This overview attempts to outline Chomskyan cognitive linguistics. Over the last four decades this field has attained tremendous development in terms of both scope and depth and probably any review, intended for a seminar presentation, of the field that seeks to capture this rich growth is bound to lack in comprehensiveness and detail. At least the present one does. Besides it is a distinctly subjective overview, written with a historical perspective, projecting ideas and themes here which another review might not.

The central concern of Chomskyan cognitive linguistics is the acquisition of language by humans. A child learns her language with very little help from her environment: the language she is exposed to is not graded from the point of view of complexity, and comprises well formed and ill formed – ill formed in various ways – utterances, which do not carry helpful labels regarding their grammatical status, and even half-formed utterances, and she receives almost no linguistic instruction from anyone – in fact, it is not even possible to provide any such instruction to her - a fact that is quite obvious to one and all, if not always with respect to lexical items, at least when it comes to grammar. Yet a one and a half year old child provides enough evidence of her having acquired commendable competence with respect to the language (even languages) she is routinely exposed to. This is undoubtedly a marvel of nature, so to speak, and it is this phenomenon that needs explanation. Attempting to provide one is the basic concern of Chomskyan cognitive linguistics.

A very significant step in this direction was taken in this cognitive linguistic enterprise when in the early sixties of the last century Chomsky distinguished between knowledge of language and its application in interpreting language and producing language, and narrowed down the domain of this research enterprise to knowledge of language, a very reasonable methodological step for the obvious reason that it is only when some insight into the knowledge of language is gained that meaningful steps could be taken for the study of how it is used. This distinction between knowledge and its use is by no means contrived; it is in fact quite a “natural” one, although it is another matter that till then linguistic research dating back to hundreds of years had not at least explicitly made that distinction. Besides, this centuries-long work does not provide reasonable evidence that in practice at least this distinction had actually guided it in any meaningful way at any time during this long history. There is indeed nothing odd or unintelligible with the idea of someone having the knowledge of swimming, but choosing not to use that knowledge. Clear empirical evidence is available that supports this distinction in, among others, the
form of impairment of knowledge under certain circumstances, such as an accident, and progressive restoration of the same during recovery. It might be mentioned here that with the choice of knowledge of language as against the use of language as the subject of study, a new paradigm of research emerged in the field of human sciences.

How one acquires knowledge is certainly not a new question; it is well known that it had agitated the minds of the ancient Indians and Greeks; it is at least a two thousand and five hundred year old question. The ancients might not have been concerned with how the knowledge of language in particular is acquired; Plato does not seem to have been and neither Panini nor his predecessors in India, be they grammarians or philosophers. However, in India a coherent account of how language is learnt was available by 7th century AD in the works of Prabhakara and Kumarilabhatta. This account was essentially behaviourist in orientation: the child learns her language basically from her experience of language use by the elders and from the teaching of the grammar and the lexicon. Incidentally, it might be worth noting that scholarly interest in the architecture of knowledge in a certain domain does not necessarily invite similar interest in the acquisition of the same. Number theorists, for example, have not been traditionally concerned with how the human child learns the number system. As far as the acquisition of the system of number is concerned, research to provide an explanation seems to be a more recent phenomenon. There is no direct route from the question of language structure to the question of language acquisition. Perhaps there is a route from the question of language acquisition to the question of language structure because language acquisition includes acquisition of language structure and deep insights into the nature of language structure might contribute to the way language is acquired. But this route was not taken, if one scans the long and rich history of the study of language.

Traditionally language learning and language structure have been conceived of, at least in India, as essentially distinct, although related concerns, related in that teaching of the grammar of a language was seen as contributing to the learning of that language. However understanding a language, which is indeed part of the use of the knowledge of that language, and explication of the structure of that language were viewed in ancient India as deeply related: expressions of a language are understood, in terms of, in part, their structure. From Panini to Bhrtrhari, grammarians and philosophers of language seem to have held this view. But how those structures are acquired or more generally how the language is acquired is clearly a substantially different question. Now it is due to the creativity of Chomsky that these became symbiotically related: one acquires a language critically because one is predisposed or genetically programmed to learn a natural language, and this genetic programming can be spelt out in terms of a certain architecture of the language faculty, one faculty of the mind – and is termed as “universal grammar (UG)”, which is not a grammar in the known sense of the term, but a set of constraints that grammars of natural languages must meet. Now in a manner of speaking, it is in terms of UG that the child makes sense of her linguistic universe to which she responds: she acquires her native language. (Perhaps the establishment of the connection between the question of language structure and language acquisition in the late fifties can be understood as follows too: by the time Chomsky examined a very influential theory of language learning that time - Skinner’s theory - and pointed out its inadequacies, there was the idea of UG already available within the framework of an approach to the study of
grammar, due to Chomsky again, which emphasized that a satisfactory description of a language can be arrived at only on the basis of a general theory of grammar. Once it was realized that a “mind as a clean state” kind of theory could not be the basis for a proper understanding of the well-known language acquisition facts, there naturally arose the need to ask what is written on the slate. The availability of the idea of UG – in some form, namely, the general theory of grammar – must have been a great help in that it could be conceptualized as what is written on the slate. It is well known that language acquisition is not an instantaneous event; it is a process that extends up to a certain stage, say, the “steady state” (this does not mean that there is any change in the architecture of the language faculty, a “mental organ”, metaphorically speaking, but actually having a neuro-physiological basis) stage in one terminology. In this research enterprise it is the characterization of UG that is prioritized, which is quite natural, since it is in only terms of UG that the system of a language can be described and at the same time it is only with reference to what is given that what is acquired can be meaningfully understood. It is obvious that the child’s growing linguistic knowledge at various stages of development can be insightfully described only with respect to a theory of the initial state of her knowledge of language.

The theory of UG can certainly be seen as a purely linguistic, as against cognitive linguistic, theory that accounts for the invariance (or near invariance) of the systems of various languages at one level and also for the limited variance among these systems at another. Research on UG can indeed be an autonomous enterprise; that is, it is a legitimate effort without any linkage with any cognitive question. In fact, one might suggest that that was how it was viewed at the initial stages of the generative enterprise. In Syntactic Structures Chomsky emphasized the necessity of a general linguistic theory for the explication of the grammar of a particular language. Now when one asks the question regarding the content of the initial state of the knowledge of language, UG becomes the obvious answer; the architecture of UG is the content of that knowledge. One might perhaps suggest that Chomsky has provided a persuasive answer to the methodological question of how to approach the issue of the content of the knowledge of language that is part of the human genetic endowment. There is no observable behaviour from which one could more directly study – the terminology of the inductive approach is merely for the sake of presentation - the nature of the innate knowledge of language: there is no universal language which is a manifestation of UG. But there is indeed such behaviour in the form of some particular language, which is a manifestation of the knowledge of language at a certain stage. It is this that can provide the necessary evidence for the validation of a theory, a particular specification of the nature of the innate knowledge of language, there being just no other way. One could adopt the methodological assumption that such knowledge systems are redundancy-free, economical and elegant, and that the relation between the initial state of the knowledge of language and some realized state is that a strongly restrictive system allows for some strictly limited options that can manifest.

UG as a theory of the content of the initial state of knowledge of language must be in consonance with a very basic fact of language acquisition, namely that this knowledge – this architecture – is activated by exposure to a natural language, and it grows into some
steady state through this exposure. The language of exposure is the primary linguistic
data (PLD) on the basis of which the child constructs a grammar of the relevant language,
using the genetic endowment. PLD can be viewed, at a certain level of abstraction
(setting aside phonological properties of it), as a linear string of (fully inflected) words,
which carries information, which includes word order and the form of words. What are
not derivable from PLD include much of what is necessary for what can be somewhat
informally called the semantic interpretation of the data. Semantic relation between
entities, for example, is not always a contiguity-based relation; for example, a reflexive or
a reciprocal entity, a referentially dependent entity, more generally, does not have its
antecedent contiguous to it or the verb and some entity with which it has a semantic role
relation such as theme or agent is not adjacent to it. In fact, it seems to be rather rarely
that a semantic relation involves contiguity; one example is that of the so-called emphatic
element, which could be a reflexive form, immediately following the entity that it
emphasizes:

(1) raama bi seiaa kalaa
   Rama – EMPH – that - did
   (Rama too did that.)
(2) raama nije seiaa kalaa
   Rama – EMPH refl – that – did
   (Rama himself did that.)

Now if PLD does not provide all necessary information to the child with respect to
semantic interpretation (About whether the PLD of a morphologically rich language
would provide more clues to the child for semantic interpretation than that of a
morphologically relatively poor language, thereby making acquisition of the former type
of languages easier, the answer would be in the negative; differences between the PLD of
languages do not seem to have consequences for language acquisition.), but at the same
time she is able to assign interpretations to the same, then whatever mechanism is
necessary for semantic interpretation has to be part of the “given”. For example, if a
certain kind of hierarchical structure is needed for semantic information (one might
disagree, and show on familiar principled ground that it is indeed not), then this
knowledge must be part of the given knowledge of the child. From this it follows that
language differences cannot be semantically driven, and that such differences can relate
to only some non-semantic features of words (morphological ones –inflections – which
include those that capture semantic connections between strings of words, such as theta
role-based ones, precedence-relationship between actions, etc.) and word order, but if
word order can be shown to be a consequence of some features of words, then it is just
the morphological features in which language variation is rooted. From this follows what
is known about language acquisition, namely the ease and the rapidity of language
acquisition. Incidentally, within this approach, a lexical item is not an atomistic element,
but a composite of features, of which some – at least, the semantic ones, for instance,
“animate”, “human”, “theta grid” feature, etc. – constitute part of the genetic endowment.
This invites the question as to the contribution of exposure to the knowledge of some
word. The basic approach seems to be that the child’s task really boils down to
connecting a certain assemblage of features to its realization in the form of a word in a
given language, connecting certain semantic relation such as attribute-attributee to some specific inflection or word in the given language, and the like.

The model of UG as a representation of the contents of the initial state of the knowledge of language, along with the necessary computational mechanism, then, may have the following organization. An assemblage of lexical features combines with another such assemblage to form larger units as dictated by the properties of these assemblages (various selectional properties), and the emerging structure of these units is a consequence of the dictates of the combining operation, there being no constraints on the number of assemblages that can be thus combined. Word order operations may be triggered by some features of the words (case morphology, for instance), which activate these operations. This activation is a consequence of the words’ conjoining to form larger units. Since word order is not relevant for semantic interpretation, the merged structure can be made available for semantic interpretation after being purged of elements that are not needed for semantic interpretation, for example, abstract case (nominative, accusative, etc.) features of nouns (the so-called agreement morphology could be viewed on a par with abstract case from this point of view, but it may not be so. Agreement, contrary to the perspective of the mainstream generative linguistics, could be viewed as an indicator of a semantic relation between the relevant entities which ancient Indian grammars called samaanaadhikarana “sharing the same substratum”. This is a relation that has different values in different cases; for example, an attribute and the object it is an attribute of, a referentially dependent entity and its antecedent, a theta relationship between kartaa and kriyaa, etc. - all instances of samaanaadhikarana, but the semantic relations are different.). This purging is needed in order to make the computations for semantic interpretation most economical. (There must not also be anything in the structure for phonological interpretation that contains an element which cannot be phonologically interpreted.) Computations for semantic interpretation can be viewed as essentially the ones that relate entities, resulting in relations of different types (theta, antecedent, etc.), and not ones that combine entities to form larger entities. Since phonological and semantic interpretations yield different objects (“sound” and ‘meaning”), making use of different structural and lexical (the feature “human” has no interpretation for phonology, for example) and computational resources in the process, the task of providing these two different kinds of interpretations can be assigned to two different components. From this however it does not follow that sound meaning connection is indirect – an approach that has governed mainstream generative linguistics throughout – in the sense that a semantic representation does not directly yield a phonological representation, as is the case with, say, Case grammar of the nineteen sixties or Paninian grammar. The so-called “Saussurean arbitrariness” does not explain why sound meaning connection must be mediated through syntax, putting it in one way.

This PLD-based perspective on the nature of UG leads to an interesting understanding of “principled” language variation (ignoring for the present purposes certain accidental features of some individual language that owe their occurrence to “creative innovations”). If the resources for semantic interpretation are part of the genetic endowment, and if word morphology can be seen – with very good reason – as, putting it rather informally, externalization of some features of words (number, gender of nouns, for example), and
relations between different words in a string of words, then language variation is a function of these externalizations. Languages would differ with respect to the manner in which they externalize these relations, inherent features, etc. For example, with respect to various kinds of relation between words, some languages might morphologically manifest person, number etc. agreement on all the entities concerned, others might not. A language such as Sanskrit shows not merely verbal agreement, but also agreement between an adjective and the nominal it modifies, whereas Oriya does not provide evidence for the occurrence of the latter, except in cases of the so-called *tatsama* lexical items (items borrowed from Sanskrit, which have retained many features of this language). A language such as Kashmiri exhibits double verbal agreement (agreement with subject and object both) in some constructions whereas Tamil or Oriya exhibits verbal agreement with the nominative subject alone. Malayalam, in contrast, shows no verbal agreement. Some language might conjoin clauses using morphological resources (the verb carrying the necessary morphological marking), some other might use separate words for the purpose. English uses the conditional word “if” (or the “if – then” sequence), whereas one of the options Oriya has is the use of the verb containing the conditional morpheme (a dependent morpheme). Such examples can be multiplied. In this way language variation can be seen as the consequence of the manner in which (semantic) features and relations are externalized in morphological terms. What is then needed is a theory of variation that would specify what kinds of variation to expect. It is eminently reasonable to expect that the number of possible options can only be very small, otherwise the speed of language acquisition cannot be explained. What exactly are the options? What do these options relate to – what are these options options of, and why only those? Is the availability of the PRO-pro option a consequence of the kind of option that is under reference here? Perhaps not, since there is no reason to suppose that these entities are not present in all languages. If this is true, then there are some morphological realizations that are relevant to language variation, and there are others that are not. What connections can there be between the options under reference – for example (speculating wildly), can it be the case that if a language allows only subject-verb agreement, it would allow something else too, say, anaphor-antecedent agreement? At the present, there is very little about a theory of language variation within what we have called here the PLD-based approach that we have reasons to feel to be really confident about.

The story of the initial state of knowledge of language would probably have ended here. Of course there are other issues regarding knowledge of language, a major one being whether knowledge of language constitutes a separate module, within a modular theory of mind. UG is the theory that specifies the content of the initial state of the knowledge of language, and there is then the need for a theory that deals with how this knowledge interacts with other kinds of knowledge in the mind. This is essentially the modularity-related question. The story does not end even here because there arises the natural question as to how the knowledge of language is “located” in the brain, and this in turn gives rise to another question as to how it is that the humans alone are endowed with knowledge of language among the species that the world has known of.

This question of the situatedness of the knowledge of language in the physical mechanisms of the brain becomes important in a certain context. In the modern
intellectual milieu, one cannot subscribe to Patanjali’s idea that “language is the great ‘spirit’ (deva) that has entered into mortals (mankind) . . . (Matilal 1990, p.11)”, which closes all questions about why humans alone have language (since it is the consequence of divine intervention), nor can one subscribe to the idea that there are human functions that can be attributed to some substance (“second substance” of Descartes, or “aatman” of ancient Indian philosophy) that resides in the body but is not part of the body. It is within the possibilities of the human biological system that functions of the organism, including the mental ones, have to be accounted for.

The human language acquisition device (LAD), the “language faculty”, which provides the mechanism for language acquisition, can be thought of in terms of a biological organ, a mental organ, using the word “organ” somewhat metaphorically, and under such a conception it can then be studied in the same way other organs of the organism are studied: its function, structure, physical basis, development in the individual, and evolutionary development (see Chomsky 1980 for some details). The study of the function of this organ involves the study of the internal structure of the other systems of the mind (say, the system of thought, for an example) which can also be conceptualized in the same way as “organs”, and the way the language faculty interacts with the relevant organs. As of now, there is hardly anything that one knows of the internal structure of some of these systems (say, the system of thought); as a result, whatever interaction between these systems and the language faculty is often conceptualized, can only be rather ad hoc. The questions of physical basis, growth in the individual and the evolutionary development are connected, although each can be separately investigated. For instance, the “growth in the individual” question that crucially involves investigating the role of nurture in the unfolding of the language faculty, an endowment of nature, can be pursued without waiting for insights regarding the physical basis of the knowledge of language or its evolutionary development, although, to state the obvious, findings concerning the former might be seriously questioned or even rejected after insights in the field of the evolutionary development of the language faculty are available.

At this point it might be stressed that such opening of the field of generative linguistics is a direct consequence of viewing linguistic enquiry as a cognitive enterprise. If generative linguistics had confined itself to the issue of capturing the deep similarities between the grammatical systems of various languages and the related one of providing an account of their differences, then such opening up of the field would not have been possible – all that would have been needed are a general theory of grammar, providing the terms of linguistic description, and the form of grammar (which would include the conditions that grammars must satisfy). Now among the many interesting consequences of this opening up, there is this methodological one: the relevant data can no more be linguistic material and the native speaker’s judgement of the same in terms of grammaticality, etc. It is no surprise then to see the point of Chomsky’s repeated observation during the last fifteen years or so, that there is no way to decide in advance which data are of relevance to generative linguistics, and which not. Data, he observes, do not come with tags indicating their relevance for this discipline or that. He also observes that it cannot be a methodological imperative concerning the generative
linguistic enterprise that any one kind of data (say, for example, data regarding the native speaker’s intuitions) must be more highly valued than some others.

Turning to a related matter, as a consequence of the viewing of the study of grammar as an essentially cognitive linguistic enterprise, experiments have assumed a very important role in this field. This observation may be looked at in a certain context. Generative linguistics has always been characterized as an empirical science. Therefore it has always been an imperative that empirical support is necessary for testing the validity of the theoretical claims. For instance, it has always been recognized that whereas specific theoretical proposals regarding UG can be made on the basis of deep and insightful study of the grammar of an individual language, the same must be evaluated for their validity through checking against the grammars of individual languages; that is, such a proposal is valid only if it is not falsified by the grammar of any language. Such checking can be seen as the equivalent of experiment in an empirical science since it performs the function of experiment in an empirical science. But there is no substitute to experiment when questions of language development in children, language pathology, etc. are investigated, whether or not results have any bearing on the studies of competence.

The opening of the field has also made communication between various disciplines (or sub-disciplines) concerned with various aspects of the study of language (language development in the child from the initial state to the steady state, language disorders, computer processing of natural language, animal communication systems and their evolution, among many others) not only possible but relevant, in the sense that quite a few are optimistic that research findings in any of these areas can be illuminating for enquiry in other areas. Even the so-called “machine learning”, which is “knowledge-poor”, and which uses statistical methods and heuristics, among a host of what might appear to cognitive linguists to be rather “crude” and ‘brute” strategies, should not be ruled out without careful examination as irrelevant for cognitive linguistics, on the a priori ground that insights obtained from machine learning cannot be illuminating for a study of a certain biological organism, namely, the language faculty. But there is so much that is unclear about such matters that taking such a stand might not yield fruitful results. Consider an observation of Chomsky’s in this connection: there are “unexpected features of complex biological systems, more like what one expects to find (for unexplained reasons) in the study of the inorganic world. The approach has, nevertheless, proven to be a successful one, suggesting that the hypotheses are more than just an artifact reflecting a mode of inquiry (Chomsky 1995, p. 168)”. Results from “machine learning” might be relevant to a study of performance since many of the strategies that are often used here appear to be based on information that straightforward analyses of performance data readily yield.

At the moment it appears that some serious interest in the evolution of language is emerging in sections of the biological community and it is possible that the most promising insights about the language faculty might come from the study of its evolution. Interest in the communicative behaviour and the learning behaviour (of systems including some recursive ones) of some animals such as apes, monkeys, chimpanzees, tamarins, etc. over the last four decades or so has generated information that is being viewed as
quite meaningful for the study of the evolution of the language faculty. Till more recently the general attitude (at least in the linguistic community) was that since language is a species-specific attribute of the humans, there could hardly be anything in the animal communication studies that would be of interest for the study of human language. The change in attitude has come owing to some very interesting findings in the study of animal communication systems. For example, it is possible that “…important aspects of language have been exapted away from their previous adaptive function (e.g., spatial or numerical reasoning, Machiavellian social scheming, tool-making) Hauser, M, et al. 2002, p.1569).” Possibly some ancestral function of language could be located in locomotion in some species (see Chomsky 2000). Traditionally language has been thought of in terms of sound-meaning connection, and grammar, a device to capture the same. Putting it in more recent terminology, language faculty generates expressions which are assigned interpretations by the sensory-motor and conceptual-intentional systems. Now there is evidence that certain properties of the sensory-motor system (such as ability to imitate) are found in species such as songbirds and dolphins, apart from the humans, and certain properties of the conceptual system (such as “a sense of self and the ability to represent the beliefs and desires of other group members” Hauser, M, et al. 2002, p.1575) are found in such species as chimpanzees, rhesus monkeys, etc. apart from the humans. What is particularly interesting is that apart from the humans, those species which have properties of sensory-motor system do not demonstrate having any conceptual skills, and those which demonstrate having conceptual skills have very impoverished capacity for imitation of sound. The question is how humans alone in nature have come to acquire these two abilities together.

The discovery of the facts noted above (along with similar others) have led to a certain rethinking about the internal structure of the language faculty. It is proposed that the language of language may be conceptualized in terms of FLB (broad sense) and FLN (narrow sense), and the latter could be restricted to certain crucial properties of lexical items (associated with the ones expressing many abstract notions) and grammatical computations with the property of recursion (see Hauser, M., et al 2002). The proposal needs support from experimental findings. It cannot be supported or rejected on the basis of theoretical ideas internal to FLN, such as the form of derivation, of binding theory, etc.

There may be something interesting about this: it has probably never been the case that specific proposals regarding the form of grammar, say, UG (its design, its computations, the elements that are computed, etc.), have been influenced so strongly by findings obtained in areas related to generative (cognitive) linguistics, such as language development in children, neurolinguistics, language disorder studies, natural language processing, and the like. That is, if the architecture of UG in Chomsky (1995) is not the same as the architecture of UG in Chomsky (1965), it is unrelated to the findings arrived at in these related areas of research. But the proposal to differentiate between FLB and FLN seems to be clearly a consequence of the insights gained in studies of animal communication.

Returning to the concept of sound-meaning connection, it may be worth noting that in the almost two thousand five hundred years of history of the discipline, this was never
viewed as something to be explained. It has always been viewed as axiomatic – language is characterized as such, and there is no issue here to investigate. But now it is a research question, answer to which would come from cooperative effort of linguists, psychologists, ethologists, biologists, among others.

To conclude, a remark on the significance at another level, (one might call it “philosophical”) of the postulation of the distinction between FLB and FLN – it is rather something obvious, though. Language has always been considered as a typically human attribute – part of defining the notion “human”. This distinction is the result of an attempt to make precise what this particular attribute is. It also reveals to us the way we may relate to the rest of the species. In a sentence the story of Chomskyan cognitive linguistics involves the growth of a research enterprise that began with attempting an explanation of the well-known remarkable facts of language acquisition and going beyond it, has concerned itself with the question of how the humans have the kind of language acquisition device they have.

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