival" movement led by the activist linguist Elizer Ben-Yehuda contributed to the revival of oral Hebrew with the establishment of the "Hebrew Language Council" in 1889. During the period of its revival, Jews were speaking other languages such as Ladino (Spanish-Hebrew), Yiddish (German-Hebrew), and Russian. Not using Hebrew for centuries has resulted in the inclusion of neologisms in its vocabulary. However, many loan-words derived from both the Hebrew Bible and other languages have intruded into the Modern Hebrew vocabulary. Additionally, although there is a gap of thousands of years between Ancient and Modern Hebrew, their differences are less than those that exist between Ancient and Modern Greek because the use of oral Hebrew had been frozen for centuries. The words of the first Prime Minister of Israel, Ben Gurion, in relation to the minimal differences

between Ancient and Modern Hebrew provide an understanding of how the old and the modern language are related: "If Moses returned today and demanded a piece of bread, one could immediately understand him".

Hebrew is a shining example of a modern language revival. This may open the way for the "resurrection" of other "dead" languages in the future.

Fig. 5-2: The letters and sounds of the Hebrew alphabet[4]

5.3. The phenomenon of linguistic reborrowing

Linguistic borrowing is a frequent procedure in which words belonging to the official vocabulary of a language appear with either their previous or a new form in the official vocabulary of another language. Apart from linguistic borrowing, there is the phenomenon of *reborrowing* in which one word is borrowed from language A into language B, but the word then returns to language A.

We can see a multitude of reborrowed words in languages with a long history, such as Greek. At first, many words have returned to the Greek and integrated into its inflectional system by acquiring inflectional suffixes. For example, the word "limáni" (λιμάνι = port) is considered to

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[4] Retrieved from Omniglot

be a reborrowed word because Ancient Greek lent the word "limín" (λιμήν) to Turkish, where it was incorporated as "liman", and then the word returned to Greek. "Limáni" is not an irregular form in Greek since it can be conjugated [(limán-i (nom.), liman-ioú (gen.), etc.]. In contrast, reborrowed words may be included in the official Greek vocabulary in a "foreign" form (non-adapted) without being able to be conjugated. For example, the word "butík" (μπουτίκ = boutique) is not at first perceived to be a Greek reborrowed word because no Modern Greek word ends in <k>. However, Ancient Greek lent the word "αpoθíki" (αποθήκη) to Latin, in which it was appeared as "apotheca", then, it passed into Italian as "bottega" and later in French as "boutique". Finally, it returned to Greek as an acoustic transcription of the French word.

It is worth noting that a word may return to its "original" language with a different spelling or meaning. The Ancient Greek word "ksiríon" (ξηρíον = elixir), which meant the medicine that healed many diseases, passed into Arabic with the addition of the Arabic article "al" (al-iksir), then passed into French as "élixir", and returned to Greek as "eliksírio" (ελιξήριο). Thus, the spelling of the word is not the same as its original form (ελι-ξήριον), but it was simplified according to the spelling given from the French (ελι-ξíριο). An example of a reborrowed word that has differentiated its meaning is "glámur" (γκλάμουρ = glamour), which today means prestige, beauty, and allure. The word comes from the Ancient Greek word "γrammatikí" (γραμματική = grammar), which is not related to "glamour's" current meaning. The American word "glamor" connected literate people with occult magic practices; its meaning changed entirely when it was returned into the Greek.

Various factors push the words on this journey into different languages. Economic, social, historical, cultural, psychological, and other factors may affect the phenomenon of word reborrowing. Thus, in the example of Greek reborrowed words, we can say that this process reflects the great cultural radiance of the Greek language around the world, which is reinforced by historico-cultural conditions. Also, word reborrowing proves the interdependence of languages and refutes the statement that "what is given is not returned".

5.4. Not All Languages are Natural: The Case of Esperanto

Esperanto is an artificial language: that is, it is a variety that has not been developed naturally but with predetermined linguistic levels (e.g., phonology, syntax, etc.) created by a person or a group of people. It was

created in 1887 by the Russian-Jewish ophthalmologist Loudoviev Lazar Zhanemov, who became later known by the pseudonym, Dr Esperanto. The original idea behind the construction of this language was the facilitation of communication between people with different mother tongues. Currently, it is estimated that there are 2 million Esperanto speakers worldwide, and there are also 1000–2000 people who learn it from birth. These people are called "denaskuloj", and they acquired Esperanto as their native language through their family in the same way that other children acquire their natural native languages.

5.4.1. Linguistic Features

Esperanto constitutes a simple language system lacking idioms and grammatical irregularities. Its vocabulary is Romanic, and it is influenced by Germanic languages to facilitate its use by people who originate from Europe, America, and/or Oceania. For example, the Esperanto sentence, "La imperiestro pretendis, ke li estas filo de la drako" ("The emperor considered himself as the dragon's son"), has a very similar vocabulary and structure to Romance languages (e.g., Italian, Spanish, or French). Also, Esperanto's grammar is simple: for example, there is only one article ("la"), nouns take the suffix "-o", adjectives "-a", and adverbs "-e"; in addition, all its verbs are regular. The components of a sentence follow the order of subject-verb-object, with adjectives positioned either before or after the noun they specify. Its alphabet consists of 28 letters and it is slightly differentiated from the Latin alphabet with the addition of diacritics. Phonologically, Esperanto consists of 23 consonants, five vowels, and two semivowels, which, if combined with the vowels, form six diphthongs. The words are pronounced just as they are written, and the phonemes are borrowed from the Slavic languages.

5.4.2. Official Status

Esperanto is the official language (along with English) of one nation in the world: the "Republic of Molossia", which is located near Dayton, Nevada. Probably, very few people have heard of this country since it is a non-recognized microstate that has only three inhabitants in 2.5 hectares of land (!). This "state" was established in 1977 by Kevin Baugh and only consists of his own house (!) and some adjacent farmland. The "president" Baugh often "rules" in absolute terms, forbidding, for example, sea elephants and onions. The Molossian Republic has a website that delivers free online courses to learn Esperanto!

Although Esperanto is an artificial language, it managed to spread across the world and it was used in various fields, such as theatre, music, and literature. By 2015, Wikipedia included more than 200.000 articles in Esperanto. It is noteworthy that Esperanto constitutes the primary teaching language in one university institute: the San Marino International Academy of Sciences. The ingredients of its success are five-fold—internationality, neutrality, parity, ease, and liveliness—all of which characterize Esperanto.

A a	B b	C c	Ĉ ĉ	D d	E e	F f	G g	Ĝ ĝ	H h
a	bo	co	ĉo	do	e	fo	go	ĝo	ho
[a]	[b]	[ts]	[tʃ]	[d]	[e]	[f]	[g]	[ʤ]	[h]
Ĥ ĥ	I i	J j	Ĵ ĵ	K k	L l	M m	N n	O o	P p
ĥo	i	jo	ĵo	ko	lo	mo	no	o	po
[x]	[i]	[j]	[ʒ]	[k]	[l]	[m]	[n]	[o]	[p]
Ř r	S s	Ŝ ŝ	T t	U u	Ŭ ŭ	V v	Z z		
ro	so	ŝo	to	u	ŭo	vo	zo		
[r/ɾ]	[s]	[ʃ]	[t]	[u]	[u̯]	[v]	[z]		
aj	aŭ	ej	eŭ	oj	uj				
[ai̯]	[au̯]	[ei̯]	[eu̯]	[oi̯]	[ui̯]				

Fig. 5-3: The letters and sounds of Esperanto[5]

5.5. Do young people suffer from a lack of vocabulary?

The "language" of young people is a set of language conventions that young people use to communicate with each other. It does not constitute an autonomous linguistic system but instead uses linguistic structures in the context of a "sociolect" that deviates from the established lexical, pragmatic, and structural conventions of conventional linguistic systems.

Those who interact with young people may distinguish particular characteristics of their "language". In English, we often hear utterances, such as "shaking my head", "throw shade", and "get all preachy". These utterances do not always remain the same as they are differentiated, thereby reflecting social, psychological, and even historical trends.

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[5] Retrieved from Omniglot

Young people's sociolect is often criticized by older people or conservative groups who argue that it "deforms" the language system resulting in the inappropriate use of language. Also, it is believed that young people have a "poor" vocabulary because they do not use a multitude of norm expressions but prefer, instead, to use neologisms, which cannot be used in official communication circumstances. In fact, young people do not have a limited number of words in their vocabulary because they create a great number of words, even if most of them are slang. However, the lack of expression is a reality, but it is not related to the use of slang words and the particular "language" of young people.

There are many reasons that push young people into adopting a "different" language. First, there is the need to move away from adults' "established" way of life and, consequently, their language by creating alternative language behaviors that deviate from the "ordinary". Also, the "language" of young people is reproduced in several youth groups because they tend to imitate behaviors in order to be accepted by other members. It is worth noting that this "language" does not have a standard form, but it varies from group to group and person to person.

The "language" of young people does not constitute a dangerous linguistic lattice that must be abandoned. Instead, it indicates their spirit of imagination and ingenuity since they can use the linguistic system in such a way as to transform words or phrases, as well as creating new ones. However, this "language" is abandoned during the post-school or post-academic periods, when young people become mentally mature, and when their contact network changes.

> The notion that young people suffer from a lack of vocabulary is a misconception. However, it is true that young speakers usually use vague expressions.

5.6. The role of abbreviations in the written communication

Abbreviations are now a structural and integral element of written communication. They are practical in that they release users from typing

lengthy words, thereby making written communication easier and faster. In practical terms, every word and phrase can be abbreviated.

Abbreviations may have an expiration date: that is, their use might cease after a short or long period of use. For example, one of the most common abbreviations used by early internet users at the end of the 1990s was "asl", according to which the sender was asking for the age, the sex, and the place of residence of the recipient of the message. Nowadays, this abbreviation has been abandoned since the aforesaid information is provided through the users' network profiles as a consequence of the development of social media. Another commonly used abbreviation was "brb", which indicates that the user would return to the conversation shortly (be right back). Technological advancements that have led to the ability to communicate via a smartphone from any location (since the internet is everywhere!) has decreased the use of that abbreviation since there is no need to interrupt communication when speakers move to another place.

Today, the most common abbreviations include "lol" (laugh out loud), "lmk" (let me know), "btw" (by the way), "jk" (just kidding), "omg" (oh my God), "aka" (also known as), and "V.I.P" (very important person). In theory, all words or phrases can be written in a shorter way: (a) by removing all or most of their vowels (disemvoweling) (e.g., message → "msg", text → "txt"); (b) by shortening the word (e.g., information → "info"); (c) by writing the initial letter of each word (e.g., direct message → "dm"); (d) by using a letter of the alphabet that sounds like the word (e.g., see you → "cu", why → "y"); or (e) by using symbols or emojis (e.g., and → "&", ok → 👌). Conspiracy theories about the deterioration of the written language are unsubstantial since users do not deliberately attempt to write differently from the norm, but they are looking for an easier use of language to achieve faster communication with other users. In any case, the languages have assimilated a multitude of abbreviations that are widely accepted and which are even used in formal communication: e.g., "BC/AD" (Before/After Christ), "a.m./p.m." (Ante Meridiem/Post Meridiem), "Mr/Mrs" (Mister/ Mistress), "Dr." (Doctor), "U.N." (United Nations), and "F.B.I." (Federal Bureau of Investigation). Besides, most "informal" abbreviated words are only limited to the leaky framework of informal communication offered by social media and mobile phones. It is, therefore, understood that they serve as communication between friends and acquaintances, and that they are not intended for more formal purposes.

However, it seems that younger people tend to use "informal" abbreviations to a greater extent during communication with friends on social media than older people. It is clear that abbreviations are not a threat

to the written language system, but they are mostly interpreted as a tendency that emerged from technological advancement.

5.7. Perceptions Regarding the Use of the Roman Alphabet for Writing Languages with a Non-Roman Alphabet: The Case of Greeklish

The issues surrounding *Greeklish* (a portmanteau of the words, Greek and English), that is, the use of Latin characters to write Greek (note that the official script of the Greek language is the Greek alphabet), has grown, especially after the advent of the new millennium and the technological "bombs" that have completely changed our way of life. Greeklish bothers some conservative literary circles who mainly blame young people for using this form of writing in their daily written communication. Most of these people talk about the destruction of the Greek language through this type of writing, which results in the constant disapproval of Greeklish and its users.

First, the distinction between spoken and written word should be underlined. The spoken word precedes the written word, and it constitutes what we call language; this is also one of the main principles of linguistics. The written word is a later artificial invention, which always follows behind the changes that take place in speech. So, if we write the Greek language with a Latin, Arabic, or Chinese alphabet, it will continue to exist. Thus, it would be extravagant to talk about the destruction or the extinction of the Greek language just because it is written with a different alphabet.

However, is the Greek alphabet threatened with extinction? Greeklish constitutes a written language code, regardless of whether this code is used differently by each person (there is not a standard Greeklish written form). The use of Greeklish should not cause concern providing it is limited to informal communication through text messaging or social media, and as long as its users are aware that it constitutes an informal form of communication. For example, it is not possible for a formal letter in Greek to be sent using Romanized characters instead of Greek ones, because its writers understand the unconventionality of such an action.

A few decades ago, users started to use Greeklish as the internet and mobile phones could not support written communication with alphabets other than Latin in the earlier stages of their development. Users have "embraced" Greeklish over time because it offered them practical facilities: fast writing without spelling and the avoidance of the "annoying" use of stress mark. In Greek, every word with more than a single syllable receives a stress mark on the vowel to provide emphasis on

a particular syllable. Perhaps, through Greeklish, users cover their inability to correctly spell certain words and avoid stigmatization; writing Greek in Greeklish does not oblige learners to use correct orthography and, therefore, they do not feel bad about not following the rules.

The biggest concern is related to a possible increase of misspellings in Greek writing due to Greeklish. Although there is no serious research demonstrating a causal relationship between misspelling and Greeklish, their prolonged use could contribute to the visual degradation of the word's signifier. For example, if someone continually writes the word "μήνυμα" ("mínima" = message) as "mnm" or "minima", they may ignore or "forget" the spelling of the word; in this case, the word includes two /i/ sounds, which are represented by two different Greek letters ("η" and "υ"). However, without any evidence, we cannot predict the damage that Greeklish may cause to spelling.

Finally, some people see Greeklish as a scourge that must be abandoned immediately, whereas others consider it to be a normal development. In any case, Greeklish will not downgrade the Greek language or destroy its alphabet, at least in the near future. It does not exist as an innovative invention because it was used centuries ago, but it is a purely occasional invention facilitated by language users. Besides, millions of language users choose Greeklish for their convenience, and it would be unfair to deprive them of it based on unfounded arguments. Who knows, Greeklish might also be a "fashion": a linguistic firework that could disappear as rapidly as it exploded.
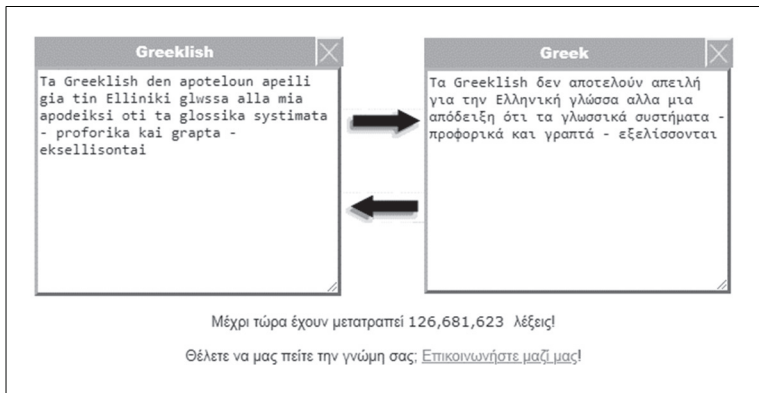

Fig. 5-4: Greeklish to Greek converter[6]

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[6] Retrieved from http://speech.ilsp.gr/greeklish

CHAPTER 6

SPEECH PERCEPTION AND PRODUCTION MODELS

The *Speech Learning Model* (SLM) and the *Perceptual Assimilation Model* (PAM) are the two most cited and important approaches in the study of L2 sound perception and production. A description of the theoretical framework of both SLM and PAM is given below.

6.1. Speech Learning Model (SLM)

James Flege addressed essential issues in the field of L2 acquisition. He investigated how English speakers acquire foreign languages, such as Chinese, Spanish, Dutch, French, and Japanese. Among his most important contributions is the development of SLM.

The main purpose of SLM is to account for the ways individuals learn, or fail to learn, to produce and perceive phonetic segments. It is related to the ultimate attainment of L2 perception and production. SLM strives to answer three main research questions: (a) Are certain L2 speech sounds learnable whereas others are not? (b) Are some L2 sounds learnable, but only by children? (c) Can difficulties in producing certain L2 sounds be traced back to inaccurate perception?

The model's predictions are based on L2 experienced learners supporting the formation of intelligible categories during the perception of L2 sounds. Flege and his colleagues also studied age limits related to the ability to achieve native-like pronunciation, which proved that even adult listeners can pronounce L2 segments just like native speakers. Furthermore, SLM attempts to observe the learnability of sounds and find possible links between production and perception. It argues that inaccurate perception of L2 sounds leads to problematic production, which indicates that both levels have a strong bond.

6.1.1. The Early Theoretical Framework and its Later Revision

In its early developmental stage, SLM supported that there are similar, new, and identical sounds between two languages. The acquisition of *identical* sounds seems to be easy because learners may subsume an L2 sound into the corresponding identical L1 category. Consequently, no problems are expected for the perception and production of identical sounds by L2 learners. *New* L2 sounds, namely sounds that do not exist in the learner's L1 sound inventory, are also predicted to be easily perceived because learners form new categories as they are able to distinguish the phonetic difference between L1 and L2 sounds. However, the new sounds may not be produced in a native-like manner. Finally, adults may face difficulties in the perception of *similar* sounds because of listeners' weakness in following the articulatory routines required to separate L1 and L2 sounds. The production of L2 sounds will be also inaccurate.

Flege (1987) examined the production of the French vowels /u/ and /y/ by English speakers. These speakers (apart from the inexperienced group) tended to produce the new French vowel /y/ like French monolinguals, but they differed in the production of the French vowel /u/. Flege stated that the French vowel /y/ constituted a new vowel category which did not cause any production difficulties to the L2 learners. On the contrary, the L2 vowel /u/ was perceived as "similar" to the English vowel /u/ (there is a phonetic differentiation between the English vowel /u/ and the French vowel /u/) and, therefore, production problems arose. Thus, he proved his hypothesis that a cognitive mechanism (equivalence classification) prevented experienced learners from correctly producing similar L2 phones. He also referred to some hypotheses which try to explain why adults cannot acquire L2 phones in the right way. For example, phonological filtering from L1 to L2 might occur due to the full acquisition of L1 phonology by an adult, which leads to an inability to distinguish differences between similar sounds.

However, this tri-partite division (new, similar, and identical) was abandoned by SLM in the mid-1990s. The revised version of the model predicts that a learner's success in the acquisition of unfamiliar sounds of an L2 depends on the amount of *perceived similarity between the sounds of the L1 and the L2*. Specifically, in the early stages of the L2 acquisition, the sounds that were rated as phonetically similar to a respective L1 sound will be produced fairly well. Moreover, sounds that are very dissimilar from any close L2 sound will be poorly produced during the early stages of the L2 development. However, years of experience will allow a more accurate production of these sounds than others that are less dissimilar from the closest L1 sound because new phonetic categories will be

formed. The formation of a new phonetic category does not guarantee accented-free pronunciation because it will shift away from the closest L1 sound category in the phonetic space. The formation of a new category is prevented if an L2 sound is very similar to an L1 sound.

6.1.2. Hypotheses of the Speech Learning Model

SLM is based on seven hypotheses which summarize its theoretical framework. These hypotheses are analyzed epigrammatically below (Flege, 1995).

H1. *L1 and L2 are related to one another at a position-sensitive allophonic level, rather than at a more abstract phonemic level.*

This hypothesis suggests that learners relate an L2 sound to the closest allophonic sound of an L1 phoneme, and not simply to an L2 phoneme. The phonetic differences that characterize both an L1 and an L2 sound can be perceived by bilinguals, even if they are not assimilated to the L1 phonological inventory. Further evidence supports this hypothesis because of L2 learners' ability to produce and perceive certain allophones of English phonemes. For example, English liquids in a word-final position are perceived and produced more successfully than liquids in a word-initial position by Japanese native speakers.

H2. *A new phonetic category can be established for an L2 sound that differs from the closest L1 sound if bilinguals discern at least some of the phonetic differences between L1 and L2 sounds.*

One of the most important SLM hypotheses is the formation of categories during L2 sound acquisition. Phonetic categories consist of long-term memory representations. The precondition for the correct perception of an L2 sound is the categorization of the segment in a new category, which can be formed if the learner is able identify at least some different phonetic features between L1 and L2 sounds. The categorization of an L2 sound in an existing L1 category leads to inaccurate perception and production of the sound.

H3. *The greater the perceived phonetic dissimilarity between an L2 sound and the closest L1 sound, the more likely the phonetic differences between the sounds will be discerned.*

If an L2 sound is similar to any L1 sound then learners may face difficulties in discerning the two sounds. In contrast, if they are able to distinguish the phonetic differences between the two sounds, and consider the L2 sound to be acoustically dissimilar from its closest L1 sound, they will not face any problems in distinguishing them.

H4. *The likelihood of phonetic differences between L1 and L2 sounds and between L2 sounds that are non-contrastive in the L1 being discerned decreases as AOL increases.*

Flege investigates many sociolinguistic factors that affect the acquisition of L2 sounds. One of these factors is the age of learning (AOL) (Piske, 2007). Flege argues that the earlier someone starts to learn an L2, the more effectively they will achieve accent-free pronunciation. However, AOL on its own does not lead to successful perception and production of L2 sounds. A combination of many factors is needed for better acquisition, such as high quality and quantity input, and L2 sound training.

H5. *Category formation for an L2 sound may be blocked by the mechanism of equivalence classification. When this happens, a single phonetic category will be used to process perceptually linked L1 and L2 sounds (diaphones). Eventually, the diaphones will resemble one another in production.*

Flege hypothesizes that the formation of an L2 sound category may fail, resulting in accented pronunciation due to the involvement of a mechanism called *equivalence classification*. Equivalence classification is a cognitive mechanism which prevents humans from perceiving constant phonetic categories. If some instances of an L2 speech category are perceived as instances of an L1 category, then new category formation will be blocked, leading to merged L1-L2 categories (*diaphone*). Thus, there will be difficulties in the discrimination between L1 and L2 sounds, and the production of the L2 sound will be accented.

H6. *The phonetic category established for L2 sounds by a bilingual may differ from that of a monolingual if 1) the bilingual's category is "deflected" away from an L1 category to maintain a phonetic contrast*

between categories in a common L1-L2 phonological space; or 2) the bilingual's representation is based on different features or feature weights than a monolingual's.

This constitutes a later addition to SLM and provides evidence for a common phonological space for L1 and L2 phonetic categories. Bilinguals strive to retain sound contrast in this shared phonological space. The result will be the formation of a deflected L2 sound category in the bilingual's mind, and this category is different from that of the native speaker. Mack's case study (1990) strongly supports the above hypothesis. Mack, a ten-year-old boy who spoke German at home and English elsewhere, managed to achieve phonetic contrast for the three categories (/p, t, k/) between his L1 and his L2. However, the production of these sounds in both languages was inaccurate. A significant conclusion arises from this specific hypothesis. Even if an L2 sound category is developed, the L2 sound might not be produced exactly as it would have been by native speakers. This happens when L2 sounds produced by bilinguals differ from other L2 sounds because they are based on different acoustic features. Piske, Flege, MacKay, and Meador (2002) examined the production of English vowels by fluent early and late Italian-English bilinguals and concluded that even early fluent bilinguals produce English vowels in a way that is distinguishable from native English speakers. This can be explained by the inability to develop the established weigh features of L1 sounds, resulting in an inappropriate L2 accent.

H7. *The production of a sound eventually corresponds to the properties represented in its phonetic representation.*

The formation of categories takes place through the perception of a sound. A phonetic category contains all the properties and features of the phone as they are perceived by a learner. A learner will produce a sound according to the representations of their cognitive phonetic category. This provides strong evidence that sound production is strongly affected by sound perception, which is the first step when it comes to the proper acquisition of L2 sounds.

6.1.3. The Four Postulates of SLM

Flege's SLM can be summarized in four postulates (Flege, 1995). The first postulate indicates that the "mechanisms and processes used in learning the L1 sound system, including category formation, remain intact over the

life span and can be applied to L2 learning". This means that adults can correctly perceive and produce the sounds of an L2 in the same way that they rearrange their L1 speech over the years. According to Best and Tyler (2007), the aforementioned postulate does not imply that adult L2 learners perceive the sounds in the same way as children do. Eckman (2004) points out that, as the age of arrival to the target country increases, the acquisition of the L2 sounds might become difficult even without being prohibited by any mechanism.

The second postulate of SLM is that "language-specific aspects of speech sounds are specified in long-term memory representations called phonetic categories". In other words, L2 learners form cognitive phonetic categories when they correctly perceive L2 sounds. If an L2 sound is heard as being different from any of the learner's L1 sound repertoire (new sound), then a new category is formed to accommodate the L2 sound, which results in an accurate acquisition of that L2 sound. The problem seems to occur with L2 sounds that are similar to L1 sounds; this prevents the formation of new L2 sound categories.

The third postulate supports that "phonetic categories established in childhood for L1 sounds evolve over the life span to reflect the properties of all L1 or L2 phones identified as a realization of each category". This postulate suggests that there are no age-limits in the formation of L2 sound categories. Therefore, even adults have the opportunity to learn new L2 sounds, as these phonological categories are able to be formed at any point in life.

The last postulate of SLM argues that "bilinguals strive to contrast L1 and L2 phonetic categories which exist in a common phonological space". Flege claims that the phonetic categories of L1 and L2 exist in a common phonological space and, because of this common existence, speakers strive to not mix the categories of L1 and L2. Research has shown that phonetic elements tend to disperse to maintain phonetic contrast. This also takes place in the bilinguals' L1 and L2 phonetic space both within and between the phonetic categories of their two phonetic subsystems. The result of this process is the differentiation of bilinguals' L1 and L2 categories from those of monolingual speakers. The production of L1 and L2 sounds by bilinguals will be different from those produced by monolingual speakers.

6.2. Perceptual Assimilation Model (PAM)

The most cited speech model, alongside SLM, is PAM, which was proposed by Catherine Best. PAM predicts the success of monolingual

adults in the discrimination of unfamiliar contrasts in a non-native language (Best, 1995). During the perception of non-native sounds, learners assimilate non-native sounds to the most similar L1 sounds. Thus, assimilation of non-native segments takes place according to the perceived similarities or differences between a non-native and an L1 sound. According to PAM, this perceptual assimilation is affected by the learners' native language experience (Best & Tyler, 2007). However, listeners can assimilate non-native sounds to a single L1 phonological category, as they are able to perceive internal category differences, if they show sensitivity to gradient phonetic information.

PAM was initially created to account for naïve learners. According to Best and Tyler (2007), naïve listeners are defined as functional monolinguals who do not actively learn or use an L2. Even so, L2 learners are defined as learners who actively learn an L2 to achieve functional and communicative goals. Best and Tyler rest upon three dimensions that separate naïve listeners from experienced (bilingual) ones: L1 acquisition at the beginning of L2 learning, the ratio of L1/L2 on an average daily basis, and the ratio of L1/L2 in the language context.

PAM takes both phonological and phonetic levels into account to explain the failure of naïve learners to correctly identify the contrasts between two sounds of an unfamiliar language. It is difficult for them to distinguish the phonological and phonetic levels in a language they have minimal or no knowledge of, which is something that does not happen in their native language (L1) as they can relate to both levels.

One of PAM's central postulates that differentiates it from other models (e.g., SLM, Native Language Model) is that learners extract invariants about articulatory gestures from the speech signal. The model rests upon a direct realist approach of perception where the speech signal is directly picked by the listeners, without needing any knowledge of the vocal tracts or to process acoustic information. In other words, the listener acquires articulatory gesture cues from other speakers and then, through perceptual learning, detects the invariants found in the speech stimuli. In the same way, Best and Tyler (2007) add that more emphasis is provided by L2 learners on L2 syntax and lexicon, which consist of higher-order phonological aspects rather than on L2 phonetic details during L2 perception.

When perceiving a speech signal, phones might be categorized (consisting either good or poor exemplar of a native sound), be uncategorized (be different from any native sound and not belonging in any native category) or, more rarely, not be assimilated (consisting a non-speech

sound). PAM supports the development of a mechanism called perceptual assimilation (equivalent to SLM's equivalence classification), which determines the degree of the learner's discrimination of two contrastive non-native sounds. Six possible assimilation types reflect the attempts of naive listeners to discriminate the contrast between two segments (Best & Tyler, 2007):

(a) *Two Category Assimilation (TC):* Two non-native sounds are perceived by learners as exemplars of two different sounds from the native sound inventory. The discrimination of the unfamiliar sounds is predicted to be excellent.

(b) *Single Category Assimilation (SC):* The two non-native sounds are assimilated to a single phonological category but they differ equally from the ideal native phone. The assimilation predicts that discrimination will be poor.

(c) *Category Goodness Difference Assimilation (CG):* The two non-native sounds are assimilated to a single phonological category of the native language. One of the sounds constitutes a good exemplar of a native vowel category while the other is completely different. The discrimination will probably fluctuate from a moderate to good rate.

(d) *Uncategorized–Categorized (UC):* The non-native sound is assimilated to a single native phonological category while the other is not; it falls into native phonological space. Very good discrimination is expected.

(e) *Uncategorized–Uncategorized (UU):* Neither of the two non-native sounds falls into a native phonological category. Poor to moderate discrimination is predicted.

(f) *Non-assimilated (NA):* This means that none of the two non-native segments is perceived as a speech sound. The prediction indicates that discrimination might range from good to excellent.

Best and her colleagues have conducted a number of studies to test PAM postulates. Best, Hallé, Bohn, and Faber (2003) investigated the cross-linguistic perception of non-native vowel contrasts by native speakers of English, French, Danish, and Norwegian. The model's predictions were based on differences in the phonetic-articulatory properties of the listeners' L1s. Listeners were asked to discriminate non-native vowel contrasts, and the findings supported the initial PAM predictions. Among others, Best, McRoberts, and Sithole (1988) examined the discrimination of non-native contrasts by American adults and infants.

Specifically, English-speaking American adults were expected to not assimilate the Zulu non-nasalized click consonant because this segment differs from any English gestural constellation. The results of the study indicated that the initial predictions were upheld. In addition, infants could discriminate Zulu consonants up to the age of 14 months in contrast to evidence from previous work which supported that their ability to discriminate contrastive sounds of an unfamiliar language ended at the age of 10–12 months.

6.3. Perceptual Assimilation Model-L2 (PAM-L2)

PAM-L2 is an extended version of PAM (Best & Tyler, 2007), which predicts how phonetic distinctions are acquired and how a phonological system attuned to L1 sounds can change through extensive L2 experience. PAM-L2 supports the idea that L2 sounds are initially assimilated to existing L1 phonological categories or they dissimilate from them and create new categories. Also, it argues that L2 sounds are more distinguishable if learners acquire a large vocabulary of L2 words. The expansion of the L2 vocabulary is correlated with being attuned to the phonetic, phonological, and articulatory differences that were not previously taken into consideration. A large L2 vocabulary compels L2 learners to focus on a different version of L2 phonology, which is found in L2 words, in order to perceive L2 sounds. As a consequence, the level of L2 sound perception might vary among L2 learners.

PAM-L2 supports the possibility of the lifelong perception of speech gestures. Therefore, there is not any biological process related to age that might prevent learners from acquiring the sounds of an L2. However, according to PAM and PAM-L2, adults might face more difficulties in perceiving L2 sounds than children because of the large amount of input that they have received from their L1. So, external factors (e.g., L1 experience) rather than internal ones (e.g., brain plasticity) might force adults to put more effort than younger learners into the acquisition of L2 sounds. The theoretical framework of PAM-L2 makes the following predictions (Best & Tyler, 2007):

(a) If one of the two L2 sounds is assimilated to an L1 phonological category, then a significant discrimination between the two L2 phonological counterparts will take place.
(b) If two L2 sounds are assimilated to a single L1 phonological category with one sound being a good exemplar and the other being

a deviant exemplar of the L1 phone, then a new phonological category may be established in favor of the deviant phone via training.

(c) If two L2 sounds are perceived either as a good or a bad exemplar of an L1 phone, discrimination between the non-native sounds will be difficult as they will be acquired as homophones.

(d) If both of the L2 sounds can be perceived as speech sounds without being assimilated to any L1 category, one or two new categories for the sounds might be formed.

6.4. A Comparison of SLM and PAM/PAM-L2

This chapter attempts a comparison of the theoretical framework of both SLM and PAM/PAM-L2 to underline the standpoint of each model regarding L2 sound perception and production.

First, both of the models try to predict in a descriptive and detailed manner the success or failure of L2 learners in distinguishing segmental contrasts. They agree that the greater perceived dissimilarity between an L1 and an L2 sound (SLM) or between two L2 sounds (PAM), the greater the discrimination between their phonological and phonetic differences. Another important parameter is that SLM deals with listener perception and production patterns, while PAM/PAM-L2 mainly deals with perception. SLM is interested in the link between perception and production, as it states that accented production is strongly linked to inaccurate perception.

One of the most important differences between SLM and PAM is the leaners' competence in the L2. SLM's work focuses on experienced L2 learners while PAM's work focuses on naïve listeners. Best and Tyler define naïve learners as those who do not learn an L2 actively: namely, they are monolingual. On the contrary, L2 learners actively learn the L2, and aim to achieve high communicative goals. One might say that SLM and PAM are incomparable due to the different nature of the learners they study: L2 learners and naïve learners, respectively. Naïve L2 learners have just started to learn the new language in contrast to experienced learners who are at least aware of the basic language skills (reading, writing, listening, etc.). If we consider that both SLM and PAM support that the mechanisms for the learning of an L2 remain intact over the learner's lifespan, then we can conclude that SLM could also integrate naïve learners as long as they start to form phonetic categories. Anyway, the extended version of PAM, PAM-L2, focuses on experienced L2 learners

and it is based on four hypotheses which predict the degree of success with respect to L2 sound perception.

One of SLM's predictions states that the mechanisms and processes used in learning the L1's sound system, including category formation, remain intact over a person's lifespan and can also be applied to L2 learning. Flege's SLM suggests that the language-specific aspects of speech sounds are specified in long-term memory representations called phonetic categories; L2 learners employ the perceived phonetic cues by forming mental categories. If an L2 sound is perceived as very dissimilar from an L1 sound, then it will be produced accurately because a new phonetic category will be formed. PAM/PAM-L2 generally agrees with the lifelong refinement of speech perception. According to Best and Tyler (2007), learners refine their speech, even in their L1, due to the changes that occur in their environment. Therefore, adults can also perceive and produce new L2 sounds in the same way that they refine their L1 speech. However, PAM/PAM-L2 supports that, instead of forming categories, L2 learners directly perceive the speaker's articulatory gestures. In other words, during speech perception, learners detect higher-order articulatory invariants according to the stimuli, as they are able to discriminate between phonetic and phonological differences by attending to the invariants which create a contrast between one category and others. Following perceptual processes, existing phonological categories are reorganized according to the type of assimilation that takes place. Best and Tyler (2007) point out that SLM is based on learners' passive reception of meaningless acoustic features and the estimation of their statistical distribution in the input. In contrast, PAM/PAM-L-2 supports learners' direct and active perception of meaningful vocal tract gestures.

At the final stage of the L2 development, PAM does not make clear assumptions about the effect of age on the acquisition of L2 sounds, while SLM examines how age affects the attainment of native-like pronunciation. Generally, SLM is also interested in other factors which might affect L2 learning (e.g., age of arrival in a foreign country, age of L2 learning onset, and L1/L2 use).

SLM argues that L1 and L2 phonetic categories exist in a common phonological space and, therefore, L1-L2 differences can predict the perception and production of L2 sounds. Furthermore, it supports the point that the phonetic/allophonic level is crucial for perception. Best's PAM-L2 also agrees that the phonological categories of the L1 and L2 exist in a common space. Nevertheless, it diverges from SLM by ensuring that both phonological and phonetic levels interact with L2 speech

learning. For instance, if the assimilation of an L2 phonological category to an L1 phoneme takes place and if the L1 and L2 phonetic versions that belong to this category can be distinguished by the learners, then L1 and L2 phones will possibly be perceived as separate phonetic realizations of the aforementioned phonological category. Thus, in some cases, learners may have to use phonological patterns to discriminate foreign sounds while, in others, they may use phonetic ones or even both. Therefore, speech perception is a dual-level process: it consists of both phonetic and phonological levels.

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