LECTURE NOTES

ON

LANGUAGE AND COMMUNICATION

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Preface

The study of language and communication has evolved over the years and newer areas have to be systematically incorporated into the teaching of the subject to young students. These lecture notes and materials are brought together with a view to bringing under a project a view of language and communication that would look at both standard material and new developments in the field. It is hoped that a useful picture of the human language faculty will emerge from the material provided below. The notes on communication skills are included to highlight also the non-verbal elements of communication. I have adapted material and cited from several books which I mention in the reference provided below. I have also benefited from and used classroom discussions and presentations made by my students over the last few years of teaching in IIT Guwahati. The material has been arranged in a manner that would facilitate and highlight the way the notes are to be used for lectures.

(Liza Das) 

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Definitions and Properties

The following definitions may be offered to students to provide an idea of the wide areas Language Studies can encompass:

a) “Language is a purely human and non-instinctive method of communicating ideas, emotions and desires by means of voluntarily produced symbols.” (Edward Sapir)

b) The language of a class or social position is potentially a prison-house, “a sealed-off and impermeable monoglossia.” (Mikhail Bakhtin)

c) To the question: “WHO is speaking?” Mallarme, the French poet, answered, “Language is speaking.”

d) Language determines one’s entire way of life, including one’s thinking and all other forms of mental activity. To use language is to limit oneself to the modes of perception already inherent in that language. The fact that language is only form and yet molds everything goes to the core of what ideology is. (Benjamin Whorf)

e) Its systematic nature in order to be complete needs only to be valid, and not to be true. Language effects the original split between wisdom and method. "Freedom of speech" does not exist; grammar is the invisible "thought control" of our invisible prison.
With language we have already accommodated ourselves to a world of unfreedom.

The tendency to take the conceptual as the perceived and to treat concepts as tangible, is as basic to language as it is to ideology. (Roland Barthes)

f) “A language [is] a set (finite or infinite) of sentences, each finite in length and constructed out of a finite set of elements.” (Noam Chomsky)

**Human Language and Communication have the following properties:**

1. **Displacement:** Capacity to produce messages that can refer to past and future time, and to other locations.

2. **Arbitrariness:** There is no one-to-one correspondence between a linguistic form and its meaning. Meaning is always arbitrary and maintained by convention.

3. **Productivity:** The ability to be creative and to produce utterances not heard before.

4. **Cultural transmission:** Language does not develop automatically if there is no culture to transmit it to the young members.

5. **Discreteness:** The sounds used in language are meaningfully distinct and discrete.

6. **Duality:** Distinct sounds and distinct meanings. It is one of the most economical features of human language, since with a limited set of distinct sounds we can produce a very large number of sound combinations.
Important: Structuralist Linguistics

Structuralists believe that the underlying structures which organize units and rules into meaningful systems are generated by the human mind itself, and not by sense perception. As such, the mind is itself a structuring mechanism which looks through units and files them according to rules. This is important, because it means that, for structuralists, the order that we perceive in the world is not inherent in the world, but is a product of our minds. It is not that there is no "reality out there," beyond human perception, but rather that there is too much "reality" (too many units of too many kinds) to be perceived coherently without some kind of "grammar" or system to organize and limit them.

So structuralism sees itself as a science of humankind, and works to uncover all the structures that underlie all the things that humans do, think, perceive, and feel--in mathematics, biology, linguistics, religion, psychology, and literature, to name just a few disciplines that use structuralist analyses.

Structuralist analysis posits these systems as universal:

1. Every human mind in every culture at every point in history has used some sort of structuring principle to organize and understand cultural phenomena. For instance, every human culture has some sort of language, which has the basic structure of all language: words/phonemes are combined according to a grammar of rules to produce meaning.

2. Every human culture similarly has some sort of social organization (like a kind of government), some sort of system for who can marry whom (usually referred to as a kinship system), and some sort of system for exchanging goods (usually referred to as an economic system). All of these organizations are governed, according to structuralist analyses, by structures which are universal.
For a more formal definition: a structure is any conceptual system that has the following three properties:

**Wholeness.** This means that the system functions as a whole, not just as a collection of independent parts.

**Transformation.** This means that the system is not static, but capable of change. New units can enter the system, but when they do they’re governed by the rules of the system.

**Self-Regulation.** This is related to the idea of transformation. You can add elements to the system, but you can’t change the basic structure of the system no matter what you add to it. The transformations of a system never lead to anything outside the system.

**Ferdinand de Saussure**, a Swiss linguist', provided us with a structuralist analysis of language as a signifying system. Saussure is interested in language as a system or structure. His ideas apply to any language--English, French, Farsi, computer languages--and to anything we can call a "signifying system". He describes the structures within any language which make meaning possible, but he’s not interested in what particular meanings get created. Like all structuralists, he’s not interested in the details of what fills up the structure, the specifics of speech or writing, but only in the design of the structure itself.

**1. Language is based on a naming process**, by which things get associated with a word or name. Saussure says this is a pretty naive or elementary view of language, but a useful one, because it gets across the idea that the basic linguistic unit has two parts.

Those two parts Saussure names the "concept" and the "sound image". The sound image is not the physical sound (what your mouth makes and your ear
hears) but rather the psychological imprint of the sound, the impression it makes. An illustration of this is talking to yourself—you don't make a sound, but you have an impression of what you’re saying.

2. The linguistic sign is made of the union of a concept and a sound image. The union is a close one, as one part will instantly conjure the other; Saussure’s example is the concept “tree” and the various words for tree in different languages. When you are a speaker of a certain language, the sound image for tree in that language will automatically conjure up the concept “tree.” The MEANING of any SIGN is found in the association created between the sound image and the concept: hence the sound "tree" in English means the thing "tree." Meanings can (and do) vary widely, but only those meanings which are agreed upon and sanctioned within a particular language will appear to name reality. (More on this as we go on).

3. A more common way to define a linguistic sign is that a sign is the combination of a signifier and a signified. Saussure says the sound image is the signifier and the concept the signified. A word may be thought of as a signifier and the thing it represents as a signified, though technically these are called sign and referent, respectively.

4. The sign has two main characteristics:

A. The bond between the signifier and the signified is arbitrary. There is nothing in either the thing or the word that makes the two go together, no natural, intrinsic, or logical relation between a particular sound image and a concept. An example of this is the fact that there are different words, in different languages, for the same thing. Dog is "dog" in English, "perro" in Spanish, "chien" in French, "Hund" in German. This principle dominates all ideas about the structure of language. It makes it possible to separate the signifier and signified, or to change the relation between them. Language is only one type of semiological system (the word "semiological," like the word "semiotic," comes from the Greek word for "sign"). Any system of signs, made up of signifiers and signifieds,
is a semiotic or signifying system. Any time we make up a secret code or set of signals we are making our own signifying system.

B. The second characteristic of the sign is that the signifier (here, meaning the spoken word or auditory signifier) exists in time, and that time can be measured as linear. We cannot say two words at one time; we have to say one and then the next, in a linear fashion. (The same is true for written language: we have to write one word at a time (though we can write over an already written word) and we generally write the words in a straight line).

5. Saussure talks about the system of language as a whole as *langue* (from the French word for language), and any individual unit within that system (such as a word) as a *parole*.

6. The arbitrary nature of the sign explains why language as a system can only arise in social relations. It takes a community to set up the relations between any particular sound image and any particular concept (to form specific paroles. An individual cannot fix value for any signifier/signified combination. We could make up our own private language, but no one else would understand it; to communicate, two or more people have to agree on what signifiers go with what signifieds. Value is thus defined as the collective meaning assigned to signs, to the connections between signifiers and signifieds.

The value of a sign is determined, however, not by what signifiers get linked to what particular signifieds, but rather by the whole system of signs used within a community. Value is the product of a system or structure (langue), not the result of individual signifier-signified relations (parole).

7. **Value and Signification:** SIGNIFICATION is what we commonly think of as "meaning," the relationship established between a signifier and a signified. Value by contrast, is the relation between various signs within the signifying system. As Saussure says "Language is a system of interdependent terms in which the value of each term results solely from the simultaneous presence of the others."
Value is always composed of two kinds of comparisons among elements in a system. The first is that dissimilar things can be compared and exchanged, and the second is that similar things can be compared and exchanged. A good example of this is money. A dime is a signifier connected to a signified of 10 cents of something. The value of a dime is established because it can be exchanged for something dissimilar—a piece of gum—or something similar—ten pennies. (Coins are also good examples of the arbitrary nature of signs. A dime is worth 10 cents because we all agree that it is, not because the materials in the coin have some absolute value of 10 cents).

Words work the same way. A word can be "exchanged" for something similar—another word, a synonym—or for something dissimilar—an idea, for example. In both cases (coin or word), it is the system itself which creates value, and sets up the ways that exchanges can be made. A signifier, such as a coin or a word, when considered alone, has only a limited relation to its own signified; when considered as part of a system, a signifier has multiple relations to other signifiers in the system.

8. The most important relation between signifiers in a system, the relation that creates value, is the idea of difference. One signifier has meaning within a system, not because it's connected to a particular signified, but because it is not any of the other signifiers in the system. The word "cat" has meaning, not because of the animal it's associated with, but because that word is not "hat" or "bat" or "car" or "cut."

9. This idea of difference depends upon the idea of binary opposites. To find out what a word or sign is not, we compare it to some other word or sign. (And because language exists in time and space, we can only do this comparison one word at a time, hence always forming binary pairs, pairs of two.) A binary pair shows the idea of difference as what gives any word value: in the pair cat/cats, the difference is the "s"; what makes each word distinct is its difference from the other word.
10. The most important kind of relation between units in a signifying system is a syntagmatic relation. This means, basically, a linear relation. In spoken or written language, words come out one by one (see above, the second characteristic of the linguistic sign). Because language is linear, it forms a chain, by which one unit is linked to the next.

An example of this is the fact that, in English, word order governs meaning. "The cat sat on the mat" means something different than "The mat sat on the cat" because word order -- the position of a word in a chain of signification -- contributes to meaning. English word order has a particular structure: subject-verb-object. Think of this sentence: "The adjectival noun verbed the direct object adverbially." Other languages have other structures; in German, that sentence might be "The adjective noun auxiliary verbed the direct object adverbially main verb." In French it might be "The noun adjective verbed adverbially the direct object ." In Latin, word order doesn't matter, since the meaning of the word is determined, not by its place in the sentence, but by its cases (nominative, ablative, etc.)

Combinations or relations formed by position within a chain (like where a word is in a sentence) are called syntagms. Examples of syntagms can be any phrase or sentence that makes a linear relation between two or more units: under-achiever; by the way; lend me your ears; when in the course of human events.

The terms within a syntagm acquire value only because they stand in opposition to everything before or after them. Each term is something because it is not something else in the sequence.

Syntagmatic relations are most crucial in written and spoken language, in discourse, where the ideas of time, linearity, and syntactical meaning are important. There are other kinds of relations that exist outside of discourse.

Signs are stored in your memory, for example, not in syntagmatic links or sentences, but in associative groups. The word "education", for example, may get linked, not to verbs and adjectives, but to other words that end in "-tion":
education, relation, association, deification. You may store the word education" with other words that have similar associations: education, teacher, textbook, college, expensive. Or you may store words in what looks like a completely random set of linkages: education, baseball, computer games, psychoanalysis (things I like). The idea of associative groups or linkages is like pigeonholing and what pigeonholes we put certain words or ideas in; when we pull out that word or idea, all the other things in that pigeonhole come tumbling out with it.

Associative relations are only in your head, not in the structure of language itself, whereas Syntagmatic relations are a product of linguistic structure.

Syntagmatic relations are important because they allow for new words--neologisms--to arise and be recognized and accepted into a linguistic community. "To office," for example has meaning because the noun "office" can be moved to the position of verb, and take on a new syntagmatic position and relation to other words. Associative relations are important because they break patterns established in strictly grammatical/linear (syntagmatic) relations and allow for metaphoric expressions.

(Some parts adapted from Chandler)
Language Origin

*Old Theories:*

1. **Bow-Wow Theory:** Speech arose through imitation of environmental sounds, such as animal calls.
   Evidence: Use of onomatopoeic words like “hiss”, “pant”, “cuckoo”, etc.

2. **Pooh-Pooh Theory:** Speech arose through people making instinctive cries, such as those caused by pain or other emotions.
   Evidence: Universal use of sounds as interjections.

3. **Ding-Dong Theory:** Speech arose because people reacted to stimuli in the world around them, spontaneously producing sounds (“oral gestures”) in response to them.
   Eg: mama or some similar-sounding word referring to mother; bilabial nasal sound of [m] could result from approximation of lips while nursing.

4. **Yo-he-ho Theory:** Hypothesizes that when people work together, their physical efforts promote communal rhythmic grunts, leading to chants, leading to language.
   Evidence: Universal use of prosodic features in language, esp. rhythm (like stress or accent).
**New Theories:**

1. Speech-Based Theory

Bipedalism led to restructuring of vocal tract
Big change: descent of the larynx (larynx much higher in other animals), which produces a larger pharyngeal cavity
Larger pharyngeal cavity useful in making a wide variety of vowel sounds
Other changes (development of fat lips) useful in making consonant sounds.
Ability to produce dynamic, rapidly changing stream of sounds makes language possible.

Note:
Some studies have found that mammalian larynx placement is much lower during vocalizations ("dynamic descent of the larynx"), yet non-human mammals still cannot speak
Female human larynx not nearly so low as male
Human vocal tract of no evolutionary advantage without the brain to run it
Some animals have immense vocal range (cf. birds, esp. parrots and mynah birds), but still cannot speak

2. Intelligence-Based Theory

Increased brain size led to increased ability for symbolic thought
Symbolic thought led to symbolic communication ("mentalese" precedes language ability)
Symbolic communication endows humans with decided survival advantage (cooperation, planning, etc.)
3. Protolanguage theory

The first linguistic systems were extremely rudimentary, gradually developed greater complexity

Protolanguage: Basically limited to nouns (“object-names”) and verbs (“actionnames”); supported by ontogeny and some simple ordering requirements. Essentially no grammar.

Claim: A wide variety of things can be communicated using such a system, especially. With reference to immediate needs, things physically present, coordinating activities, etc.

Extension of the Protolanguage for “Off-Line Thinking”— reliving the day’s events, planning the next day, etc. To fully express all the things you can think about, the protolanguage has to be enriched to use grammar. This heralds the emergence of true language.

“Ontogeny recapitulates phylogeny”— Evolutionarily prior stages of an organism are frequently replicated in the development of an immature individual of that species. Protolanguage is basically what 2-yr olds are using. The use of protolanguage spurred rapid development of the brain, making more advanced language use possible.

4. Gesture to Speech theories

First human linguistic systems were gestural (rudimentary sign systems)
Innovation of bipedalism frees up the hands, can be used for communication
Existence of signed languages today. A good vocal apparatus is not enough
5. The Cognitive Niche

Our niche in nature, the ability to understand the world well enough to figure out ways of manipulating it to outsmart other plants and animals. Several things evolved at the same time to support this way of life.

a) **Cause-and-effect intelligence:**

E.g. How do sticks break, how do rocks roll, how do things fly through the air?

b) **Social intelligence:**

How do I coordinate my behavior with other people so that we can bring about effects that one person acting alone could never have done?

c) **Language:**

If I learn something, I don't get the benefit of it alone, but I can share it with my friends and relatives, I can exchange it for other kinds of commodities, I can negotiate deals, I can gossip to make sure that I don't get exploited.

Each one of these abilities -- intelligence about the world, social intelligence, and language -- reinforces the other two, and it is very likely that the three of them coevolved like a ratchet, each one setting the stage for the other two to be incremented a bit.
Evolutionary Theory

Evolutionary Psychology, based on Darwinian theory, claims that language emerged in evolutionary history owing to selection pressures.

**The five major principles of EP:**

1. The brain is a physical system. It functions as a computer. Its circuits are designed to generate behavior that is appropriate to your environmental circumstances.

2. Our neural circuits were designed by natural selection to solve problems that our ancestors faced during our species' evolutionary history.

3. Consciousness is just the tip of the iceberg; most of what goes on in your mind is hidden from you. As a result, your conscious experience can mislead you into thinking that our circuitry is simpler than it really is. Most problems that you experience as easy to solve are very difficult to solve -- they require very complicated neural circuitry.

4. Different neural circuits are specialized for solving different adaptive problems.

5. Our modern skulls house a stone age mind.

Could Language have evolved through Darwinian natural selection?

- Is there continuity or discontinuity with animal communication systems?
- Brain enlargement first or Language first?
• Does Language emerge primarily from gesture, vocalization, both, or neither?
• Is the emergence of Language sudden or gradual?
• What are the neurological bases for Language?

It is held by evolutionary theorists that the first truly human cognitive breakthrough was a revolution in motor skill -- mimetic skill -- which enabled hominids to use the whole body as a representational device. This mimetic adaptation had two critical features: it was a multimodal modelling system, and it had a self-triggered rehearsal loop that is, it could voluntarily access and retrieve its own outputs. The sociocultural implications of mimetic skill are considerable, and could explain the documented achievements of Homo erectus. In modern humans, mimetic skill in its broadest definition is dissociable from language-based skills, and retains its own realm of cultural usefulness. The mimetic motor adaptation set the stage for the later evolution of language.

**Important: Steven Pinker’s theory**

Q.: Is language a distinct part of the human phenotype?
Q.: Did language evolve by means other than Natural Selection?

“The human language faculty is a complex biological adaptation that evolved by natural selection for communication in a knowledge-using, socially interdependent lifestyle.”

*Adaptation implies ‘language is a human phenotype.*

Is it really something as spontaneous and universal as phenotypic feelings of fear or humor?
Or is it just a manifestation of more general cognitive abilities?

All the languages in the world have got common design features related to words and language. There may be technologically primitive peoples, but there are no primitive languages. The anthropologists who first documented the languages of technologically primitive societies a century ago were repeatedly astonished by their complexity and abstractness.

*Language acquired by a universal series of stages*
Children master the language by taking in a finite sample of sentences (as speech from parents) and inducing a grammar capable of generating the infinite language. Systematic pattern of speech and even errors confirm to the linguistic universals. In aphasias and in Specific Language Impairment, intelligent people can have extreme difficulties speaking and understanding.

In a number of retardation syndromes, such as Williams syndrome and the sequelae of hydrocephalus, substantially retarded children may speak fluently and grammatically. The fact that the two kinds of abilities can dissociate quantitatively and along multiple dimensions shows that they are not manifestations of a single underlying ability.

Apart from Charles Darwin's theory of natural selection, various other theories explaining the genetic evolution of language have been put forward:

1. Macro-Mutation
2. Random genetic drift
3. Genetic hitchhiking
4. Development of a large brain

Together put as the non-selectionist theories, they attack the Darwinian theory from various angles.

• What is Language an adaptation for?
• What are the selective pressures that shaped Language?
• What is the ‘Machinery of Language’ trying to accomplish?

Answer: Language was needed to encode propositional information.

Who did what to whom?
What is true of what?
When, Where, Why?

Gathering and Exchanging information is an integral part of ‘The Cognitive Niche’.

Language is an adaptation to satisfy needs of Cognitive Niche

• Human Traits that are unusual in other living beings:

  a) Extensive manufacture of and dependence on complex tools
  b) Wide range of habitats and diets
  c) Hypersociality
  d) Complex patterns of mating and sexuality
  e) Division into groups or cultures

Human lifestyle is a consequence of specialisation in Cause-and-Effect Reasoning. This *cause-and-effect reasoning* depends on intuitive theories about various domains of the world. Such reasoning enables humans to invent and use new technologies, to exploit other living things before they can develop defensive countermeasures in evolutionary time. Language is a way of converting information about cause-and-effect and action into perceptible signals.
Language meshes neatly with other features of cognitive niche. Hypersociality comes about because information is a particularly good. Abstractness of Language helps humans to inhabit wide range of habitats. Many groups and cultures because knowhow and social conventions have spread via a local network of information sharing

**Knowhow, Sociality, and Language** – three distinct features of human lifestyle co-evolved with each constituting a selection pressure for the others.

Deviousness and Deception:

Some hold that a devious mind was a basic prerequisite for the evolution of language. Primate social structure is characterized by -
- Strong family ties
- Active interaction at the group level
- Well defined ranking or pecking order

To promote these, two types of behaviors have emerged –
- Predisposition to groom one another.
- Ability to make guesses of mental state of others.

Social chit chat is human equivalent to friendly grooming found in other primate groups. Grooming was not feasible in large groups. Better quality of interaction matters more than overall numbers. Several other factors e.g. hands free, sounds can be heard in dark and messages can be transmitted rapidly.

The ability to deceive was an important prerequisite for language for the following reasons:
- It is essential to understand someone else’s point of view.
- Those who can represent the minds of others in their own mind are said to have a ‘Theory of mind’, something possessed by all normal human beings.
Open country living may have aided aptitude for deception since chimps are good deceivers as compared to tree-oriented monkeys.

The use of cunning perhaps helped to cause an enlarged brain which in turn developed a superb manipulating device called language.

**Language beginnings**

One view: Sign language provided a stepping stone. The Early humans used sign language instinctively. Then the gesture became conventionalized and were sometimes accompanied by sounds. Consequently they opted for ‘action language’. Finally in the long run Sounds became more important than the gestures. Modern supporters of the gesture theory emphasize points –

a) Language is not inevitably spoken.
b) Gestures are universal and obvious.
c) Signs are easier to acquire than ‘full’ languages.
d) Language and gesture may be linked in the brain.

**Gesture Language**

Gestures are neither obvious nor universal. Example – Some English students who have hires a rowing boat were arrested off the coast of Greece as they unknowingly approached a military installation: Locals had tried to warn them but the students have interpreted the local “go away” gesture as a “come hither” one.

Sign language vs. Speech: It is claimed by some researcher that ‘signs’ can be picked up more easily than speech. Some mentally handicapped children have also found signs easier to grasp than ordinary language. Brain structure is another factor used by supporters of sign language origin for language – The left hemisphere of the human brain is specialized both for right handedness and for
language, suggesting a neurological connection, especially as hand movements tend to occur during speech.

Humans have never automatically taken the easiest way forward, especially if it is inefficient: and since the sign cannot be seen in the dark, and they occupy the hands, some researcher claims that signs do not come naturally to humans.

**The POP Hypothesis**

Is our big brain the cause of language? OR The language causes our big brain?

According to POP Hypothesis, language is just a by-product and that the human language just “pop” into being after the mind cross a certain threshold for other reasons.

The POP Hypothesis
In support of the POP Hypothesis prominent evolutionist Stephen Jay Gould said –

“Our brains were made to carry language so we have language”

And according to him the purposeful evolution of language is a topsy-turvy argument.

**‘Language is a spandrel’ view:**

Spandrels are an inevitable by-product of mounting a dome on rounded arches which are placed at right angle to one another. Some researchers believe that ‘Exaptation’ is the key to language. But this view point is highly unlikely-The complexity of language, and the interwoven adaptations of the mouth, larynx and brain make it unlikely that language could have developed as an accidental by-product.

Humans’ brain size is around 3 times the size of that of average chimp. It is twice as large as that of Homo habilis. And a third as big again as that of Homo erectus
Relationship between brain size and language is unclear. Possibly increased social interaction combined with tactical deception gave the brain an initial impetus. Better nourishment due to meat eating may also have played an important part in the development of brain. Then brain size and language possibly increased together so language can be regarded as the “reason” or “need” for the development of human brain. Humans were not using and refining language then what were they doing with their improving brain. The argument is that Humans used their developing brain to refine and improve the Language. So it is kind of a one to one relationship in which Language was the need which made our brain to develop and increased brain size helped Humans for the betterment of their language. Like the brain of many other animals, the human brain is divided into two halves or hemispheres, each of which has its own tasks. A major advantage is that damage to one side does not inevitably mean lost faculties in the other part. The left hemisphere controls movement in the right side of the body and also language in most humans. The connection has been known for a long time.

The crucial fact is that the left hemisphere has sequencing as one of its specialties. So it helps in arranging sounds and words one after the other.

One odd thing about Humans, compared with other primates, is that we can stay quiet whenever we want to, apart from occasional cries such as the little screams uttered by passengers when an aircraft drops into an air pocket. But mostly, sound emissions are under our conscious control. This control is rare in primates.
In general utterances come into three categories:

1. The lowest level corresponds to a reflex action such as involuntary coughing due to a tickle in one’s throat.
2. The intermediate level is when the vocalization is innate, but the trigger has to be learned, like the alarm calls of some monkeys.
3. At the highest level, both the vocalization and the stimulus have to be learned as in human language.
Language in the Brain and Mind

Features of the brain:

1. The human brain is lateralized that is, it has specialized functions in each of the two hemispheres. The brain - more particularly the cerebrum - is divided into two halves, or hemispheres, linked (in normal circumstances) by the corpus callosum. The outer layer of both hemispheres consists of grey matter - the cortex - containing something like $10^{10}$ neurons, or nerve cells; and these are interconnected by means of an equally numerous set of fibres in the white matter that lies below the cortex. The right hemisphere controls (and responds to signals from) the left side of the body, whereas the left hemisphere controls the right side.

2. Analytic functions such as tool-using and language are largely confined to the left hemisphere of the brain for most humans. All languages, including sign language, require the organizing and combining of sounds or signs in specific constructions. This does seem to require a specialization of some part of the brain.
3. Lateralization is a precondition of the acquisition of language. Language-acquisition begins at about the same time as lateralization does and is normally complete, as far as the essentials are concerned, by the time that the process of lateralization comes to an end. It becomes progressively more difficult to acquire language after the age at which lateralization is complete.

4. The right hemisphere can interpret single words denoting physical entities without difficulty; it is not so good at the interpretation of grammatically complex phrases. Non-speech-sounds are processed directly and efficiently by the right hemisphere, but speech-sounds are generally passed to the left hemisphere, which is more highly specialized for this purpose.
5. There are four areas in our brain responsible for different functions. Starting from front to back, the first one is responsible for word associations. Then is the area which deals with conditional connections, as in; “IF it rains, THEN put up an umbrella.” Then is the area which controls sequential order, that is, the arrangement of things one after the other. Finally the area which deals with the muscles controlling speech, mainly those of the mouth.

6. Co-ordination among the different parts of the brain may be the key to human language. The human race may have been able to achieve this degree of co-ordination because of their extended childhood, known as ‘neoteny’ from the Greek “young-stretch”. Compared with other primates, Human children grow up very slowly so they get more time for all this co-ordination development.
Fig shows basic modularity of brain functions
Seven Components of the Wernicke-Geshwind Model
Major Language processing areas:

**Broca's area**
It is technically described as the anterior speech cortex. Paul Broca, a French surgeon, reported in the 1860s that damage to this specific part of the brain was related to extreme difficulty in producing speech. It was noted that damage to the corresponding area on the right hemisphere had no such effect. This finding was first used to argue that language ability must be located in the left hemisphere and since then has been taken as more specifically illustrating that Broca's area is crucially involved in the production of speech.

**Wernicke's area**
It is the posterior speech cortex. Carl Wernicke was a German doctor who, in the 1870s, reported that damage to this part of the brain was found among patients who had speech comprehension difficulties. This finding confirmed the left-
hemisphere location of language ability and led to the view that Wernicke's area is part of the brain crucially involved in the understanding of speech.

The Motor Cortex
It is the motor cortex which 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. Evidence that this area is involved in the actual physical articulation of speech comes from the work, reported in the 1950s, of two neurosurgeons, Penfield and Roberts. These researchers found that, by applying minute amounts of electrical current to specific areas of the brain, they could identify those areas where the electrical stimulation would interfere with normal speech production.

Arcuate fasciculus
A bundle of nerve fibers which forms a crucial connection between Wernicke's area and Broca's area.

A word is heard and comprehended via Wernicke's area. This signal is then transferred via the arcuate fasciculus to Broca's area where preparations are made to produce it. A signal is then sent to the motor cortex to physically articulate the word. This is, unfortunately, a massively oversimplified version of what may actually take place. The problem is, essentially, that in attempting to view the complex mechanism of the human brain in terms of a set of language 'locations', we have neglected to mention the intricate interconnections via the central nervous system, the complex role of the brain's blood supply, and the extremely interdependent nature of most brain functions.

The localization view is one way of saying that our linguistic abilities have identifiable locations in the brain. However, it is invariably argued by others involved in the study of the brain that there is a lot of evidence which does not support the view. Any damage to one area of the brain appears to have
repercussions in other areas. Consequently, we should be rather cautious about assigning highly specific connections between particular aspects of linguistic behavior and sites on the wrinkled grey matter inside the head.

Some researchers have noted that, as language-users, we all experience occasional difficulty in getting the brain and speech production to work together smoothly. Minor production difficulties of this sort have been investigated as possible clues to the way our linguistic knowledge may be organized within the brain.

Language disorders

Aphasia
Aphasia is defined as an impairment of language function due to localized cerebral (i.e. brain) damage which leads to difficulty in understanding and/or producing linguistic forms. The most common cause of aphasia is a stroke, though traumatic head injuries suffered through violence or accidents may have similar effects. It is often the case that someone who is aphasic has interrelated language disorders, in that difficulties in understanding can lead to difficulties in production. Consequently, the classification of types of aphasia is normally based on the primary symptoms of an aphasic who is having difficulties with language.

Broca's aphasia
The type of serious language disorder known as Broca's aphasia (also called 'motor aphasia') is characterized by a substantially reduced amount of speech, distorted articulation and slow, often effortful speech. What is said often consists almost entirely of lexical morphemes (e.g. nouns and verbs). The frequent omission of functional morphemes (e.g. articles, prepositions, inflections) has led to the characterization of this type of aphasia as agrammatic. The grammatical markers are missing.
**Wernicke's aphasia**
The type of language disorder which results in difficulties in auditory comprehension is sometimes called 'sensory aphasia', but is more commonly known as Wernicke’s aphasia. Someone suffering from this disorder can actually produce very fluent speech which is, however, often difficult to make sense of. Very general terms are used, even in response to specific requests for information.

**Conduction aphasia**
This type of aphasia is identified with damage to the arcuate fasciculus and is called conduction aphasia. Individuals suffering from this disorder typically do not have articulation problems. They are fluent, but may have disrupted rhythm because of pauses and hesitations. Comprehension of spoken words is normally good. However, the task of repeating a word or phrase (spoken by someone else) will create major difficulty, with forms such as 'vase' and 'fish' being reported as attempted repetitions of the words 'base' and 'wash'. What is heard and understood cannot be transferred to the speech production area.

Language disorders of these types are almost always the result of injury to the left hemisphere. This left-hemisphere dominance for language has also been demonstrated by another approach to the investigation of language and the brain.

It has been proposed that a language signal received through the left ear is first sent to the right hemisphere and then has to be sent over to the left hemisphere (language center) for processing. This non-direct route will take longer than a linguistic signal which is received through the right ear and goes directly to the left hemisphere. First signal to get processed wins. The right hemisphere appears to have primary responsibility for processing a lot of other incoming signals of a non-linguistic nature. In the dichotic listening test, it can be shown
that non-verbal sounds (e.g. music, coughs, traffic noises, birds singing) are recognized more often via the left ear (i.e. processed faster via the right hemisphere). So, among the specializations of the human brain, the right hemisphere handles non-verbal sounds (among other things) and the left hemisphere handles language sounds (among other things too). It should be noted, however, that more recent research in this area has indicated that the specializations of the two hemispheres may have more to do with the type of 'processing' rather than the type of 'material' which is processed. In effect, the real distinction (at least for the majority of right-handed, monolingual, male adults in the United States) may be between analytic processing, done with the 'left brain', and holistic processing, done with the 'right brain'.

► A Hypothetical Explanation of Conduction Aphasia
Effects of Cortical Lesions on Language Abilities

Language and Cognitive Metaphor

Metaphor is a figure of speech in which a name or descriptive word or phrase is transferred to an object or action different from, but analogous to, that to which it is literally applicable. E.g. - Time is Money, Rock is religion.

Marriage, for example, is understood metaphorically as:

- A Contract agreement
- Team play
- Negotiated settlement
- Russian Roulette
- Indissoluble merger
- Religious sacrament

This raises the question: are metaphors just a device of the poetic imagination and the rhetorical flourish - a matter of extraordinary rather than ordinary language?

Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature. Language is a tool to understand our concept system. We are not normally aware of our concept system. We think and act along certain lines, which are not so obvious. Communication is based on same conceptual system as thinking and acting. Linguistic evidence suggests that the conceptual system is metaphorical in nature.
Let us take the conceptual metaphor:

“ARGUMENT IS WAR“, where:
Concept: Argument
Metaphor: War

Your claims are indefensible.
He attacked every weak point in my argument.
His criticisms were right on target.
I demolished his argument.
I've never won an argument with him.
If you use that strategy, he'll wipe you out.
He shot down all of my arguments.

Argument is thus not a physical battle but a verbal one with the structure: attack, defense, counter-attack. The language of argument is not poetic, fanciful, or rhetorical; it is literal

**Systematicity of metaphorical concepts**

“Arguments” follow patterns: certain things are typically done and others not done in an argument. Expressions from vocabulary of war (indefensible, strategy etc.) form systematic way of talking about battling aspects of argument. Portion of conceptual network of battle characterizes fight aspect of an argument. Metaphorical expressions in everyday language give insight into the metaphorical nature of concepts that structure our actions.

Time is Money as in:
You're wasting my time.
This gadget will save you hours.
How do you spend your time these days?
That flat tire cost me an hour.
I've invested a lot of time in her.
Is that worth your while?
Do you have much time left?
I lost a lot of time when I got sick.

Time is Money
Time is
A valuable commodity
A limited resource used to accomplish goals
Work is associated with time it takes, so it is customary to pay by the hour, week or year.

Time is money in many ways:
  Telephone units
  Hourly wages
  Yearly budgets
  Interest on loans
  Paying debt to society by “serving time”

These practices exist in modern societies and even structure our daily activities. We understand and experience time as something that can be spent, wasted, budgeted, invested wisely/poorly, saved, squandered etc. Thus we metaphorically conceptualise time as money, valuable commodity and a limited resource.

Metaphorical concepts help focus on one aspect of a concept, but hide another. Argument also has a cooperative aspect. The other party gives you his/her time, a valuable commodity, in an effort to have mutual understanding.
The Conduit Metaphor
Ideas (of meanings) are Objects.
Linguistic expressions are Containers.
Communication is Sending.

The speaker puts ideas (objects) into words (containers) and sends them (along a conduit) to a bearer who takes the idea/objects out of the word/containers.

It's hard to get that idea across to him.
I gave you that idea.
It's difficult to put my ideas into words.
Try to pack more thought into fewer words.
The meaning is right there in the words.
His words carry little meaning.
Your words seem hollow.
The sentence is without meaning.
The introduction has a great deal of thought content.

LINGUISTICS EXPRESSIONS ARE CONTAINERS FOR MEANING entails that words (and sentences) have meanings, again independent of contexts and speakers. The Conduit Metaphor is applicable in situations where context differences don’t matter. Participants in a conversation understand the sentences in the same way

Orientational Metaphors:
Up, Down
In, Out
Front, Back
On, Off
The Orientational Metaphor has its basis in our physical and cultural experiences.

E.g. Health and Life are up
He’s at the peak of health
He’s in top shape
As to his health, he’s way up there

e.g. Sickness and Death are down
He fell ill
He came down with the flu
He dropped dead
Physical Basis: Illness forces us to lie down, when healthy, we are up and running.

High status is UP, Low status is DOWN
Good is UP, Bad is DOWN
Conscious is UP, Unconscious is DOWN

Many of our understandings of events like war or systems like information technology are deeply informed by metaphors. For e.g. consider the following excerpt by UC Berkeley Professor George Lakoff on the metaphors used for war:
The Metaphor System Used to Justify War in the Gulf

"Metaphors can kill. The discourse over whether to go to war in the gulf was a panorama of metaphor. Secretary of State Baker saw Saddam Hussein as "sitting on our economic lifeline." President Bush portrayed him as having a "stranglehold" on our economy. General Schwarzkopf characterized the occupation of Kuwait as a "rape" that was ongoing. The President said that the US was in the gulf to "protect freedom, protect our future, and protect the innocent", and that we had to "push Saddam Hussein back." Saddam Hussein was painted as a Hitler. It is vital, literally vital, to understand just what role metaphorical thought played in bringing us in this war.

Metaphorical thought, in itself, is neither good nor bad; it is simply commonplace and inescapable. Abstractions and enormously complex situations are routinely understood via metaphor. Indeed, there is an extensive, and mostly unconscious, system of metaphor that we use automatically and unreflectively to understand complexities and abstractions. Part of this system is devoted to understanding international relations and war. We now know enough about this system to have an idea of how it functions.

The metaphorical understanding of a situation functions in two parts. First, there is a widespread, relatively fixed set of metaphors that structure how we think. For example, a decision to go to war might be seen as a form of cost-benefit analysis, where war is justified when the costs of going to war are less than the costs of not going to war. Second, there is a set of metaphorical definitions that that allow one to apply such a metaphor to a particular situation. In this case, there must be a definition of "cost", including a means of comparing relative "costs". The use of a metaphor with a set of definitions becomes pernicious when it hides realities in a harmful way.
It is important to distinguish what is metaphorical from what is not. Pain, dismemberment, death, starvation, and the death and injury of loved ones are not metaphorical. They are real and in this war, they could afflict hundreds of thousands of real human beings, whether Iraqi, Kuwaiti, or American.

**War as Politics; Politics as Business**

Military and international relations strategists do use a cost-benefit analysis metaphor. It comes about through a metaphor that is taken as definitional by most strategic thinkers in the area of international politics, Clausewitz's Metaphor:

WAR IS POLITICS PURSUED BY OTHER MEANS.

Karl von Clausewitz was a Prussian general whose views on war became dominant in American foreign policy circles during the Vietnam War, when they were seen as a way to rationally limit the use of war as an instrument of foreign policy. Clausewitz is most commonly presented as seeing war in terms of political cost-benefit analysis: Each nation-state has political objectives, and war may best serve those objectives. The political "gains" are to to be weighed against acceptable "costs." When the costs of war exceed the political gains, the war should cease.

There is another metaphor implicit here: POLITICS IS BUSINESS, where efficient political management is seen as akin to efficient business management. As in a well-run business, a well-run government should keep a careful tally of costs and gains. This metaphor for characterizing politics, together with Clausewitz's metaphor, makes war a matter of cost-benefit analysis: defining beneficial "objectives", tallying the "costs", and deciding whether achieving the objectives is "worth" the costs.

_The New York Times_, on November 12, 1990, ran a front-page story announcing that "a national debate has begun as to whether the United States should go to war in the Persian Gulf." The _Times_ described the debate as defined by what I
have called Clausewitz's metaphor (though it described the metaphor as literal), and then raised the question, "What then is the nation's political object in the gulf and what level of sacrifice is it worth?" The "debate" was not over whether Clausewitz's metaphor was appropriate, but only over how various analysts calculated the relative gains and losses. The same was true of the hearings of the Senate Foreign Relations Committee, where Clausewitz's metaphor provided the framework within which most discussion took place.

The broad acceptance of Clausewitz's metaphor raises vital questions: What, exactly, makes it a metaphor rather than a literal truth? Why does it seem so natural to foreign policy experts? How does it fit into the overall metaphor system for understanding foreign relations and war? And, most importantly, what realities does it hide?

To answer these questions, let us turn to the system of metaphorical thought most commonly used by the general public in comprehending international politics. What follows is a two-part discussion of the role of metaphorical reasoning about the gulf crisis. The first part lays out the central metaphor systems used in reasoning about the crisis: both the system used by foreign policy experts and the system used by the public at large. The second part discusses how the system was applied to the crisis in the gulf.

The State-as-Person System

A state is conceptualized as a person, engaging in social relations within a world community. Its land-mass is its home. It lives in a neighborhood, and has neighbors, friends and enemies. States are seen as having inherent dispositions: they can be peaceful or aggressive, responsible or irresponsible, industrious or lazy.

Well-being is wealth. The general well-being of a state is understood in economic terms: its economic health. A serious threat to economic health can thus be seen as a death threat. To the extent that a nation's economy depends on foreign oil, that oil supply becomes a 'lifeline' (reinforced by the image of an oil pipeline).
Strength for a state is military strength. Maturity for the person-state is industrialization. Unindustrialized nations are "underdeveloped", with industrialization as a natural state to be reached. Third-world nations are thus immature children, to be taught how to develop properly or disciplined if they get out of line. Nations that fail to industrialize at a rate considered normal are seen as akin to retarded children and judged as "backward" nations. Rationality is the maximization of self-interest.

There is an implicit logic to the use of these metaphors: Since it is in the interest of every person to be as strong and healthy as possible, a rational state seeks to maximize wealth and military might.

Violence can further self-interest. It can be stopped in three ways: Either a balance of power, so that no one in a neighborhood is strong enough to threaten anyone else. Or the use of collective persuasion by the community to make violence counter to self-interest. Or a cop strong enough to deter violence or punish it. The cop should act morally, in the community's interest, and with the sanction of the community as a whole.

Morality is a matter of accounting, of keeping the moral books balanced. A wrongdoer incurs a debt, and he must be made to pay. The moral books can be balanced by a return to the situation prior to the wrongdoing, by giving back what has been taken, by recompense, or by punishment. Justice is the balancing of the moral books.

War in this metaphor is a fight between two people, a form of hand-to-hand combat. Thus, the US sought to "push Iraq back out of Kuwait" or "deal the enemy a heavy blow," or "deliver a knockout punch." A just war is thus a form of combat for the purpose of settling moral accounts.

The most common discourse form in the West where there is combat to settle moral accounts is the classic fairy tale. When people are replaced by states in such a fairy tale, what results is the most common scenario for a just war. So:
The Fairy Tale of the Just War

Cast of characters: A villain, a victim, and a hero. The victim and the hero may be the same person.

The scenario: A crime is committed by the villain against an innocent victim (typically an assault, theft, or kidnapping). The offense occurs due to an imbalance of power and creates a moral imbalance. The hero either gathers helpers or decides to go it alone. The hero makes sacrifices; he undergoes difficulties, typically making an arduous heroic journey, sometimes across the sea to a treacherous terrain. The villain is inherently evil, perhaps even a monster, and thus reasoning with him is out of the question. The hero is left with no choice but to engage the villain in battle. The hero defeats the villain and rescues the victim. The moral balance is restored. Victory is achieved. The hero, who always acts honorably, has proved his manhood and achieved glory. The sacrifice was worthwhile. The hero receives acclaim, along with the gratitude of the victim and the community.

The fairy tale has an asymmetry built into it. The hero is moral and courageous, while the villain is amoral and vicious. The hero is rational, but though the villain may be cunning and calculating, he cannot be reasoned with. Heroes thus cannot negotiate with villains; they must defeat them. The enemy-as-demon metaphor arises as a consequence of the fact that we understand what a just war is in terms of this fairy tale.

Metaphorical Definition

The most natural way to justify a war on moral grounds is to fit this fairy tale structure to a given situation. This is done by metaphorical definition, that is, by answering the questions: Who is the victim? Who is the villain? Who is the hero? What is the crime? What counts as victory? Each set of answers provides a different filled-out scenario.
As the gulf crisis developed, President Bush tried to justify going to war by the use of such a scenario. At first, he couldn't get his story straight. What happened was that he was using two different sets of metaphorical definitions, which resulted in two different scenarios:

The Self-Defense Scenario: Iraq is villain, the US is hero, the US and other industrialized nations are victims, the crime is a death threat, that is, a threat to economic health.

The Rescue Scenario: Iraq is villain, the US is hero, Kuwait is victim, the crime is kidnap and rape. The American people could not accept the Self-Defense scenario, since it amounted to trading lives for oil. The day after a national poll that asked Americans what they would be willing to go to war for, the administration settled on the Rescue Scenario, which was readily embraced by the public, the media, and Congress as providing moral justification for going to war.

The Ruler-for-State Metonymy

There is a metonymy that goes hand-in-hand with the State-as-Person metaphor: THE RULER STANDS FOR THE STATE. Thus, we can refer to Iraq by referring to Saddam Hussein, and so have a single person, not just an amorphous state, to play the villain in the just war scenario. It is this metonymy that was invoked every time President Bush said "We have to get Saddam out of Kuwait."

Incidentally, the metonymy only applies to those leaders perceived as illegitimate rulers. Thus, it would be strange for us to describe the American invasion of Kuwait by saying, "George Bush marched into Kuwait."

The Experts' Metaphors

Experts in international relations have an additional system of metaphors that are taken as defining a "rational" approach. The principal ones are the Rational Actor metaphor and Clausewitz's metaphor, which are commonly taught as truths in courses on international relations. We are now in a position to show precisely
what is metaphorical about Clausewitz's metaphor. To do so, we need to look at a system of metaphors that is presupposed by Clausewitz's metaphor. We will begin with an everyday system of metaphors for understanding causation:

The Causal Commerce System

The Causal Commerce system is a way to comprehend actions intended to achieve positive effects, but which may also have negative effects. The system is composed of three metaphors:

*Causal Transfer:* An effect is an object transferred from a cause to an affected party. For example, sanctions are seen as "giving" Iraq economic difficulties. Correspondingly, economic difficulties for Iraq are seen as "coming from" the sanctions. This metaphor turns purposeful actions into transfers of objects.

*The Exchange Metaphor for Value:* The value of something is what you are willing to exchange for it. Whenever we ask whether it is "worth" going to war to get Iraq out of Kuwait, we are using the Exchange Metaphor for Value plus the Causal Transfer metaphor.

*Well-being is Wealth:* Things of value constitute wealth. Increases in well-being are "gains"; decreases in well-being are "costs." The metaphor of Well-being-as-Wealth has the effect of making qualitative effects quantitative. It not only makes qualitatively different things comparable, it even provides a kind of arithmetic calculus for adding up costs and gains.

Taken together, these three metaphors portray actions as commercial transactions with costs and gains. Seeing actions as transactions is crucial to applying ideas from economics to actions in general.

Risks

A risk is an action taken to achieve a positive effect, where the outcome is uncertain and where there is also a significant probability of a negative effect. Since Causal Commerce allows one to see positive effects of actions as "gains"
and negative effects as "costs", it becomes natural to see a risky action metaphorically as a financial risk of a certain type, namely, a gamble.

**Risks are Gambles**

In gambling to achieve certain "gains", there are "stakes" that one can "lose". When one asks what is "at stake" in going to war, one is using the metaphors of Causal Commerce and Risks-as-Gambles. These are also the metaphors that President Bush uses when he refers to strategic moves in the gulf as a "poker game" where it would be foolish for him to "show his cards", that is, to make strategic knowledge public.

**The Mathematicization of Metaphor**

The Causal Commerce and Risks-as-Gambles metaphors lie behind our everyday way of understanding risky actions as gambles. At this point, mathematics enters the picture, since there is mathematics of gambling, namely, probability theory, decision theory, and game theory. Since the metaphors of Causal Commerce and Risks-as-Gambles are so common in our everyday thought, their metaphorical nature often goes unnoticed. As a result, it is not uncommon for social scientists to think that the mathematics of gambling literally applies to all forms of risky action, and that it can provide a general basis for the scientific study of risky action, so that risk can be minimized.

**Rational Action**

Within the social sciences, especially in economics, it is common to see a rational person as someone who acts in his own self-interest, that is, to maximize his own well-being. Hard-core advocates of this view may even see altruistic action as being in one's self-interest if there is a value in feeling righteous about altruism and in deriving gratitude from others.
In the Causal Commerce system, where well-being is wealth, this view of Rational Action translates metaphorically into maximizing gains and minimizing losses. In other words:

Rationality is Profit Maximization

This metaphor presupposes Causal Commerce plus Risks-as-Gambles, and brings with it the mathematics of gambling as applied to risky action. It has the effect of turning specialists in mathematical economics into "scientific" specialists in acting rationally so as to minimize risk and cost while maximizing gains.

Suppose we now add the State-as-Person metaphor to the Rationality-as-Profit-Maximization metaphor. The result is:

International Politics is Business

Here the state is a Rational Actor, whose actions are transactions and who is engaged in maximizing gains and minimizing costs. This metaphor brings with it the mathematics of cost-benefit calculation and game theory, which is commonly taught in graduate programs in international relations. Clausewitz's metaphor, the major metaphor preferred by international relations strategists, presupposes this system.

Clausewitz's Metaphor: War is Politics, pursued by other means.

Since politics is business, war becomes a matter of maximizing political gains and minimizing losses. In Clausewitzian terms, war is justified when there is more to be gained by going to war than by not going to war. Morality is absent from the Clausewitzian equation, except when there is a political cost to acting immorally or a political gain from acting morally.

Clausewitz's metaphor only allows war to be justified on pragmatic, not moral, grounds. To justify war on both moral and pragmatic grounds, the Fairy Tale of the Just War and Clausewitz's metaphor must mesh: The "worthwhile sacrifices"
of the fairy tale must equal the Clausewitzian "costs" and the "victory" in the fairy tale must equal the Clausewitzian "gains."

Clausewitz's metaphor is the perfect expert's metaphor, since it requires specialists in political cost-benefit calculation. It sanctions the use of the mathematics of economics, probability theory, decision theory, and game theory in the name of making foreign policy rational and scientific.

Clausewitz's metaphor is commonly seen as literally true. We are now in a position to see exactly what makes it metaphorical. First, it uses the State-as-Person metaphor. Second, it turns qualitative effects on human beings into quantifiable costs and gains, thus seeing political action as economics. Third, it sees rationality as profit-making. Fourth, it sees war in terms of only one dimension of war, that of political expediency, which is in turn conceptualized as business.

**War as Violent Crime**

To bear in mind what is hidden by Clausewitz's metaphor, we should consider an alternative metaphor that is not used by professional strategists nor by the general public to understand war as we engage in it.

**WAR IS VIOLENT CRIME: MURDER, ASSAULT, KIDNAPPING, ARSON, RAPE, AND THEFT.**

Here, war is understood only in terms of its moral dimension, and not, say, its political or economic dimension. The metaphor highlights those aspects of war that would otherwise be seen as major crimes.

There is an Us/Them asymmetry between the public use of Clausewitz's metaphor and the War-as-Crime metaphor. The Iraqi invasion of Kuwait was reported on in terms of murder, theft and rape. The American invasion was never discussed in terms of murder, assault, and arson. Moreover, the US plans for war were seen, in Clausewitzian terms, as rational calculation. But the Iraqi invasion was discussed not as a rational move by Saddam Hussein, but as the work of a
madman. We portrayed Us as rational, moral, and courageous and Them as criminal and insane.

**War as a Competitive Game**

It has long been noted that we understand war as a competitive game like chess, or as a sport, like football or boxing. It is a metaphor in which there is a clear winner and loser, and a clear end to the game. The metaphor highlights strategic thinking, team work, preparedness, the spectators in the world arena, the glory of winning and the shame of defeat.

This metaphor is taken very seriously. There is a long tradition in the West of training military officers in team sports and chess. The military is trained to win. This can lead to a metaphor conflict, as it did in Vietnam, since Clausewitz's metaphor seeks to maximize geopolitical gains, which may or may not be consistent with absolute military victory. Indeed, the right wing myth that the Vietnam War was fought "with one hand tied behind our back" uses the boxing version of the sports metaphor. What is being referred to was the application of Clausewitzian principles in Vietnam to limit our involvement in that war.

**War as Medicine**

Finally, there is a common metaphor in which military control by the enemy is seen as a cancer that can spread. In this metaphor, military "operations" are seen as hygienic, to "clean out" enemy fortifications. Bombing raids are portrayed as "surgical strikes" to "take out" anything that can serve a military purpose. The metaphor is supported by imagery of shiny metallic instruments of war, especially jets.

**The First Days of the War**

All these metaphor systems were apparent in the TV coverage of the first days of the war. The Fairy Tale: American soldiers were "heroes." They had used their
magic weaponry to smite the demonic enemy. There was voluminous TV reportage on the magical quality of the weapons.

Sports: Commanding officers told their troops "This is our Super Bowl." The actual Super Bowl half-time activities mixed war and sports imagery interchangeably. Pilots returning from bombing runs gave each other "high-fives" and waved their index fingers in the air proclaiming "We’re number one!" Casualty estimates was given in the form of a scoreboard. The major American tactic was named after a football play.

Cost-benefit: Within hours of the first bombing, Pentagon officials and Republican politicians started declaring that the enormously expensive development of weapons over the last fifteen years was "well worth it" and a sound investment.

Medicine: Endless pictures of surgical strikes.

In short, the War brought the basic metaphors into full view. Those things highlighted by the metaphors were shown vividly and often. But what was hidden by the metaphors was largely undiscussable.

Application of the Metaphors

Is Saddam Irrational?

The villain in the Fairy Tale of the Just War may be cunning, but he cannot be rational. You just do not reason with a demon, nor do you enter into negotiations with him. The logic of the metaphor demands that Saddam Hussein be irrational. But was he?

Administration policy was confused on the issue. Clausewitz’s metaphor, as used by strategists, assumes that the enemy is rational: He too is maximizing gains and minimizing costs. Our strategy from the outset was to "increase the cost" to Saddam Hussein. That assumed he was rational and was maximizing his self-interest.
At the same time, he was being called irrational. The nuclear weapons argument depends on it. If rational, he should follow the logic of deterrence. We have thousands of hydrogen bombs in warheads. Israel is estimated to have between 100 and 200 deliverable atomic bombs. It would have taken Saddam Hussein at least eight months and possibly five years before he had a crude, untested atomic bomb on a truck. The argument that he would not be deterred by our nuclear arsenal and by Israel's assumes irrationality.

The Hitler analogy also assumes that Saddam is a villainous madman. The analogy presupposes a Hitler myth, in which Hitler too was an irrational demon, rather than a rational self-serving brutal politician. In the myth, Munich was a mistake and Hitler could have been stopped early on had England entered the war then. Military historians disagree as to whether the myth is true. Be that as it may, the analogy does not hold. Whether or not Saddam is Hitler, Iraq wasn't Germany. It has 17 million people, not 70 million. It is economically weak, not strong. It simply was not a threat to the world.

Saddam Hussein is certainly immoral, ruthless, and brutal, but there is no evidence that he is anything but rational. Everything he has done, from assassinating political opponents to invading Kuwait can be see as furthering his own self-interest.

Kuwait as Victim

The classical victim is innocent. To the Iraqis, Kuwait was anything but an innocent ingenue. The war with Iran virtually bankrupted Iraq. Iraq saw itself as having fought that war partly for the benefit of Kuwait and Saudi Arabia, where Shiite citizens supported Khomeini’s Islamic Revolution. Kuwait had agreed to help finance the war, but after the war, the Kuwaitis insisted on repayment of the "loan." Kuwaitis had invested hundreds of billions in Europe, America and Japan, but would not invest in Iraq after the war to help it rebuild. On the contrary, it began what amounted to economic warfare against Iraq by overproducing its oil quota to hold oil prices down.
In addition, Kuwait had drilled laterally into Iraqi territory in the Rumailah oil field and had extracted oil from Iraqi territory. Kuwait further took advantage of Iraq by buying its currency, but only at extremely low exchange rates. Subsequently, wealthy Kuwaitis used that Iraqi currency on trips to Iraq, where they bought Iraqi goods at bargain rates. Among the things they bought most flamboyantly were liquor and prostitutes, widows and orphans of men killed in the war, who, because of the state of the economy, had no other means of support. All this did not endear Kuwaitis to Iraqis, who were suffering from over 70% inflation.

Moreover, Kuwaitis had long been resented for good reason by Iraqis and Moslems from other nations. Capital rich, but labor poor, Kuwait imported cheap labor from other Moslem countries to do its least pleasant work. At the time of the invasion, there were 800,000 Kuwaiti citizens and 2.2 million foreign laborers who were treated by the Kuwaitis as lesser beings. In short, to the Iraqis and to labor-exporting Arab countries, Kuwait is badly miscast as a purely innocent victim.

This does not in any way justify the horrors perpetrated on the Kuwaitis by the Iraqi army. But it is part of what is hidden when Kuwait is cast as an innocent victim. The "legitimate government" of Kuwait is an oppressive monarchy.

What is Victory?

In a fairy tale or a game, victory is well-defined. Once it is achieved, the story or game is over. Neither is the case in the gulf crisis. History continues, and "victory" makes sense only in terms of continuing history.

The president's stated objectives were total Iraqi withdrawal and restoration of the Kuwaiti monarchy. But no one believes the matter will end there, since Saddam Hussein would still be in power. General Powell said in his Senate testimony that if Saddam withdrew and retained his military strength, the US would have to "strengthen the indigenous countries of the region" to achieve a balance of power. Presumably that means arming Assad of Syria, who is every bit as dangerous as Saddam. Would arming another villain count as victory?
What could constitute "victory" in the present war? Suppose we conquer Iraq, wiping out its military capability. How would Iraq be governed? No puppet government that we set up could govern effectively since it would be hated by the entire populace. Since Saddam has wiped out all opposition, the only remaining effective government for the country would be his Ba'ath party. Would it count as a victory if Saddam's friends wound up in power? If not, what other choice is there? And if Iraq has no remaining military force, how could it defend itself against Syria and Iran? It would certainly not be a "victory" for us if either of them took over Iraq. If Syria did, then Assad's Arab nationalism would become a threat. If Iran did, then Islamic fundamentalism would become even more powerful and threatening.

It would seem that the closest thing to a "victory" for the US in case of war would be to drive the Iraqis out of Kuwait; destroy just enough of Iraq's military to leave it capable of defending itself against Syria and Iran; somehow get Saddam out of power, but let his Ba'ath party remain in control of a country just strong enough to defend itself, but not strong enough to be a threat; and keep the price of oil at a reasonably low level.

The problems: It is not obvious that we could get Saddam out of power without wiping out most of Iraq's military capability. We would have invaded an Arab country, which would create vast hatred for us throughout the Arab world, and would no doubt result in decades of increased terrorism and lack of cooperation by Arab states. We would, by defeating an Arab nationalist state, strengthen Islamic fundamentalism. Iraq would remain a cruel dictatorship run by cronies of Saddam. By reinstating the government of Kuwait, we would inflame the hatred of the poor toward the rich throughout the Arab world, and thus increase instability. Even the closest thing to a victory doesn't look very victorious.

If we weaken Iraq's military, the result would most likely be civil war within Iraq. This has been considered by the U.S. administration, which has decided that it could not allow either a Shiite victory (which would strengthen Iran) or a Kurdish victory (which would threaten Turkey). This means that we would not prevent a
defeat, and most likely, a slaughter of Shiites and Kurds by Saddam Hussein’s Sunni minority. Would this be "victory"?

Considering the tens of thousands of man hours that have gone into the planning how to "win" the war, very little time and effort has been spent clarifying what "winning" would be.

The Arab Viewpoint

The metaphors used to conceptualize the gulf crisis hide the most powerful political ideas in the Arab world: Arab nationalism and Islamic fundamentalism. The first seeks to form a racially-based all-Arab nation, the second, a theocratic all-Islamic state. Though bitterly opposed to one another, they share a great deal. Both are conceptualized in family terms, an Arab brotherhood and an Islamic brotherhood. Both see brotherhoods as more legitimate than existing states. Both are at odds with the state-as-person metaphor, which sees currently existing states as distinct entities with a right to exist in perpetuity.

Also hidden by our metaphors is perhaps the most important daily concern throughout the Arab world: Arab dignity. Both political movements are seen as ways to achieve dignity through unity. The current national boundaries are widely perceived as working against Arab dignity in two ways: one internal and one external.

The internal issue is the division between rich and poor in the Arab world. Poor Arabs see rich Arabs as rich by accident, by where the British happened to draw the lines that created the contemporary nations of the Middle East. To see Arabs metaphorically as one big family is to suggest that oil wealth should belong to all Arabs. To many Arabs, the national boundaries drawn by colonial powers are illegitimate, violating the conception of Arabs as a single "brotherhood" and impoverishing millions.

To those impoverished millions, the positive side of Saddam’s invasion of Kuwait was that it challenged national borders and brought to the fore the divisions
between rich and poor that result from those lines in the sand. If there is to be peace in the region, these divisions must be addressed, say, by having rich Arab countries make extensive investments in development that will help poor Arabs. As long as the huge gulf between rich and poor exists in the Arab world, a large number of poor Arabs will continue to see one of the superstate solutions, either Arab nationalism or Islamic fundamentalism, as being in their self-interest, and the region will continue to be unstable.

The external issue is the weakness. The current national boundaries keep Arab nations squabbling among themselves and therefore weak relative to Western nations. To unity advocates, what we call "stability" means continued weakness.

Weakness is a major theme in the Arab world, and is often conceptualized in sexual terms, even more than in the West. American officials, in speaking of the "rape" of Kuwait, were conceptualizing a weak, defenseless country as female and a strong militarily powerful country as male. Similarly, it is common for Arabs to conceptualize the colonization and subsequent domination of the Arab world by the West, especially the US, as emasculation.

An Arab proverb that was reported to be popular in Iraq before the US invasion was "It is better to be a cock for a day than a chicken for a year." The message is clear: It is better to be male, that is, strong and dominant for a short period of time than to be female, that is, weak and defenseless for a long time. Much of the support for Saddam Hussein among Arabs is due to the fact that he is seen as standing up to the US, even if only for a while, and that there is a dignity in this. Since upholding dignity was an essential part of what defined Saddam's "rational self-interest", it should be no surprise that he was willing to go to war to "be a cock for a day." Just surviving a war with the US makes him a hero in much of the Moslem world.

What is Hidden By Seeing the State as a Person?

The State-as-Person metaphor highlights the ways in which states act as units, and hides the internal structure of the state. Class structure is hidden by this
metaphor, as is ethnic composition, religious rivalry, political parties, the ecology, and the influence of the military and of corporations (especially multi-national corporations).

Consider the "national interest." It is in a person's interest to be healthy and strong. The State-as-Person metaphor translates this into a "national interest" of economic health and military strength. But what is in the "national interest" may or may not be in the interest of many ordinary citizens, groups, or institutions, who may become poorer as the GNP rises and weaker as the military gets stronger.

The "national interest" is a metaphorical concept, and it is defined in America by politicians and policy makers. For the most part, they are influenced more by the rich than by the poor, more by large corporations than by small business, and more by developers than ecological activists.

When President Bush argues that going to war would "serve our vital national interests", he is using a metaphor that hides exactly whose interests would be served and whose would not. For example, poor people, especially blacks, are represented in the military in disproportionately large numbers, and in a war the lower classes and those ethnic groups will suffer proportionally more casualties and have their lives disrupted more. Thus war is less in the interest of ethnic minorities and the lower classes than the white upper classes.

Also hidden are the interests of the military itself. It is against the military's interest to have its budget cut, or to diminish its own influence in any way. War justifies the military's importance and its budgetary needs. The end of the cold war promised to reduce the size and influence of the military. This war has guaranteed the continued influence of the military. Given that Air Force General Brent Scowcroft heads the National Security Council and that he played a major role in advising the president to go to war, it would appear as if the military played a decisive role in maintaining its own influence.

Energy Policy
The State-as-Person metaphor defines health for the state in economic terms, with our current understanding of economic health taken as a given, including our dependence on foreign oil. Many commentators argued prior to the war that a change in energy policy to make us less dependent on foreign oil would be more rational than going to war to preserve our supply of cheap oil from the gulf. This argument may have a real force, but it has no metaphorical force when the definition of economic health is taken as fixed. After all, you don't deal with an attack on your health by changing the definition of health. Metaphorical logic pushes a change in energy policy out of the spotlight in the current crisis.

I do not want to give the impression that all that is involved here is metaphor. Obviously there are powerful corporate interests lined up against a fundamental restructuring of our national energy policy. What is sad is that they have a very compelling system of metaphorical thought on their side. If the debate is framed in terms of an attack on our economic health, one cannot argue for redefining what economic health is without changing the grounds for the debate. And if the debate is framed in terms of rescuing a victim, then changes in energy policy seem utterly beside the point.

The "Costs" of War

Clausewitz's metaphor requires a calculation of the "costs" and the "gains" of going to war. What, exactly, goes into that calculation and what does not? Certainly American casualties, loss of equipment, and dollars spent on the operation count as costs. But Vietnam taught us that there are social costs: trauma to families and communities, disruption of lives, psychological effects on veterans, long-term health problems, in addition to the cost of spending our money on war instead of on vital social needs at home, as well as the vast cost of continuing to develop and maintain a huge war machine.

Barely discussed is the moral cost that comes from killing and maiming as a way to settle disputes. And there is the moral cost of using a "cost" metaphor at all.
When we do so, we quantify the effects of war and thus hide from ourselves the qualitative reality of pain and death.

But those are costs to us. Recall that something can be a cost to us only if it is one of our "assets." The "cost-benefit" metaphor therefore rules out certain possible costs. Consider the oil spill in the gulf and the oil well fires, which are major ecological disasters to the region. It was known in advance that Saddam Hussein would cause the spill and start the fires if we invaded. The American military decided that these would be "acceptable costs." What that means is that American soldiers would not be affected that much. But since the ecology of the region is not an American "asset", it could not be a significant "cost" to the US. Had the oil spill and fires occurred in Florida or Texas, the assessment of "cost" would have been very much higher.

What is most ghoulish about the cost-benefit calculation is that it is a zero-sum system: "costs" to the other side count as "gains" for us. In Vietnam, the body counts of killed Viet Cong were taken as evidence of what was being "gained" in the war. Dead human beings went on the profit side of our ledger.

There is a lot of talk of American deaths as "costs", but Iraqi deaths aren't mentioned. The metaphors of cost-benefit accounting and the fairy tale villain lead us to devalue of the lives of Iraqis, even when most of those actually killed will not be villains at all, but simply innocent draftees or reservists or civilians, especially women, children and the elderly.

America as Hero

The classic fairy tale defines what constitutes a hero: it is a person who rescues an innocent victim and who defeats and punishes a guilty and inherently evil villain, and who does so for moral rather than venal reasons. Is America a hero in the Gulf War?

It certainly does not fit the profile very well. First, one of our main goals was to reinstate "the legitimate government of Kuwait." That means reinstating an
absolute monarchy with an abysmal record on human rights and civil liberties. Kuwait is not an innocent victim whose rescue makes us heroic.

Second, the actual human beings who are suffering from our attack are, for the most part, innocent people who did not take part in the atrocities in Kuwait. Killing and maiming a lot of innocent bystanders in the process of nabbing a much smaller number of villains does not make one much of a hero.

Third, in the self-defense scenario, where oil is at issue, America is acting in its self-interest. But, in order to qualify as a legitimate hero in the rescue scenario, it must be acting selflessly. Thus, there is a contradiction between the self-interested hero of the self-defense scenario and the purely selfless hero of the rescue scenario.

Fourth, America may be a hero to the royal families of Kuwait and Saudi Arabia, but it will not be a hero to most Arabs. Most Arabs do not think in terms of our metaphors. A great many Arabs see us as a kind of colonial power using illegitimate force against an Arab brother. To them, we are villains, not heroes.

Fifth, America had been supporting and supplying arms to Saddam Hussein prior to his invasion of Kuwait, during years when he was no less villainous to the Iraqi citizenry. Classic heroes don't help out and provide arms to well-known villains.

America appears as classic hero only if you don't look carefully at how the metaphor is applied to the situation. It is here that the State-as-Person metaphor functions in a way that hides vital truths. The State-as-Person metaphor hides the internal structure of states and allows us to think of Kuwait as a unitary entity, the defenseless maiden to be rescued in the fairy tale. The metaphor hides the monarchical character of Kuwait and the way the Kuwaiti government treats its own dissenters and foreign workers. The State-as-Person metaphor also hides the internal structure of Iraq, and thus hides the actual people who will mostly be killed, maimed, or otherwise harmed in a war. It also hides the political divisions in Iraq between Shiites, Sunnis, and Kurds. The same metaphor also hides the internal structure of the US, and therefore hides the fact that it is the poor and
minorities who will make the most sacrifices while not getting any significant benefit. And it hides the main ideas that drive Middle Eastern politics.

Final Remarks

Reality exists. So does the unconscious system of metaphors that we use without awareness to comprehend reality. What metaphor does is limit what we notice, highlight what we do see, and provide part of the inferential structure that we reason with. Because of the pervasiveness of metaphor in thought, we cannot always stick to discussions of reality in purely literal terms.

There is no way to avoid metaphorical thought, especially in complex matters like foreign policy. I am therefore not objecting to the use of metaphor in itself in foreign policy discourse. My objections are, first, to the ignorance of the presence of metaphor in foreign policy deliberations, second, to the failure to look systematically at what our metaphors hide, and third, to the failure to think imaginatively about what new metaphors might be more benign.

It is in the service of reality that we must pay more attention to the mechanisms of metaphorical thought, especially because such mechanisms are necessarily used in foreign policy deliberations, and because, as we are witnessing, metaphors backed up by bombs can kill.”

Excerpts and ref.: Lakoff, “Metaphor and War”
Language Acquisition

‘Language-acquisition’ can be interpreted as meaning either "the acquisition of language" or "the acquisition of a language".

*Here we consider the chief aspects of LA as described by Pinker:*

1. **Learning** a first language is something every child does successfully, in a matter of a few years and without the need for formal lessons. With language so close to the core of what it means to be human, it is not surprising that children's acquisition of language has received so much attention. Anyone with strong views about the human mind would like to show that children's first few steps are steps in the right direction.

   **a) Modularity.** Do children learn language using a "mental organ," some of whose principles of organization are not shared with other cognitive systems such as perception, motor control, and reasoning? Or is language acquisition just another problem to be solved by general intelligence, in this case, the problem of how to communicate with other humans over the auditory channel

   **b) Human Uniqueness.** A related question is whether language is unique to humans. At first glance the answer seems obvious. Other animals communication with a fixed repertoire of symbols, or with analogue variation like the mercury in a thermometer. But none appears to have the combinatorial rule system of human language, in which symbols are permuted into an unlimited set of combinations, each with a determinate meaning. On the other hand, many other claims about human uniqueness, such as that humans were the only animals to use tools or to fabricate them, have turned out to be false. Some
researchers have thought that apes have the capacity for language but never profited from a humanlike cultural milieu in which language was taught, and they have thus tried to teach apes language-like systems. Whether they have succeeded, and whether human children are really "taught" language themselves, are questions we will soon come to.

c) Language and Thought. Is language simply grafted on top of cognition as a way of sticking communicable labels onto thoughts? Or does learning a language somehow mean learning to think in that language? A famous hypothesis, outlined by Benjamin Whorf asserts that the categories and relations that we use to understand the world come from our particular language, so that speakers of different languages conceptualize the world in different ways. Language acquisition, then, would be learning to think, not just learning to talk. This is an intriguing hypothesis, but virtually all modern cognitive scientists believe it is false. Babies can think before they can talk. Cognitive psychology has shown that people think not just in words but in images and abstract logical propositions. And linguistics has shown that human languages are too ambiguous and schematic to use as a medium of internal computation.

d) Learning and Innateness. All humans talk but no house pets or house plants do, no matter how pampered, so heredity must be involved in language. But a child growing up in Japan speaks Japanese whereas the same child brought up in California would speak English, so the environment is also crucial. Thus there is no question about whether heredity or environment is involved in language, or even whether one or the other is "more important." Instead, language acquisition might be our best hope of finding out how heredity and environment interact.

Language and General Intelligence:
Humans evolved brain circuitry, mostly in the left hemisphere surrounding the sylvian fissure, that appears to be designed for language, though how exactly their internal wiring gives rise to rules of language is unknown. The brain mechanisms underlying language are not just those allowing us to be smart in general. Strokes often leave adults with catastrophic losses in language, though not necessarily impaired in other aspects of intelligence, such as those measured on the nonverbal parts of IQ tests. Similarly, there is an inherited set of syndromes called Specific Language Impairment which is marked by delayed onset of language, difficulties in articulation in childhood, and lasting difficulties in understanding, producing, and judging grammatical sentences. By definition, Specifically Language Impaired people show such deficits despite the absence of cognitive problems like retardation, sensory problems like hearing loss, or social problems like autism.

More interestingly, there are syndromes showing the opposite dissociation, where intact language coexists with severe retardation. These cases show that language development does not depend on fully functioning general intelligence. One example comes from children with Spina Bifida, a malformation of the vertebrae that leaves the spinal cord unprotected, often resulting in hydrocephalus, an increase in pressure in the cerebrospinal fluid filling the ventricles (large cavities) of the brain, distending the brain from within. Hydrocephalic children occasionally end up significantly retarded but can carry on long, articulate, and fully grammatical conversations, in which they earnestly recount vivid events that are, in fact, products of their imaginations.

Another example is Williams Syndrome, an inherited condition involving physical abnormalities, significant retardation (the average IQ is about 50), incompetence at simple everyday tasks (tying shoelaces, finding one's way, adding two numbers, and retrieving items from a cupboard), social warmth and gregariousness, and fluent, articulate language abilities.

*Maturation of the Language System*
The maturation of language circuits during a child's early years may be a driving force underlying the course of language acquisition.

a) Before birth, virtually all the neurons (nerve cells) are formed, and they migrate into their proper locations in the brain. But head size, brain weight, and thickness of the cerebral cortex (gray matter), where the synapses (junctions) subserving mental computation take place, continue to increase rapidly in the year after birth. Long-distance connections (white matter) are not complete until nine months, and they continue to grow their speed-inducing myelin insulation throughout childhood.

b) Synapses continue to develop, peaking in number between nine months and two years (depending on the brain region), at which point the child has 50% more synapses than the adult. Metabolic activity in the brain reaches adult levels by nine to ten months, and soon exceeds it, peaking around the age of four. In addition, huge numbers of neurons die in utero, and the dying continues during the first two years before leveling off at age seven.

c) Synapses wither from the age of two through the rest of childhood and into adolescence, when the brain’s metabolic rate falls back to adult levels. Perhaps linguistic milestones like babbling, first words, and grammar require minimum levels of brain size, long-distance connections, or extra synapses, particularly in the language centers of the brain.

d) Similarly, one can conjecture that these changes are responsible for the decline in the ability to learn a language over the lifespan. The language learning circuitry of the brain is more plastic in childhood; children learn or recover language when the left hemisphere of the brain is damaged or even surgically removed (though not quite at normal levels), but comparable damage in an adult usually leads to permanent aphasia.
The Course of Language Acquisition

Language acquisition begins very early in the human lifespan, and begins, logically enough, with the acquisition of a language’s sound patterns.

a) The main linguistic accomplishments during the first year of life are control of the speech musculature and sensitivity to the phonetic distinctions used in the parents’ language. Interestingly, babies achieve these feats before they produce or understand words, so their learning cannot depend on correlating sound with meaning. That is, they cannot be listening for the difference in sound between a word they think means bit and a word they think means beet, because they have learned neither word. They must be sorting the sounds directly, somehow tuning their speech analysis module to deliver the phonemes used in their language. The module can then serve as the front end of the system that learns words and grammar.

b) Shortly before their first birthday, babies begin to understand words, and around that birthday, they start to produce them. Words are usually produced in isolation; this one-word stage can last from two months to a year. Children’s first words are similar all over the planet. About half the words are for objects: food (juice, cookie, body parts (eye, nose), clothing (diaper, sock), vehicles (car, boat), toys (doll, block), household items (bottle, light, animals (dog, kitty), and people (dada, baby). There are words for actions, motions, and routines, like (up, off, open, peekaboo, eat, and go, and modifiers, like hot, allgone, more, dirty, and cold. Finally, there are routines used in social interaction, like yes, no, want, bye-bye, and hi -- a few of which, like look at that and what is that, are words in the sense of memorized chunks, though they are not single words for the adult. Children differ in how much they name objects or engage in social interaction using memorized routines, though all children do both.

c) Around 18 months, language changes in two ways. Vocabulary growth increases; the child begins to learn words at a rate of one every two waking hours, and will keep learning that rate or faster through adolescence (Clark,
1993; Pinker, 1994). And primitive syntax begins, with two-word strings like the following:

<table>
<thead>
<tr>
<th>All dry.</th>
<th>All messy.</th>
<th>All wet.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I sit.</td>
<td>I shut.</td>
<td>No bed.</td>
</tr>
<tr>
<td>No pee.</td>
<td>See baby.</td>
<td>See pretty.</td>
</tr>
<tr>
<td>Other pocket.</td>
<td>Boot off.</td>
<td>Siren by.</td>
</tr>
<tr>
<td>Our car.</td>
<td>Papa away.</td>
<td>Dry pants.</td>
</tr>
</tbody>
</table>

Children's two-word combinations are highly similar across cultures. Everywhere, children announce when objects appear, disappear, and move about, point out their properties and owners, comment on people doing things and seeing things, reject and request objects and activities, and ask about who, what, and where. These sequences already reflect the language being acquired: in 95% of them, the words are properly ordered.

d) Between the late two's and mid-three's, children's language blooms into fluent grammatical conversation so rapidly that it overwhelms the researchers who study it, and no one has worked out the exact sequence. Sentence length increases steadily, and because grammar is a combinatorial system, the number of syntactic types increases exponentially, doubling every month, reaching the thousands before the third birthday.

Normal children can differ by a year or more in their rate of language development, though the stages they pass through are generally the same regardless of how stretched out or compressed. Adam's language development, for example, was relatively leisurely; many children speak in complex sentences before they turn two.

During the grammar explosion, children's sentences are getting not only longer but more complex, with fuller trees, because the children can embed one constituent inside another. Whereas before they might have said Give doggie
paper (a three-branch Verb Phrase) and Big doggie (a two-branch Noun Phrase),
they now say Give big doggie paper, with the two-branch NP embedded inside
the three-branch VP. The earlier sentences resembled telegrams, missing
unstressed function words like of, the, on, and does, as well as inflections like -
ed, -ing, and -s.

e) By the 3's, children are using these function words more often than they are
omitting them, many in more than 90% of the sentences that require them. A full
range of sentence types flower -- questions with words like who, what and where,
relative clauses, comparatives, negations, complements, conjunctions, and
passives. These constructions appear to display the most, perhaps even all, of
the grammatical machinery needed to account for adult grammar. Though many
of the young 3-year-old's sentences are ungrammatical for one reason or
another, it is because there are many things that can go wrong in any single
sentence. When researchers focus on a single grammatical rule and count how
often a child obeys it and how often he or she versus flouts it, the results are very
impressive: for just about every rule that has been looked at, three-year olds
obey it a majority of the time. As we have seen, children rarely scramble word
orders and, by the age of three, come to supply most inflections and function
words in sentences that require them.

Explaining Language Acquisition

Several kinds of mechanisms are at work. The brain changes after birth, and
these maturational changes may govern the onset, rate, and adult decline of
language acquisition capacity. General changes in the child's information
processing abilities (attention, memory, short-term buffers for acoustic input and
articulatory output) could leave their mark as well. In the next chapter, I show
how a memory retrieval limitation -- children are less reliable at recalling that
broke is the past tense of break -- can account for a conspicuous and universal
error pattern, overregularizations like breaked.

Complex forms are sometimes first used in simpler approximations. Russian
contains one case marker for masculine nominative (i.e., a suffix on a masculine
noun indicating that it is the subject of the sentence), one for feminine
nominative, one for masculine accusative (used to indicate that a noun is a direct
object), and one for feminine accusative. Children often use each marker with the
correct case, never using a nominative marker for accusative nouns or vice-
versa, but don’t properly use the masculine and feminine variants with masculine
and feminine nouns.

Learnability Theory

Learnability theory has defined learning as a scenario involving four parts

1. A class of languages. One of them is the "target" language, to be attained by the learner, but the learner does not, of course, know which it is. In the case of children, the class of languages would consist of the existing and possible human languages; the target language is the one spoken in their community.

2. An environment. This is the information in the world that the learner has to go on in trying to acquire the language. In the case of children, it might include the sentences parents utter, the context in which they utter them, feedback to the child (verbal or nonverbal) in response to the child's own speech, and so on. Parental utterances can be a random sample of the language, or they might have some special properties: they might be ordered in certain ways, sentences might be repeated or only uttered once, and so on.

3. A learning strategy. The learner, using information in the environment, tries out "hypotheses" about the target language. The learning strategy is the algorithm that creates the hypotheses and determines whether they are consistent with the input information from the environment. For children, it is the "grammar-forming" mechanism in their brains; their "language acquisition device."
4. A success criterion. If we want to say that "learning" occurs, presumably it is because the learners' hypotheses are not random, but that by some time the hypotheses are related in some systematic way to the target language. Learners may arrive at a hypothesis identical to the target language after some fixed period of time; they may arrive at an approximation to it; they may waiver among a set of hypotheses one of which is correct.

*Children clearly need some kind of linguistic input to acquire a language.*

Children do not, however, need to hear a full-fledged language; as long as they are in a community with other children, and have some source for individual words, they will invent one on their own, often in a single generation. Children who grew up in plantations and slave colonies were often exposed to a crude pidgin that served as the lingua franca in these Babels of laborers. But they grew up to speak genuinely new languages, expressive "creoles" with their own complex grammars. The sign languages of the deaf arose in similar ways. Indeed, they arise spontaneously and quickly wherever there is a community of deaf children. Children most definitely do need to hear an existing language to learn that language, of course. Children with Japanese genes do not find Japanese any easier than English, or vice-versa; they learn whichever language they are exposed to. The term "positive evidence" refers to the information available to the child about which strings of words are grammatical sentences of the target language.

*(Adapted from Steven Pinker, “Language Acquisition”)*
Language Sounds and Meanings

The phonic medium can be studied from three points of view:

1. **Articulatory phonetics** investigates and classifies speech-sounds in terms of the way they are produced by the speech-organs
2. **Acoustic phonetics**, in terms of the physical properties of the sound-waves that are created by the activity of the speech-organs and travel through the air from speaker to hearer
3. **Auditory phonetics**, in terms of the way speech-sounds are perceived and identified by the hearer's ear and brain. Of these three branches of phonetics, the longest established, and until recently the most highly developed, is articulatory phonetics.

There are, however, several facts that have been either discovered or confirmed by acoustic and auditory phonetics - and more especially by the former, which has made great progress in the last twenty-five or thirty years - of which no one with a serious interest in language can afford to be ignorant. Most important of these perhaps is the fact that repetitions of what might be heard as the same utterance are only coincidentally, if ever, physically (i.e. acoustically) identical. Phonetic identity (unlike phonological identity, as we shall see in the following section) is a theoretical ideal: in practice, the speech-sounds produced by human beings -even by highly trained phoneticians - do no more than approximate to this ideal to a greater or less degree. Phonetic similarity, not phonetic identity, is the criterion with which we operate in the phonological analysis of languages. And phonetic similarity, considered from an articulatory, an acoustic or an auditory point of view is multidimensional. Given three speech-sounds, x, y, and z: x may be more similar to y than it is to z on one dimension, but more similar to z than it is to y on another dimension.
Acoustic phonetics has also confirmed what had already been established by articulatory phonetics: the fact that spoken utterances, considered as physical signals transmitted through the air, are not sequences of separate sounds. Speech is made up of continuous bursts of sound. Not only are there no breaks between the sounds of which spoken words are composed; the words themselves are not usually separated by pauses (except of course when the speaker hesitates momentarily or adopts a special style of delivery for dictation or some other purpose). Continuous speech is segmented into sequences of speech-sounds in terms of the more or less grossly discernible transitions between one relatively steady state of the signal and a preceding or following relatively steady state. This point will be exemplified below from the articulatory point of view. It is important to note, however, that segmentation on the basis of purely acoustic criteria would frequently give quite different results from segmentation carried out on the basis of purely articulatory (or auditory) criteria. The integration of the three branches of phonetics is no simple matter. One of the most important, and initially most surprising, findings of acoustic phonetics was that no straightforward correlation can be established between some of the most prominent articulatory dimensions of speech and such acoustic parameters as the frequency and amplitude of sound-waves. To make the point more generally, in relation to all three branches of phonetics: the categories of articulatory, acoustic and auditory phonetics do not necessarily coincide. For example, what might seem to be obvious articulatory and auditory differences between different kinds of consonants, let us say between p-sounds and r-sounds or A-sounds, do not show up as any single identifiable feature, or set of features, in an acoustic analysis of signals containing them. The auditory dimensions of pitch and loudness correlate with the acoustic parameters of frequency and intensity; but the correlation between pitch and frequency, on the one hand, and between loudness and intensity on the other, is not stateable in terms of a fixed ratio valid for the whole range of speech-sounds varying along the relevant dimensions. This does not mean that the categories of one branch of phonetics are more or less reliable, or intrinsically more or less scientific, than the categories of any
other branch of phonetics. Speaking and hearing, it must be remembered, are not independent activities. Each involves feedback from the other. It is a matter of common observation that when someone goes deaf his speech also tends to deteriorate. This is because we normally monitor our production of speech as we are producing it and, for the most part unconsciously, make the necessary adjustments to the settings of what we may think of as the articulatory apparatus, as and when feedback from this monitoring process tells the brain—that the auditory norms are not being met. The acoustic signal contains all the information that is linguistically relevant, but it also contains a lot of information that is not. Furthermore, the acoustic information that is linguistically relevant must be interpreted by the human speaker-hearer mechanisms controlled by the human brain. The new-born baby seems to be endowed with a predisposition to concentrate upon certain kinds of acoustic information and to neglect others. In the acquisition of language he perfects the ability to produce and to identify the sounds that occur in the speech that he hears around him; and he refines both his articulatory and his auditory performance by monitoring the acoustic signals that he himself produces. There is a sense, therefore, in which the child, in the normal process of language-acquisition, is, and must be, without the aid of scientific instruments or specialized training and over a limited range of the phonic medium, a competent practitioner in all three branches of phonetics, and, more especially, in the integration of the quite disparate information that the three branches operate with. So far, the professional phoneticians can give only an incomplete description and explanation of the highly skilled integrative ability that the vast majority of human beings acquire in childhood and practise throughout their speaking lives.

The so-called speech-organs have other functions, unconnected with speech and even with the production of sound, and that these other functions are biologically primary. The lungs supply oxygen to the blood; the vocal cords (situated in the larynx, or Adam’s apple) serve, when brought together, to close off the trachea, or windpipe, and prevent food from entering; the tongue and teeth are used for
eating; and so on. Nevertheless, the speech-organs do constitute what might be reasonably described as a secondary biological system, and there is some evidence of their evolutionary adaptation to the production of speech. In articulatory phonetics, speech-sounds are classified in terms of the speech-organs that produce them and the manner in which they are produced.

Most speech-sounds in all languages are produced by modifying, in some way, the airstream that is expelled by the lungs up the windpipe, through the glottis (the space between the vocal cords) and along the vocal tract. The vocal tract runs from the larynx, at one end, to the lips and nostrils at the other. If the vocal cords are kept close together and made to vibrate as the air passes through the glottis the sound thus produced is voiced; if the air passes through without vibration of the vocal cords, the resultant sound is voiceless. This yields one of the major articulatory variables. Most vowels in all languages, and all vowels in English (except in whispered speech), are voiced. But both voiced and voiceless consonants are common throughout the languages of the world, even though the distinction between voiced and voiceless
Voiceless consonants include [p], [t], [k], [s], [f]; the corresponding voiced sounds are [b], [d], [g], [z], [v]. When the IPA does not provide two different letter-symbols for corresponding voiced and voiceless speech sounds, diacritics can be used to draw the distinction. The diacritic for voicelessness is a small circle below the letter-symbol. For example, the IPA makes the assumption that vowels are voiced unless they are explicitly marked as voiceless, so that [a], [e], [i], etc. are the voiceless counterparts of the voiced vowels [a], [e], [i], etc. It is important to note that, despite the fact that diacritics are used in the one case, but not in
the other, the phonetic relationship between [a] and [a], or [e] and [e], is exactly
the same as that between [b] and [p], or [d] and [t].

Another important articulatory variable is that of nasality. If the velum, or soft
palate, is lowered at the back of the throat to keep open the passage into the
nasal cavity, air can escape through the nose at the same time as it also
emerges from the mouth. Speech-sounds produced in this way are nasal, in
contrast with non-nasal (or oral) sounds, in the production of which there is no
emission of air through the nose. Possible nasal consonants include [m], [n] and
[n], all of which occur in English, [n] as the final sound in forms like wrong, sing
(in the RP pronunciation of them). Nasal consonants are assumed to be voiced
unless they are marked as voiceless with the appropriate diacritic: [m], [n],
[g], etc. As [b] contrasts with [p] and [m] with [m] on the dimension of voice, so [m]
contrasts with [bj and [m] with [p] on the dimension of nasality. Similarly for [d]:
[t]:
[n]:[n], and for [g]:[k]:[n]:[r]j. Vowels are assumed to be oral unless they are
explicitly marked as nasal by means of a so-called tilde [~~] above the appropriate
letter-symbol. Thus, [a], [e], etc. are the (voiced) nasal counterparts of [a], [e],
etc. Once again, it is important to realize that [b], [p] and [m], [d], [t] and [n], and
[g], [k] and [n] are related to one another phonetically in precisely the same way
as [a], [a] and [a].

A third articulatory dimension is that of aspiration. Aspirated sounds differ from
the corresponding unaspirated sounds in that the former are produced with an
accompanying small puff of breath. (Actually, aspiration is more properly treated
as an aspect of the-voice/voiceless distinction rather than as being a completely
independent variable. It depends upon the timing of the switching on and off of
voice relative to concomitant articulatory processes. There are other secondary
articulations that we shall not go into here: glottalization, palatalization,
labialization, velarization, etc.) Aspirated consonants, usually voiceless, occur in
many languages, including English, as we shall see later. Instead of using the
IPA diacritic for aspiration, we shall follow what is the more common practice nowadays and put a raised letter aitch immediately after the appropriate IPA letter-symbol. Thus [pʰ] is the aspirated counterpart of [p].

As far as their articulation is concerned, consonants differ from vowels in that consonants are produced by temporarily obstructing or restricting the airstream as it passes through the mouth, whereas vowels are produced without any obstruction or restriction of the airstream. The phonetic difference between consonants and vowels is not, in fact, absolute; and there are certain speech-sounds which have an intermediate status. In the brief and simplified exposition of the main concepts of articulatory phonetics that is being given here we need not go into such details.

Consonants may be subdivided into several groups according to the nature of the obstruction of the airstream. The obstruction may be total, resulting in a stop (or occlusive), or partial; if it is partial, but such as to cause audible friction, the resultant sound is classified as a fricative. Typical stops are [p], [t] and [k]; typical fricatives are [f] and [s]. Consonants are also classified, on another articulatory dimension, in terms of their place of articulation: i.e. according to the place in the mouth where the obstruction occurs. There are indefinitely many points along the vocal tract at which the breath can be obstructed by the articulators: vocal cords, tongue, teeth, lips, etc. No language makes use of more than a small number of these. The following places of articulation are among those used in English and other familiar languages (with or without secondary articulations of various kinds):

- bilabial (or simply labial), the lips being brought together, e.g. [p], [b], [m].
- labiodental, the lower lip being brought into contact with the upper teeth, e.g. [f], [v]. Whereas [p], [b], [m] are stops, [f], [v] are fricatives. (Bilabial fricatives and labiodental stops, both oral and nasal, are less common, but do occur.)
- dental, the tip of the tongue being brought into contact with the upper teeth, e.g.
alveolar, the tip of the tongue being brought into contact with the alveolar ridge (the upper teeth-ridge), e.g. [t], [d], [n], [s], [z]. It should be noted that the same symbols may be used, in a broad transcription, for both dental and alveolar stops, though the IPA provides diacritics to distinguish the one class from the other, if it is necessary to do so. The initial consonants of English thick and this are dental fricatives, voiceless and voiced respectively, transcript-able as [9] and [6], whereas the [t]-, [d]- and [n]-sounds of most accents of English (in most positions of a word) are alveolar (unlike the [t]-, [d]- and [n]-sounds of French, Spanish or Russian or, for [t] and [d] at least, Italian).

palatal, the front of the tongue being brought in contact with the hard palate, e.g. the stops [c] and [j] and the fricatives [c] and [j].

velar, the back of the tongue being brought into contact with the velum, or soft palate, e.g. the stops [k] and [g] and the fricatives, [x] and [y]. The difference between palatals and velars, like the difference between dentals and alveolars, is a matter of degree (more so than, for example, the difference between labials and dentals, or between dentals and palatals). Though palatals are not common in most positions of a word in English, the voiceless palatal fricative, ' [c] is found in German (in most dialects), Castilian, Spanish and Modern Greek, as well as being one of the possible RP pronunciations of the initial consonant of an English form like hue (the letter <h> in English covers a range of sounds the quality of which is largely determined by the accompanying vowel). The sounds that correspond in the English writing-system to the letters <k> and <c> are, in most phonetic environments, varieties of velars, but in certain positions (as is also the case for many languages) they come close to being palatals, e.g. in key and cue. The voiceless velar fricative [x] does not occur in RP, but is found as the final consonant in a' Scottish pronunciation of loch and is common in German and some dialects of Spanish. The voiced velar fricative [y] is rarer in European languages than its voiceless counterpart, but it does occur in Modern Greek (and in some dialects of Russian).
glottal, the vocal cords being brought momentarily together, e.g. the stop P] and
the fricatives [h] and [fi], voiceless and voiced respectively. Since the vocal cords
cannot be vibrating when fully closed, there is no voiced glottal stop, though both
voiceless and voiceless glottal fricatives exist. The glottal stop occurs as what is
often perceived as a socially stigmatized variant of a [t]-sound between vowels,
in forms like city, united, butter, in many urban accents of England and Scotland
including those of London (Cockney), Manchester, Birmingham and Glasgow (as
well as occurring, unnoticed as such, in other phonetic environments, even in
RP). It is important to emphasize, therefore, that it is from a phonetic point of
view a perfectly respectable, independent consonant, not to be confused with [t],
and is widespread in the languages of the world.

Many other places of articulation are recognized by the IPA for the classification
of consonants, and some of them need to be referred to in a complete phonetic
description of English. For the purpose of illustrating the general principles of the
articulatory classification of consonants the above will suffice. The symbols
introduced so far (and a few others) are given in Table i. It will be noted that
whereas the vertical dimension of the table represents what may be regarded as
a single articulatory parameter (if we neglect co-articulation and secondary
articulations), the horizontal dimension of the table does not. There is a
hierarchical arrangement of stops vs. fricatives, with stops being further
subclassified as oral vs. nasal and both stops and fricatives being subclassified
as voiceless vs. voiced. The multi-dimensionality of what is called manner of
articulation, in contrast with the essential unidimensionality of place of
articulation, would be even more obvious if we were to go more fully into the
classification of consonants (distinguishing such classes as rolls, flaps, liquids,
etc.). Let us keep this point in mind.

Since vowels (in so far as they can be sharply distinguished from consonants)
are characterized by the absence of obstruction of the airstream in the mouth,
they do not have a place of articulation in the same sense as Table I. Selected
We possess a
Sound organizer
Sound producer
Receiver
Interpreter

Recognizing Sounds entails:

Telling noise from signal
Humans are “tuned in” to sounds of their own species
It’s a far advanced ability than producing sound
Reception and Production skills are separate
“Categorical Reception”
The primate ear is highly sensitive
Recognizing the mood of the speaker

Making Noises
The Respiratory Component
The Phonatory Component
The Articulatory Component
The Respiratory Component

These are required to puff out the wind. According to Charles Darwin lungs developed from swim bladders, inflated sacs which allow fish to float. But recent studies have shown that swim bladders arose from lungs.
VOICE – BOX or LARYNX

a) Needed to transform the air into noise.
b) Contains the vocal folds (or chords), thin strips of membrane deep in the throat.
c) Human larynx is more streamlined than that of other primates.
d) More lower in the throat.

Why is the Larynx lower in humans? The reason to this is still unclear. But according to one theory, primates developed hand-eye coordination for food gathering, leading to sophisticated sight, but weaker smelling capacities. Consequently, primate muzzles became shorter which in turn reduced the size of the upper jaw but not of the tongue. As this became thicker and more muscular in humans, it may have pushed the Larynx down in the neck. The lowered Larynx led to our modern-day human vocal tract. This section is shaped like an upside-down L which runs from top of the Larynx to the mouth. This L-shape increased the number of sounds which could be pronounced and also their clarity.

The Articulatory Components

Muscular Tongue, even sized teeth and powerful lips.
These are necessary for a wide range of sounds
These sounds include the Syllables which are the basic frame for speech sounds.
The core of a syllable is the Vowel.

Vowels and Consonants

Vowels are made by altering the flow of air from the lungs via different tongue shapes.
This is possible because humans have a good control over their tongue and also because humans can produce vowels via the mouth rather than the nose.
Three extreme vowels are “I” “A” “U”.
The Vowel “I”
This vowel is particularly important. It is produced with the tongue pushed forward with the front part raised, a so called “high front vowel”.

The Vowel “U”
This is the counterbalance of “I”. It’s a high back vowel in which the tongue is pulled back, with the back part raised.

The Vowel “A”
This is the 3\textsuperscript{rd} of the trio and is produced with the mouth fairly open and the tongue low and fairly central.

Consonants
Primate lip-smacks use essentially the same mechanism as humans do for “P”, “B” and “M” – and these are among the first sounds produced by human infants.
Primates can move the tip of the tongue up against the teeth and roof of the mouth to produce sounds such as “D”, “S” and “T” but only humans can produce “K” and “G”. Finally, an overall control system is needed to co-ordinate it all:

“The utterance of even a simple one-syllable word requires the co-ordination in time and space of over 70 muscles and 8 to 10 different body parts, ranging from the diaphragm to the lips .”

Although language-systems are, to a very considerable extent, independent of the medium in which they are manifest, the natural or primary medium of human language is sound. For this reason, the study of sound is of more central
importance in linguistics than is the study of writing, of gestures, or of any other
language-medium, whether actual or potential. But it is not sound as such, and
not the full range of sound, that is of concern to the linguist. He is interested in
the sounds that are produced by the human speech-organs in so far as these
sounds have a role in language. Let us refer to this limited range of sounds as
the phonic medium and to individual sounds within that range as speech-sounds.
We may now define phonetics as the study of the phonic medium.

A close (or high) vowel is one in the production of which the jaws are held close
together (because the tongue is high in the mouth); in contrast, the production of
an open (or low) vowel involves the opening of the mouth more widely (because
of the lowering of the tongue). Both [i] and [u] are close (high), and both [a] and
[a] open (low).

A front vowel is one produced by holding the tongue (more precisely, the highest
point of the tongue, since it is of course fixed at its root in the back of the mouth)
towards the front of the mouth; a back vowel involves retraction of the tongue.
Both [i] and [a] are front, and both [u] and [a] back.

A rounded vowel is produced with the lips rounded; an unrounded vowel is
produced without lip-rounding. [u], [o] and [3] are round
ed; [i], [e], [e] and [a] are unrounded. Cardinal vowel no. 5, [a], being maximally
open, is also unrounded.

There are several theories of phonology. They may be distinguished as being
either phonemic or non-phonemic theories, according to whether they take
phonemes to be the basic elements of phonological analysis or not. Of phonemic
theories of phonology, what may be referred to as classical American phonemics,
though it has now been abandoned by most linguists, is of considerable
importance for an understanding of the development of more modern theories.
Phonemes are defined with reference to two principal criteria: (a) phonetic
similarity and (b) distribution (subject to the overriding criterion, which finds its
application in all theories of phonology, of functional contrast: see below). As we
saw in the previous section, phonetic similarity is a matter of more or less, and is multidimensional. It follows that a particular speech-sound may be similar to a second speech-sound on one or more dimensions, whilst differing from it and being similar to a third speech-sound on one or more other dimensions. The practical consequence of this fact, as far as phonemic analysis is concerned, is that the analyst is often faced with alternative solutions when it comes to the problem of deciding which phonetically similar speech-sounds should be grouped together as variants, more technically allophones, of the same phoneme. At that point, various supplementary criteria may be applied (which we shall neglect). However, there may still be room for disagreement as to how many phonemes there are in a particular language and what their allophones are in their various contexts of occurrence, even when these supplementary criteria have been invoked. Despite the impression that is given in many textbooks of the period, there is little doubt that classical American phonemics fails, with many languages, to yield a unique and universally acceptable analysis of their phonology.

Distribution:
The distribution of an entity is the set of contexts in which it occurs throughout the sentences of a language. The term 'entity' is to be taken in as general a sense as possible. As far as the present section is concerned, it may be held to include speech-sounds and phonetic features, on the one hand, and phonemes, on the other. The notion of distribution presupposes the notion of well-formedness. What this means, as far as phonology is concerned, is that we must operate, not simply with the actual forms of the language-system, but with the set of phonetically and phonologically well-formed forms, both actual and potential. In all natural languages there are actual forms in more or less common use (frequently borrowed from other languages) which do not conform to the more general phonological patterns and there are many non-existent forms which speakers of the language will recognize as being, in the relevant sense, potential forms of their language: i.e. as conforming to the general patterns. To take a now
classic example: [brik] is both a potential and an actual word-form of English (in broad phonetic transcription), cf. brick; [blik] is a potential, but non-actual, form. *[bnik], on the other hand, is not only not an actual word-form of English, it is phonologically ill-formed (hence the asterisk): there are no well-formed forms of English beginning with [bn].

To the extent that languages are rule-governed systems, every linguistic entity that is subject to the rules of a language-system has a characteristic distribution. Two or more entities have the same distribution if and only if they occur in the same environment - i.e. they are substitutable for one another, intersubstitutable - in all contexts (subject to the condition of well-formedness). Entities that are intersubstitutable in some, but not all, contexts overlap in distribution: distributional identity can therefore be seen as the limiting case of distributional overlap and, if "some" is held to subsume "all", be so defined that it falls within the definition of 'overlap'. Let us henceforth so define it. Entities that are not intersubstitutable in any context are said to be in complementary distribution.

We can now apply these notions to the problem of defining phonemes and their allophones. First, it should be noted that two speech-sounds cannot be in functional contrast unless they overlap in distribution: in particular, speech-sounds that do not overlap in distribution cannot have the function of distinguishing one form from another. For example, there are several phonetically different [I]-sounds in the RP pronunciation of English. Most of them fall into two sets, impressionistically referred to as clear and dark (the members of the two sets may have the same primary place of articulation, but differ as to whether the main part of the tongue is towards the front or the back of the mouth), which never occur in the same position in word-forms: the clear [I]'s occur before front vowels within word-forms and the dark [I]'s in all other positions. This being so, the substitution of a clear [I] for the normal dark [I] in, say, feel cannot change it into another form (though it might have the effect of making it sound, in this respect, Irish or French); similarly, the substitution of the dark [I] for the normal clear [I] of, say, leaf cannot change it into another word-form, actual or potential.
More generally, since all the [l]-sounds, whether clear or dark, are in complementary distribution, they cannot be in functional contrast. They satisfy both of the conditions mentioned above as definitional for the phoneme, phonetic similarity and complementary distribution, and would be universally assigned to a single phoneme as its allophones: its phonetically distinct, positional variants. It is of the essence of phonological elements that they should be in functional contrast at least somewhere in the language-system.

Allophones are subphonemic. Nevertheless, they have a rule-governed distribution: in that respect they belong to the language-system as it is realized in the phonic medium. But they are not elements of the language-system. The elements of a language-system (according to phonemic theories of phonology) are its phonemes. Phonemes are, by convention, represented by taking the letter-symbol (with or without diacritics) appropriate to a broad transcription of one of the phonetically distinguishable allophones and putting it between obliques. For example, the English phoneme /l/ has as its allophones a set of phonetically distinct speech-sounds, all of which could be kept apart, if necessary, in a narrow transcription. So, we now have yet another way of referring to forms: phonemically, or more generally, if we generalize the use of oblique strokes (as we shall in this book), phonologically. It is important to realize, as should be obvious from the explanation given above, that a phonemic representation is not simply a broad phonetic transcription.

One other point should be made. All too often, textbooks of linguistics give an imprecise, not to say nonsensical, formulation of the principle of functional contrast. They might say, for example, that the substitution of a clear [l] for a dark [l] in feel does not change the meaning of feel, whereas the substitution of [r] for [l] in lamb changes its meaning. Strictly speaking, this is wrong. What the substitution of [r] for [l] in lamb does is to change the form, not the meaning: it changes the form lamb into the form ram. True, 'lamb' and 'ram' (i.e. the words of which lamb and ram are forms) differ in meaning, so that utterances containing them will (generally) differ in meaning. But it is not just unmotivated pedantry
which leads me to call attention to the frequently imprecise formulation of the principle of functional contrast. Difference of form does not guarantee difference of meaning (cf. the phenomenon of synonymy). Nor is difference of meaning the sole criterion whereby we establish difference of form. Whether there can ever be a difference of form which does not correlate at some point in a language-system with a difference of meaning is a controversial question, partly dependent on how we define 'meaning'. But there is no doubt that what is at issue in the formulation of the principle of functional contrast is identity and difference of form, not identity and difference of meaning.

Distributional overlap is a necessary, but not a sufficient, condition of functional contrast. It is quite common for phonetically different speech-sounds to be intersubstitutable in the same context and yet to be in free variation: i.e. not to be in functional contrast. For example, [p] and [t] are in free variation, for many RP speakers of English, in forms like brightness, [. . . '•>n . . .] vs. [. . . tn . . .] or that bloke, [. . . ^b . . .] vs. [. . . tb . . .]: i.e. before stop consonants whether oral or nasal. Here the substitution of one speech-sound for the other does not change brightness or that bloke into some other form. Indeed, it might very well pass unnoticed. In other cases of what is, for the purpose of phonemic analysis, normally regarded as free variation, the choice of one pronunciation rather than another by speakers might be determined by stylistic factors of various kinds. As far as phonemic analysis is concerned, 'functional contrast' may be understood as being restricted to distinctive function: i.e. the function of distinguishing one form from another. It is arguable, as the Prague School phonologists insisted, that phonological description should also take account of stylistic variation. It was one of the earliest and most important discoveries of phonology that speech-sounds that are in functional contrast in one language may be in complementary distribution or free variation in another. For example, [6] and [d] are in functional contrast in English (cf. there vs. dare), but in complementary distribution (with perhaps some stylistic variation) in Castilian Spanish (cf. nada [na6a] "nothing" vs. dos [das] "two"). Examples could be multiplied. The important point is that languages differ considerably with respect to the phonetic distinctions that they
put to work.

Speech-sounds may be represented as sets of phonetic features. The phonetic features used above were articulatory; but they might equally well have been acoustic or, in principle, auditory. The same is true with respect to the phonological features of distinctive-feature theory; and both articulatory and acoustic features have been employed. In so far as phonology, unlike phonetics, can be thought of as making no direct reference to the phonic medium (though distinctive-feature theorists, on the whole, tend not to take this rather abstract view of phonology), one should perhaps operate with phonological features that are neither articulatory nor acoustic, but relatable (though in a rather complex way) equally well to both and, when auditory phonetics is more highly developed than it is at present, to auditory features. For simplicity of exposition, we will employ articulatory labels. To make it clear when we are talking about phonological features, rather than phonetic features, we will put oblique strokes, rather than square brackets, around the articulatory labels. (This is not standard practice, but it makes for conceptual clarity and allows certain theoretical options to be kept open.) Thus, whereas the speech-sound [p] can be described, with reference, as the set { [+ labial], [+ stop], [-voiced], [-nasal] }, so the English phoneme /p/, let us suppose, is analysable as the set { /+ labial/, /+ stop/, /- voiced/ }.

At first sight, it might appear that we have done no more than play a notational trick, substituting oblique strokes for square brackets and calling the result phonology, instead of phonetics. It should be noted, however, that three, not four, features are listed for English /p/ as distinctive. There is no phonemic feature /- nasal/ listed for /p/ because the absence of nasality is predictable in English (though not in all languages) from the absence of voice; /- nasal/ would be listed for /b/ in order to account for its distinctive function in ban vs. man, cub vs. come, etc. Also, the articulatory description of [p] is very incomplete (being restricted to the articulatory features). In general, the set of distinctive features that define and
characterize a phoneme will be much smaller than the set of phonetic features that characterize any one of its allophones. For example, the English phoneme /p/ has as one of its allophones an aspirated, voiceless, bilabial, oral stop whose fuller articulatory description would involve reference, not only to aspiration, but also to the degree of the air with which the air is released after the labial obstruction, to the duration of the obstruction and the aspiration, and to several other features that go to make it a recognizable English [p∗] (in a particular accent) for the position in which it occurs. But none of these other phonetic features is distinctive: none of them serves to change the phonetic realization of one English form into the phonetic realization of another English form.

As to the three features recognized above as components of /p/: /+ labial/ (which matches [+ labial]) distinguishes (a pronunciation of) pin from (a pronunciation of) tin, kin, etc.; /+ stop/ distinguishes pa/from/of (since English has no labial fricatives, except as allophones of /p/ in other positions, and no labio-dental stops, one can think of HI and /v/ as being the /+ fricative/ counterparts of /p/ and /b/), tick from sick (and thick); I- voiced/, according to the conventional view, is the feature which distinguishes pin from bin, pat from pad. It is arguable that the feature which distinguishes /p/, /t/, /k/, /s/, /6/, etc. from /b/, /d/, /g/, /z/, /o/, etc. in English should not be identified with voicelessness, but with something else, of which either voicelessness or aspiration (or both) are the usual phonetic concomitants. However, whatever view we take on this question, the fact remains that we do not need both /+ aspirate/ and /- voice/ in a distinctive-feature analysis of English.

We have used the term 'allophone' in the account just given of the relation between phonemes and the distinctive features of which they are composed. In fact, the notion of allophonic variation is handled rather differently in distinctive-feature theory, so that the applicability of the term itself is questionable. The crucial point about the distinctive-feature analysis of phonemes is that every phoneme should differ from every other phoneme in the language-system with respect to the presence or absence in the set of features that define it of at least
one feature; and its set of defining features remains constant throughout the whole range of its occurrences. What classical American phonemics referred to in terms of allophonic variation is handled in distinctive-feature theory (especially within the framework of generative grammar) by means of rules which (having converted the minimal set of phonological features, sufficient to distinguish each phoneme from every other, into phonetic features: /+ labial/-» [+ labial], /+ voiced/-» [+ voiced], etc.) add contextually appropriate, non-distinctive phonetic features for particular positions of occurrence. For example, the phonetic feature [+ aspirate] would be added for the phonetic realization of English /p/ in word-initial position (e.g. m pit or pot) but not for its realization when it follows /s/ (e.g. in spit or spot); and the phonetic feature [- voiced] would be added for all positions of occurrence.

It was pointed out in the previous section that languages differ considerably as to the phonetic features that they make distinctive and the phonetic features which, if they have them at all, they treat as non-distinctive. This remains true, regardless of the theory of phonology within which it is stated. It is after all an empirical fact that [+ aspirated] is distinctive in Hindi and Mandarin Chinese; that French vowels may be simultaneously both distinctively front and distinctively rounded; that in very many Australian languages nasality, but not voice, is distinctive and characterizes more phonemes than it does in any European language; and so on. It will be noticed, however, that in each of these examples we have made use of terms - 'aspirated', 'front', 'back', 'nasality' - that are also used in the description of hundreds, not to say thousands, of other spoken languages. Distinctive-feature theory as such would not be incompatible with the view that there is an unlimited number of possible distinctive features from which particular language-systems make their own unique selection, as it were, and combine in unpredictable ways to construct their own phonemes. But recent formulations of distinctive-feature theory have tended to assume, with a fair amount of evidence to support the assumption, that all existing natural languages can be satisfactorily described, as far as their phonology is concerned, with reference to a master-list of little more than a dozen potentially
distinctive features. It is certainly true that there are very many physiologically phonetic features that are not made distinctive, as far as we know, in the phonology of any natural language; and there are many physiologically possible combinations of features that are extremely rare, or not found at all. Chomsky has suggested that this is because the phonology of natural languages, like their syntax and their semantics, is heavily constrained by a specifically human predisposition to operate with certain kinds of distinctions, rather than others.

One of the most striking advantages of distinctive-feature theory by comparison with classical American phonemics is that it gives a motivated account of the principles that determine the well-formedness of sequences of phonemes over a wide range of instances in many languages. For example, between initial /s/ and /k/ within the same form in English /p/, /t/ and /k/ can occur, but /b/, /d/ and /g/ cannot (cf. spray, stripe, scratch vs. */sbr-/, */sdr-/, */sgr-/). This is just one of many contexts in which /p/, /t/, /k/ are intersubstitutable whereas Pol, 1d/, /g/ are not. This part of the distribution of these two sets of phonemes is accounted for (in a phonetically motivated way) by means of a single rule which makes reference to /- voice/ vs. /+ voice/. Similarly, the assimilation of /n/ to lml and /O/ (under certain circumstances) in the context of a following /p/, fbt or lml, on the one hand, and /k/ or /g/, on the other can be attributed to the presence of /+ labial/, on the one hand, and /+ velar/, on the other, as components of the phoneme that conditions the assimilation: cf. unproductive [mp], unbeatable [mb], unmis-takeable [mm], uncouth [nk], unguarded [rg]. (The spelling does not here bear witness to the assimilative process, as it does for /n/ -> lml in the Latin-derived forms imponderable, imbued, immutable.) It is commonly the case that a particular feature, e.g. /+ labial/, /+ nasal/, /+ voice/, can be seen as being, in certain contexts, suprasegmental: i.e. as running over a sequence of two or more (phonemic) segments.

But what about the possibility that a particular distinctive feature should never be other than suprasegmental in a particular language-system? This is not simply a theoretical possibility. Suprasegmental features of this kind are found in many
languages. For example, what is referred to as vowel harmony is not uncommon. As it operates in Turkish, it involves the contrasting features /+ back/ vs. /- back/ and /+ rounded/ vs. /- rounded/. If we set aside word-forms that do not conform to the general pattern (forms of words that have been for the most part borrowed from other languages), we can say that all vowels in successive positions of a Turkish word must have the same value for the 1± back/ contrast and (subject to a further condition, which excludes the combination of /+ rounded/ with the segmental feature /+ open/ in all but the initial syllable) for the 1± rounded/ contrast. No matter how long the word is - and by virtue of its grammatical structure Turkish has many long word-forms - /± back/ and /± rounded/ are suprasegmental in the sense explained.

Suprasegmental distinctive features of the kind just exemplified are what the so-called prosody theory of phonology refers to, in a specialized sense of the term, as prosodies. The prosodic theory of phonology, characteristic of what has been called the London School of Linguistics, has much that it shares with distinctive-feature theory in its more recent developments. Unfortunately, differences of terminology, not to mention differences of theoretical outlook in respect of more general issues, tend to obscure the similarities. The principal difference between orthodox distinctive-feature theory, as it were, and prosodic theory is that the former is still an essentially phonemic, or segmental, theory, as classical American phonemics was. Prosodic theory, on the other hand, allows that both phonemic (segmental) and prosodic (suprasegmental) elements are to be found and have equal, but complementary, status in the phonological inventories of language-systems. Furthermore, it recognizes that, although there is a tendency (for phonetic reasons) for certain features to be segmental and others suprasegmental in languages, the notion of suprasegmentality is, in principle, relative to particular language-systems.

Suprasegmental:
Most linguists, if they employ the term 'suprasegmental' at all, use it to refer to such things as stress, tone and length, which were a problem for classical
American phonemics, whose basic assumption was that the structure of words and sentences could be fully accounted for in terms of sequentially ordered phonological elements.

The stress-difference between the noun-form import and the verb-form import in spoken English (the former being stressed on the first, and the latter on the second, syllable) is not naturally handled as a difference between segmental phonemes. There are two partly independent reasons why it is not: first, stress is essentially a matter of the greater prominence of one syllable in relation to other syllables in the same form (or accompanying forms); second, the phonetic realization of stress, unlike the phonetic realization of segmental phonemes, cannot be said to precede or follow in time the phonetic realization of its neighbouring phonological elements. Obviously, one could represent the stress-difference between forms in a phonemic representation by more or less arbitrarily deciding to put the corresponding stress-phoneme before (or after) the vowel-phoneme which corresponds to the nucleus of the syllable in the phonetic realization. The point is that, although segmentalization can always be carried out in phonology at the price, if necessary, of arbitrary decision, the arbitrariness of the decisions forced upon the linguist in cases like this is itself an indication of the theoretical inadequacy of the framework within which the analysis is being carried out.

What has been said in relation to stress, holds also for tone which, in many languages (so-called tone languages), serves to distinguish forms in much the same way that stress does, though not very extensively, in English. As to length, there can be long consonants, just as there can be long vowels, in particular languages; and there can be an interdependence between the length of the one and the length of the other. Even in English (in the RP pronunciation), the length of vowels varies according to the quality of the consonants that follow them in the same syllable. What are traditionally called long vowels and are analysed as such by some phonologists, but not others, are realized as phonetically shortened segments when they are followed by a /- voiced/ stop: thus the vowel
segment of seat is phonetically shorter than that of either seed or see. Indeed, it
can be shorter, in its phonetic realization, than that of the phonologically short
vowel of sit. This fact will serve to illustrate, not only the difference between
phonological length and phonetic duration, but, more generally, the complexity of
the relationship between phonological analysis and phonetic transcription.

Phonetics
The general study of the characteristics of speech sounds is called phonetics. Our
primary interest will be in articulatory phonetics, which is the study of how
speech sounds are made, or 'articulated'. Other areas of study within phonetics
are acoustic phonetics, which deals with the physical properties of speech as
sound waves 'in the air', and auditory (or perceptual) phonetics, which deals with
the perception, via the ear, of speech sounds. One other area, called forensic
phonetics, has applications in legal cases involving speaker identification and the
analysis of recorded utterances.

Articulation: voiced and voiceless
In articulatory phonetics, we investigate how speech sounds are produced using
the fairly complex oral equipment we have. We start with the air pushed out by
the lungs up through the trachea (the 'windpipe') to the larynx. Inside the larynx
are your vocal cords which take two basic positions.

(1) When the vocal cords are spread apart, the air from the lungs passes
between them unimpeded. Sounds produced in this way are described as
voiceless.

(2) When the vocal cords are drawn together, the air from the lungs repeatedly
pushes them apart as it passes through, creating a vibration effect. Sounds
produced in this way are described as voiced.

The distinction can be felt physically if you place a fingertip gently on the top of
your 'Adam's apple' (i.e. part of your larynx) and produce sounds like Z-Z-Z-Z or
V-V-V-V. Because these are voiced sounds, you should be able to feel some
vibration. Keeping your fingertip in the same position, make the sounds S-S-S-S-
or F-F-F-F. Because these are voiceless sounds, there should be no vibration. Another trick is to put a finger in each ear, not too far, and produce the voiced sounds (e.g. Z-Z-Z-Z) to hear some vibration, whereas no vibration will be heard if the voiceless sounds (e.g. S-S-S-S) are produced in the same manner.

**Important: Places of articulation**

Once the air has passed through the larynx, it comes up and out through the mouth and/or the nose. Most consonant sounds are produced by using the tongue and other parts of the mouth to constrict, in some way, the shape of the oral cavity through which the air is passing. The terms used to describe many sounds are those which denote the place of articulation of the sound: that is, the location, inside the mouth, at which the constriction takes place.

**Bilabials.** These are sounds formed using both (= bi) upper and lower lips (= labia). The initial sounds in the words pat, bat and mat are all bilabials. They are represented by the symbols [p], which is voiceless, and [b] and [m], which are voiced. The [w] sound found at the beginning of way, walk and world is also a bilabial.
**Labiodentals.** These are sounds formed with the upper teeth and the lower lip. The initial sounds of the words fat and vat and the final sounds in the words safe and save are labiodentals. They are represented by the symbols [f], which is voiceless, and [v], which is voiced. Notice that the final sounds of laugh and cough, and the initial sound of photo, despite the spelling differences, are all pronounced as [f].

**Dentals.** These sounds are formed with the tongue tip behind the upper front teeth. The term interdental is sometimes used to describe a manner of pronunciation with the tongue tip between (=inter) the upper and lower teeth. The initial sound of thin and the final sound of bath are both voiceless dentals. The symbol used for this sound is [θ], usually referred to as 'theta'. It's the symbol you would use for the first and last sounds in the phrase three teeth. The voiced dental is represented by the symbol [ð], usually called 'eth'. This sound is found in the pronunciation of the initial sound of common words like the, there, then and thus. It's also the middle sound in feather and the final sound of bathe.

**Alveolars.** These are sounds formed with the front part of the tongue on the alveolar ridge, which is the rough, bony ridge immediately behind the upper teeth. The initial sounds in top, dip, sit, 7.00 and nut are all alveolars. The symbols for these sounds are quite easily remembered - [t], [d], [s], [z], [n]. Of these, [t] and [s] are voiceless, whereas [d], [z] and [n] are voiced. It may be clear that the final sounds of the words bus and buzz have to be [s] and [z] respectively, but what about the final sound of the word raise? The spelling is misleading because the final sound in this word is voiced, and so must be represented by [z]. Notice also that despite the different spelling of knot and not, both of these words are pronounced with [n] as the initial sound. Other alveolars are the [l] sound found at the beginning of words such as lap and lit, and the [r] sound at the beginning of right, write and rip.
**Alveo-palatals.** If you feel back behind the alveolar ridge, you should find a hard part in the roof of your mouth. This is called the palate. Sounds which are produced with the tongue at the very front of the palate, near the alveolar ridge, are called alveo-palatals. Examples are the initial sounds in the words shout and child, which are voiceless.

Although there are two letters in the spelling of 'sh' and 'ch', the sounds are represented by the single phonetic symbols [s] and [c] respectively. The small mark above the symbols is called 'wedge'. So, the word shoe-brush begins and ends with the voiceless alveo-palatal sound [s] and the word church begins and ends with the voiceless alveo-palatal sound [c].

One of the voiced alveo-palatal sounds, represented by the symbol [z], is not very common in English, but can be found as the middle consonant sound in words like treasure and pleasure, or the final sound in rouge. The other voiced alveo-palatal sound is represented as [j] and is the initial sound in words like joke and gem. The word judge and the name George both begin and end with the sound [j], despite the obvious differences in spelling.

One sound which is produced with the tongue in the middle of the palate is the [y] sound to be found at the beginning of words like you and yet. This sound is usually described as a palatal.

**Velars.** Even further back in the roof of the mouth, beyond the hard palate, you will find a soft area which is called the soft palate, or the velum. Sounds produced with the back of the tongue against the velum are called velars. There is a voiceless velar sound, represented by the symbol [k], which occurs not only in kid and kill, but is also the initial sound in car and cold. Despite the variety in spelling, this [k] sound is both the initial and final sound in the words cook, kick and coke. The voiced velar sound to be heard at the beginning of words like go, gun and give is represented by [g]. This is also the final sound in words like bag, mug and, despite the spelling, plague.

The velum can be lowered to allow air to flow through the nasal cavity and
thereby produce another voiced velar which is represented by the symbol \([n]\), typically referred to as 'angma'. In written English, this sound is normally spelled as the two letters 'ng'. So, the \([n]\) sound is at the end of sing, sang and, despite the spelling, tongue. It would occur twice in the form ringing. Be careful not to be misled by the spelling - the word bang ends with the \([g]\) sound only. There is no \([g]\) sound in this word.

**Glottals.** There is one other sound that is produced without the active use of the tongue and other parts of the mouth. It is the sound \([h]\) which occurs at the beginning of have and house, and, for most speakers, as the first sound in who and whose. This sound is usually described as a voiceless glottal. The 'glottis' is the space between the vocal cords in the larynx. When the glottis is open, as in the production of other voiceless sounds, but there is no manipulation of the air passing out through the mouth, the sound produced is that represented by \([h]\).

The IPA aims to describe the sounds of all languages and includes, for example, symbols for the velar fricative sound you may have heard in the German pronunciation of the "ch" part of Bach or Achtung. It also includes sounds made with the back of the tongue and the uvula (below the velum) which represents the "r" parts of the French pronunciation of rouge and let-tre. Uvular sounds also occur in many American Indian languages. Other, non-English sounds such as pharyngeals (produced in the pharynx) occur in Semitic languages such as Arabic. There are many more.

Another shortcoming of the chart above is the single entry covering \(r\) sounds in English. There can be a lot of variation among speakers in the pronunciation of the initial sound in raw and red, the medial sound in very, and the final sound in hour and air. Different symbols (e.g. \([j]\), \([R]\)) may be encountered in transcriptions where the different \(r\) sounds are distinguished.

Finally, the IPA uses different symbols for a few of the sounds represented here. These alternatives are \([\text{j}] = [s]; [\text{3}] = [z]; [\text{tj}] = [c]; [\text{d3}] = [\text{J}]\) and \([\text{j}] = [\text{y}]\).
Manner of articulation

We can describe the same sounds in terms of how they are articulated. Such a description is necessary if we wish to be able to differentiate between some sounds which, in the preceding discussion, we have placed in the same category. For example, we can say that [t] and [s] are both voiceless alveolar sounds. How do they differ? They differ in their manner of articulation, that is, in the way they are pronounced. The [t] sound is one of a set of sounds called 'stops' and the [s] sound is one of a set called 'fricatives'.

Stops. Of the sounds we have already mentioned, the set [p], [b], [t], [d], [k], [g] are all produced by some form of complete 'stopping' of the airstream (very briefly) and then letting it go abruptly. This type of consonant sound resulting from a blocking or stopping effect on the airstream is called a stop (or a 'plosive'). A full description of the [t] sound at the beginning of a word like ten is as a 'voiceless alveolar stop'. On occasion, only the manner of articulation is mentioned, as when it is said that the word bed, for example, begins and ends with 'voiced stops'.

Fricatives. The manner of articulation used in producing the set of sounds [f], [v], [e], [z], [s], [z], [s], [z] involves almost blocking the airstream, and having the air push through the narrow opening. As the air is pushed through, a type of friction is produced and the resulting sounds are called fricatives. If you put your open hand in front of your mouth when making these sounds, [f] and [s] in particular, you should be able to feel the stream of air being pushed out. A word like fish will begin and end with 'voiceless fricatives'. The word those will begin and end with the 'voiced fricatives' [6] and [z].
**Affricates.** If you combine a brief stopping of the airstream with an obstructed release which causes some friction, you will be able to produce the sounds [c] and [j]. These are called affricates and occur at the beginning of the words cheap and jeep. In the first of these, there is a 'voiceless affricate', and in the second a 'voiced affricate'.

**Nasals.** Most sounds are produced orally, with the velum raised, preventing airflow from entering the nasal cavity. However, when the velum is lowered and the airstream is allowed to flow out through the nose to produce [m], [n] and [ŋ], the sounds are described as nasals. These three sounds are all voiced. Words like morning, knitting and name begin and end with nasals.

**Approximants.** In the set of sounds called approximants, the articulation of each is strongly influenced by the following vowel sound. Indeed, the sounds [w] and [y] are sometimes called 'semi-vowels' or 'glides', because they are typically produced with the tongue moving, or 'gliding', to or from the position of a nearby vowel. Both [w] and [y] are voiced, occurring at the beginning of we, wet, you and yes. Also voiced are the two initial approximants in led and red. The [l] sound is formed by letting the airstream flow around the sides of the tongue as it makes contact with the alveolar ridge. The type of sound for which we are using the [r] symbol is formed with the tongue tip raised and curled back behind the alveolar ridge. The [l] and [r] sounds are also sometimes called 'liquids'. The sound [h] is a voiceless approximant which, in common words like Hi or hello, simply begins the pronunciation of the following vowel as if it was voiceless.

**The glottal stop and the flap.** Two common terms used to describe ways of pronouncing consonants are not included in the chart presented earlier. The glottal stop, represented by the symbol [ʔ], occurs when the space between the vocal cords (the glottis) is closed completely, very briefly, and then released. Try saying the expression Oh oh!. Between the first Oh and the second oh,
people typically produce a glottal stop. Some people do it in the middle of Uh-uh (meaning 'no'), and others put one in place of 't' in pronouncing Batman. You can also produce a glottal stop if you try to say the words butter or bottle without pronouncing the -tt- part in the middle. This sound is considered to be characteristic of Cockney (London) speech, but it is also used by Scottish speakers and New Yorkers. If, however, you are an American English speaker who pronounces the word butter in a way that is close to 'budder', then you are making a flap. It is represented by [D] or sometimes [r]. This flap is produced by the tongue tip being thrown against the alveolar ridge for an instant. Many Americans tend to flap the [t] and [d] consonants between vowels so that, in casual speech, the pairs latter and ladder, writer and rider, metal and medal do not have distinct middle consonants. They all have flaps. The student who was told about the importance of 'Plato' in class and reported it as 'play-dough' was clearly a victim of a misinterpreted flap.

(Some parts adapted from Lyons, Yule)

**Semantics**

Semantics is the study of meaning. Meaning occurs at the levels of:

a) Words

b) Sentences

c) Grammar

d) Utterances

e) Propositions

The meaning of a sentence depends upon the meaning of its constituent lexemes and the meaning of some, if not all, lexemes depends upon the meaning of the sentences in which they occur. But the grammatical structure of sentences is also relevant to the determination of their meaning. Lexical meaning, gram-
Mathematical meaning and sentence-meaning clearly fall within the scope of linguistic semantics. Somewhat more controversial is the status of utterance-meaning. The meaning of an utterance includes, but is not exhausted by, the meaning of the sentence that is uttered. The rest of the meaning is contributed by a variety of factors that may be referred to, loosely, as contextual. Many scholars would say that utterance-meaning falls outside the province of linguistic semantics, as such, and within that of what has come to be called pragmatics. This is controversial, because the notion of sentence-meaning is arguably dependent, both logically and methodologically, upon the notion of utterance-meaning, so that one cannot give a full account of sentence-meaning without relating sentences, in principle, to their possible contexts of utterance.

Another set of distinctions has to do with the variety of semiotic, or communicative, functions that languages are used for. There is clearly some kind of connection between meaning and use.

We can draw a distinction, then, between the descriptive meaning of statements and the non-descriptive meaning of other kinds of speech-acts. We can also, for the present at least, identify the descriptive meaning of an utterance with the proposition that is asserted in statements and may be presented, though is not asserted, in other speech-acts, notably in questions. For example, the following utterances, intended and understood as a statement and a question respectively:

(6) John gets up late
(7) Does John get up late?

can be said to present, or contain, the same proposition, though only (6) asserts it and thereby describes, or purports to describe, a particular situation. It is the defining property of propositions that they have a definite truth-value: i.e. they are either true or false.
Truth-conditional semantics, in effect, restricts the scope of the term ‘semantics’ so that it covers only descriptive meaning. From what has been said, it will be clear that some utterances at least may have both a descriptive and a non-descriptive meaning.

Exclamation is but one way in which a speaker (or writer) expresses, or reveals, his feelings, attitudes, beliefs and personality. In so far as we cannot, in the last resort, draw a distinction between a person and his personality or feelings, it is legitimate to interpret the term 'self-expression' literally. Expressive meaning relates to everything that falls within the scope of 'self-expression and can be subdivided, and has been for particular purposes, in various ways.

One kind of expressive meaning to which both literary critics and moral philosophers have paid particular attention is emotive (or affective) meaning. Somewhat different from expressive meaning is social meaning. This has to do with the use of language to establish and maintain social roles and social relations. Much of our everyday discourse has this as its principal purpose and can be subsumed under the term phatic communion (i.e. "communion by means of speech"). This felicitous expression, coined by the anthropologist Malinowski in the 1920s and widely employed by linguists since then, emphasizes the notions of fellowship and participation in common social rituals: hence 'communion' rather than 'communication'.

**Meaning Relationships among words:**

**a) Synonymy:** Similar Meanings

Royal – French
Regal – Latin
Kingly – Anglo-Saxon

Total synonymy is rare for it would mean that words are interchangeable in all linguistic environments.
a.1) **Stylistic difference:**
Steed (Poetic)    Nag (Slang)

a.2) **Connotational:**
Hide/conceal    tight/conceal
(One word is stronger)

a.3) **Collocational:**
Powerful (language)
Mighty (ocean)
Strong (tea)

b) **Antonyms: Opposite Meanings**

b.1) **Gradable: Degree of opposition is gradable**
Wide/narrow
old/young
tall/short

b.2) **Complementary: Opposition is absolute**
Alive/dead
Married/single

b.3) **Relational**
Husband/wife
Above/narrow
Lend/borrow
3. **Hyponyms:**
A sense relation between two terms in which the sense of one is included in the other.

Hyponyms of flower: Daisy, Daffodil, Rose (These are co-hyponyms)

Similarly,

Colour – Red
Instrument – Flute
Tool – Hammer

4. **Meronyms:**
A part-whole relationship

Cover/page – Meronyms of book

5. **Polysemy:**
A word acquires more than one meaning

Flight: ----- power of flying

----- a journey by air

----- a series of steps

----- digression/escape

----- unit of the air force

6. **Homonymy:** Same form (sound) but unrelated sense

Sight/site
Right/rite

Lead (as ion leading a group)
Lead (of a dog)

Pupil (eye)
Pupil (student)
7. Incompatibility:
The choice of one word excludes the other. They are ‘exclusive’ members of a field.
Colour – Red/black
Fruit – Apple/pineapple

Associative Meaning
Meaning that is attached to a word because of its use (not because of a part of its core sense)

a) Connotation:
Communicative value of a word. Meaning is socially acquired.
Man (core): A real man (culturally variable), A white man (race)

b) Collocation:
The tendency of certain words to appear together.
Quiver – with excitement
Tremble – with fear
Wander – mind
Stroll – humans

c) Stylistic meaning:
Degrees of formality:
Domicile (Official)
Residence (Formal)
Abode (Poetic)
Home (General)
Digs (Colloquial)
Gaff (Slang)
d) **Reflected Meaning**: Innuendos, Puns, Ambiguity

8

**Language Change**

As a dynamic and man-made phenomenon, language is subject to change in several of its aspects. The changes are viewed with varied perceptions and opinions.

**Perceptions of Language Change**

Height of purism – expression of dismay and disgust for a supposedly corrupt state of language. “Even the best authors commit many gross improprieties which ought to be discarded” -- Jonathan Swift

"Blind surrender to the momentum or inertia of slovenly and tasteless ignorance and insensitivity"

**Social Factors:**

Admiration for Latin

- Language of the Church and Scholars in Middle Ages
- ‘Queen of Tongues’
- Powerful Class Snobbery
- Variants used by lower class seen as incorrect
- Need for correct fixed form of English

Consequences:

- ‘Fixed’ correct form of every language
Written language superior to Spoken one
Loss of word-endings seen as ‘slipping’ from classical purity

Cultural factors
“There is a direct correspondence between the language we speak and the world we perceive”: Sapir Whorf Hypothesis
Language change leads to change in our perception world, and the values, morals
Loss of identity of the previous culture of community

Psychological factors
Failure to cope up with fast-moving world
Insecurity
Attempts to preserve life unchanged
Every generation believes in deterioration of manners by following one.

Explanations of Language Change
18\textsuperscript{th} century: Language decay
19\textsuperscript{th} century: Natural law
Later: Social Bonding

Language Decay
Complex Declensions and Conjugations in old Indo-European languages like Sanskrit, Greek etc.
Absence of these complexities in modern European languages
Flaw: Increase in number of articles and auxiliary verbs.

Natural Law
Change is automatic and mechanical
Uncontrolled by the speaker
Slow shift from the “Idealized” form by deviations
Counterview: Deviations may cancel out each other in the absence of
Defense:

Simplification of sounds: the natural tendency of the speakers is to modify the hard-to-say sounds to easier ones. Eg camera->camra->cambra.
Children imperfectly learning the speech of their parents.

Social Bonding- William Labov
Change starts as difference in pronunciation of some words in a part of population
Gradually, it becomes a signal of cultural and social identity.
The group then adopts, exaggerates and applies it to change pronunciation of other words.

Word Formation (Changes in words)

Parts of Speech

Noun as verb
‘Pocket the money’
‘face the danger’

Adjective as noun
Submarine’ for submarine vessel
Wireless for wireless communication device

Abbreviations
For terms or words
zoo for zoological garden,
cab for cabriolet,
taxi for taximeter cabriolet,
pram for perambulator
sofing for Soldier of Fortune playing

For phrases eg. Done for to do on.

**Portmanteau Words:** grouping of different words
- interconnected + networks - internet
- smoke + fog – smog
- electric + execute - electrocute

**Foreign Language**
- Pundit, guru, bungalow

**Imitation** - of bodily articulations in words
- bl – inflation eg. blow, blast
- p/t/k - quick action eg. trick, slick, pluck
- u/oo – heaviness
- fl – hurry eg. flow, flash

**Prefix / Suffix**
- Ambi + dextrous, Post + humous,
- Techno + logy

**Back Formation**
- ‘beg’ from beggar,
- ‘edit’ from editor

**Slangs**
- ‘trip’ for short voyage,
- ‘pluck’ for pulling out,
- ‘bet’ for amount risked in gamble
Proper Names-
“guy” from Guy Fawkes- an English soldier attempted to kill James I of England and members of Parliament of England burning of his effigy popularized “guy” as a person of grotesque appearance later replaced ‘fellow’, ‘bloke’ or ‘chap’.

‘boycott’ from Captain Charles Boycott, an estate agent in County Mayo, Ireland refused to reduce rents for tenants and ejected them from land and faced a social ostracism like stoppage of work in fields, stable and house, loss of trade and isolation and denial of postal service.

Growth of Vocabulary
Need to express new idea or conceptions
New inventions must be given a name
Thus as knowledge grows, language grows with it.
Vocabulary grows in numerous ways

Change of Meaning
Words are not static contrary to popular belief
Changing psychological attitude
Changing sense of social values

Processes and Methods of Change:

1. Generalisation
Once had a specialised and restricted meaning, comes to have a wider application.
e.g.- Box : name of tree → small caskets from box wood → any material → any size
Journey (jour= a day) → any time duration

crisis, a “glass” of beer, a “box” of chocolates, companion (con=with; + panis= bread)

2. Specialisation
Restriction of meanings. The absorption of Norman-French elements and introduction of words from Latin etc → large number of synonyms. Numerous examples ::
fowl → bird
deer → wild animal
wedd → pledge or promise (currently only matrimonial promise)

3. Extension followed by differentiation
Combination of generalisation and specialisation, but differs from both. i.e. transferred meaning
to give a ring → telephone
to drop a line → letter or postcard
fast → a) quick moving, b) remain firm (like continuous abstention from food)

4. Association of ideas
villein → a labourer on the manitorial estate
Seen low by other people which gradually gives way to its present meaning.
vulgarity (root: vulgus) → behavior expected from crowd
Traffic → trade or commerce.

5. Polarisation or Colouring
Word acquires a emotional significance
Enthusiasm and fanaticism
Patriotism and Nationalism
gothic → was in derogatory sense → present sense
6. Reversal of Meaning
Words may change its meaning to the point of actual reversal
grocer : wholesaler → retailer
restive: at rest → impatient or fretful

7. Popular Misunderstanding
Example of “dulating”
Such misunderstandings are responsible for change of meaning in many words.
emergency → which emerges → apt to create an awkward situation → combined
with urgency → present meaning
preposterous (pre = before; post = after) → intolerably absurd

Contemporary Changes:
ICT is one of the major drivers in process of globalization. It enables speedy
contacts across borders, but it is not enough to spread messages quickly – they
must also be comprehensible to receiver. The need for a global language is
evident.

English is the dominant cross-cultural language, a so called ‘lingua franca’ of
modern times.

It is becoming necessary to master English in order to utilize Internet resources
and participate in “global classroom”.

Due to Internet and media, English is increasingly affecting all other languages

More English terms and grammar are being adopted in other languages. New
hybrid languages are emerging –
Hinglish (linein mitana, hand-wash kar lo)
Spanglish (clickear, tipear, e-mailar)
Denglish
Franglias
Swenglish (mobil telefon, Börje) etc.

Languages are dying. Of 6000 languages known today, only half are expected to survive another century.

Speed and complexity
Need to communicate faster and to convey more in each message is influencing the language changes.
Technology itself encourages abrupt and abbreviated language use, because in some communication modes it is necessary in order to get across in reasonable time.

SMS and Chat Language

Use of Acronyms – ASAP, IGP, ^5, <o><o>.
Use of numbers because of their shorter form for spoken words.
E.g. - "thnks 4 da invtn. un42n8ly i cnt mk it 2 ur bday. i hv guests @ hm"

E-mail Language
E-mail has its own mixture of written and spoken language, mostly written informally. Traditional greetings as “hello”, “goodbye” are disappearing. Instead, slang and universal loanwords are used, a so-called “globespeak”.

Images

Another way to speed up communication is – and to make it universal – is to use images. Our society is increasingly using visual communication.
E.g. – use of icons to indicate toilets, luggage, keys and other services at international places like hotels, airports; browsers and interfaces. In one way, written language is moving back to its origins, since the earliest examples of writing were pictorial.

Slang language develops due to numerous reasons some of which are:

- for the fun of it
- as an exercise in wit or ingenuity
- to be different
- to be picturesque
- to be arresting
- to escape from clichés
- to enrich the language
- to add concreteness to speech
- to be colloquial
- to reduce seriousness
- for ease of interaction
- to induce intimacy
- to show that one belongs
- to exclude others
- to be secret

Origins of slang

- Words derived from standard words but giving new meaning to these
- Words which are new formal creations
- Words derived from local languages
- Words of obscure linguistic background but with a local linguistic sound
Political, social and religious developments also introduces numerous words into English.

Changing psychological attitudes and sense of social values gives way to change in meaning of already existing words.

English at the same time is changing also due to interaction with various other languages, resulting in “globespeak”. New technologies have brought new pressures on language. Also communication needs to be fast and effective. Thus language needs to evolve and keeps pace with time. This gives way to uses of abbreviations, images etc. Certain group languages flourish as they provide faster communication between people who constitutes a common group.
Aspects of Communication

Communication

Communication is the process of sending and receiving information among people. However, communication is not wholly – some would say, not even majorly – verbal. Several aspects and techniques of the human communicative experience are discussed below:

Distortion or the barriers to understanding/listening
a) Perceptions
b) Language
c) Semantics
d) Personal Interests
e) Emotions
f) Inflections

Need for Improving listening skills:

a) Eliminate distractions
b) Concentrate
c) Focus on the speaker
d) Maintain an open mind
e) Look for nonverbal cues
f) Do not react to emotive words
g) Ask questions
h) Sit so you can see & hear
i) Avoid prejudices
j) Take notes

A good question to ask yourself is, are you really listening or simply waiting for your turn to talk?

If you are thinking about your reply before the other person has finished, then you are not listening!

How can we improve our listening & facilitation skills?
Practice your questioning skills…

Rephrase the following closed questions to make them open-ended:

Are you feeling tired now?
Isn’t today a nice day?
Was the last activity useful?
Is there anything bothering you?
So everything is fine, then?

Other questioning techniques include:

Direct questions: asked of a particular individual – allows you to initiate control – good for re-directing discussion from excessive talkers.

Return questions: puts the question back to the questioner or group – “What do you think about that?”
General overview questions: used to initiate a discussion or set up a thoughtful exercise – “How would you respond to the situation?”

Hypothetical questions: tests the responder’s problem-solving ability by posing a hypothetical situation – “If you had an unlimited budget, what would you fund?”

Five Axioms of Communication
   a) One cannot not communicate.
   b) Every communication has a content and a relationship aspect such that the latter defines the former and is therefore metacommunication.
   c) Every communication sequence is defined by the way the interactants punctuate communication events.
   d) Interpersonal contacts are digital and analogic.
   e) Communication relationships are either symmetrical or complementary.

Listening

It is a skill that involves receiving, interpreting and responding to the message send by the communicator. It needs to be learnt and developed for effective communication. Poor listening can result in the breakdown of communication or wrong, improper and incomplete communication. Because of poor listening messages can be lost, misunderstandings may crop up and people perceive or may be perceived wrongly.

Hearing:
   It is primarily a physical act that depends on the ears
   It happens automatically
   It requires no special effort as such from the listener
Listening:

It is a much more conscious activity that requires a lot more than just hearing.

It requires the conscious involvement of the listener, the acknowledgement of understanding and response.

The listener here has to hear, analyze, judge and conclude.

Listening is an active process in which the listener plays a very active part in constructing the overall message that is eventually exchanged between the listener and the speaker.

While the listener is listening, he/she has to process the facts, study the body language of the speaker and also project the appropriate body language to the speaker.

Hence it is a process that equally engages the speaker as well as the listener.

Active Listening:

Active listening is a way of listening and responding to another person that improves mutual understanding.

Problems in listening arise because of the discrepancy in or speeds of talking and listening.

Active listening is a structured form of listening and responding that focuses the attention on the speaker.

It is as engaging as talking.

It leaves no empty space in the listener’s mind for speculation or formation of anti-discourse.

Benefits of Active Listening:

It forces people to listen attentively to others.

It avoids misunderstandings, as people have to confirm that they do really understand what another person has said.
It tends to open people up, to get them to say more

*Kinds of Listening:*

**Ignoring:** A kind of listening where the listener is entirely ignoring the message as well as the message giver. Can be very damaging because the listener’s lack of participation becomes evident through the body language. This might lead to a total breakdown of communication.

**Selective Listening:** Listening to parts of the conversation while ignoring most of it. For example: Listening to repeated public announcements or even the TV news if we are looking out for some specific information. If the listener or listeners are listening only selectively, the structuring of the content may need to be altered; the matter be made more relevant, or repetitions be avoided.

**Attentive Listening:** It is a kind of listening where there is no selective dismissal. For example: Listening to a serious discussion. It allows us to form an opinion of the topic being discussed and even design our response completely. It allows us to assess the perspective of the speaker and weigh the arguments appropriately.

**Empathetic Listening:** This is the ultimate kind of listening that is done not just to listen but to understand the speaker’s world as he sees it. It has an almost therapeutic effect on both the speaker and the listener. According to Stephen Covey, this kind of listening gets into “another person’s frame of reference. It is listening not only with one’s ears but with one’s heart.” “You listen for feeling, for meaning. You use both your right brain as your left. You sense, you intuit, you feel.”

**Barriers to good listening**
Physical reasons
- Inability to hear properly
- Noise
- Distance

Age and Attitude
- A small child’s conversation is likely to be ignored by most parents
- A teenager is likely to ignore parent’s advices.

Mind-set
- Sometimes the listener has a pre-determined idea of what speaker is going to speak.
- Due to this meanings are wrongly inferred and vital parts of the conversation are skipped.
- This kind of mind-set is harmful in both professional and personal interactions.

Language
- Unfamiliarity with a language can be a major barrier in listening.
- Language can sometimes be very context specific. Slang might be used in specific ways and words too might have different codes and meanings.
- It is important, therefore, to make sure that we speak the language we are conversing in with reasonable clarity.

Careless Listening
- Listening carelessly is an important barrier in listening and this can put the speaker in a very awkward position.
- Signs of careless listening may be looking at papers, sifting through lists or fidgeting with objects like paper weights.

Good Listening
Try to understand the speaker’s perspective
- It is not necessary to agree with the speaker, but a good listener will
always try to see things from the speaker’s perspective.

Listen with whole body
- For the speaker the body language of the speaker is one of the most important feedback.
- The posture, facial expression and eye contact constitute the body language during listening.

Do not judge prematurely
- We should avoid judging the speaker’s talk or personality prematurely. First the speaker should be given some time, then only any conclusion about him should be derived.

Go beyond the words of the speaker
- Sometimes it is more important to understand the spirit and the sentiment than the words themselves to keep the conversation going.

Paraphrase the speaker
- A good speaker while listening might also paraphrase the speech of the speaker. This may not be detail paraphrasing, but responding in a few words.

**Oral presentation strategies**

Engineers are frequently asked to present or brief a boss on a project work, at times argue on the floor to prove a point, make scheduled presentations to update superiors and clients.

**Oral presentation strategies:**
Layout
Being skillful in oral communication is one of the keys to successful engineering career. We are frequently called on to share and present ideas orally. You will address subordinates, peers, supervisors, non-engineering audiences, engage in brainstorming sessions, at trade shows and marketing conferences and so on.

Presentations are essential everywhere. They ensure efficient functioning of
project teams, progress, and maintain productive relationship between the hierarchy of an organization.

In an industry, proper passage of information right from the product development stage to the product marketing stage between the employees quickens the decision making process and hence the time for producing one particular item is reduced. Hence the profits rise.

Challenges
Immediacy of an audience splits written and oral communication modes.
Adapting to the audience is a major challenge. We must be prepared to adjust the complexity, style and content of presentation to meet the audience. For a successful ppt, observing the gestures of the audience is important. We must look for signs that audience wants to interact, to ask questions or even “end the ppt”.

Audience
To capture the audience’s attention
Make the presentation more gripping and interesting.
The listener must be clear of the objective and structure of the presentation.
Major points must be repeated and emphasized in the appropriate places.

Changes in delivery techniques
Use of “visual aids”
Interaction with the audience.
Factors such as gestures, body movements, pace, volume, tone and quality of voice affects the listeners as they indicate the speaker’s degree of commitment and understanding into the subject.
Visual aids
Plays a major role in
Emphasize critical info.
Draw attention into areas where we want more discussion.
Create understanding & interest in the topic.
Helps audience remember what they have just seen.

Anxiety/Nervousness
When you are in front of an audience, there is a chance of little nervousness. more nervousness in now further a problem which can inhibit spontaneity and reduce the ability to focus.
No nervousness at all can even make the ppt very dry and lifeless.

Controlling Anxiety
Sufficient time for rehearsals: allow time for several dry runs. work on timing. Try presentation over a virtual audience.
Tension/relaxation exercises: brisk exercise before the presentation.
Reduces adrenaline rush. Muscles relax completely once they have been stretched.
Begin with a smile

Breathing deeply
Making eye contact: reduce the visual stimulus your brain receives from looking at masses of faces ,limit your gaze to 1 person only.

Formal Presentations

Formal presentations
Importance of attitude
Planning a presentation
Preparing and using speaker notes
Preparing for questions
Rehearsing
A positive Attitude
Speaker’s attitude is a measure of his confidence, preparedness and enthusiasm. A key to connecting to the audience is respect, building rapport and understanding with the audience.
Looking after the requirements of the audience and keeping them focused.

Attitude
No apologies.
Leaves a bad impression.
Being well prepared is the only defense.
Imagine a situation where the projector fails and delivering a presentation becomes difficult both for the speaker and audience. The positive approach taken to tackle this difficulty is a measure of his attitude.

Planning a presentation
Proper preparation and planning will ensure the productivity of your presentation.
The main constituents of planning would be:
Learn about audience:
  Find information about the target group. Sources could be the organizers, a sample group, recent speakers or internet

Adapt to the audience
Audience is the best guide to selecting content.
The factors that should influence your approach
Motivation
Attitude
Group dynamics
Demographics
Knowledge and expertise

Motivation: motivation behind the audience should guide you on how brief or detailed the presentation should be.

Attitude: determine the attitude of listeners. acknowledging and demonstrating respect for conflicting opinions is important.

Demographics: physical attributes of the audience should be reflected in the language, visuals and style.

Technical know-how: audience’s level of knowledge should also be kept in mind.

Clarify objectives
A clear picture of your audience must be accompanied by a clear sense of objectives you hope to achieve.

if I am successful, my listeners will… filling this sentence should be helpful.

Different objectives direct you toward different approaches, content and styles.

Organize content
Structure of a presentation should be in three or four major sections:

Opening
Body
Closing
Question period (if appropriate)

For a long presentation each section can be subdivided further.

Opening: begin with a greeting or a grabber. opening should include an outline of the presentation — content and order of coverage.
outline should be followed by a value statement explaining why the audience should listen to you.

well structured opening would set the stage for the rest of presentation.

Organizational patterns
Points in the body should be logically arranged to assist in understanding.
Different patterns are:
  Time sequence
  Selling
  Problem solving
  Spatial relationships
  PREP (point, reason, example, point)

Patterns
Time sequence: when providing an update on a project or leading through a process.
  The basic pattern is first ->next-> last.

Selling: this approach is used to win support of your audience.
  the basic pattern is problem-> impact ->solution->benefits.

Problem solving: this approach helps solve problem through consensus.
  Problem->possible solutions->discussion->decision

Patterns
Spatial relationships: appropriate when providing technical detail.
  Application->Overview->Description of parts.

PREP approach: useful for persuasive presentations where one explains his/her stand before the audience.
  Point ->reason ->example ->point.
Closing: it could be a review of the main points.
The purpose is to persuade audience then emphasis must be laid on the critical info.
Remind the audience of the purpose

Importance of Visual Aids
  We live in a visual society
  We understand and retain information better if presented visually
  Increase interest, illustrate key points
  Increase the impact of message
  Help listeners retain important information
  Helps reduce the language barrier

*Overhead Transparencies and Computer-Projected Images*
  Overhead Transparencies are standard presentation equipment because they are inexpensive
  Recently more expensive equipment like computers are being used using presentation software
  Create full-color slides that can be easily edited
  Support interesting on-screen features
  Care should be taken that visual effects support the content rather than substituting for it

General Guidelines
  Limit content
  No more than five lines per slide and no more than eight words per line
  Provide bare bones in slides
  Add details as you speak
Keep graphics and diagrams simple

Computer Interfaces to Online Resources
- Connecting to online programs or internet
- Create real-time demonstrations
- Take advantage of internet resources
- Can create confusion if not dealt properly
- Rehearsal is a must
- Susceptible to errors
- Need a backup plan like good humor

Use of video
- Useful to portray the operation of a device
- Demonstrate a working prototype
- Should be set to precise starting point
- Explain before hand the purpose of video
- Effective when its context and purpose is clear

Objects
- Should be large enough
- We should avoid passing it around distracting the listeners
- Display it only as long as it is relevant
- Once finished using, it should set out of sight

Using Speaker’s Notes
- Ideally should speak without constant reference to notes
- But should have them available in case they are needed
- Notes should be instantly readable instead of worrying their size and shape
- Include details that are hard to remember
Minimize audience attention towards notes

Preparing for questions
   Anticipate questions
   Answering questions
   Through your answers you can address confusing points
   Dealing with tough questions
   Politely divert inappropriate questions

Rehearsing presentation
   Walkthrough rehearsal
   Section-wise
   Using visual aids
   Entire presentation
   With an audience
   Perfect timing
   Prepare psychologically

Delivering a presentation:
   Body Language :- we see speakers before they start talking and immediately form opinions about their abilities and attitudes.
   Voice :- the clarity and qualities of your voice impact the way an audience receives your presentation.
   Speaking style :- listeners generally require shorter sentences, simpler words and more repetition than readers do.

**Body Language**

   Eye Contact: Sustained eye contact tells your audience that you believe in this message, that you want them to pay attention and that you are giving them
the honest goods.

Use of Space and Movement: While making full use of the space available expresses control and authority, moving close to your audience is useful to invite discussion, to express agreement, or to emphasize a point.

Gesture: Gestures, including posture and facial expressions, project attitudes and are effective means of holding an audience’s attention. Upright posture and emphatic movement express confidence, enthusiasm, and control.

Voice

Projection: Your voice must always project but need not always be loud.

Pitch: A low pitched voice is pleasant, project an aura of authority, and is most appropriate in delivering key points. A higher-pitched voice is associated with excitement, humor, and friendliness, and is appropriate when providing examples.

Pace: A well-paced, varied message suggests enthusiasm, self-assurance, and awareness of audience. A varied pace and adequate pauses maintain an audience’s attention.

Speaking Style

Personalize Your Presentation: Example, a solution must be found can be phrased more personally as we will all benefit by working together to solve the problem.

Use Clear, Simple Language: Revise sentences such as “Due to parental ignorance and apathy, pertussis is once again a threat to juvenile patients”

Avoid Jargon: The difference between alienating jargon and useful specialized language is in the ears (and experience) of the audience

Minimize Filler Sounds and Words: Filling pauses with sounds such as um or ah or by words, phrases, and questions such as like, basically, right, you
Team Presentations

Team planning
Group delivery styles
Team rehearsals
Group question period

Audience & Purpose:

Discuss what the presentation should have to accomplish
Analyze the audience like identifying their needs, reasons for their attending, knowledge and expertise, etc.

Content

Write down the ideas first
Discard any ideas which might seem impractical and organize the rest into main points
Highlight the main points and indicate the secondary points
Decide on the basic content of the opening and closing sections

Tasks

Initially itself, you must decide who will take the responsibility for each aspect of preparing the presentation.
Ensure that work is equally distributed and everyone is clear on deadlines.

Group Delivery Styles
One presentation, Several Presenters: Each person takes responsibility for each section

Panel Presentation: In this type, one team member serves as a moderator while other act as panelists

Debate Format: This is similar to panel presentation, except panelists demonstrate disagreement with one another’s position

Role Playing: This type brings a team presentation to life given sufficient acting ability. Team members perform like characters in a play recreating an event or discussing an issue if they were in the situation. At the end of the performance, the actor usually describe their roles, positions and thinking and then members of the audience voice their opinion and ask questions.

Team Rehearsals

A crucially important presentation merits rigorous rehearsals.

For the first rehearsal team members focus on ensuring that each section includes appropriate content.

After any major issues with content, organization, timing and delivery are identified and resolved, the team should rehearse again with team members coaching one another.

Common Problems

Novice presenters will encounter some problems with

Body Language
Problems with posture
Problems with gestures
Other problems
Voice
Speaking Style

Body Language
What do they do well and what could they improve?
Are their movements appropriate and do they use space effectively?
Is their posture straight and natural?
Are their gestures natural and appropriate to their context and situation?
Do they make appropriate eye contact with members of the audience?
Do they avoid repetitive movements and irritating habits?

Problems with Posture
- Tilted Posture: Putting weight mainly on one foot or hip
- Slumped posture: Shoulders fall forward, chin thrusts out, hips are forward and back is arched
- Leaning away: with weight back on the heels or one leg.
- Leaning on: tables, microphone stands, ledges, etc
- Closed gestures: turn the back of hands to the audience
- Fig Leaf posture: clasping hands in front of the waist or little lower down

Problems with Gestures
- Lecturing Gestures: Pointing a finger at the audience, by standing with arms crossed at the chest, or standing with hands on hips
- Steepling: Describes the positioning of hands in front of chest in the position of prayer.
- Too few and too small gestures: Gestures add life to both voice and appearance. As a coach, you can model more appropriate gestures.
- Too few sustained gestures: Distract the audience. While some gestures should be brief, many should be held while the speaker completes a point.

Voice
Speakers have some control over how well listeners hear what they say and can influence listener’s interest in their topic through skillful use of their voices.

Does the voice sound lively and natural?
Is the voice consistently easy to hear?
Does the speaker enunciate clearly?
Is the speaker’s pronunciation acceptable?

Pitch
Pitching up generally signals the end of a question while pitching down indicates the end of a statement.
When coaching, draw this problem to a speaker’s attention by repeating one or more of their sentences with and without the rise in pitch at the end.
Working from an audio tape may prove useful.

Pace
Sounding stilted occurs when the rhythm and expression of voice do not match the accompanying words.
Not enunciating clearly results from being nervous and speaking more quickly than usual. A speaker can improve diction by pausing, breathing deeply and slowing down

Projection
Fading out results when the voice begins loud enough but becomes quiet and hard to hear just when a speaker reaches the important part of the message. It generally suggests lack of confidence.
Not projecting results when a speaker’s voice is too quiet to hear because of insufficient breath in the lungs. Breathing more deeply or speaking in shorter less complicated sentences will solve this problem.

Other problems
Sounding dull results when the voice lacks variety in tone, pitch, pace, volume, and expression.
People with problem should try listening to an audio recording of their
voices, and should pay attention to the above.

Pronunciation problems occur when a speaker is working in second language or speaks a different dialect from that of the majority.

Speaking style
Besides a distinctive voice each presenter has an individual speaking style.

Note whether a speaker has developed the following good habits.
Does the speaker avoid jargon and use acronyms appropriately for the audience?
Is the speaker concise?
Are personal pronouns used to good effect?
Does the speaker avoid fillers?

Problems:
Being wordy and profuse
Lacking personal pronouns is a problem because they help speakers connect with their audiences.
Saying ‘most of us’ is more personal than using ‘most people’.
Using fillers i.e., habitually repeating words, sounds or questions can be both annoying and distracting.
Best advice is to encourage speakers to pause silently.

Team Work and Workplace Communication

Issues:
Team Writing
Routine Workplace Communication
Chairing Meetings
Team Writing Heuristic and
Team Work Checklist
Team Writing

Benefits –
- Improvement of interpersonal and leadership skills
- Increase creativity
- Better solutions/document

Team Writing

Not every Rhetorical situation demands Team Writing.
An individual, generally produces short, routine documents more quickly and effectively than a team.

Situations demanding Team Writing –
- Long documents
- Documents requiring Interdisciplinary knowledge

Team Writing Processes

Team Composing approach –
Documents produced by working together to plan, draft, revise and edit.

Advantages –
- Refining a issue, approach or position
- Incorporates a compromise b/w different viewpoints

Disadvantage: Time consuming

Team Writing Processes

Single File Approach – planning, drafting, revising and even editing done individually

Advantages –
- Easy to implement
- Less time consuming

Disadvantages –
- No or very little interaction.
- One person does not have any control over other works – affects motivation.

Combined Approach – Combination of above two approaches

Provides an opportunity to develop interpersonal skills while introducing a kind of collaborative writing which is relatively easy to implement.

Team Planning
Initiated with a brainstorming sessions to determine how to deal with various aspects of writing tasks.
- Identifying the type of document to be written.
- Help of the members familiar with similar documents.
- Review of other documents of same type.

Team Planning
Establish Objectives and Analyze Readers
Clarifying the objectives that document must fulfill to be successful.
Analyzing the readers for which the document is intended and deciding on an effective approach.

Plan Content and Generate an Outline
Deciding up on content, organization, graphics, format and style.
Generating a topic outline for the document.

Deciding what roles can each member of the team will play
What portion of work each will do
Schedule for completing the various tasks: steps involved
Decide which approach you will use for drafting and revising the document
Assign individual tasks equitably
Set the deadlines

Review and clarify agreements
   review the outline to ensure that all content requirements have been met and topics are logically arranged
   ensure that everyone is clear on and agrees to the approach, task division and schedule, team revision
   revising is handled in a top down approach
   appoint members to take on the role of the intended audience

Team Revision; Document Review
   - Revision is handled in the top-down manner, concentrating first on content and organisation at the document, section, subsection and paragraph levels and then on sentence structure, grammar, punctuation etc.
   - Revision is done in several stages
   - Appoint an Editor who listens to everyone’s comments but is trusted to choose the best solution
   - Appoint members to take the role of the intended audiences, and suggest revisions from the audience’s perspective

Peer Reviews
   - Different than Document reviews which are often undertaken by the supervisors who have authority to demand
   - Another form of revision commonly employed in the workplace
   - Reviews where peers read each other’s work
   - Collaborative in nature
Reviewing

Too much criticism will not help the writer
Guidelines to provide constructive criticism
- Evaluate from the reader’s perspective
- Focus on the writer’s purpose
- Comment on a second reading
- Avoid telling writer what to do
- Respond to positive as well as negative features
- Do not force your style on another writer

Interpersonal communication

Making conversation

**Communicating by Telephone**

Approach each call as an opportunity to make a good first impression.

To ensure one makes a favorable impression he has to monitor the speed of his speech, enunciate clearly, and use pauses to separate one piece of information from another.

Given the international nature of much engineering business, one goal of each call is to ensure your listener understands you.

**Recording a Voice Mail Message**

If you are going on vacation and will not be answering voice mail, you have to provide alternate contacts. Give phone number slowly and observe phone number rhythm. If you suspect they will need to replay your message (writing phone number), record it second time, slowing down and repeating each number.
Voice mail provides an opportunity to increase efficiency, but only when used properly. Busy people do not appreciate receiving long messages or ones that must be replayed several times in an attempt to catch significant details.

Brief and clear voice mail message includes:
First and last name (enunciating clearly with a pause between names).
Company name and the date and time of call.
The reason of call.
Advice on the best times to return the call.
Phone number (twice) and alternate phone numbers, if appropriate.

Office Relationships

Avoid Disturbing Others
A simple greeting might be a problem if your colleague is working seriously to meet a deadline.
The goal is to build relationships and get work done. So, avoid disturbing your colleagues.
Observe your co-workers’ reactions and limit yourself to a simple greeting if they seem uncomfortable.

Avoid Touching Colleagues
With the exception of handshake when you first meet, as a rule avoid touching your colleagues, because a friendly pat might be misinterpreted or make someone feel uncomfortable (the reasons may be personal, cultural, etc.).

Tackling Behavioral Problems
If someone tells you your behavior or communication is a problem, while remaining friendly, ask for specifics and, where possible, avoid such behavior.
If you are uncomfortable with someone’s behavior, either tell them directly or involve someone (preferably with a HR background) to assist you in communicating your displeasure and resolving the problem.

Avoid Lengthy Informal Discussions
Some people view informal office communication as a time waster, so keep it brief to avoid appearing to waste company time.
When you find yourself involved in such a discussion, politely suggest getting back to work.

Arranging *Ad Hoc* Meetings
When work is the subject of your communication, respect the value of your colleague’s time.
Consider the following two approaches: “We need to meet in the seminar room.” “Do you have time to join me in the seminar room to discuss the dredging contract? I’m meeting Mr. Rao today and could use your help in understanding the situation.”

Chairing a Meeting
The ability to plan, organize and run an efficient meeting is a vital communication skill for all professionals.
A well organized meeting saves time and increases productivity.

Five steps in chairing an effective meeting
Clarify the purpose of the meeting
Select appropriate participants, location and visual aids
Prepare and distribute agenda
Demonstrate leadership
Distribute minutes and follow up on outstanding issues
Demonstrate Leadership

Promoting Participation
- throughout a meeting promote participation
- .. by calling on people who have appropriate experience or expertise
- remind participants of the time, so you can move on to the next topic
- further discussion may be postponed
- Be sure to summarize decisions, and obtain agreement

Arranging for a minute taker
- Someone other than leader should record the proceedings
- minute taker should be identified well in advance
- The minutes should include the decisions made or actions taken, the name of names of those responsible for the follow-up
- This would minimize confusion

Teamwork Checklist

Listening Skills
- Do you listen actively?
- Are you aware of your biases?
- Do you pay attention to non-verbal communication?

Team Dynamics
- Interaction between team members
- Do team members avoid blaming on one another when problems arise?
- Has your team avoided groupthink?

Writing as a part of team
- Team Planning
  Has the team clarified its goal?
  Have the team members agreed to deadlines?
Team Dynamics
  Are tasks divided equitably?
  Have leadership roles been assigned?
Team Revising
  Has a team meeting to discuss revisions been scheduled?
  Is criticism of people constructive

Routine Work Communication
  - Are you practicing traits of good conversationalist?
  - Are your informal communications both collegial and respectful?
  - Do you plan meetings to maximize use of time and resources?

Communication Breakdown

Common Workplace Communication Complaints
  Recognize miscommunication in its varying forms
  Acknowledge conversation rituals
  Add to your understanding of why workplace communication occurs

Negative Interpretations
  Less than honest/ Defensiveness
  Insecurity

Positive Interpretations
  Get your way without taking a stand
  Can even make you look neutral

Communication Savvy
Become aware of communication issues
Learn what your rituals are

References

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“Language as an Adaptation to the Cognitive Niche.” In Christiansen and Kirby, pp. 16-37.