



## CHAPTER ONE

### ((Basics))

#### 1. Historical Perspectives

A brief overview of the history of linguistics provides a base for understanding the contributions of the past, as well as the misconceptions about language that developed in earlier times and have continued among non-linguists until today.

Much of the terminology used in the modern study of language dates back to ancient Greece, when philosophers and literary critics devised terms to use in their study of language. The earliest records of Greek interest in language relate to the **Sophists** in the 5<sup>th</sup> century B.C. The sophists' concerns were practical in nature, for they were teachers of rhetoric, the art of public debate. Not greatly interested in understanding the principles underlying language, the Sophists carefully studied the speeches of the masters and counted the various elements in such speeches. They then advised their students to use the same number of sentences, words, and syllables in their own language, modeling their utterances on those of the masters. The meaning of speech was of little interest to these rhetoricians; they were interested primarily in the linguistic form.

One of the earliest questions which concerned philosophers, and still does, was about the relationship between the pronunciation of a word and its meaning. Those who supported the **natural position** argued that the relationship was a natural one in which pronunciation was related to meaning, while those who supported the **convention position** maintained that the relationship was conventional and arbitrary with no direct connection to reality. In support of the natural position, scholars cited examples of onomatopoeic words like bow-wow in which the pronunciation seems to bear some resemblance to the actual sounds involved in the activity presented by the words. On the other hand, supporters of convention position pointed to the fact that a large majority of words in language bear no such relationship to natural sounds.

Another issue revolved around the issue of regularity in language. Some scholars maintained that language was basically systematic and regular; these were called **analogists**. Other Greek philosophers, while not denying that regularity was present in language, emphasized that there were many irregular aspects; these were called **anamolists**.

Not all Greek interest in language centered on philosophical matters. The **Alexandrians** of the 3<sup>rd</sup> and 2<sup>nd</sup> centuries B.C. were interested in the literature of the past. An unfortunate side effect of the Alexandrian study of language in relation to literature has continued down to our own times. Admiration for the literature led to the totally unwarranted assumption that the use of language in great literature is somehow 'better' or 'more pure' than everyday language. Common speech was assumed to be a 'corrupt' form of language.

In the 4<sup>th</sup> and 5<sup>th</sup> centuries A.D. the most influential and well-known **Roman** grammarians followed the Alexandrian tradition. Writing about Latin, rather than Greek, they nevertheless concentrated on the language of literature instead of describing the Latin used by the contemporaries. When the Latin grammatical description was applied to English, the result was a distortion of English –an attempt to fit it into the same mold which had been designed for quite different languages. That we should not split infinitive is a heritage of that time.

From 13<sup>th</sup> century a different tradition of linguistic research began to emerge. Scholastic philosophy, dominant during the 13<sup>th</sup> and 14<sup>th</sup> centuries, attempted to form a unified theory of human language. The scholastic

philosophers concerned with the study of language were known as **Modistae**. They wanted to describe why language consists of systems of rules. They believed: thoughts and knowledge are determined by the universe (since both are about the universe), and language is a reflection of thought. The Modistae concluded that because the universe is governed by a system of rules, thought and the attainment of knowledge are also rule-governed and therefore language is also rule-governed. Further, they said despite the superficial differences among human languages, there are basic, underlying similarities— a core of linguistic universals shared by all human languages.

The Modistae's interest in explanation, linguistic universals, and a theory of language was continued by the rationalist philosophers of the 16<sup>th</sup>, 17<sup>th</sup>, and 18<sup>th</sup> centuries. Both groups were concerned with the meaning of linguistic utterances as well as with their form.

Between rationalist approach to the study of language and the modern linguistic view, in late 18<sup>th</sup> century, European students and scholars turned their attention away from the philosophical investigation of language and began to concentrate on the study of language change, using Sanskrit, Greek, and Latin as a base and succeeded in determining various relationships among existing languages. These **historical linguists** primarily studied the ways in which languages change over time, by means of examining languages which were recognizably related through similarities such as vocabulary, word formation, and syntax, as well as the surviving records of ancient languages. Thus, they had the following concerns:

- ❖ to describe and account for observed changes in particular languages;
- ❖ to reconstruct the pre-history of languages and determine their relatedness, grouping them into language families;
- ❖ to develop general theories about how and why language changes.

Before long, scholars turned their attention once again to the form of languages, emphasizing descriptions, rather than the history of these languages. It was in the beginning of the 20<sup>th</sup> century when the **structural linguistics** school emerged. The father of modern structural linguistics was *Ferdinand de Saussure*, who believed in language as a systematic structure serving as a link between thought and sound. In America, the linguists frequently approached American Indian languages without the advantage of knowing even the basic sound system. Thus, they had to start their studies with what was immediately observable in language. Because of their attention to form/structure, they were called *structuralists*. Franz Boas, Edward Sapir, and Bloomfield are some of these famous American structuralists. In their work, they gradually evolved a set of procedures considered useful in determining the sound system of languages. Later, known as **discovery procedures**, these techniques of linguistic analysis involved collecting a corpus of utterances and then applying discovery procedures to them in an attempt to classify all of the elements of the corpus at their different linguistic levels. The two discovery procedures used by structuralists were *structural analysis* and *immediate constituent analysis*.

The main concern of *structural analysis* was to investigate the distribution of forms in a language. The method involved the use of 'test-frames' that can be sentences with empty slots in them. For example:

*The ..... makes a lot of noise.*

There are a lot of forms that can fit into this slot to produce good grammatical sentences of English (e.g. car, child, radio). As a result, we can propose that because all these forms fit in the same test-frame, they are likely to be examples of the same grammatical category. The label we give to this grammatical category is 'noun'.

*Immediate constituent analysis* employed in this approach was designed to show how small constituents in sentences go together to form larger constituents as shown in the following example:

the	man	bought	a	book	for	his	daughter

However, when applied to syntax, these procedures were not fully successful. Take the following two sentences:

*John is eager to please*

*John is easy to please*

According to structuralists, the above sentences have the same structure. But this is contrary to the speakers' intuition. 'John' in the first sentence is the subject of 'please'; while in the second sentence 'John' is the object of 'please'.



Since insights into syntax achieved by structuralist approach were limited and with a renewed interest in the rationalist approach to language, some American linguists, led predominantly by the distinguished scholar Noam Chomsky, developed a new approach to the study of language now known as **transformational linguistics**. Chomsky postulated a syntactic base of language (called deep structure), and a series of rules (called transformations). The end result of a transformational-generative grammar is a surface structure that, after the addition of words and pronunciations, is identical to an actual sentence of a language. All languages have the same deep structure, but they differ from each other in surface structure because of the application of different rules for transformations, pronunciation, and word insertion.

## Progress Check

### 1- From the historical perspective of linguistics, Modistae .....

- 1) paid little attention to meaning and were mostly concerned with form
- 2) were scholastic philosophers concerned with the study of language
- 3) tried to write commentaries on the difference between language of literature and spoken language
- 4) suggested that the type of language used by people was determined in part by their race and culture

### 2- Discovery procedure was the common technique used by .....

- 1) Sophists
- 2) structuralists
- 3) rationalists
- 4) Transformationalists

### 3- Rationalist philosophers' realm of interest was like that of .....

- 1) Alexandrians'
- 2) structuralists'
- 3) Modistae's
- 4) Sophists'

### 4- Test-frames, a device to know about distribution of forms in languages, were used by .....

- 1) structuralists
- 2) transformationalists
- 3) rationalists
- 4) Modistae

### 5- The purpose of historical linguistics is to.....

- 1) analyze old literature and extract rules of language
- 2) describe languages at the surface level
- 3) find regularities and irregularities of language
- 4) discover how languages change over time

## Answers

### 1- Choice "2"

Scholastic philosophy, dominant during the 13<sup>th</sup> and 14<sup>th</sup> centuries, attempted to form a unified theory of human language. The scholastic philosophers concerned with the study of language were known as **Modistae**.

### 2- Choice "2"

**Discovery procedures**, used by structuralists, involved collecting a corpus of utterances and then applying discovery procedures to them in an attempt to classify all of the elements of the corpus at their different linguistic levels.

### 3- Choice "3"

The Modistae's interest in explanation, linguistic universals, and a theory of language was continued by the **rationalist** philosophers of the 16<sup>th</sup>, 17<sup>th</sup>, and 18<sup>th</sup> centuries.

### 4- Choice "1"

The main concern of *structural analysis* was to investigate the distribution of forms in a language. The method involved the use of 'test-frames' that can be sentences with empty slots in them.

### 5- Choice "4"

These **historical linguists** primarily studied the ways in which languages change over time, by means of examining languages which were recognizably related through similarities such as vocabulary, word formation, and syntax, as well as the surviving records of ancient languages.

## 2. Semiotics

Semiotics is the theory and study of signs, especially as elements of language or other systems of communication, which comprises semantics, syntactics, and pragmatics.

### 2.1. Sign

We seem as a species to be driven by a desire to make meanings. Distinctively, we make meanings through our creation and interpretation of 'signs'. Signs take the form of words, images, sounds, odors, flavors, acts or objects, but such things have no intrinsic meaning and become signs only when we invest them with meaning. Anything can be a sign as long as someone interprets it as 'signifying' something –referring to or standing for something.

In other words, a sign is "whatever that signifies or stands for something" and as can be inferred from above it may be understood as an intersection or relationship between *form* and *meaning*, where form is something concrete and meaning is the concept or object that appears in our minds when we encounter the form.

Saussure offered a 'dyadic' or two-part model of the sign. He defined a sign as being composed of:

- ❖ a 'signifier' (signifiant) - the form which the sign takes; and
- ❖ the 'signified' (signifié) - the concept it represents

If we take a linguistic example, the word 'Open' (when it is invested with meaning by someone who encounters it on a shop doorway) is a sign consisting of:

- ❖ a signifier (form): the written word **open**;
- ❖ a signified concept (meaning): that the shop is open for business

The word 'table' (when it is invested with meaning by someone who hears it) is a sign consisting of:

- ❖ a signifier (form): the oral word **table**;
- ❖ a signified concept (meaning): a wooden object with four legs

If somebody has a red nose (when it is invested with meaning by someone who sees it) is a sign consisting of:

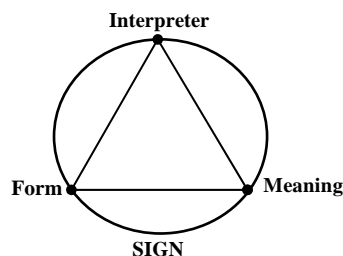
- ❖ a signifier (form): a physical form;
- ❖ a signified concept (meaning): the person is afflicted with allergy or cold

The schematic representation of sign would look like:



As illustrated in the examples, a form without a meaning is not sign, nor is a meaning without a form. It may be argued that form and meaning cannot exist apart from one another, and it is not easy to argue otherwise.

Here, we can define communication as 'the use of signs' in which one presents the signs to others. Accordingly we can define a third component for sign which is called *interpreter*. The relationship between the form of a sign and its meaning must be part of the knowledge of its interpreter. In the course of communication the speaker may attach a meaning to the form s/he presents while the interpreter or third party may attach another meaning to that form. As a result, interpreter adds an aspect or dimension of variability to our understanding of sign, because different interpreters may recognize different aspects of meaning in association with different forms.



Sign آن است که بر چیزی دلالت دارد و یا مظهر آن چیز است. می توان sign را همان رابطه میان form (صورت) و meaning (معنا) دانست. برای مثال وقتی کسی کلمه "کتاب" را که در جایی نوشته شده می بیند. sign به form نوشتار است و در ذهن شی ای را تداعی می کند که از کاغذ و جوهر درست شده است. و وقتی کسی کلمه "میز" را ادا می کند sign به form گفتار است و در ذهن فرد یک شی چوبی با ۴ پایه تداعی می کند. شاید بتوان گفت form و meaning هیچ کدام به تنهایی و جدا از یکدیگر وجود ندارند. در حقیقت ایجاد ارتباط، استفاده از همین sign هاست. عامل سوم هم در این میان وجود دارد که به آن interpreter گفته می شود. در حقیقت رابطه میان form و meaning باید بخشی از دانش interpreter باشد زیرا

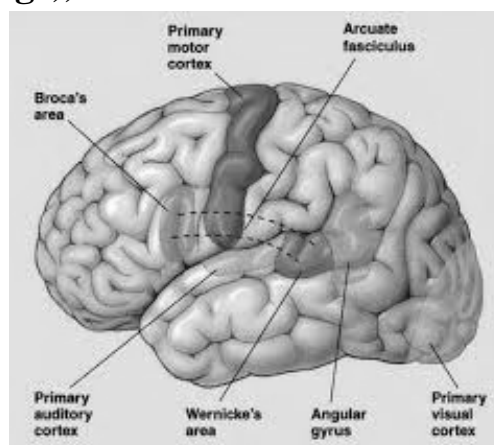


## مدرسان شریف

### CHAPTER FIVE

#### ((Brain and Language))

This chapter concerns the special language centers of the brain which all humans have. It provides a survey of evidence for these language centers, including the main types of aphasia and the loss of language ability resulting from brain injuries. Before moving to the first section, let's review some parts of the brain involved in language production and comprehension.



#### 1. Basic Concepts and Definitions

##### 1.1. Neurolinguistics

It is the study of the functions the brain performs in language learning and language use. It includes research into how the structure of the brain influences language learning; how and in which part of the brain language is stored (memory); how damage to brain affects language ability (aphasia).

##### 1.2. Psycholinguistics

It is the study of (a) the mental processes that a person uses in producing and understanding language, and (b) how humans learn language. It includes the study of speech perception, the role of memory, concepts and other processes in language use, and how psychological factors affect the use of language.

#### 2. Evidence for Brain Lateralization

Different experiments show lateralization –development of control over different functions that are localized primarily on one side of the brain or the other. As the brain develops, it is thought that different bodily functions (e.g. speech, hearing, actions) are gradually brought under the control of different areas of the brain. Those parts of the brain which control language are usually in the left hemisphere.

Children do not require explicit language instruction, but they do need exposure to language for first language acquisition in order to develop normally. Children who do not receive linguistic input during their formative years do not achieve native-like grammatical competence. The **critical age hypothesis** is part of the biological basis of language and states that the ability to learn a native language develops within a fixed period, from birth to puberty. During this **critical period**, language acquisition proceeds easily, swiftly, and without external intervention. After this period, the acquisition of grammar is difficult and for some individuals never fully achieved. However, it is possible to acquire words and various conversational skills after this point. This evidence suggests that the critical period is for the acquisition of certain aspects of language, but not all aspects.

##### 2.1. Hemiplegics

Hemiplegics are those with lesions in one side of the brain. Children with damaged left hemispheres show greater deficiency in language acquisition and performance with the greatest impairments in their ability to form words and sentences.

In extreme cases of disease, the patient has to undergo a procedure known as *hemispherectomy*, in which a hemisphere of the brain is surgically removed. When this happens, the remaining hemisphere attempts to take over the functions of the missing one. This shows the *plasticity* (i.e. flexibility) in the system during the early stages of language development. This means that under certain circumstances, the right hemisphere can take over many of the language functions that would normally reside in the left hemisphere. However, mature patients who have their right hemispheres excised retain their language abilities. Surgical removal of the left hemisphere of adults results in severe loss of the language function.

## 2.2 Split Brains

They are patients whose corpus callosum, the fibrous network that connects the two halves, has been cut. Studies of split-brain reveal that the two hemispheres are distinct. Moreover, messages sent to the two sides of the brain result in different responses, depending on which side receives the message. In general, the left hemisphere supervises the right side of the body, and the right hemisphere supervises the left side. If you point with your right hand, it is the left hemisphere that controls your action, and conversely. This is referred to as **contralateral** brain function. In a split-brain patient, information in the right hemisphere is inaccessible to the left hemisphere. If an apple is placed in the left hand of a split-brain human whose eyes are closed, the person can use it appropriately but cannot name it. The right brain senses the apple and distinguishes it from other objects, but the information cannot be relayed to the left brain for linguistic naming.

## 2.3. Dichotic Listening

It is an experimental technique that uses auditory signals to observe the behavior of the individual hemispheres of the brain. Subject sits with a set of earphones on and is given two different sound signals simultaneously, one through each earphone. For example, through one earphone comes the syllables *ga* or the word *dog*, and through the other earphone at exactly the same time comes *da* or *cat*. When asked to say what was heard, the subject more often correctly identifies the sound that came via the right ear. This is known as the **right ear advantage** for *linguistic sounds*. Since linguistic stimuli are processed in the left hemisphere, the linguistic stimuli sent through right ear are received sooner than those sent through left ear (remember the contralateral function of the brain). Stimuli sent via left ear, first go to right hemisphere and then go to left hemisphere.

Similarly, when non-linguistic stimuli like laugh or cough were sent through the earphones simultaneously, the subjects reported to have heard the stimulus sent through left ear. The reason is that non-linguistic elements are processed on the right hemisphere and thus the stimuli sent through left ear go directly to the right hemisphere and are processed there, while those sent through right ear first go to left hemisphere and then to right hemisphere. This is referred to as **left ear advantage** for *non-linguistic stimuli*.

Both hemispheres receive signals from both ears, but the **contralateral** stimuli outweigh the **ipsilateral** (same side) stimuli because they are more intense and arrive more quickly. The accuracy with which subjects report what they heard is evidence that left hemisphere is superior for linguistic processing, and the right hemisphere is superior for nonverbal information.

**Dichotic Listening:** آزمایشی که در آن شنونده دو صوت متفاوت را همزمان، و هر صوت را از یک گوشی، می‌شنود. برای مثال، از یک گوشی، هجای *ga* یا واژه *dog* و از گوشی دیگر، دقیقاً در همان زمان، هجای *do* یا واژه *cat* پخش می‌شود. وقتی از سوزنه پرسیده می‌شود که او چه کلمه یا هجایی را شنیده است، او غالباً آن هجا یا واژه‌ای را که از گوش راست شنیده، به درستی تشخیص می‌دهد. این را برتری گوش راست برای اصوات زبانی می‌نامند. هر دو نیمکره پیام‌ها را از هر دو گوش دریافت می‌کنند اما محرک‌های دگرسو (*contralateral*) نسبت به محرک‌های یک سمت (*ipsilateral*) اهمیت بیشتری دارند. چون خیلی شدیدتر و زودتر به گوش می‌رسند. وقتی که اشخاص مورد آزمایش آن چیزی که می‌شنوند را گزارش می‌کنند، مدرکی دال بر برتر بودن نیمکره راست برای اطلاعات غیرکلامی است.

## 3. Evidence for Localization

**Localization**, put forward by Franz Joseph Gall, proposes that different human cognitive abilities and behaviors are localized in specific parts of the brain. He also put forward a pseudoscientific theory called 'organology' that later came to be known as **phrenology**, which is the practice of determining personality traits, intellectual capacities, and other matters by examining the 'bumps' on the skull. Then, it could be said that he argued in favor of **modularity**, with the brain divided into distinct anatomical faculties (referred to as cortical organs) that were directly responsible for specific cognitive functions, including language.



### 3.1. ERPs (event-related brain potentials)

As one of the experimental techniques, researchers tape electrodes to different areas of the skull and investigate the electrical activity of the brain related to perceptual and cognitive information. In such experiments, scientists measure the electrical signals emitted from the brain in response to different stimuli (called ERPs). For example, ERP differences result when the subject hears speech sounds versus non-speech sounds.

### 3.2. Aphasia

Aphasia is any language disorder that results from brain damage. As another definition it is an impairment of language function due to localized cerebral damage which leads to difficulty in language understanding or production. In the following we will consider some types of aphasia along with their symptoms.

**Aphasia:** اختلال در عملکرد زبان از آسیب منطقه‌بندی مغز است و منجر به دشواری در درک یا تولید گفتار می‌شود. در قسمت زیر برخی از انواع **Aphasia** و علائم و نشانه‌های آن را بیان می‌کنیم.

**Broca's area:** Broca's area is located in front part of the left hemisphere and is responsible for producing language. This region of the brain was named for French neurosurgeon Paul Broca who discovered the function of this area during the 1860s while examining the brains of patients with language difficulties. Symptoms of **Broca's aphasia/ Motor aphasia:**

- The speech of such aphasics may be *agrammatic* because of their particular problems with syntax. Agrammatic refers to the reduced amount of speech, i.e. only lexical morphemes are used and function words are omitted.
- Such patients have word-finding pauses and disturbed word order. Therefore, their speech is slow and effortful. Ah ... Monday ... ah, Dad and Paul Haney [himself] and Dad ... hospital. Two .. ah, doctors ... and ah ... thirty minutes .. and yes ... ah ... hospital. And, er, Wednesday ... nine o'clock. And er Thursday, ten o'clock .. doctors. Two doctors ... and ah ... teeth. Yeah, ... fine
- Such patients' comprehension is typically better than their production. Still they have problems with the comprehension of ambiguous sentences.

**Wernicke's area:** Wernicke's area is the back part of the left hemisphere that is responsible for the comprehension of speech. This area was first described in the 1870s by German neurologist Carl Wernicke. Symptoms of **Wernicke's aphasia (or sensory aphasia; fluent aphasia):**

- Such patients suffer from anomia, that is, difficulty in finding the correct word and lexical morphemes. As a result of not remembering the proper word, the patients use circumlocutions.
- The second symptom is paragrammatism which is characterized by substitution errors of function words.
- Another symptom is paraphasia, that is, the mispronunciation of words, or the production of inappropriate words. Three kinds of paraphasia are recognized:
  - *Phonemic paraphasia:* results when the patient substitutes phonemic segments. For example s/he may pronounce *sable* instead of *table*.
  - *Semantic paraphasia:* patients will replace the desired word with another that sounds or looks like the original one, or has some other connection. It is as if a foreigner is speaking. For example, the patient may use *paper* instead of *pencil*
  - *Neologistic paraphasia:* is the production of new content words that have been fabricated (i.e. neologisms). For example, someone may say, *You know that smoodle pinkered and that I want to get him round and take care of him like you want before*, meaning *The dog needs to go out so I will take him for a walk*.

**Arcuate fasciculus** is a nerve of fibers connecting Wernicke's area to Broca's area.

Symptoms of **conduction aphasia:**

- These patients have disrupted rhythm because of pauses and hesitations.
- In such patients comprehension of spoken words is good but the task of repeating a word or phrase is difficult for them.

**Motor cortex:** generally controls movement of the muscles (i.e. for moving hands, feet, arms). Close to Broca's area is the part of the motor cortex that controls the articulatory muscles of the face, jaw, tongue and larynx.

Other types of aphasia:

If we find that damage to different parts of the brain results in different kinds of linguistic impairment, for example, syntactic or semantic, this supports the hypothesis that the mental grammar is not a homogeneous system, but rather consists of distinct modules, as proposed in various linguistic models. The substitution of semantically or phonetically related words provides evidence about the organization of our mental dictionaries. The substituted words are not random but are similar to the intended words either in their sounds or in their meanings.

## Progress Check

### 1- Neurolinguistics is the .....

- 1) study of the mental processes that a person uses in producing and understanding language
- 2) study of the physiological aspects of language principally with regard to the areas in brain
- 3) study of how damage to the brain affects the ability to use language
- 4) study of linguistic data involving maximum depth of details

### 1- "I surprise no new glamour." This sentence, spoken by an aphasic person, is an example of .....

- 1) agrammatism
- 2) anomia
- 3) neologism
- 4) paraphasia

### 2- Language is characterized as fluent, often excessively so, with no articulatory difficulty, though there may be several erratic pauses. There are many stereotyped patterns, circumlocutions, unintelligible sequences and errors in choosing words and phonemes, which are symptoms of .....

- 1) Agrammatics
- 2) Broca's aphasia
- 3) Euphemism
- 4) Wernicke's aphasia

### 3- Conduction aphasia is defined as a state in which a patient has .....

- 1) transferred the passive words into his/her active mind
- 2) transferred the active words into his/her passive mind
- 3) difficulty in repeating words
- 4) difficulty in remembering cardinal numbers

### 4- Which statement is NOT valid?

- 1) Aphasia is simply defined as language disorder due to cerebral damage.
- 2) Broca's aphasia results in fluent speech production.
- 3) Wernicke's aphasia results in impairment of auditory comprehension.
- 4) Wernicke's area in the brain is mainly involved in speech understanding.

### 5- Which of the following is NOT shown by a person who suffers from Wernicke's aphasia?

- 1) Having harder times understanding sentences with more complex grammatical construct
- 2) The production of grammatically correct sentences with normal rate and prosody
- 3) The speech doesn't make a lot of sense or it is seeded with non-existent or irrelevant words
- 4) Profound language comprehension deficits

## Answers

### 1- Choice "3"

Psycholinguistics is the study of how damage to the brain affects the ability to use language

### 1- Choice "1"

In the given sentence grammatical words are omitted and only content words are present. The sentence is, thus, agrammatic.

### 2- Choice "4"

As one of its symptoms, patients with Wernicke's aphasia have difficulty in finding the correct word and lexical morphemes (**anomia**) and thus circumlocutions may be used.

### 3- Choice "3"

Conduction aphasia is defined as a state in which a patient has difficulty in repeating words.

### 4- Choice "2"

Broca's area is responsible for speech production, then damage to this area results in distorted speech production.

### 5- Choice "3"

Choice (1) is a characteristics of Broca's aphasia.





### 3.3 Specific Language Impairment (SLI)

There are cases of children who have difficulties in acquiring language or are much slower than the average child. They show no other cognitive deficits, are not retarded and have no perceptual problems. Such children are suffering from a Specific Language Impairment. Children with SLI show that language may be impaired while general intelligence stays intact.

### 3.4 Language Savants

We know of numerous cases of intellectually handicapped individuals who, despite their disabilities in certain spheres, show remarkable talents in others. They are referred to as **savants**. Accordingly, there are *language savants* who are individuals with extraordinary language skills, but who are deficient in general intelligence. Their existence suggests that linguistic ability is not derived from some general cognitive ability, but exists independently. This asymmetry of abilities further shows the modularity of language in that if brain were not modular, these savants would be deficient in all cognitive abilities, while here we see that in case of language savants at least their linguistic ability remains intact.

**Language Savants:** ما موردهای زیادی از افراد عقبمانده ذهنی را دیده‌ایم که علی‌رغم ناتوانی‌هایشان در گستره‌های خاصی، استعداد‌های قابل توجهی در چیزهای دیگر دارند. که آن‌ها را اندیشمندان ما می‌نامند.

### 3.5 Genetic Evidence

Studies of genetic disorders also reveal that one cognitive domain (intellectual abilities and skills) can develop normally along with abnormal development in other domains. Children with chromosomal anomalies have normal or advanced language skills along with serious non-linguistic (visual and spatial) cognitive deficits.

Thus, evidence from aphasia, SLI, and other genetic disorders strongly supports the view that the grammatical aspect of the language faculty is an autonomous, genetically determined module of the brain.

## 4. Tip of the Tongue and Slip of the Tongue Phenomena

Minor production difficulties provide possible clues to how our linguistic knowledge is organized within the brain. There is, for example, the **tip of the tongue** phenomenon in which we feel that some word is just eluding us, that we know the word, but it just won't come to the surface. When we make mistakes in this retrieval process, there are often strong phonological similarities between the target word we're trying to say and the mistake we actually produce. Words are stored unevenly, some parts are more prominent than others. In malapropism the initial sounds and endings are identical or very similar to the target word. This is known as the **bathtub** effect, by analogy with someone lying in the tub with only their head and feet visible. For example, the speaker may produce *secant* instead of *sextant*. Mistakes of this type are sometimes referred to as **malapropisms**.

Another type of speech error is described as **slip of the tongue** or **speech error** sometimes called **spoonerism**. Slips of the tongue may involve a) the interchange of two initial sounds (*you have hissed my mystery class* → *you have missed my history class*); b) a sound being carried over from one word to the next (*black blox* → *black box*); c) a sound used in one word in anticipation of its occurrence in the next word (*noman numeral* → *Roman numeral*).

One other type of slip may provide some clues to how the brain tries to make sense of the auditory signal it receives. These have been called **slips of the ear** and can result, for example, in our hearing *great ape* instead of *gray tape*, or hearing *realize* instead of *real eyes*, or hearing *fork handles* instead of *four candles*.

## 5. To be Remembered

5.1. Some other types of aphasia are:

- **Alexia/ Acquired dyslexia:** (is acquired after brain damage) is the loss of ability to read.
- **(Developmental) dyslexia:** (acquired genetically) is having difficulty to read.
- **Agraphia/ Dysgraphia:** is having difficulty in writing.

5.2. A couple of right-hemisphere linguistic abilities, which are revealed in aphasias resulting from right-hemisphere injury, are *intonation* and *non-literal language*. Intonation carries emotional overtones of language such as doubt, certainty and neutrality about what is said, and non-literal language, for example idioms such as *Kick the bucket* or *Bury the hatchet*, are non-analytic and presumably holistically represented in the mental lexicon. The meaning of idioms is not based on an analysis of their structure. Instead, interpretation is holistic. Therefore, injury to the right brain, in persons with general left-hemisphere dominance for language results in inability to understand intonation and the emotional tone of utterance, and an inability to understand non-literal language.

## Questions

- 👁️ **1- Agrammatism is due to injury in ..... area and it is typically characterized by .....**  
(Public University 82)
- 1) Motor cortex - difficulty in accessing lexical morphemes
  - 2) Wernicke's - ability to name things seen and inability to read
  - 3) Broca's - effortful speech and absence of grammatical morphemes
  - 4) Corpus callosum - absence of grammatical morphemes and inability to read
- 👁️ **2 Which of the following utterances is produced by an aphasic whose Broca's area is damaged?**  
(Public University 82)
- 1) The book on the table
  - 2) I'm a male demaploze on my own
  - 3) I can no longer keep in mind to minds keep me from
  - 4) Bus...um...going...yes...going down...and hospital...um...Monday.
- 👁️ **3- The two halves or hemispheres of the brain exercise ..... control of the body. That is, the left and right hemispheres control their opposite sides of the body.**  
(Azad University 82)
- 1) general
  - 2) gestural
  - 3) longitudinal
  - 4) contralateral
- 👁️ **4- A patient was asked to describe his daily activities – In response, he said:**  
*Yes ... ah ... Today ... ah ... my ... ah ... brother ... ah ... and I ... school ... and, ah ... play and ... ah, noon, ah ... home*  
(Azad University 82)
- 1) Wernicke's aphasia
  - 2) Broca's aphasia
  - 3) Anomic aphasia
  - 4) Condition aphasia
- 👁️ **5- Lateralization refers to .....**  
(Public University 83)
- 1) L2 acquisition during adult years
  - 2) brain readiness to learn a particular language
  - 3) the use of language to interact with each other
  - 4) the specialization of the left hemisphere for language
- 👁️ **6- The dichotic listening test is used to show that .....**  
(Public University 83)
- 1) there are slips-of-the-ear
  - 2) auditory comprehension is very difficult
  - 3) there is the left ear advantage for linguistic sounds
  - 4) the language functions are located in the left hemisphere
- 👁️ **7- Where do we store the knowledge of language?**  
*Which hemisphere is responsible for language perception and production?*  
*What makes people suffer from aphasia?*  
**Scientists who deal with such questions are called .....**  
(Azad University 83)
- 1) Psycholinguists
  - 2) Neurolinguists
  - 3) Speech therapists
  - 4) Sociolinguists
- 👁️ **8- In Wernicke's aphasia, .....**  
(Public University 84)
- 1) circumlocutions may be used
  - 2) sensory aphasia is not at work
  - 3) fluent speech is not produced
  - 4) agrammaticality is very common
- 👁️ **9- All of the following provide strong evidence for brain lateralization EXCEPT .....**  
(Public University 84)
- 1) split brains
  - 2) aphasic studies
  - 3) linguistic determinism
  - 4) dichotic listening



# مدرسان شریف

## CHAPTER EIGHT

### ((Phonetics))

When you know a language you know the sounds of the language, and you know how to combine those sounds into words. Although languages may contain different sounds, the sounds of all the languages of the world together constitute a class of sounds that the human vocal tract is designed to make. This chapter will discuss these speech sounds, how they are produced, and how they may be classified.

The general study of the characteristics of speech sound is called **phonetics**. All sounds, whether notes, animal noises, or human speech, are simply patterns or waves of energy that move through the air. The field of study devoted to the investigation of sound waves (physical properties of sounds) is known as **acoustic phonetics**. Sounds may also be studied in terms of their origin, that is, how they are produced. When the means of production is the human vocal apparatus, the study is called **articulatory phonetics**. The sound waves move in the air and we hear to interpret them. **Auditory phonetics** is concerned with how listeners perceive these sounds. Many aspects of the highly detailed descriptions of speech sounds are of only marginal interest to the linguist. Certain properties of the sounds are important for language and others are not. For example a child and an adult could pronounce the word 'fire', yet the pitch or tone of the child's sounds would be higher than that produced by the adult, or the child might speak more loudly. Individual variations in speech that cannot be controlled by any speaker, as well as socially determined variation are not relevant to an investigation of linguistic competence. When linguists study speech sounds, they are concerned with **systematic phonetics**, that is, with just those independently controllable features of sounds that people use in the sound systems of their language.

One other area, called **forensic phonetic**, has applications in legal cases involving speaker identification and the analysis of recorded utterances.

#### :Phonetics

مطالعه عام خصوصیات اصوات گفتاری را Phonetics (آواشناسی) گویند. Phonetics به سه قسمت تقسیم می‌شوند:

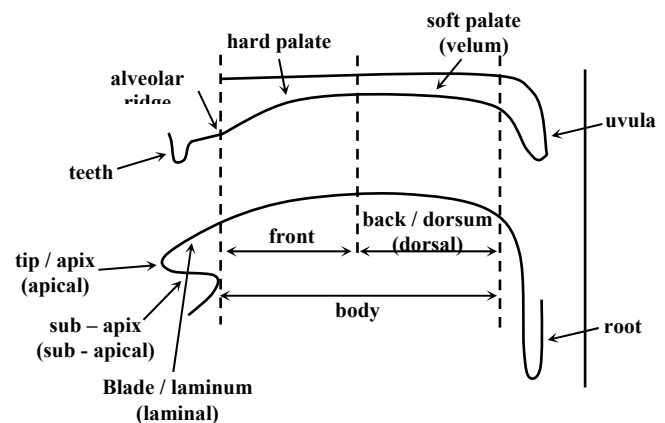
**Articulatory phonetics**: که به مطالعه نحوه تولید اصوات گفتاری می‌پردازد.

**Acoustic phonetics**: که به ویژگی‌های فیزیکی گفتار به عنوان امواج صوتی در فضا می‌پردازد.

**Auditory phonetics**: که به درک اصوات گفتار از طریق گوش می‌پردازد. برای مثال، چگونه تفاوت بین "p" دمشی و "p" غیر دمشی را می‌فهمیم.

### 1. Articulatory Phonetics

The production of any sound involves the movement of air. Most speech sounds are produced by pushing lung air through vocal cords up the throat, and into the mouth or nose, and finally out of the body. A brief anatomy lesson is in order. The opening between the vocal cords is the **glottis** and is located in the voice box or **larynx**. The tubular part of throat above the larynx is the **pharynx**. What sensible people call 'the mouth' we linguists call the **oral cavity** to distinguish it from **nasal cavity**, which is the nose and the plumbing that connects it to the throat, plus your sinuses. All of it together is the **vocal tract**.



## 2. Airstream Mechanisms

The essential ingredient of any act of speech is a moving stream of air. There are four air stream mechanisms by which speech sounds are produced:

Airstream	Direction	Brief Description	Specific Name for Stop Consonant
pulmonic	egressive	lung air pushed out under the control of the respiratory muscles	plosive
glottic	egressive	pharynx air compressed by the upward movement of the closed glottis	ejective
glottic	ingressive	downward movement of the vibrating glottis	implosive
velaric	ingressive	mouth air rarefied by the backward and downward movement of the tongue	click

English uses pulmonic airstream mechanism in which the air stream begins in the lungs and moves up through the vocal tract. Whenever we are about to speak, our lungs fill up with air our vocal tract assume the **pre-speech position**. In this position the muscles of the vocal tract become tense, the position of the tongue moves up from the floor of the mouth, the air steam is blocked at the larynx, and the velum moves to close off the nasal cavity.

## 3. Sound Descriptions

Linguists differ regarding the particular set of features they utilize in their descriptions of sounds. Basically, there are two overlapping sets of features: those of *traditional structural linguistics* and those of contemporary *transformational linguistics*.

In traditional linguistics we investigate consonants and vowels from the following perspectives:

### Consonants

place of articulation  
manner of articulation  
voiced vs. voiceless

### Vowels

high vs. low  
front vs. back  
lip rounding  
lax vs. tense

In transformational linguistics we investigate both consonants and vowels from the following perspectives: coronal, anterior, high, low, and back.

### 3.1. Traditional Structural Linguistics

#### 3.1.1. CONSONANTS

As was mentioned earlier, in traditional phonetics, consonants are investigated from three points of view; place of articulation, manner of articulation, voiced vs. voiceless.

- **Place of articulation:** we classify consonants according to where in the vocal tract the airflow restriction occurs, called the *place of articulation*. Movement of the tongue and lips creates the constriction, reshaping the oral cavity in various ways to produce the various sounds.

جایگاه تولید یعنی محلی در داخل دهان که در آن گرفتگی و تنگی ایجاد می‌شود. عباراتی که برای توصیف اصوات گوناگون بکار می‌روند، همان‌هایی هستند که مربوط به جایگاه تولید صوت می‌شوند.

**Bilabials** [p], [b], [m], [w] are produced using both (=bi) upper and lower lips (=labia); ([w] is also treated as a labio-velar).





مدرسان شریف

## CHAPTER THIRTEEN (Language in Society)

### 1. Dialect

All speakers of English can talk to each other and pretty much understand each other. Yet, no two speakers speak exactly alike. Some differences are the result of age, sex, social situation, and where and when the language was learned. These differences are reflected in word choices, the pronunciation of words, and grammatical rules. The unique characteristics of the language of an individual speaker are referred to as the speaker's **idiolect**.

If we study many samples of idiolects from all over the world, we find that some idiolects are more similar to one another than are other idiolects. In other words, certain idiolects share linguistic features not found in others. By comparing idiolects in this way, we can divide the speakers of a language into groups, where speech of each group contains certain features not found in the other groups. Where there are systematic differences in the way different groups speak a language, we say that each group speaks a **dialect** of that language. In the study of dialects or **dialectology**, dialects are defined as mutually intelligible forms of a language that differ in systematic ways.

It is not always easy to decide whether the systematic difference between two speech communities reflects two dialects or two languages. The difference between them is a matter of degree. There is a kind of hierarchy in the organization of idiolects, dialects and languages. If we start with individual speakers and their idiolects, we can see that a dialect is simply a set of similar idiolects, and a language is a set of similar dialects. Generally, a rule-of-thumb definition says: when dialects become mutually unintelligible, these dialects become different languages.

Another closely related concept is accent. Regional phonological or phonetic distinctions are often referred to as different accents. **Accent** refers to the characteristics of speech that convey information about the speaker's dialect, which may reveal in what part of the country the speaker grew up or to which sociolinguistic group the speaker belongs. The term accent is also used to refer to the speech of non-native speakers, that is, someone who has learned the language as a second language. It is different from the term dialect, which is used to describe features of grammar and vocabulary as well as aspects of pronunciation.

#### 1.1. Regional Dialect

A change that occurs in one region and fails to spread to other regions of the language community creates dialect differences. When enough such differences accumulate in a particular region, the language spoken has its own character, and that version of the language is referred to as a **regional dialect**.

The chief factor involved in the creation of dialects or related languages is the degree of *intercommunication* among the speakers of a language. If all speakers of a language come into contact with all other speakers, then, although linguistic change will occur, it will not result in division of the language into dialects or new languages. However, since all languages have too many speakers, they don't have to be in total contact and thus each keeps its own language/dialect.

In addition to the number of speakers involved, lack of complete intercommunication may be due to several factors. *Geographical* or *natural features* may prevent contact among peoples; a broad river or a mountain range was sometimes a great obstacle to intercommunication in the past. The obstacles that inhibit intercommunication among the speakers of a language are not always as concrete as a mountain. When a particular portion of the population is separated from other because of *social barriers* – of a political, racial, class, or religious kind – there is little



opportunity for intercommunication and thus a strong possibility for the development and maintenance of separate dialects. Dialects resulting from such social class divisions in a society are social in nature, not regional; that is, the dialect is characteristic of people from a particular social class, not of those from a particular region of the country (we will attend to sociolect in a later section).

Just as lack of intercommunication tends to create dialect distinction, so the existence of intercommunication may prevent the development of separate dialects. In fact, intercommunication may even bring about **dialect leveling**, the situation in which dialect differences disappear. *Population mobility* is one of the chief factors involved in the dialect leveling. As people move from one region to another, they carry with them their original dialect. Encountering a new dialect, they may then lose some of their old features while at the same time acquiring new ones. Other possible causes of dialect leveling may be increased exposure to various forms of *mass communication* and *ease of travel* (though little evidence supports this theory).

To investigate regional dialects, it is important to know if the person whose speech you are recording really is a typical representative of the region's dialect. Consequently, the informants in the major dialect surveys of the twentieth century tended to be **NORMS** or 'non-mobile, older, rural, male speakers'. Such speakers were selected because it was believed that they were less likely to have influences from outside the region in their speech. One unfortunate consequence of using such criteria is that the resulting dialect description tends to be more accurate of a period well before the time of investigation.

### 1.1.2. Isogloss and Dialect Areas

Studies by dialectologists show that people who live in different regional dialects have phonological differences. For example, one dialect may pronounce *herb* as [hɜrb] while another dialect pronounces it as [ɛrb]. Regional dialects may differ in the vocabulary and syntax people use for the same object, as well as in phonology. The aim of the surveys of this type is naturally to find a number of significant differences in the speech of those living in different areas and to be able to chart where the boundaries are, between those areas. All the information collected through these surveys is transferred into **dialect maps** which show the areas where specific dialectal characteristics occur in the speech of the region (a book of dialect maps is called **dialect atlas**). If it is found, for example, that the vast majority of informants in one area say they carry things home from the store in a *paper bag* while the majority in another area say they use a *paper sack*, then it is usually possible to draw a line across a map separating the two areas. This line is called an **isogloss**. These separated areas which are distinguished by different word usages and varying pronunciations, among other linguistic differences, are called **dialect areas**. When you cross an isogloss, you are passing from one dialect area to another. If a very similar distribution is found for another two items, then another isogloss, probably overlapping the first, can be drawn on the map. When a number of isoglosses coincide in this way, a more solid line, indicating a **dialect boundary** can be drawn.

It is worth mentioning that at most dialect boundary areas, one dialect or language variety merges into another. Suppose we start moving from West, where everybody uses the term *pail*, to East. As we move further East the number of speakers who uses *pail* gradually decreases; on the other hand, the number of those who use the term *bucket* increase. Keeping this in mind, we can view regional variation as existing along a **dialect continuum** rather as having sharp breaks from one region to the next. Those who move back and forth across a border area, using different varieties with some ease (in the above example, using both *pail* and *bucket*) may be described as **bidialectal**.

### 1.2. Social Dialect

In many respects, social boundaries and class differences are as confining as the physical barriers that often define regional dialects. It is therefore not surprising that different dialects of a language evolve within social groups. The social boundaries that give rise to dialect variation are numerous. They may be based on socioeconomic status, ethnic or racial differences, country or origin, education, and even gender. Dialect differences that seem to come about because of social factors are called **social dialects/ sociolect**, as opposed to regional dialects, which are spawned by geographical factors. What distinguishes people as belonging to one group or another is the use of **social markers** – a linguistic feature that marks the speaker as a member of a particular social group. For example in US, people with high socioeconomic status tend to produce /r/ after vowels as in *fourth floor*, while the working class produced less /r/ after vowels.

Also, there are observable linguistic differences between men and women. These differences concern gender preferential features of language, which may be used by either but are preferred by one gender or the other. In conversation, there is evidence that women (a) ask more questions, (b) “hedge” their speech more often than men, (c) use more **back-channeling** (inserting short comments like *unhuh*, *mmm*, *yes*, and head nods to confirm their attention to a speaker), (d) use more tag questions, (e) use words of politeness more than men and (f) interrupt men less than men interrupt women.

### 1.2.1. Standard dialect

In most societies, there is some model of language usage that members identify as highly acceptable. Those who use this particular variety of the language are accorded some prestige, and speakers of other varieties may attempt to model their own speech after this variety. In such cases, we may speak of the standard dialect of the language.

### 1.2.2. Non-standard dialect

Other dialects, which differ from this standard, are sometimes subject to criticism from those who use the standard dialect. Dialects that differ to some extent from the standard are referred to as non-standard.

The bases for classifying a dialect as standard or non-standard have little or nothing to do with the linguistic facts about the dialect. Rather, such judgments are based on nonlinguistic facts. The selection of a standard dialect is determined by such matters as the political or social prestige of those who speak the dialect. Then, dialects are intimately related to the notion of prestige within a society. Basically, the standard dialect is the dialect that is associated with prestige in the society at large. Since most prestigious people speak the standard it is easy to associate the standard with prestige.

**Vernacular** is a general expression for a kind of social dialect, typically spoken by a lower-status group, which is treated as non-standard because of marked differences from a socially prestigious variety treated as the standard language. This term has been used since the Middle Ages, first to describe local European languages (low prestige) in contrast to Latin (high prestige), then to recognize any non-standard spoken version of a language used by lower-status groups.

## Progress Check

👉 1- ..... refers only to distinctive pronunciation, whereas ..... refers to grammar and vocabulary as well.

- 1) Accent - dialect      2) Nation dialect - accent      3) Dialect - register      4) Register - accent

👉 2- The speech of every particular individual speaker of a language is referred to as .....

- 1) accent      2) dialect      3) idiolect      4) sociolect

👉 3- When a number of isoglosses come together, ..... is formed.

- 1) overt prestige      2) social dialect      3) dialect leveling      4) dialect boundary

👉 4- When due to natural obstacles, a change fails to affect the speech of the people beyond the obstacle, ..... is created.

- 1) idiolect      2) regional dialect      3) non-standard dialect      4) accent

👉 5- Dialect leveling may be created as a result of .....

- 1) different social groups  
2) mass communication  
3) high number of speakers in one region  
4) economic growth in an area



## Answers

### 1- Choice "1"

**Accent** is a mode of pronunciation, as pitch or tone, emphasis pattern, or intonation, characteristic of or peculiar to the speech of a particular person, group, or locality.

**Dialect** is a variety of a language that is distinguished from other varieties of the same language by features of phonology, grammar, and vocabulary and pronunciation.

### 2- Choice "3"

The speech of every particular individual speaker of a language is referred to as idiolect.

### 3- Choice "4"

When a number of isoglosses come together, dialect boundary is formed

### 4- Choice "2"

A change that occurs in one region and fails to spread to other regions of the language community creates regional dialect.

### 5- Choice "2"

Causes of dialect leveling are mass communication, ease of travel and population mobility.

## 2. Languages in Contact

### 2.1. Bilingualism, Code-switching, Diglossia

In many countries, regional variation is not simply a matter of two (or more) dialects of a single language, but can involve two (or more) quite distinct and different languages. Canada, for example, was an English speaking country with a French-speaking minority group. In such a situation, the members of the minority group have the feature of **bilingualism**; on the one hand they grow up in a linguistic community, mainly speaking one language (French), on the other they learn another language (English) to take part in the larger dominant linguistic community.

Codeswitching is a speech style unique to bilinguals, in which fluent speakers switch languages between or within sentences, as illustrated by the following sentence:

Sometimes I'll start a sentence in English and termino en español.

Sometimes I'll start a sentence in English and finish it in Spanish.

Codeswitching is a universal language-contact phenomenon that reflects the grammars of both languages working simultaneously. Codeswitching occurs wherever groups of bilinguals speak the same two languages. Furthermore, codeswitching occurs in specific social situations, enriching the repertoire of the speakers.

Codeswitching is to be distinguished from (bilingual) borrowing, which occurs when a word or short expression from one language occurs embedded among the words of a second language and adapts to the regular phonology, morphology, and syntax of the second language. In codeswitching, in contrast, the two languages that are interwoven preserve their own phonological and other grammatical properties. Borrowing can be easily distinguished from codeswitching by the pronunciation of an element. Sentence (1) involves borrowing, and (2) codeswitching.

(1) I love biscottis [biskariz] with my coffee.

(2) I love biscotti [biskɔt:i] with my coffee.

In sentence (1) biscotti takes on an (American) English pronunciation and plural -s morphology, while in (2) it preserves the Italian pronunciation and plural morpheme -i (plural for biscotto, 'cookie').

A rather special situation involving two distinct varieties of a language, called **diglossia**, exists in some countries. In diglossia, there is a 'low' variety (demotic), acquired locally and used for everyday affairs, and a 'high' or special variety, learned in school and used for important matters. A type of diglossia existed in Europe with Latin as the high variety and one of the local languages of Europe (early versions of French, Spanish, etc.) as the low variety or 'vernacular'.





## CHAPTER FOURTEEN (Language History and Change)

### 1. Three Characteristics of Language Change

#### 1.1. Constancy of Language Change

The stages of English history could be divided into three stages; Old English (449 – 1100 C. E.), Middle English (1100 – 1500) and Modern English (1500 – present). If you read a piece of writing from Old English, you would have difficulty understanding it. This is due to the fact that all living languages change with time. Language change is constant but it is often imperceptible. It is slow enough that the replacement of forms and rules is rarely noticeable within one generation, but fast enough that we are often aware that generations before and after ours speak differently. Whenever a language at some point in time is compared with its descendant language even a few hundred years later, the change is obvious.

#### 1.2. Pervasiveness of Language Change

In all languages change is pervasive as well as constant. Changes in a language affect the grammars of people who speak the language and are perpetrated as new generations of children acquire the altered language and make further changes to the grammar. No part of the grammar remains the same over the course of history. In other words, phonology, morphology, syntax and even semantics are affected during the course of time. Following is a brief account of such changes.

##### 1.2.1. Lexical Change

Lexical change was elaborately discussed in chapter 7. It may occur as a result of changes to lexical categories of words (zero-derivation), addition of new words, blends, back-formations, acronyms, abbreviations, clippings, compounding and coinage. Lexical change may occur through borrowing. For example, over years French foods have given English a flood of borrowed words for menu preparers such as *mousse*, *bisque*, *bouillon*, etc. English borrowed many learned words from ancient Greek and Latin such as *bonus*, *scientific*, *alumnus*, etc. Many scientific words such as *algebra*, *alcohol*, etc. were borrowed indirectly from Middle East, because scholarship in these fields was quiet advanced then. Languages can also lose words, although the departure of an old word is never as striking as the arrival of a new one. When a new word comes into vogue, its unusual presence draws attention, but a word is lost through inattention. For example, the expression *two bits*, meaning 'twenty-five cents' is no longer used by the younger generation and is in the process of being lost.

**Relic forms** of a word generally lost from a language may survive in specialized uses in which their meaning has become well extended, for example, Middle English *let* 'hinder', survives in the tennis term *let* (ball) (hindered by the net).

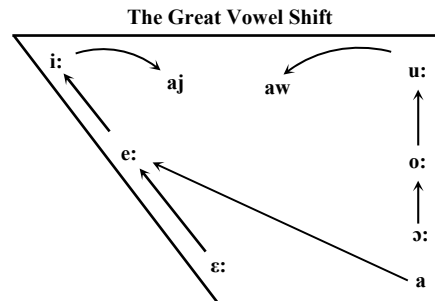
Finally, semantic change is another sources. This occurs in 'broadening' where the meaning of a word encloses everything it used to mean and more; and 'narrowing' where the meaning of a word becomes less encompassing.

##### 1.2.2. Phonological Change

- **Phonetic changes:** pronunciations are always changing, and after hundreds of years it often can be seen that the changes were of a very general or regular pattern according to which all phones of a type in a given environment changed identically. Sound shift is evidenced by the **regular sound correspondence** that is the occurrence of different sounds in the same position of the same word in different languages or dialects, with this parallel holding for a significant number of words. For example, [ai] in British English corresponds to [i] in American English in a

word like *direct*: British [daɪrekt] and American [dɪrekt]. This *regularity of phonetic change* is also seen in two examples.

- o Grimm's Law (Refer to section 3.3)
- o The Great Vowel Shift: this major change in English that resulted in new phonemic representations of words and morphemes took place approximately between 1400 and 1600.



You can see that the high vowels [i:] and [u:] became the diphthongs [aj] and [aw], while the long vowels underwent an increase in tongue height, as if to fill in the space vacated by the high vowels. In addition, [a:] was fronted to become [ɛ:].

Middle English	→	Modern English	Middle English	→	Modern English	Example
[i:]	→	[aj]	[mi:s]	→	[majs]	mice
[u:]	→	[aw]	[mu:s]	→	[maws]	mouse
[e:]	→	[i:]	[ge:s]	→	[gi:s]	geese
[o:]	→	[u:]	[go:s]	→	[gu:s]	goose
[ɛ:]	→	[e:]	[brɛ:ken]	→	[bre:k]	break
[ɔ:]	→	[o:]	[brɔ:ken]	→	[bro:k]	broke
[a:]	→	[ɛ:]	[na:mə]	→	[ne:m]	name

Thus, the phonemic representation of many thousands of words changed. Today, some reflection of this vowel shift is seen in the alternating forms of morphemes in English: 'crime/criminal'. Before the Great Vowel Shift, the vowels in each pair were the same ([kri:m]/[kri:mi:nəl]). Then the vowels in the second word of each pair were shortened by the **Early Middle English Vowel Shortening** rule ([kri:m]/[krɪmməl]). As a rule, the Great Vowel Shift, which occurred later, affected only the first word in each pair. The second word, with its short vowel, was unaffected ([kraim]/[krɪmməl]).

- **Phonemic changes:** phonological changes could occur through the loss of phonemes in the sounds inventory of languages. For example velar fricative /x/ is no longer part of the phonemic inventory of English sounds inventory. This sound was used in the pronunciation of words like 'night' /nixt/. The reverse situation is also possible where a phoneme may be added to sounds inventory of a language. For example phoneme /ʒ/ was added when phoneme /z/ underwent palatalization.
- **Phonological rules:** could contribute to phonological changes. Consider 'bath' and 'bathe'. A general rule added voicing to intervocalic fricatives; thus /θ/ in 'bath' was pronounced /ð/ in 'bathe'. In this case /θ/ and /ð/ were allophones. Later, another rule deleted unstressed vowel at the end of words and as a result /θ/ and /ð/ contrasted meaning ('bath' is a large, long container that you put water in and then get into to wash your whole body; 'bathe' is to wash with water) and were considered as different phonemes.
- **Epenthesis:** involves the addition of a sound to the middle of a word. For example the sound [p] could be added after the nasal [m], as in *emty*→ *empty* and *something*→ *somþing*.

Epenthesis: یعنی افزودن یک صدا به وسط کلمه.

- **Prosthesis:** is another sound change that doesn't occur in English. It involves the addition of a sound to the beginning of a word. It is common in the evolution of some forms from Latin to Spanish, as in *schola*→ *escuela*.

Prosthesis: یعنی افزودن یک آوای اضافی به ابتدای کلمه.