



An integrated approach to how children acquire language

Project report
CS784: Language Acquisition

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1 Introduction

Language acquisition in children has been the most intriguing problem for child development theorists. Biologists, linguists, psychologists and behaviorists, alike, have proposed numerous theories in the past century in order to answer the question.

Each of these investigators saw the problem in a way that was grounded principally in the way that they saw the language, that language is a collection of motor responses, that language is a set of grammatical sentences, that language is an example of symbolic functioning, that language is a means of social control.

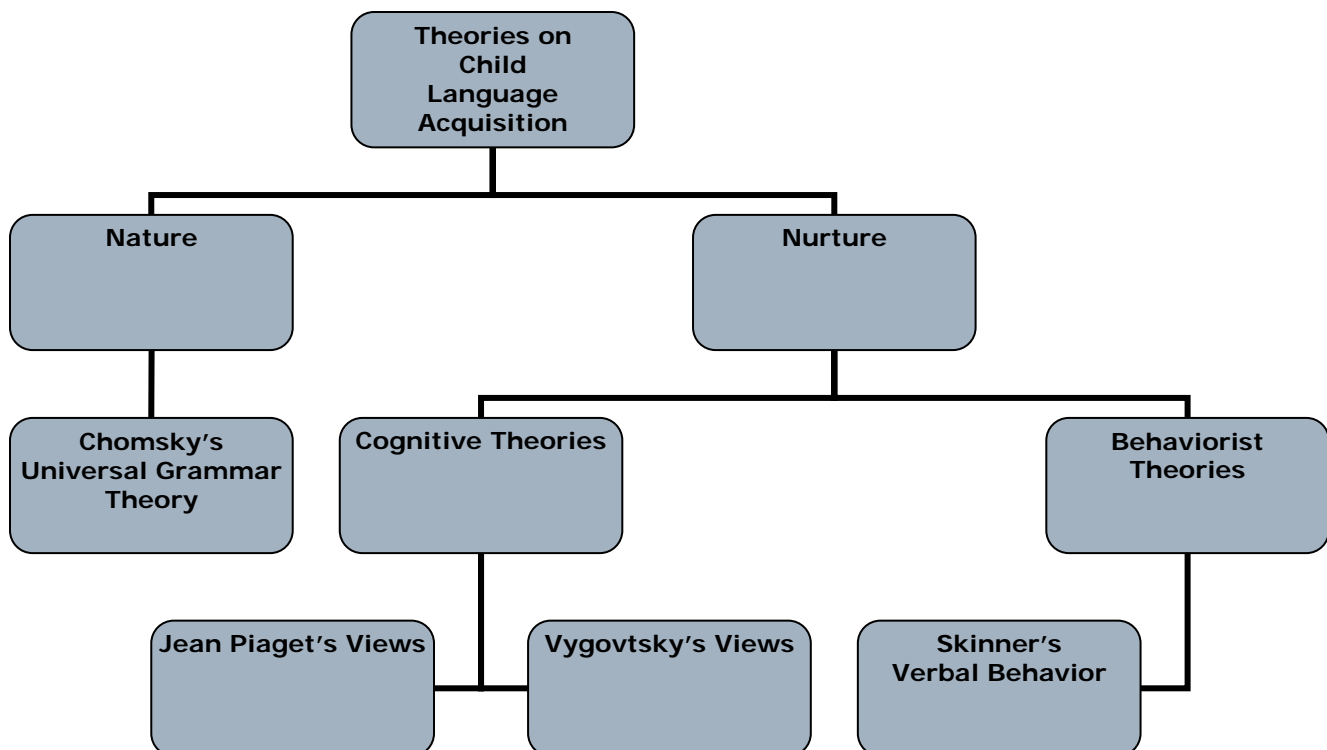
Similarly the kind of data they set out to gather depended partly on the question they were asking but also on their view of human learning, that we learn language as we learn everything else, that we have a special skill for discovering the rules of our language from a minimal linguistic input, that learning consists in a constant restructuring of our understanding of the working of the world about us, that each child creates language afresh in response to an increasing need to communicate with others.

It is easy to see from the above discussion that language acquisition has many facets. In order to come up with a genuine theory that rightly models the problem and answers it, one needs to take all the factors into account. And hence, an integrated approach is dearly necessary.

2 A Discussion of Various Theories

Language acquisition theories have basically centered around “**nurture**” and “**nature**” distinction or on “**empiricism**” and “**nativism**”.

The doctrine of empiricism holds that all knowledge comes from experience, ultimately from our interaction with the environment through our reasoning or senses. Empiricism, in this sense, can be contrasted to nativism, which holds that at least some knowledge is not acquired through interaction with the environment, but is genetically transmitted and innate. The nativist theories assert that much of the capacity for language learning in human is ‘innate’. It is part of the genetic makeup of human species and is nearly independent of any particular experience which may occur after birth. Thus, the nativists claim that language acquisition is innately determined and that we are born with a built-in device which predisposes us to acquire language. To put it another way, some theoreticians have based their theories on environmental factors while others believed that it is the innate factors that determine the acquisition of language. Before sifting through language acquisition theories here, therefore, making a distinction between these two types of perspectives will be beneficial for a better understanding of various language acquisition theories.

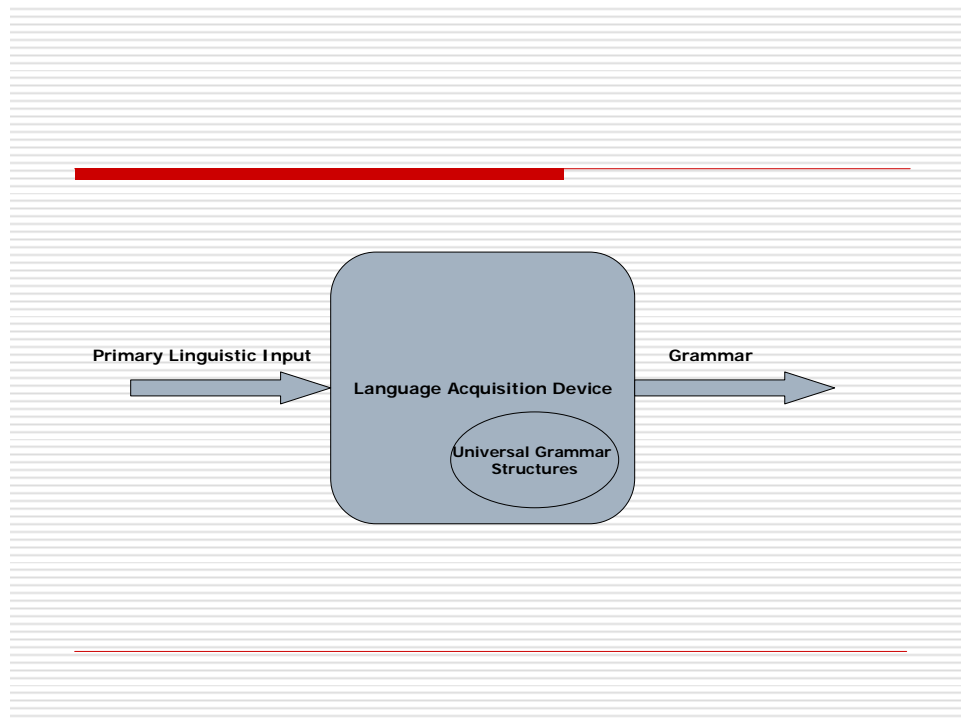


2.1 Innate Theory

2.1.1 Noam Chomsky's Universal Grammar Theory

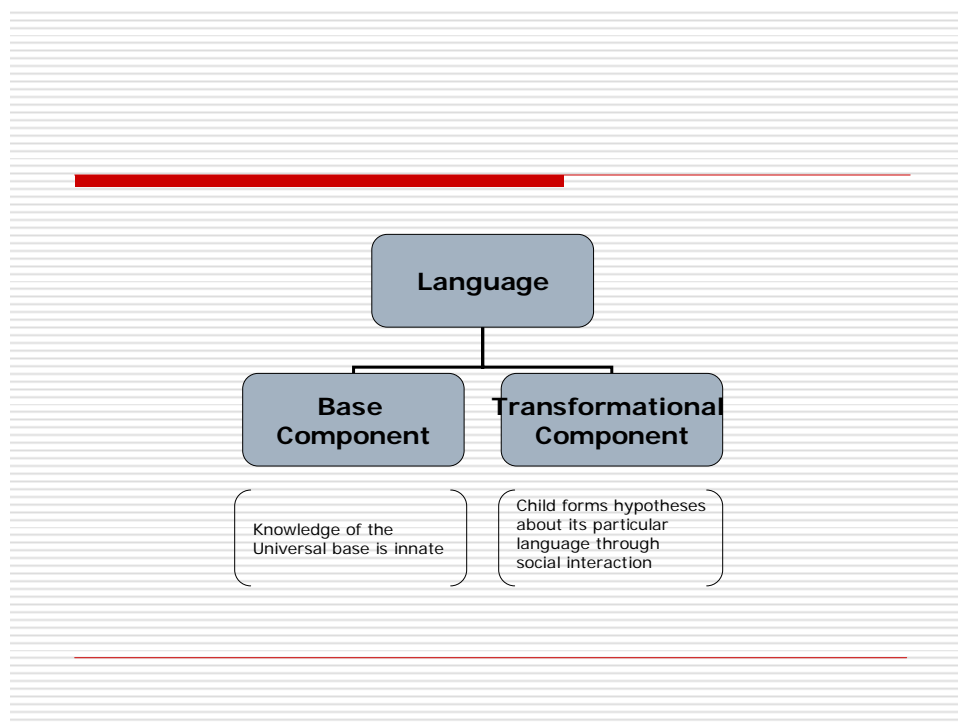
Chomsky proposes a theoretical construct a language acquisition device (LAD), which accepts as input the primary linguistic data and has as output a grammar of the language from which the data have been drawn. He then sees the task of general linguistic theory to be that of specifying the nature of the device. The problem of language acquisition will be solved for him once the characteristics of the LAD have been made explicit.

Chomsky has claimed that the categories necessary for linguistic analysis were not identifiable in the surface form of the sentences; he could not find a satisfactory account of how children could come to discover the kinds of hypotheses necessary for the task. At this stage he introduced into the argument some observations about language and its acquisition. He stressed the importance of Universals of language: despite many superficial differences between them in their surface structure, the languages of the world share many important features at a deeper level.



As to the precise structure of the LAD, Chomsky still sees this as a topic for further research, but he suggests that it should incorporate within it information about universal aspects of language structure. About the development of the specific properties of the language the child is learning, Chomsky is silent. McNeill proposed to divide the task into acquisition of the base component and the transformational component of the language. Hypothesizing the existence of a universal base, he

suggested that knowledge of the universal base is innate, along with sufficient information about the nature of transformations to enable the child to form hypotheses about the form of his particular language. It is unfortunate that details of this process which are, after all, the crux of the problem, are not given, particularly since it is here that the complexity and source of linguistic creativity are most evident.



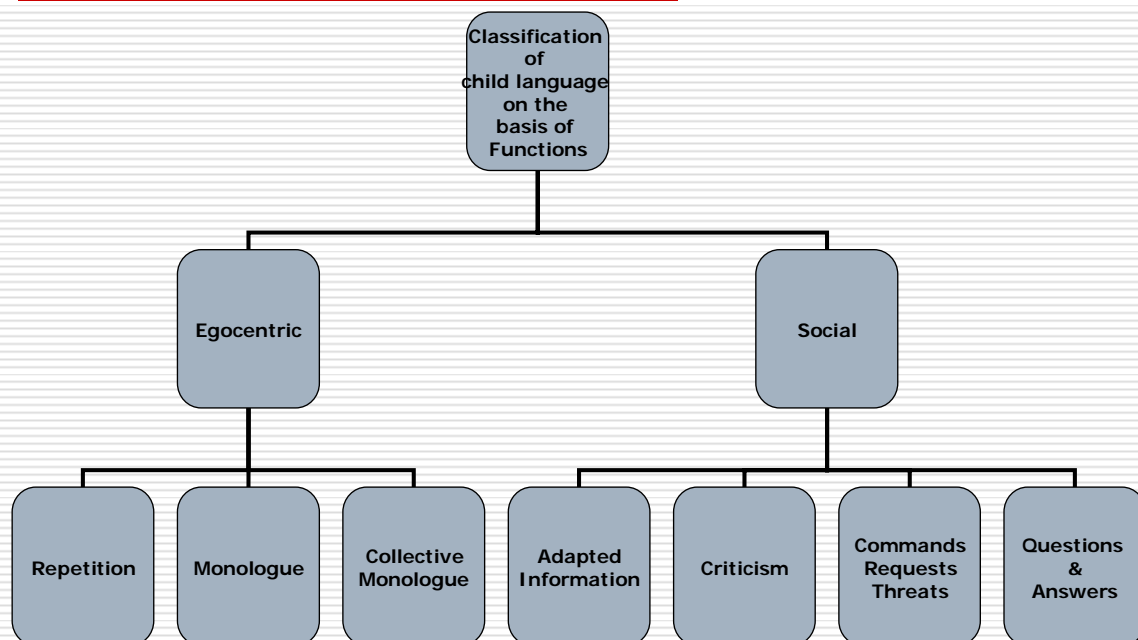
2.2 Cognitive Theories

The idea that children can learn things when they are developmentally ready to do so since learning follows development can be regarded as a starting point of the cognitivist theories. Cognitive psychologists emphasized the importance of meaning, knowing and understanding. According to them, 'meaning' plays an important role in human learning. Learning is a meaningful process of relating new events or items to already existing cognitive concepts. Cognitive and social developments meet and modify each other in an illuminating way when we look at the function and social nature of speech. Since the child is learning more about language, people and objects simultaneously, it is unlikely that these developments do not continually modify each other. Any adequate explanation of language development must therefore take these other developments into account.

2.2.1 Jean Piaget's View on Language Acquisition

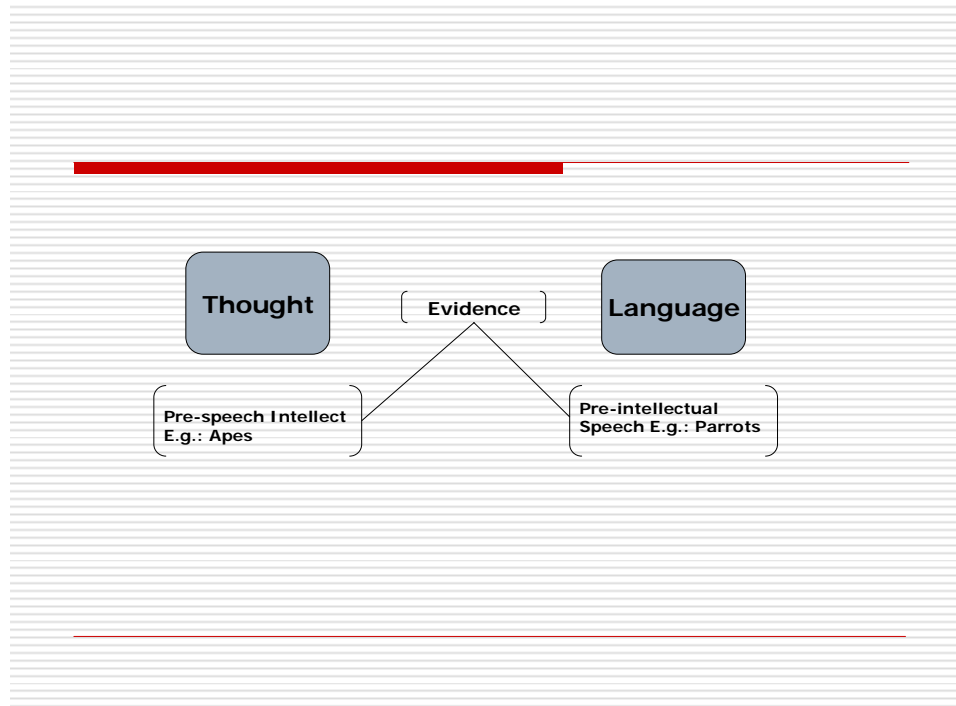
Piaget's claim is that language depends on thought for its development, and is based on four sources of evidence:

- 1) the period of infancy, in which fundamental principles of thought are exhibited well before language
- 2) the simultaneous emergence of language, deferred imitation, symbolic play, evocative memory, and mental imagery, suggesting language is but one outcome of more fundamental changes in cognitive abilities
- 3) the lack of effect of language upon reasoning abilities in middle childhood
- 4) and the nature of speech in early childhood, the claim being that the communicative function of speech results from cognitive developments.

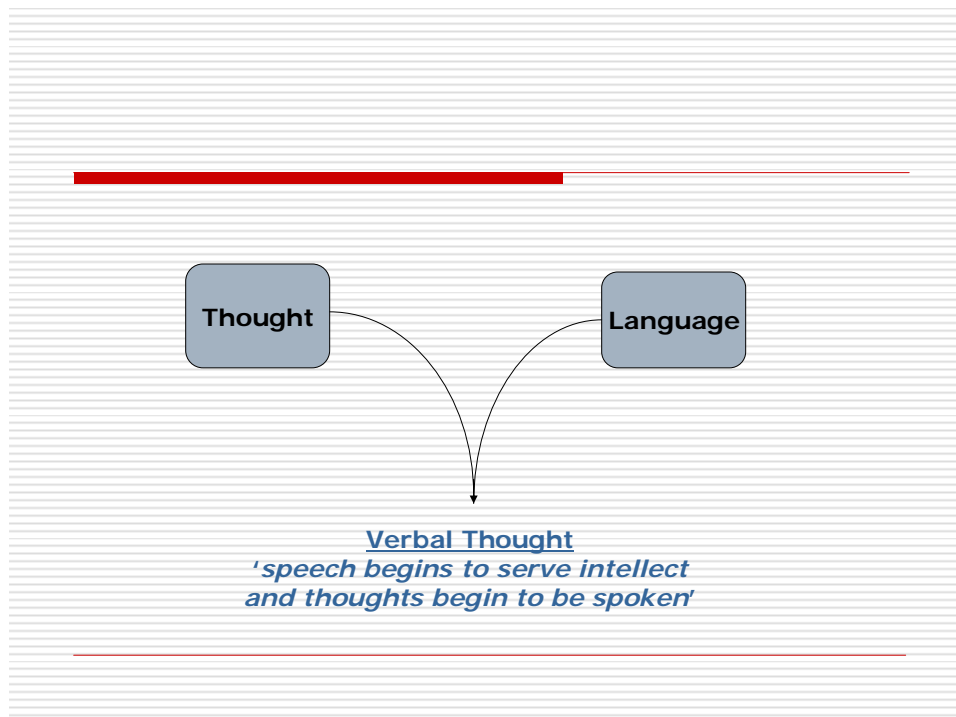


2.2.2 Vygotsky's Theory on Language and Thought

While seeing thought and language as initially separate systems,



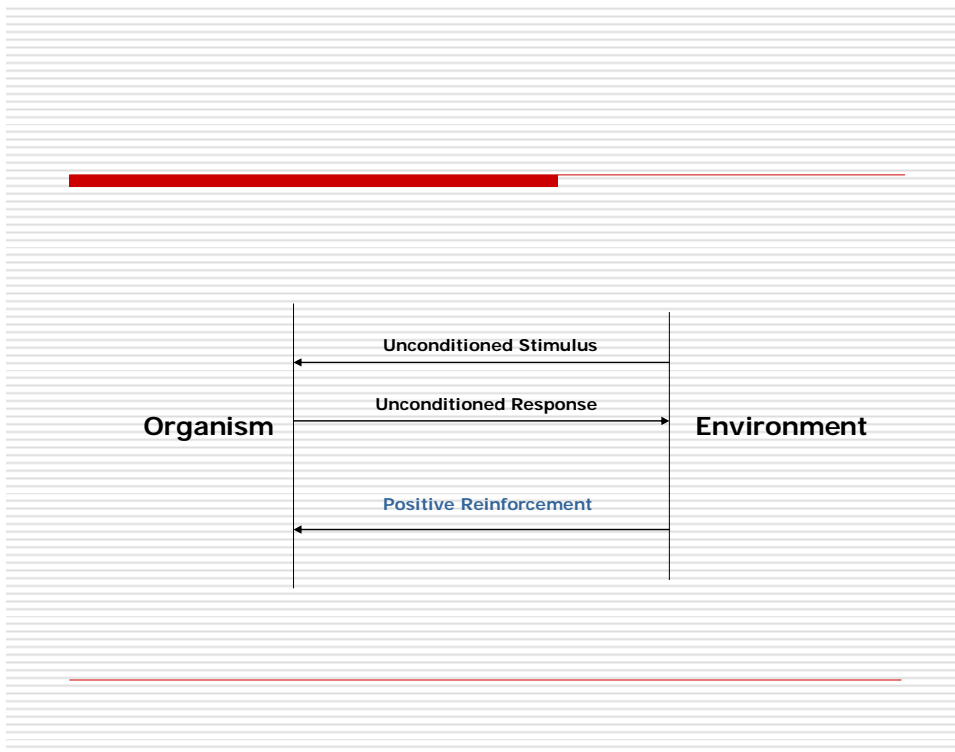
Vygotsky considers the two merge at around two years of age, producing verbal thought. Mental operations are regarded as embodied in the structure of language, and hence cognitive development results from an internalization of language.



2.3 Behaviorist Theories

Behaviorist view of language acquisition simply claims that language development is the result of a set of habits. This view has normally been influenced by the general theory of learning described by the psychologist John B. Watson in 1923, and termed behaviorism. Behaviorism denies nativist accounts of innate knowledge as they are viewed as inherently irrational and thus unscientific. Knowledge is the product of interaction with the environment through stimulus-response conditioning.

Broadly speaking, stimulus (ST) – response (RE) learning works as follows. An event in the environment (the unconditioned stimulus, or UST) brings out an unconditioned response (URE) from an organism capable of learning. That response is then followed by another event appealing to the organism. That is, the organism’s response is positively reinforced (PRE).



If the sequence UST --> URE --> PRE recurs a sufficient number of times, the organism will learn how to associate its response to the stimulus with the reinforcement (CST). This will consequently cause the organism to give the same response when it confronts with the same stimulus. In this way, the response becomes a conditioned response (CRE).

2.3.1 Skinner's Verbal Behavior

In 1957, the psychologist B.F. Skinner produced a behaviorist account of language acquisition in which linguistic utterances served as CST and CRE.

When language acquisition is taken into consideration, the theory claims that acquirer receives linguistic input from speakers in their environment, and positive reinforcement for their correct repetitions and imitations. As mentioned above, when language learners' responses are reinforced positively, they acquire the language relatively easily.

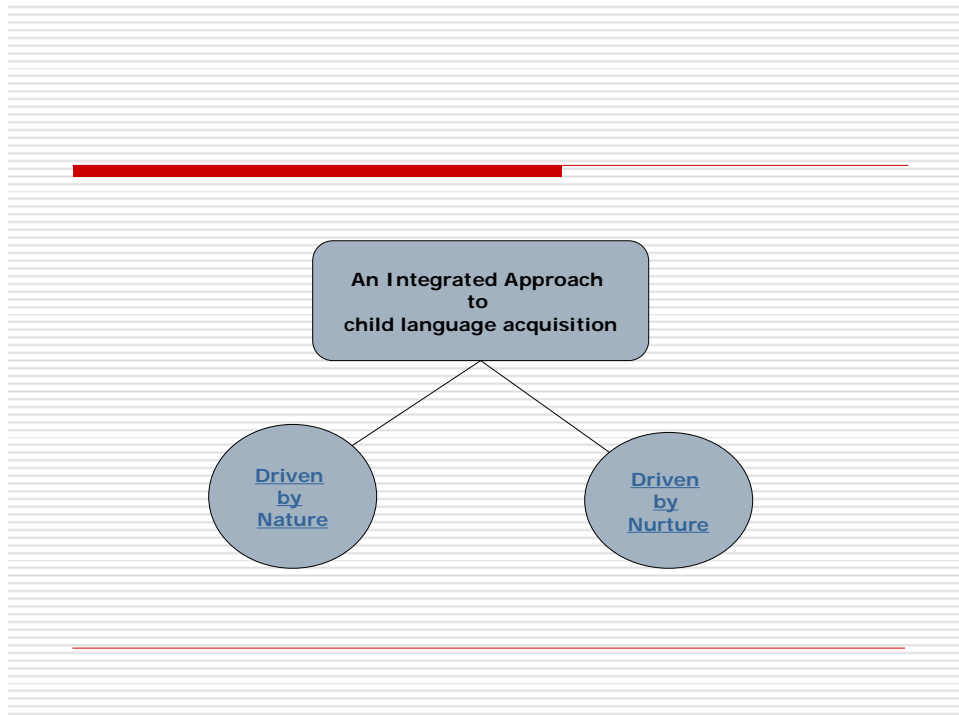
These claims are strictly criticized in Chomsky's "A Review of B.F. Skinner's Verbal Behavior". Chomsky (1959) asserts that there is "neither empirical evidence nor any known argument to support any specific claim about the relative importance of feedback from the environment". Therefore, it would be unwise to claim that the sequence UST --> URE --> PRE and imitation can account for the process of language acquisition. Also, the theory overlooks the speaker (internal) factors in this process.

3 An Integrated Approach

It is evident from the above discussion that none of the above theories give a complete picture of how a child learns a language. Every theory seems to have left out at least one important aspect of child language acquisition.

THEORIES	DRAWBACKS
Innate Theories	<ol style="list-style-type: none">1) They do not have empirical evidence.2) They leave out details on how the specifics of a particular language are acquired.3) They are not very clear on the exact innate nature of acquisition. For ex: in Chomsky's theory, he does not describe the exact nature of the Language Acquisition Device (LAD) that he proposed.
Cognitive Theories	The clinical method adopted by the cognitive experimentalist in language studies are severely criticized by later scholars.
Behaviorist Theories	If, as behavior theorists say, all that was sufficient to learn a language was interaction with the environment, then why is it that animals do not and cannot learn to speak while humans do?

The following discussion on an integrated approach is divided into two parts – driven by nature and driven by nurture.



3.1 Driven by nature

The first one year in a child’s life is mainly driven by nature. A set of observations made by Hippolyte Taine on her baby daughter are in order.

From the first hour, probably by reflex action, she cried incessantly and kicked about all her limbs.... About the third month she began to feel with her hands and to stretch out her arms, but she cannot yet direct her hand. She tries various movements of her arms and the tactile and muscular sensations which follow from them.

In my opinion it is out of this enormous number of movements that there will be evolved by gradual selection the intentional movements. The same is true for vocal actions. The progress of the vocal organ goes on just like that of the limbs; the child learns to emit such or such a sound as it learns to turn its head or eyes.

In the early months, the sounds that a baby produces are entirely its own creation.

An immediate question that comes to mind at this point is the “why” of Child Language Acquisition. Surely, the sacrosanct function that adults attach to language i.e. to be able to communicate with others cannot satisfy a functional psychologist working with a 3 month old baby. As observed by cognitive psychologists, at that age a child probably does not have the concepts of ‘self’ and ‘others’.

This makes the argument on communication futile. However, this still does not answer the question. Returning to the claim made above, I assert that the initial sounds and exclamations produced by the child are for the mere pleasure of discovery just as in the case of limb movements.

She takes delight in her twitter like a bird, she seems to smile with joy over it, but as yet it is only twittering of a bird, for she attaches no meaning to the sounds she utters. Example and education were only useful in calling her attention to the sounds that she had already found out herself, in calling forth their repetition and perfection, in directing her preference to them and in making them emerge and survive amid the crowd of similar sounds. The source is higher.

From the fifth and sixth month children employ their whole time for two years and more in making physical experiments. They make a constant study of all bodies within their reach. It is pure curiosity. And I propose that it is this same curiosity that drives a child to make vocal experiments with sounds and exclamations. The question of the source of curiosity belongs to the larger field of cognitive studies.

From 11 months, when she is asked "Where is mama?" she turns towards her mother.

There is nothing more in this than a simple association.

In the past six weeks, she has gradually enlarged the meaning she associated with baby; for instance yesterday in the garden seeing two little wet places left by the watering pot on the gravel she said her word with an evident meaning; she meant by it 'whatever wets'.

As various concepts begin to take shape in a child's mind as part of its general cognitive functioning, it makes generalizations suited to its own mental state. It is evident from the previous example that the general character which we wished to make the child catch is not that which she has chosen.

She makes imitative sounds with great ease. She first learnt to apply the word oua-oua to a little black dog that belonged to the house which barked a lot. Very quickly and with very little help she applied it to dogs of all shapes and kinds.

At this age, analogy making is not restricted to language but can be extended to all aspects of cognition. However, it is important to note here that the child made this discovery long before she started speaking. Through speaking, she is only giving verbal expression, precision and coherence to knowledge that she already possesses.

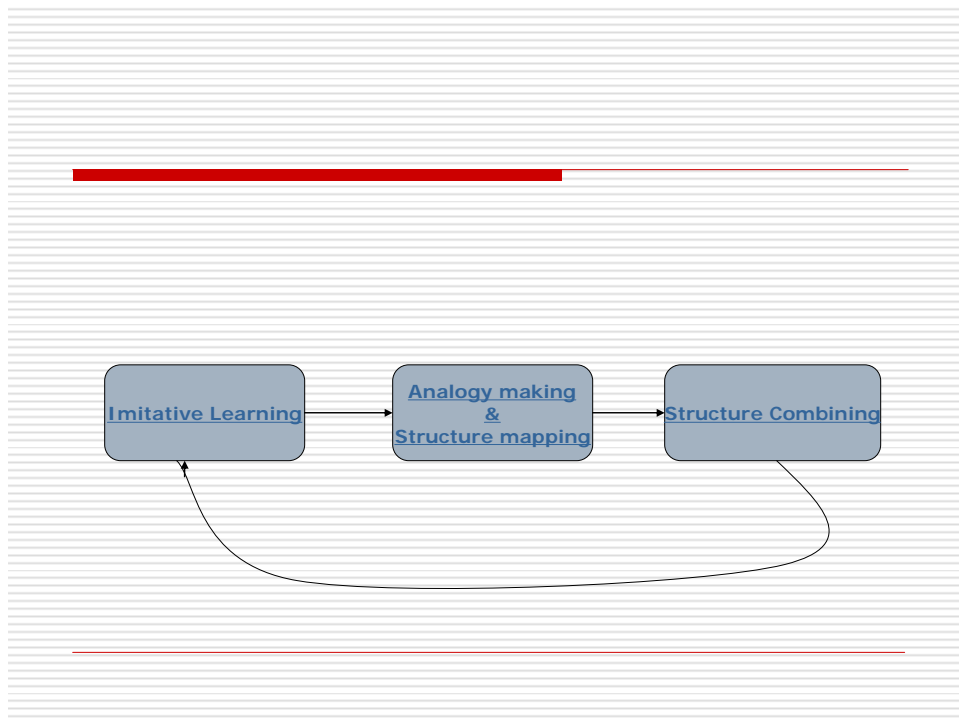
When she began to use consonants freely, she invented a few new words to which she attaches meanings. For example, ham and tem. The child never omits to produce ham when she is hungry or thirsty, all the more that she sees that we understand it, and that by this articulation she gets something to eat or drink. For the last two months, on the other hand, she has left off using the word tem.

This is no doubt because we did not choose to learn it. We did not use it with her, so she left of using it herself.

Hence, the initial phase of producing sounds for the mere pleasure of discovery has subsided. From this age onwards, social influences seem to play an important role in reinforcing the linguistic knowledge of the child.

3.2 Driven by Nurture

Starting from the second year onwards, thought and linguistic abilities grow together both conditioned to a large extent by the social environment of the child. The central theme of this period is relating language to other social and cognitive kinds of knowledge, and how it changes during development.



A large part of language is acquired by some form of social or imitative learning. While imitating, the child understands the purpose or function of the behavior she is reproducing. The child knows in what way an adult intends to manipulate her attention through the use of certain words or phrases. So, as the child hears a piece of language she attempts to read the speaker's communicative intentions – both at the level of the entire communicative act and at the level of its constituents. It is to be noted here that this tendency towards imitation is not restricted to language alone. Children between

1 and 3 years of age attempt to understand and reproduce virtually all of the activities they see in the cultural activities around them.

It is important to stress that imitative learning by itself can support only limited sounds (words or phrases) that are actually heard by the child. It does not enable children to produce novel utterances because it cannot create abstract linguistic categories or schemas. This means that imitative learning cannot be the whole story of language development.

Once the child acquires an initial minimal repertoire of linguistic constructs through imitation, she very naturally discerns similarities and dissimilarities among the various the constructs. And hence a rudimentary abstract structure to language is in place. As seen earlier, analogy making is a general cognitive ability. More sophisticated abstractions are created over time.

It is important to stress here that children cannot engage in these processes of analogy making and structure mapping unless they understand something of the functional structure of the utterances they have imitatively learned. It is only with such an understanding – based ultimately on an understanding of the communicative intentions of others – that children can go on to align appropriately the corresponding constituents in the different constructions with respect to their similar functional roles (what Gentner calls “structural alignment”)