Chapter 4

Language as an Object of Inquiry

Introduction

The nature of the object of enquiry is a question that is central to philosophy of science. Do all sciences work with similar objects? Coming specifically to linguistics, what sort of an object is language? In the case of language, there have been some debates concerning whether language is a mental object or a real object. Is the fact that language is a social and cultural object going to have an impact on a scientific treatment of language?

Chapter 2 was aimed at showing how Chomsky restricts his view of language so that he can lay the foundation for a scientific inquiry. There are philosophical and empirical problems associated with such a constrained view of language. Some of those have consequences on the practice of the discipline as a science itself. In chapter 3, we made an overview of science and tried to fit linguistics in the larger picture of science.

The aim of this chapter is to critically examine Chomsky’s well worked out views about language and assumptions about science and show how a restricted view of language coupled with a slightly outdated view of science leads to a limited understanding of the phenomenon of language.

This chapter tries to do the following:

• critically examine Chomsky's position regarding naturalistic inquiries of language in light of our understanding of science;
• use Chomsky's ideas as a tool that helps one reflect on the larger questions of the validity of internalist/ mentalist explorations;
• to point to certain flaws in Chomsky's characterisation of the object of linguistics using arguments for external reality and greater empirical focus and;
• to underscore the idea that linguistics can be a legitimate enquiry without
aspiring for a scientific status.

Dealing with the Object of Inquiry

In a general sense, language is the meeting-place between sound and meaning. Understood that way, human beings' physiological ability of making sounds and psychological ability of forming concepts form the substrata for language. Chomsky defines the object of enquiry of linguistics in a very specific or narrow sense; it is not everything connected to language. It is from this theoretical assumption that the object is analysed. From this perspective, it looks different from that of the natural sciences, in which the object of enquiry is more or less clearly out there.¹ In other words, they deal with real objects. An object is real when it is present independent and outside of the enquirer's mind. So our question becomes what kind of object language is.

This question seems to lead us to wonder whether a scientist has to study everything that is related to what is being studied. The difference between reality and appearance is central to Chomskyan linguistics because the way its object of study is defined is to focus on the core computational system of language and to keep out things deemed irrelevant by Chomsky and his group, such as context and society. There is a belief, within the tradition of the non-behaviourist psychological (and psychoanalytical) thinking, that one has to go deeper than the surface level to find out the 'real' truth.

This question of reality is certainly going to pose a problem if we assume that language is connected to thought, which is intangible and is connected to another abstract entity, namely mind. Since we cannot really observe what is going on in the mind, the behaviourists argued that language is to be studied in relation to the actions it related to in the observable world. Chomsky, on the other hand, argues for the mentalist view of language according to which language is a mental object. He also tries to show how a mental object can be an object of inquiry for science. It is clear right from the outset that he is attempting to drive the discipline away from questions about society and culture. As

¹ This is a contentious position even for natural sciences given 'theoretical' and 'unobservable' entities in physics and biology.
an idea, this view of Chomsky’s was adventurous for the 1950's. But such an approach was also part of a larger trend in allied disciplines like psychology.

Michael Lynch (2001) brings up two positions about science and its relation to human thinking, held by scientists – (1) the Sokal type of position, which is that science is continuous with common sense, and (2) the Wolpert type of position, which maintains that science is counterintuitive, in the sense that it requires specialised training to think and theorise according to the rules of the system. Chomsky, obviously, takes the latter kind of position, as it is clear from the technical implementation of say, the minimalist program. We have reasons to think that direct and commonsensical aspects of language need to be studied to a significant level before diving deeply into abstract and counterintuitive theories. So we will look at what perception and production data, typological work and metaphorical aspects of language teach us about the nature of the object of enquiry.

Chomsky's attempts to mathematise and 'precisify' the object of inquiry seem similar to the efforts of Galileo and Newton in physics. He brought in formal mathematical tools based on set theory to describe natural language. As part of his attempt to define language in a precise way, he brought into the picture several abstract categories. In order to justify this move, he has to struggle to convince us that the mental categories are real. He does it by providing the example of the way the mechanistic philosophy was got rid of in physics in the seventeenth century. But is it possible to apply a physics analogy to linguistics? Do both these disciplines have similar concerns or similar objects of enquiry? This, in a sense, is the tension underlying Chomsky's programme.

Chomsky has also been modifying his theoretical details over the past few decades although the basic framework has remained the same. This is consistent with certain norms of understanding scientific progress. Laudan pointed out that a scientific theory is

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never entirely true, although the goal of science is to arrive at truth.\(^3\) It is a common observation that an existing theory gets replaced by a new theory. For example, the Newtonian understanding of the physical world got replaced by Einstein's theory. So, what we can really understand about truth from the scientific point of view is that a theory just tends to be true (in the 'limit' sense of differential calculus) and never really true. This also suggests that in the future also, we really cannot have the hope of the project of science generating an entirely true theory. This bleak picture of scientific theories is called \textit{pessimistic induction}. An important question in this regard is whether a new theory is a little closer to truth than the previous theory. Applying to generative linguistics, the question would be whether the minimalist program is closer to the truth about human language than the government and binding theory.

Chomsky has been a believer in reductionism at one level. However, at another level, he has been critical of it. His reductionist urges are visible from his pronouncements about linguistics being part of cognitive psychology, from his painstaking efforts at making innateness arguments which seeks the inclusion of linguistics under biology and his invocations of some basic principles (such as 'merge' and 'move') as underlying linguistic theory. While he agrees that though it might be great to give neurological explanations to grammatical matters, as long as we do not have a clear sense of the nature of the relationship between the mind and the brain, we might have to work with a rigorous structural analyses of the object in itself.

It is clear that formal linguistics uses a type of mathematics. So one or other philosophical approach to mathematics has to be compatible with it. Here we see two contenders – the platonic view, as advocated by Katz and Postal, and the mentalist-formalist view, which we can infer to be the position of Chomsky and his followers. We can make this inference because of their emphasis on the rules and formalisms, although couched in a discourse about the mind. The discovery of formal descriptions for human

grammars are central to the project.\textsuperscript{4} Given the focus in linguistic theory on formal operations and theoretical entities, it seems the philosophy of mathematics that would work well with the discipline is formalism. Formalism views that mathematics is basically about “rules and formal manipulations of mathematical symbols and terms according to these rules”.\textsuperscript{5} The Chomskyan theory makes use of structural operations such as C-command on basic symbols or nodes on the syntactic trees.\textsuperscript{6}

Linguistics uses a kind of formalism using set theory and functions. It also is multi-semiotic because in addition to the quasi-mathematical formalism and descriptions in natural languages, the discipline also uses tree diagrams,\textsuperscript{7} representations involving bracketing and so on. It is clear that mathematics is applied to linguistics because some of the mathematical toolkit is made use of in the field – such as tree notations, set theory and functions. However, mathematics does not seem to be unreasonably effective in linguistics, as it is in physics.\textsuperscript{8}

Here it is important to be clear what we mean by applying mathematics to linguistics. Sarukkai (2012) has an important insight that mathematics is not applied to phenomena, but to descriptions of phenomena. Following this idea, what we mean by applying mathematics to syntax is that set theory is used to give structural descriptions for sentences. Structural descriptions are first made in natural language and then they are made in pictorial descriptions such as trees, which is the beginning of the mathematical

\textsuperscript{4} Causality is time-related and is considered central to scientific explanations. But formalisation enables linguists to go out of the temporal realm. In chapter 5 (on laws), there is a longer discussion on this.
\textsuperscript{5} Sundar Sarukkai, \textit{What is Science?}, p 137.
\textsuperscript{6} Also see footnote 54 of this chapter for Newmeyer’s comment on non-formal descriptions of a grammatical principle. On a slightly different note, the fact that the theoretical framework has developed its symbols and rules for manipulating those symbols probably rings a bell calling to our attention Wittgenstein’s idea of language as a rule-based game.
\textsuperscript{7} In “White Mythology” (\textit{Margins of Philosophy}, University of Chicago Press, 1982), Derrida characterises diagrams as mathematical or geometrical metaphors. The metaphorical aspects of language will be discussed in detail in chapter 6. Also, Sarukkai (2002) views diagrams as one of the sign systems used by science besides natural language and mathematics, Sundar Sarukkai, \textit{Translating the World: Science and Language}, (Lanham: University Press of America, 2002).
\textsuperscript{8} Here I remember a conversation with a mathematician called David Iron (November 2013 in Halifax, NS, Canada), who said to me: ‘Mathematics is like a hammer – it works well with a nail, but not with a screw.’ He further elaborated it by observing that it is effective in physics, but probably not so much when it comes to linguistics or sociology.
description. Then set-theoretic notations are applied to such descriptions as perhaps a third stage.

Trees are a graphical representation of syntactic structure, used as a mathematical tool. Saukkai (2002) argues that science's engagement with language is complex because it makes use of at least three sign-systems, namely natural language, diagrams and mathematics. Following this reasoning, trees make new narratives of dependencies in language possible by allowing for explanations that refer to operations such as C-command which are defined in relation to a syntactic tree. The rich language offered by tree and set-theoretic structures allow for rich narratives encompassing technical accounts about phrase structures.

The treatment of meaning becomes a serious problem while attempting to do a well-defined formal treatment of linguistic structures, which is the medium of theoretical work in Chomsky's scientific analysis of language. Meaning becomes a painful thorn which does not easily lend itself to a formal approach. There were earlier attempts to bring linguistic meaning under the structural analysis, but they did not prove very successful. Currently, compositional treatments of sentence meaning try to build up formalisms that describe how meaning gets created as the syntactic structure gets built up. The compositional approach is based on linguistic meaning; contextual meaning is kept out of its purview, at least in the initial stages of computation of meaning. Here, linguistic meanings of words and phrases are considered to go in tandem with their corresponding syntactic structures. General world knowledge or contextual meaning is assumed to come to play at another level of comprehension. If linguistic meaning is assumed to be inextricable from contextual meaning, more complex ways have to be thought of in order to implement compositionality.

Chomsky (1995) realises that bringing in meaning to his science would make it

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9 Sundar Sarukkai, *Translating the World*.
10 I refer to the generative semantics movement of the 1960's and 1970's. Although it provided useful insights, it did not create sustained and long-term research interest. For more on this, see Randy Allen Harris, *The Linguistics Wars*.  

158
messy and that is why he indicates that meaning probably belongs to the realm of how language is put to use in real world contexts. Partee (2005) notes that Chomsky's objection to compositionality results from the fact that it would dilute his position of autonomy of syntax by positing a correspondence between syntax and semantics, thereby opening up syntax to participating in meaning-making processes.\textsuperscript{11}

The object of inquiry defined by Chomsky – I-language – is an idealised object, which is not available for inquiry in nature as a real object. Behme (2013),\textsuperscript{12} following Katz and Postal (1991), argues that the Chomskyan biolinguistics programme works with platonic objects and not with (neuro)biological ones.\textsuperscript{13} She claims that “linguistic objects have formal, mathematical properties and human brains have physical, neurobiological properties”. The question of whether objects are platonic or otherwise (biological/social or a mix of both) have a serious impact on laws and lawlike generalisations in linguistics, a topic which will be discussed later in chapter 5. Behme makes the charge against biolinguistics that although it claims to be a biology-based discipline, it has not spelt out any exclusively “biological properties of its object of study.” She accepts that although the biolinguistics programme has discovered some interesting formal or computational properties of language, none of those can be called biological.

If we accept Chomsky's position about language as a natural object, it should presumably entail that noun phrases, verb phrases, prepositional phrases, etc., are natural kinds. Pullum and Scholz (2002) show that such an assumption would face empirical problems. A natural kind definition of NPs would include the notions that they form the subjects and objects of sentences. However, there are examples from real language use that PPs can be subjects and direct objects.\textsuperscript{14}

\begin{footnotes}
\item[13] The fact that Katz and Postal (1991) use ‘real’ and not ‘platonic’. One possible reason why they prefer ‘real’ is its association with science, (Jerrold Katz and Paul Postal, “Realism vs. Conceptualism in Linguistics.”)
\item[14] The examples given by Pullum and Scholz (2002) are: Under the sink needs some attention (PP in the subject position) and I gave behind the cooker a new coat of paint (PP in the direct object position),
\end{footnotes}
After Galileo, science began to deal with primary properties such as size, shape, mass, etc., which could be measured. It does not talk about secondary properties such as colour or smell. A secondary property is a combination of an intrinsic quality of an object and the experience it evokes in the human subject. Language, because of its sound-meaning pairing and its immeasurability, appears to be a secondary property. How Chomsky made a science of it is by redefining language as an innate faculty – a natural grammar human beings are endowed with, and hence an object of nature, which is a primary property.

Chomsky's separation of 'grammar' from 'language' is essential for a natural science treatment of the object under consideration. Scientific theorisation may prove to be impossible if the object that was studied was languages or particular instances of language use. Natural language grammar, understood in a formal sense, is argued to be scientifically tractable. Matters of variation in forms and levels of meaning beyond direct referentiality eludes scientific handling. He narrows down his view of grammar to I-language, which he defines at various points. Whether a study of I-language is termed linguistics or not, in Chomsky's view, is only a matter of terminology and not a serious question. Katz and Postal (1991) show contradictions in Chomsky's mentalist position, while recognizing the fact that he is resisting the Bloomfieldian structuralists' position of physicalism. Katz and Postal consider three possible positions about the nature of language – (1) deny the connection between logic and grammar so that language would remain a purely mentalist object; (2) accept that logic is also a mental object; and (3)
think of language as a real (platonic) object. (1) is rejected because of facts of language such as quantifier scope and entailment and (2) is rejected because of Frege's argument that laws of logic have to be necessarily true and if they are psychological, they wouldn't be. So Katz and Postal suggest that they are left with the third option, namely that language is also a Platonic object. But the problem with this position, as we will go on to show, is that this view of language does not capture the reality of language.

Chomsky's plea for methodological naturalism when it comes to the category of the 'mental' fails at the point where it is unable to explain meanings of expressions which cannot be explained using structural ambiguities (both syntactic and logical) or lexical ambiguities. If it is conceded that multiple meanings correspond to multiple states of the mind, methodological naturalism should be able to give scientific explanations for those phenomena also. But that does not seem to be the case because meaning occurs at multiple levels and at different times.

Sarukkai's (2012) observation that mathematical representations work better with some types of descriptions than others is a useful clue for understanding why formalistic means are inadequate while describing language. The nature of the mapping between language and human cognition is such that it is vague, metaphorical and dynamic in meaning. Chomsky is quite aware of this fact, which is why he specifically talks about the syntactic system in his analysis of language and keeps meaning largely out of the disciplinary purview. But even within syntax, it is not at all clear that the generative framework holds strongly in terms of explaining diverse linguistic data. The Chomskyan camp has not been able to refute Itkonen's charge that their project is one of an English-centred Universal Grammar. It makes the theoretical project easy for an English- or

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20 Structural ambiguity maybe syntactic or logical (having to do with quantifiers and operators such as conjunctions and negation).

Romance-speaking linguist to assume that the principles of Language correspond to what are specific to English. One example of this is Richard Kayne's proposal that the basic universal word order is SVO and everything else is derived from that.\textsuperscript{22} It is precisely this kind of criticism against a highly formalist approach using data from a small number of related languages which makes Mark Baker's approach – using a number of languages which belong to different families unrelated to the Indio-European group – very attractive.\textsuperscript{23}

Let us get back to the philosophical approaches to understanding the use of mathematics. The platonic and formalist approach does not make any claims to a requirement of being anchored in the real world. This is exactly the reason why Katz and Postal (1991) claim that generative grammar is platonic. It seems that Chomsky's notion of scientific realism which is based on extreme idealisation and reduction is not capable of capturing the nature of language. What this indicates is that we need a conception of realism different from Chomsky's.

Mathematics has certain axioms and based on those, further theorems can be established. The number of axioms has to be a minimum because too many of them might indicate blind faith in what is stipulated by authority. Their presence in the system should be guided by logical and conceptual necessities. Linguistic theory, in the biolinguistic tradition, has also been working with some basic axioms, such as the presence of word classes – nouns, verbs, adjectives and so on – and basic operations on them such as 'merge' and 'move'.

The goal of the discipline is to uncover the knowledge of language which comes as part of being human. It is this knowledge that is claimed to be responsible for the human baby's fast acquisition of language and the purported common grammatical features of human languages. It was earlier pointed out that Chomsky thinks an intelligent Martian scientist, who is not prone to the prejudices of the earth-dwellers, would find that

\textsuperscript{22} Richard Kayne, \textit{The Antisymmetry of Syntax}.
all human languages are the same and try to discover their principles.24

Following such reasoning, every individual has this knowledge of language, which is determined by the information coded in the human genome. As it is a specialised kind of knowledge, it is considered an autonomous module. Therefore, it is argued that this knowledge can be brought out by closely examining the language system of a person. This naturally leads to the question of how that can be accessed. The knowledge of language can be accessed by people's production and comprehension data that can be observed naturally and in experimental conditions. Practically, linguists go about asking for native speakers' linguistic intuitions and by analysing through experimental studies the measurable links between mental resources, brain areas and potentials on the one hand and linguistic features on the other.

This approach assumes that there is something like a fixed knowledge of a single I- language. There are several reasons why this is an incorrect assumption. The fact that most people are multilingual or are comfortable with multiple registers or dialects of a language shows that knowledge of language is anything but fixed. Also, people make use of figures of speech and creative expressions very often. Metaphors are very common and new ones are added at various points. Further, use of language is intimately connected to the idea of a context of usage. People have a very intimate sense of language with their own meanings of words and phrases which come to play when they tell stories and

24 As a response to this gedankenexperiment about the Martian scientist which Chomsky often tends to use, Peter Jones (2003) makes the following humorous comment(p1,2): “Chomsky often employs a rather effective expository and rhetorical device which consists in imagining how a super-intelligent extra-terrestrial being would go about the study of human language. Unencumbered by the parochial earthbound attitudes, ideological distortions and downright stupidity that humans (e.g. Chomsky's opponents) are prone to, Chomsky's Martian very quickly gets to the bottom of things, in good Chomskyan fashion, of course. The superorganism assumes that language is a biological phenomenon to be attacked with natural scientific methods (AKA 'the methods of rational inquiry', Chomsky, 1988: 41). From certain suitably idealised facts of speakers' intuitions of grammaticality, it postulates a system of abstract grammatical laws housed within the human brain. On the basis of certain suitably idealised facts about the acquisition of this system, specifically the impossibility of learning it by induction from observable evidence, an innate faculty called ‘Universal Grammar’ (UG) is postulated to explain linguistic capacity.” The logic behind the humour is clearly that the Martian's style of thinking coincides with Chomsky's style. (Peter Jones, “Critical Realism and Scientific Method in Chomsky’s Linguistics,” quoting Noam Chomsky, Language and Problems of Knowledge, (Cambridge, MA: MIT Press, 1988) p 41.)
convey personal thoughts and feelings. The power of linguistic expression is skilfully employed in writings and performative art forms.

The users’ ability to use language in a context-appropriate manner is ignored by the assumption that the language component of the mind is independent of other components. The basic idea behind this assumption is the autonomy of the language module. This idea of autonomy is called to question by studies on phonetics and phonology which study how features of language change in relation to social factors such as race, gender and class. Broadly this comes under what is known as sociophonetic literature. Many of the features measured operate at the sub-conscious level and are revealed by careful instruments, which show that these socially motivated features are not deliberately produced; instead they operate at an unconscious, (and deep if you will) part of the knowledge of language of human agents. An interesting example for such a study is Pierrehumbert and Munson et al.’s work on the vowel productions of gay and lesbian subjects. One of the main results of the study was that the speech of gay and lesbian individuals seemed to contain certain features of the speech of the opposite sex. For example, gay men had an expanded vowel space and lesbian women, the place of production of /u/ was more back than that of heterosexual women.25 Further, these features were also learned and not biological.

Jordan-Baker (2012) critically analysed Chomsky’s project as part of his work which closely looked at ceteris paribus laws in studies of language concludes that “the scope of his linguistics is motivated by a faulty philosophy of science and language.”26 This conclusion follows his observation of a serious contradiction in the generative linguistics programme. The programme, following Saussure’s guidelines for a science of language, claims to study speech and looks at writing as a derivative or an artifact.

However, the objects actually studied in a structuralist programme is anything but natural speech. They are idealised forms of linguistic items taken out of the contexts in which they were produced and expressed using some form of writing. Another problem concerning Chomsky's programme indicated by Jordan-Baker is how it ignores examples of social factors influencing language change. He discusses Labov's study of patterns of variations in vowel productions in 'Martha's Vineyard' and counters the point that the phenomenon of language change is internal to language as a system and is not influenced by social factors.27

From this discussion, it seems to follow that the context of speech and the broader social contexts influence the meaning part of language. It is not clear how language can be separated from the context in which it is used. There maybe independent arguments for the modularity of mind, but it is not clear what would constitute a good argument for separating the output level of language from contextual knowledge. Contextual knowledge with regard to language would range from knowing the geographical, climatic and ecological conditions up to knowing how to speak appropriately to different social classes which presupposes knowledge of social norms and understanding of existing power structures. Even if Chomsky's naturalistic enquiry does not include such factors, it is not clear how a comprehensive theory of language can escape an account of such 'extralinguistic' factors.

**Realist Challenges**

There are a few challenges from the real nature of language that formalist and idealised models have to deal with. Caught between the philosophical positions of mentalism and platonism, three types of facts about language often get ignored:

- facts involving perception and production of language
- facts involving diversity of languages and variations within languages and language change.
- the dynamic and metaphorical nature of language, which relates to multiple

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meanings and creative expressions

The framework of articulatory phonology is employed to discuss (1), literature from typology and language change to discuss (2) and studies from literary theory to discuss (3). These three points are expected to cover the aspects of a study of language that are missed when an abstract symbolic approach is religiously followed.

Articulatory phonology does not use something like the idealised model employed in generative linguistics. The framework of that study is built up on a model based on perception and production of language, which Goldstein and Fowler (2003) call a 'direct realism' approach.\(^\text{28}\) This approach has particular relevance if our premise is that science works with entities that are available to perception. In articulatory phonology, which involves experimental studies of phonetics and phonology using acoustic methods, researchers observe data without positing a highly idealised system of language. Articulatory phonologists pay attention to the gestures involved in the production of a sound in various words. They study how the immediate sound-related context affects the gestures associated with a particular sound. In the conventional sense of phonetics and phonology, some kind of abstract representation of individual speech sounds (or phonemes) are assumed in order to either list them out or to describe the rules that apply to them in certain contexts. However, articulatory phonologists show that in real instances of production, a sound involves a combination of gestures and not abstract representations. In that sense, they also try to unify phonetics and phonology. In their explanations, they refer to factors such as lexical frequencies, neighbourhood effects (words with similar positioning of articulators) and effects of contact with other languages.\(^\text{29}\) Articulatory phonology works with a premise of continuity across knowledge, perception and production. This is clearly different from the separation between knowledge and production maintained in generative grammar. In terms of


\(^\text{29}\) For example, the tonal effects in a subset of Nepali speakers which results from their proximity to Maram (a language in Manipur) speakers; Indranil Dutta, personal conversation.
economy, a theory that has less number of assumptions is more preferable than one with
greater number of assumptions. From that perspective, generative grammar does not seem
to be doing well because it is highly invested in mental representations, which in turn is
strongly based on the assumption of the existence of a ‘mind’.

The abstract and symbolically minded generativists might defend their position by
highlighting how phonetics and phonology are different from syntax and semantics. But
representational models of syntax and semantics, such as cognitive grammar, work with
the premise of the body as a reference point. Cognitive grammar works in an embodied
manner, without heavily relying on the mind and its operations stated in an abstract and
symbolic manner.

One of the basic assumptions of generative grammar – the competence-
performance distinction – is called to question in models of grammar such as articulatory
phonology, which follow a more directly real approach than those of symbolic
computational approaches. In the case of acoustic studies of phonetics and phonology, it
has been observed that neuro-muscular interactions which result in the movements of
articulators are influenced by the relatively higher frequencies of sounds in certain
specific contexts and smaller frequencies in others. In such studies, productions of
sounds are understood as happening as a resolution of conflicting physiological forces
towards contrast and co-articulation. While contrastive forces try to keep sounds distinct,
co-articulatory forces try to make sounds similar. The set of sounds of a language result
from a balance of these two forces and the necessity for sufficient amount of dispersion

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30 For example, see S. Bromberger and M. Halle, “Why phonology is different,” Linguistic Inquiry 20

31 Indranil Dutta and Charlie Redmon showed that the prediction about the slope of the second formant
associated with the coronal contrasts based on the three places of articulation – dental, alveolar and
retroflex – based on articulatory complexity was not confirmed by results of experiments done on
Malayalam, a language which has these three contrasts in doubled consonants in intervocalic positions.
The prediction was that the second formant associated with alveolars would show a flatter slope than
retroflexes because of their articulatory complexity. The result was that retroflexes were associated with
a flatter slope than alveolars; the probable reason given by Dutta and Redmon is the high frequency of
doubled retroflex consonants in intervocalic positions in Malayalam (Indranil Dutta and Charlie
Redmon, “Coarticulation and Contrast in Static and Dynamic Models of Second Formant
Trajectories,” Proceedings of the 166th meeting of the Acoustical Society of America, 2–6 December,
2013).
within the articulatory space in order to maintain distinctness of vocabulary.

The physics-model seems to result in serious dissonance when applied to studies of language. Physics is a different kind of science from linguistics. Physics deals with objects that are very different from language. The tool of mathematics seems to fit in very nicely with the abstract model developed by physicists. Physics posits laws that capture relations between properties. It is not easy to conceptualise linguistics in similar ways because of the volume of difficult data staring at us. Recall the discussion in chapter 3 about how variations led Pierrehumbert and Pierrehumbert (1990) to posit a dynamical model of language.\(^{32}\)

A novel way of looking at language variations strongly argues that variations and its outcome – multilingualism – is the natural state of human linguistic ability. Agnihotri (2014) provides convincing examples of how words from multiple languages are used in our daily lives.\(^{33}\) He also gives instances of how different phonetic forms of a word emerges in contexts of migration. We can infer that when a word from language X is used in language Y with certain phonetic changes, it might ultimately lead to the creation of a new word in language Y and can be a gradual contributing factor to language change.

There are many studies on the diversity and complexity of language, especially from the literature on typology and language change. It is not easy to understand how Chomsky, being a serious explorer, seems oblivious to such work and continues with the assumption that a corpora of empirical data is not as important as developing an explanatory system to account for grammars of human language. Chomsky's intelligent guess that human babies come with a language-specific learning system which comes to a full state with even minimal stimuli does sound correct. However, it does leave one with a doubt about whether there has been enough empirical support for it. This is because module-specificity and poverty of stimulus are assumptions too big to be taken for granted.

\(^{32}\) Pierrehumbert and Pierrehumbert. “On Attributing Grammars to Dynamical Systems.”
\(^{33}\) Agnihotri, “Multilinguality, Education and Harmony.”
Claims of universality of features of language have led to the placing of a heavy explanatory load on the nature of the human language acquisition device. But this is perhaps a logical leap which gives only a marginal status to other possible sources of universality. Gass and Ard (1984) propose six possible sources of universals in language.\textsuperscript{34} They are: (1) physical; (2) perceptual/cognitive; (3) language acquisition device; (4) neurological basis of language use; (5) diachronic basis; and (6) interactional basis.

Gass and Ard's listing of the possible sources of universality can indicate to us the kinds of facts that need to be studied as part of a scientific enquiry into language. The physical basis relates to the influences due to a physical fact relating to the structuring of the human body. The second relates to the influences of factors in the human perceptual and cognitive apparatus and processing capabilities. The third is the innatist one, relating to competence and the nature of the language acquisition device. The fourth is about the neurophysiological basis of language use, which in the Chomskyan parlance relates to factors of language use and performance. The fifth concerns the role played by language change in deciding what kinds of patterns are universally observed and what kinds are not. The sixth pertains to those universals which emerge from the common underlying nature of human social interactions. Given such a variety of possible sources of universality in language and the idea that universal explanations are the goals of science, it seems merely reasonable to aim for accounts of these five other factors while developing theoretical accounts of language.

There are some types of data that are not entirely explained by either social factors or linguistic factors taken in isolation. For example, consider the alveolar deletion example discussed in Radford et al. (2009) and reproduced in chapter 3, in the section on the use of prediction in linguistics.\textsuperscript{35} There is an observation that Puerto Rican speakers


\textsuperscript{35} Andrew Radford et al., \textit{Linguistics: An Introduction}, p 54.
show a greater tendency to delete word final [t] and [d] than speakers of Standard American English. What this example shows is that both social as well as linguistic factors influence this variation. If we are trying to give a scientific explanation to this phenomenon, there is no way we can keep out the social factors. So it is not clear why Chomsky thinks that social aspects of language are outside the scientific domain and form merely ‘ethnoscience’.

The drive to mathematise linguistics by developing a model of language based on abstraction and use of mathematical formalisms comes from a strong belief in the physics model. Probably the fact that the formalist system in linguistics seems to have many shortcomings arises from the fact that the idealist or Platonic tools which work well with physics does not quite fit with the nature of human language.

Itkonen (1996) raised a number of criticisms against the generative paradigm. One of them has to do with the observation that Chomsky's notion of 'grammaticality' is a normative idea. Itkonen shows that any discipline that works with normative notions cannot be a natural science because natural science, by definition, deals with physical objects, which are clearly non-normative. Here is an illustration from that paper. The concepts of request and person used in grammar are social and hence normative, but the grammatical matters corresponding to these – the sentence-type 'imperative' and the grammatical notion of 'person' are natural.

Another charge made by Itkonen is that Chomsky's Universal Grammar (UG) is based on one language. Not surprisingly, in tune with the current power structures, much of the theorising happens based on data from English and other languages of the western hemisphere. The Chomskyan group holds the position that even one language (although it is understood loosely as a socio-cultural fact) is sufficient to study the phenomenon of

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36 Itkonen, “Generative Paradigm.”
37 This has an older tradition going back to attempts to reduce all grammars to Latin. More recently, before Chomsky, Zellig Harris (Chomsky's thesis advisor) had warned against such an “undesirable effect” of trying to fit every language to a “single procrustean bed”; Harris (1947) Structural Linguistics. University of Chicago Press. Pollock (2006) shows that during the second millennium in the Indian sub-continent which marked the growth of the vernacular languages, many grammars of these growing languages were written following the model of Sanskrit.
human language. For this idea to hold, it is important to accept the assumption that any particular language is the output of a biological hardwiring which is unique to human beings. This might work well for a scientist who does not mind working with certain unquestioned tenets accepted by faith. However, a strongly empirically based scientist would try to examine a large number of cases – in this case, study a large number of languages – before she feels confident enough to make strong assertions.38

Because of the fact that a large volume of work in linguistics is done in North America and Western Europe, a substantial chunk of linguistic theory is built on the basis of Germanic (of which English is a part) and Romance languages. Are these theories falsifiable on the basis of data from languages that belong to other families? That is an empirical question, and we know of examples where theorists try to salvage the theory by fitting in the new piece or set of data into the existing framework. For example, linguists in the generative grammar framework arrived at the understanding that Wh-words move to the front of a question sentence. It was generalised that this rule of 'Wh-fronting' applied to all languages. Huang (1982) observed that (Mandarin) Chinese had no such movement, and hence behaved as if the Wh-word did not move and apparently remained in situ.39 But because of the attempt to salvage the Wh-movement module as a part of Universal Grammar, it was proposed that although Wh-fronting was a rule in Chinese, the movement took place in a covert level, unlike the very visible position change in English.

That theories are based on generalisations arrived at from a handful of languages is an epistemological problem associated with the practice of theoretical linguistics. It seems reasonable to suggest that one needs as many languages as possible to arrive at such large-scale conclusions. But an over-insistence on painstaking empirical enquiry

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38 It is relevant to listen to what Devitt and Sterelny, “What's Wrong with the Right View,” have to say regarding this, although it is from a slightly old work: “… the evidence for the innate principles is not strong. Since these principles must play a role in the acquisition of all languages, we look to other languages for evidence of them. The trouble is that very few languages have been studied in sufficient depth to provide evidence. Worse, where in-depth studies seem to agree on an innate principle, there is a high risk that this agreement is imposed by the method of study rather than discovered in nature.”

may lead to another kind of problem – the problem of induction. Even if a thousand languages work in a particular way, you might come across a new language which has a different rule or a pattern. So you would be stopped from arriving at a theory. This is probably why Chomsky, an avowed rationalist, does not emphasise serious empirical enquiry into each human language.

After Popper (1962), 'falsification' has been mainly considered a demarcating feature between science and pseudo-science and many linguists recognise the value of that and presents it as something that marks their discipline as a science. However, in linguistics, many statements we come across are made in terms of 'marked' and 'unmarked' features. The idea of markedness is based on the idea of 'what is not commonly seen' or 'statistically less probable'. Such statements about markedness are clearly not falsifiable. Itkonen calls this idea of resorting to 'markedness' one of the strategies Chomsky uses against falsification. A second strategy against falsification is to state that something in question is a performance factor.

We also note internal contradictions within the Chomskyan programme. For example, it argues against analogy as a factor that aids language acquisition, the ease of which is one of the stated goals for the discipline to uncover. However, some of the assumptions held by the discipline, such as the idea that even a simple IP has a complementizer, are purely based on analogy.

Itkonen notes that another way in which falsification is bypassed is by resorting to claims of parametric variation. He provides the example of Baker's VP parameter, according to which some languages like Yoruba have a feature of double-headed VP. According to Itkonen, there is something fundamentally wrong with the way the generative linguists handle their facts. If the facts are not consistent with the theory, they tend to say the facts are 'marked or that the theory has to be more abstract. Even if a

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41 Hubert Dreyfus, What Computers Still Can't Do, (New York: MIT Press, 1992), shows that in cognitive science and AI, the criterion of falsification is often ignored.
42 Here is Itkonen's exact comment:
piece of data does not fall in line with a theory, usually the attempt would be to save the
theory than to discard it. In that sense, the approach seems to be more along the lines of
Lakatos' idea of building a 'research programme' and not following a strict Popperian
model based on falsification. Generative grammarians of the Chomskyan persuasion, such
as Cedric Boeckx, have explicitly stated that the idea of a 'program' in the minimalist
program comes from Lakatos' view that science progresses by means of a research
programme which consists of a large number of theories and not by individual theories
which may be falsified by empirical data.43

Itkonen contends that Greenberg's universals (1966) can be checked and falsified
using empirical data and the biolinguists' formal generalisations are not usually
falsifiable.44 Greenberg's typological approach, based on close examinations of a large
number of languages,45 arrived at a listing of universals which proposed relationships
between two features of language: the relationships are stated typically in the form 'If a
language has feature X, it has feature Y also'. He proposed relationships at the levels of
word order, syntax and morphology. The type of work Greenberg did is more definitively
empirical than the abstract formal approach of the generativists, according to Itkonen.
Even when Greenberg was doing his classic work in typology in 1966, it was considered
to be a major shift in methodology for the science of language.46 Greenberg's method
seems more evidently empirical because it involved collecting data from a large set of

University Press.
44 Joseph Greenberg (1966) “Some Universals of Grammar with Particular Reference to the Order of
Meaningful Elements”. In Universals of Language. Cambridge, MA: MIT Press.
45 Thirty languages for his 1966 work belonging to various language families spoken in Africa, America,
Asia, Europe and Oceania (p. 74, 75).
46 Charles Osgood, in one of the essays of the 1966 volume (p 299), states the following about the 1961
conference on language universals in New York, which eventually led to the creation of the book:
“ At this conference we have been witness to a bloodless revolution. Quietly and without polemics
we have seen linguistics taking a giant step from being merely a method for describing language to
being a full-fledged science of language. Of course, as is true of any revolution, the step is only "in
progress.""
languages which he considered to represent the diversity of languages in the world. What was hoped by this shift, we understand, is that this project was going to lead the study of language into a full-fledged science.

According to Itkonen, the way acquisition data is treated by the committed innatists needed serious attention. There were suggestions from scholars that features of child language that are seen cross-linguistically could be treated as universals. Some psycholinguists took up this pursuit and found that the data did not fit in to the Chomskyan claims. This led to the warning that child language data should be considered extremely carefully.\(^47\) Itkonen points out that experimental evidence is selectively used – when it seems to support his theory, Chomsky would take it and when it does not, he would write about why certain types of experimental evidence cannot be used for arriving at UG principles. This attitude of cherrypicking experimental data, Itkonen suggests, is a 'cardinal sin' for any scientist. If we take a step back and look at the assumption of innateness, we would see that it is not a very well-examined one. Scholars like Pullum and Scholz (2002) have questioned the related notion of the poverty of stimulus. In that sense, the idea of innateness can be interpreted as an argument from laziness and is similar to the idea of Driesch's 'entelechy', which Carnap argued was a non-explanation.\(^48\)

The problem with innateness or \textit{a priori} knowledge is that it is not really an explanation. It just suggests that organisms are born with certain structures which enable them to handle certain types of data. These structures should be efficient enough to help us arrive at falsifiable generalisations. It is important that the idea of ‘falsifiability’ is built into the system because new data may show that the generalisation arrived at is false and hence, it needs a revision. The question of revision of grammars leads to an interesting problem. The grammar of one language maybe considered the subset of another grammar

\(^47\) Itkonen's makes the following comment about that scenario (p 17):

"Goodluck (1986) hit upon the lucky idea that children just have wild grammars, i.e. grammars disagreeing with PP; and since then it has become customary to warn that data from language-acquisition is 'potentially misleading' and should be treated with extreme caution. When put in plain language, generative child psychologists are sending us the following message: If Chomsky is wrong, blame it on children."

\(^48\) Recall the discussion in chapter 3.
based on some grammatical feature. For example, Spanish is a language which allows subject-dropping. It allows sentences with or without subjects. On the other hand, subjects are obligatory in English. Thus, from the perspective of whether subject-dropping is possible or not, a subset relation is said to exist between English and Spanish. Imagine that someone first learns the subset language and then tries to learn the superset language, in this case English first and Spanish second. The learner can obtain the extra feature of the superset language from the available input. Such input is said to result from positive evidence, i.e., evidence that is easily available in the data from the target language. On the other hand, if somebody is trying to learn a subset language after first learning the superset language, how would they get the evidence that would make them not use the extra feature of their first language? The question is whether there is any negative evidence, i.e., data which tells them that they should not be using the extra feature which was part of their first language. The problem here is that there is no negative evidence in the available data because all the data they get are permissible in both the languages. This was presented as a problem in language acquisition. This scenario could also arise in first language acquisition if the child starts with a general hypothesis which includes both the features but has to arrive at a language which has only one of the features. One way out for this logical problem of language acquisition is to posit that there is indirect negative evidence, which the learner infers from the way her interlocutor responds to her utterance.

So the basic question here is whether the grammar of a target language is learnable from the available linguistic data, which may not be presented in a clear and ready-to-learn fashion. The argument seems to be that innate structures postulated for language learning should be considered domain-specific because the type of input is also very specific. Each cognitive module is argued to be an autonomous unit because it evolved as a solution for one specific problem.\footnote{This discussion on subset and superset languages is inspired by a class on second language acquisition taught by Professor Amritavalli in Central Institute of English and Foreign Languages (2001-2002).}

\footnote{While discussing the idea of autonomous modularity of language, it might be interesting to note as a}
An implication of the idea that innate structures govern our knowledge of language is that all languages may have the same underlying grammar.\footnote{An implication of the idea that innate structures govern our knowledge of language is that all languages may have the same underlying grammar.} A quick response can then be a counter-question about the differences among languages. The similarities and differences among languages can be explained using the “principles and parameters approach,” according to which the differences can be explained by ‘on’ or ‘off’ settings of certain parameters, which are available across languages. So, using minimal input, the innate structures concerned with language learning are able to set the parameters in a particular direction. An example for how the model works can be illustrated using the ‘head parameter’, which has to do with the location of the head of a phrase. Languages can be head-left or head-right. A child acquiring a particular language is able to set this parameter as ‘left’ or ‘right’ after being exposed to a few instances.

The point of innateness is often expressed using the proposition that language acquisition happens in spite of a poverty of stimulus. At some point, the idea almost became a dogma in the 'biolinguistic' research programme. It is important to narrow down the notion of innateness. This is extremely relevant in light of careful studies on the role of genes in the making of an organism.\footnote{Richard Lewontin (1998) Biology as Ideology. Lewontin writes: “It is a fundamental principle of developmental genetics that every organism is the outcome of a unique interaction between genes and environmental sequences modulated by the random chances of cell growth and division, and that all these together finally produce an organism.”} Chomsky's \textit{Poverty of Stimulus} argument has been extremely influential in proposing innately specified rules as the basis of the faculty of language. Pullum and Scholz (2002) have made a detailed appeal for a careful and empirically-based evaluation of the argument, which is unquestioningly accepted by...
most generative grammarians.\textsuperscript{53}

Itkonen cites Newmeyer (1991) as an example of a generative linguist who is sympathetic to functionalist explanations for structure-dependency and subjacency.\textsuperscript{54} However, Newmeyer claims that what was functionally useful eventually became parts of structure by mutation. Thus Newmeyer, Itkonen points out, ends up not upsetting the Chomsky bandwagon.\textsuperscript{55}

The idea that language is an 'innate' faculty of human beings is part of the argument for naturalism. If the principles of the faculty of language are innately specified, then there is a reason to situate linguistic theory within biology. Behme notes that Chomsky has not provided us with a testable hypothesis regarding “the innate mechanisms that underwrite language.”\textsuperscript{56} It maybe true that he has not done it himself, but his followers \textit{(nachvolge)} have experimentally tested some hypotheses that arise from Chomsky's idea of “innate language faculty.”\textsuperscript{57}

Linguists who try to make predictions about language run into problems. This probably tells us something about the nature of language. Language is so full of variations that any single word uttered by two individuals or by the same individual at different

\textsuperscript{54} Itkonen, \textit{Generative Paradigm}, p 19, 20.

The replacement of (8) (i.e., the definition of the ECP - An empty NP must be property governed. by a statement making use only of constructs outside of formal grammar would involve demonstrating that every one of the following notions that enter into it are replaceable by such statements: ‘Verb’, ‘Noun’, ‘Adjective’, ‘Preposition’, ‘Noun Phrase’, ‘maximal projection’, and ‘C-command’. But, as far as I can determine, none of them are. Take the syntactic categories, Noun, Adjective, and Verb, for example. It seems unlikely that these categories can be defined semantically, since each of them can be used to encode grammatically what semantically are entities, processes, and attributes..

\textsuperscript{56} Christina Behme, “Cartesian Linguistics” (p.124) writes: “He has never formulated a testable and potentially falsifiable hypothesis regarding the language faculty.”
\textsuperscript{57} Itkonen's (1996) view about Chomsky's stated philosophical position of mentalism is pertinent here. He observes that Chomsky's initial work (of 1955) was a mix of anti-mentalism and Zellig Harris' distributionalism. Then he got himself transformed into a major advocate of mentalism and has controlled the growth of his type of linguistics across five decades, which clearly shows the uncritical adherence shown by his followers.

177
times will have different physical properties (frequencies of vowels, durations such as voice onset times, etc.). Given extreme variations, the difficulty in predicting linguistic forms may be similar to the difficulty in predicting weather, which can be predicted to some extent, but not to a high degree of accuracy.\(^{58}\) The question of variations and how it impacts lawlike statements in linguistics will be taken up in greater detail in the chapter on laws.

**Lessons Drawn about the Nature of Language**

Chomsky does have a response to the comment that language involves the interaction of various factors and it is in fact not a closed system such as those studied by natural sciences through the experimental methods. He would respond by noting that even if natural speech is an open system influenced by sociocultural and environmental factors and mental states, there must be a way of isolating and studying the individual system of language. To respond to this, we use the arguments made by Itkonen (1996) and Dasgupta (1988).\(^{59}\)

A problem with the method of studying native speakers' intuitions about grammaticality and acceptability as well as psycholinguistic experiments is also related to the problem of context. If a sentence is presented in isolation, it is not clear how speakers would be able to make sense of it because in real language use, sentences are always used in certain contexts. Also, linguists often come up with very unusual sentences and try to check their grammaticality with native speakers in order to argue for or against a theoretical point. Such data that are discussed and analysed in a context-insensitive manner face a problem of 'ecological validity.'\(^{60}\) This is because many of those test sentences are not used in real world situations and the native speakers need to assign some meanings to them even to give a judgement about their structures.

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\(^{58}\) From weather, if we move to geological events such as tsunamis, the possibility of prediction is almost nil.

\(^{59}\) Itkonen, “Concerning the Generative Paradigm”; Dasgupta, “The External Reality of Linguistic Descriptions.”

If our concern is with realistic data on language, then we cannot be satisfied with merely those facts which are collected in accordance with an unrealistic assumption of the existence of an idealised native speaker-hearer in a homogenous speech community. There is an argument which can be inferred from the school of ‘critical realism’ that in disciplines relating to society, the notion of realism itself should take into account social situations and critically engage with its dynamism and struggles.\(^\text{61}\) If we apply that principle to linguistics, we need to consider all kinds of linguistic data, no matter whether it is homogeneous or not.

What this brings into focus is the fact that the system is not entirely fixed with its own logic, at least at all levels. There are at least some aspects of it which are affected by the choices of the users or the human actors. It is not clear if the generative research programme is interested in incorporating such results into its theoretical repertory because the idea of variation and influence of social actors is fundamentally opposed to their assumption, which is that grammar is innately specified for all human beings.\(^\text{62}\)

Pierrehumbert, Beckman and Ladd (2004) offer a perspective on language which is strikingly different from Chomsky's in the sense that they reject the mind-body dualism and also have a broader view about what constitutes natural data.\(^\text{63}\) They treat phonology as a laboratory science, thus paying great attention to measurements of physical correlates to features of language. This is similar to the position of articulatory phonology which was outlined earlier. For them, forms of language result from physical principles relating to anatomical structures such as those relating to speech organs and neurophysiological features. Additionally, they consider human societies also as natural categories, leading to the bold claim that “social conventions ARE natural phenomena.”

Chomsky's *Principles and Parameters* idea was a way to address this question. It

\(^\text{61}\) Jones, “Critical Realism and Scientific Method in Chomsky's Linguistics."

\(^\text{62}\) The idea of innateness in generative linguistics is a problematic one. It reminds one of Driesch's idea of entelechy which Carnap is very critical about. Innateness is similar to entelechy in that there are no laws that could be associated with that. So it does not really take our explanation forward (R. Carnap, “The Value of Laws: Explanation and Prediction.”)

\(^\text{63}\) J. Pierrehumbert, M. Beckman, and D. R. Ladd, “Conceptual Foundations of Phonology as a Laboratory Science.”
arose from having to explain facts such as word order differences. If knowledge of language was innate to human beings, the grammars of all human languages should be very similar. But then how would differences among languages be explained? Or specifically, why is it some languages are SOV while some others are SVO and VSO? Or why is it that some languages are isolating whereas some others are polysynthetic? It was postulated that the grammar has a set of parameters with different possible settings, which would account for differences among languages. This would also claim that children acquire the language in their surroundings very fast by setting the parameters for it using minimal input. But this fails to explain how a language comes to have a parameter setting in the first place. Do a set of speakers choose the setting? Or does the setting emerge within the system of language?

What sociophonetic literature shows is that speakers can and do influence the system of language. We will discuss that more with examples later in this chapter. In order to keep social questions out of the domain of scientific exploration, Chomsky had carefully defined language as an internal system and called it I-language. If the grammar of a person is influenced by social factors such as their sense of identity, which includes the group that they belong to, it is not clear how one can conceive of a completely internal system of language.

I-language is defined as an individual's internal knowledge of language. It was already mentioned that the Chomskyan programme claims universality of grammar owing to human genetic make up. In fact, if we agree with Chomsky and grant that meanings are not external, it suggests that an individual's point of view could be a part of their knowledge of language. But this charge might be met with the response that he already addressed that question with his analysis of Lynne Baker's locust-cricket example (discussed in chapter 2).

A friend of mine has a certain expression 'chitput' in his idiolect. What he means by that is 'petty' or 'irrelevant'. You would not be able to construct a grammatical sentence
with that word unless you know what he means by that word or at least what its grammatical category is supposed to be. To do that, you have to know his point of view with regard to that word. It does not seem that the proposal of I-language cannot be clearly dissociated from an individual's points of view.

Such arguments could be countered by saying that I-language is only about syntax, not about meaning. One of the errors in conflating the categories of 'innate' and 'internal' seems to be that all aspects of mental life do not have to be determined by genes. They can also be culturally determined because the individuals concerned share similar environments. This can be empirically tested in a way similar to the questions about poverty of stimulus raised by Pullum and Scholz.

Is the object studied by Chomsky's linguistics real, in terms of its faithfulness to our experience of language? Note that in physics, even if we go into idealisations and abstractions, the notion of a substance or motion is a real experience. By I-language, does he mean the system that is internally at work whenever language is used consciously or unconsciously? An objection to the Chomskyan assumption of language being located in an individual speaker's mind is that language is like a shared code which the community of users have an agreement about. The signifiers of signs are arbitrary in a Saussurean sense, but there is a consensus among members of the community about the signifiers of these signs. In this sense, it is like a ritual. Everyone in a community of worship knows what is to be done at every stage of a ritual. But a ritual is often performed in a passive manner by 'going through the motions.' But the problem with a ritual analysis for language is that in most cases, except for mere phatic communion, the use of language is

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64 Roy Harris (1983/2013) draws the following implication from a French quote from Saussure's Cours (Ferdinand de Saussure, Course in General Linguistics, London: Bloomsbury, p xxxvii):

“... words do not exist as the dictionary portrays them, that is, as fossilized exhibits like dead butterflies in the entomologists glass case. The life of words is to be sought in the daily exchanges of actual language-users.”

65 In this particular example, there is a sense of a shared understanding of a metaphorical expression. A detailed treatment of the centrality of metaphors in language comes later in this chapter and chapter 6.

66 Pullum and Scholz, “Empirical Assessment of Stimulus Poverty Arguments.”

67 Thanks to Parvis Ghassem-Fachandi for bringing up this idea in a conversation.
not a passive act. So, a better analogy would be to the rules of a sport.\textsuperscript{68} As a user of a language, we know the rules governing its use so that you can use it to get certain things done in the world. In this game-based model, rules of playing the game are laid out by the institution and the participants play the game and arrive at results which are an outcome of the obedience of the rules. This does not mean that every aspect of language is a social construction. The features of speech sounds and tones are measurable; to some extent, the brain responses also are. So language includes both physically real and social rules that are brought in place by consensus.\textsuperscript{69}

Saussure, being very aware of the multiple dimensions of language, had written that linguistics is a discipline in which a viewpoint precedes the object and in that sense it is different from other sciences where the objects are given in advance and the viewpoint is what you arrive at by closely observing the objects.\textsuperscript{70} This opinion actually supports an eclectic approach to language. In our current discussion, it is very relevant. Suppose you choose to follow, a la Chomsky, an innatist and autonomous idea of language. It will give you some theoretical and experimental results. On the other hand, if you follow a function-based approach or a synthetic approach, they will also give valid results. In that sense, it is your point of view about language that leads to certain types of analysis and produce specific results.

Fixing the object of inquiry is a serious problem in studies of language. It is

\textsuperscript{68} This was Wittgenstein's rule-based game idea of language (Wittgenstein, \textit{Philosophical Investigations}).

\textsuperscript{69} See airplane and baseball arguments which help us understand the nature of scientific work in Michael Lynch, “Is a science peace process necessary?” in \textit{One Culture: A Conversation about Science}, eds. Jay A. Labinger and Harry Collins, (Chicago: University of Chicago Press, 2001) 54–58. The airplane argument is that even to explain everyday events such as air travel and the trouble associated with jumping from the twentieth floor of a building, one needs science. One can imagine that the airplane analogy might work in some way in linguistics if that rules like blocking and constraints like Ross's island constraints are at work in our production of language; every time we use language, we make use of such rules and constraints. But one problem such rules have is perhaps that their relationship to the production and comprehension of language is not as transparent as gravitation's to air travel. The baseball argument is that the relationship between science and nature is like a game of baseball. The equipment such as the bat and the ball are real in a very worldly sense; but to play the game there needs to be the rules that are brought in place by voting and so on. When scientists describe nature, they do not merely use pure objects or principles of nature. There is a strong community activity involved in the formulations of scientific theories. Coming specifically to linguistics, In relation to social rules, recall Pierrehumbert, Beckman and Ladd's (2000) position that social norms are also natural.

\textsuperscript{70} \textit{de Saussure, Course in General Linguistics}, (Bloomsbury, 2013) p 23.
problematic to state that we study entities like Russian or Tamil because we understand them in a social and political sense. It is further complicated by dialectal variations, interlanguages, pidgins, creoles and so on. It is not clear how we can speak of them as biological or scientific objects. By giving a very technical definition of I-language, Chomsky tries to filter out the extrinsic factors and capture the pure object of enquiry. However Dasgupta (1988) shows that still such everyday senses influence rigorous attempts to study language.

Dasgupta (1988) brings to our focus a methodologically problematic idea that is prevalent in linguistics.71 This idea impinges upon the way we view the discipline and raises questions about its scientific status. He points out that learning of an expression in a language includes appropriation of certain associated social functions also. This appropriation can happen because of the E-language that the learner is exposed to or another E-language, in which case it will be called an instance of borrowing. These two cases are standardly treated as two distinct processes, one considered pure in some sense and the other considered ‘corrupted’. The continued employment of regular social attitudes like ‘pure’ and ‘corrupted’, which are not part of a rigorous understanding of language, is an indicator of an approach to language which leaves a lot to be desired for a discipline that aspires to be considered a science.

The central problem associated with the science of language, just to recall the original question, is about the nature of the object itself. Language is not available for easy description. We have a commonsensical and everyday understanding of language. The question we are asking here is whether this everyday understanding of language is available for scientific study. There have been proposals, such as the ones from Chomsky, about how language can be rigorously studied as a scientific object.

The crucial question is whether language is in the mind or outside it. If language is in the mind, words, syntax and meanings are represented in the mind. If language is

internal, it is at least partly the output of a computational process in the mind. Because this view assumes the presence of the mind as the locus of the storage of basic units and the computational processes, it is said to be a mentalist/ psychological approach to language. The mind works with a set of words, category names and rules that combine category names to output phrases and sentences. All those language-related entities that the mind works with are thought to be mental objects.

Another view about language is that it is an abstract object, similar to numbers. Katz and Postal (1991) characterise this as the platonic realist’s response to Chomsky’s mentalist approach. According to this conception, it neither has material nor mental reality. Abstract objects exist in a realm different from the domain of external reality and it is an almost a priori fact that certain rules, such as addition and subtraction for numbers, work for them. It can be thought to be an axiomatic-deductive system consisting of basic units and rules about operations done on those basic units. Katz and Postal’s view of language as an abstract object is specifically in relation to formal modes of enquiry into language and not on the conception of language as it is used by a speech community. In terms of the distinction made by Chomsky between I-language ('internal' or 'intensional') and E-language ('external'), the latter is the version of language used in a speech community. Given this distinction between I- and E-languages, the linguistics that studies the formal aspects of language would be A-linguistics (A stands for 'Abstract) and the linguistics that studies language as it is used in the speech community would be C-linguistics (C for 'Cognitive).

Katz and Postal point out inconsistencies in Chomsky’s view about his object of enquiry. First of all, Chomsky defines generative grammar as a set of strings of symbols. But he also states that “sets are not in the mind”. From these two premises, we can conclude that generative grammar cannot be in the mind. However, Chomsky had

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claimed earlier that generative grammar is real – in the sense that when it is defined in a particular way, it is available for a naturalistic enquiry – and that it is in the mind. This clearly points to a contradiction with regard to Chomsky's position on the nature of language.  

Let us recall that Chomsky does not favour realism understood as externalism in his “Language and Nature.” He discards that in favour of mentalism, which he considers to be dealing with real objects when it comes to matters of language and mind. C-linguistics maybe realistic in an externalist sense, but it does not satisfy his scientific criterion because his goal is to give an account of language as an abstract formal system. Chomsky develops the idea of I-language as the object of linguistic theory because E-language does not correspond to anything in the real world. In that 1995 article, he then goes on to defend the position that the mental object of language is real and hence an object of valid scientific enquiry.

In the case of language, the rules of it are followed by members of a speech community. Such adherence immediately questions the sense in which rules are abstract. In the speech community, rules seem to be more social and external than merely working in an abstract platonic heaven. Itkonen, who had responded earlier to the claim that language is an abstract object, had a different conception of how language was to be treated. His stand was that cultural objects such as language are context-dependent and they need to be treated in a way different from material objects. They have to be studied in terms of the interpretive or hermeneutic possibilities. Their meanings and relations to human agents have to be understood in terms of “beliefs, reasons, motives and purposes rather than in the mechanistic vocabulary of causes and laws.”

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73 Katz and Posal, “Realism vs. Conceptualism” also makes the charge on Chomsky that the empirical facts he discusses do not suggest that they need a natural science treatment. Instead a formal science treatment seems sufficient, p 516, 517.

74 Katz and Postal (1991) show that after making the claim that E-languages are not real, Chomsky goes on to observe that E-languages are further removed from linguistic mechanisms (than presumably, I-languages). This, according to Katz and Postal, is an inconsistent claim because if something is not real, there is really no sense in saying it is further removed from any original thing.

75 Pateman, Language in Mind and Language in Society, p 11.
Probal Dasgupta (1988) has a spirited response to Chomsky's strong and long-term espousal of an internalist view of language.\footnote{Dasgupta, “External Reality.”} He shows that there are empirical reasons for thinking that what is marked as internal aspects of language, which Chomsky considers to be scientifically tractable, are not completely internal. Dasgupta's empirical reasons come from acquisition, borrowing, change and damage (a, b, c, d), which he brings under the category of externality.

Dasgupta unpacks the notion of creativity, which is considered central to Chomsky's conception of language. The idea of creativity in the Chomskyan sense is that a finite number of words can be combined in a possibly infinite number of ways using the rules of grammar which are naturally available to all human beings in a species-specific sense. Keeping aside for a moment the fact that what Chomsky means by creativity is actually novelty, we can follow Dasgupta's view that linguistic creativity has to necessarily make a connection to some social function by means of the myths, ideologies and literary forms existent in the society under consideration. Thus Dasgupta anchors creativity in social functions by means of shared memes which work through mythological and textual narratives.\footnote{Textual narratives are seen here in a broad sense, including oral narratives and folk songs.}

This line of thinking seems to lead us to the hermeneutic approach, according to which use of language is essentially an act of interpretation. Any utterance is open to multiple interpretations because of the variety of beliefs, motives and so on. This would lead us to an inescapable problem of how we ever come to meaning at all, a problem similar to Quine's indeterminacy of translation. Since at least two individuals are involved in the act of communication, Dasgupta calls it the problem of hermeneutic double mystery. There seems to be two ways out of this. One is the effect of the shared memes listed above by members of a speech community and the other is the disambiguating power of the conversational context.

A key takeaway from Dasgupta (1988) for this thesis seems to be the following.
Physics and other natural sciences work with concepts that are idealised so that they become amenable to formal or mathematical treatment. Linguistics, as a science, also seems to have concepts such as phrases and relative clauses whose formal descriptions transcend the here and now. As we noticed in chapter 2, the scientific treatment of language advocated by Chomsky involves an internalist and syntax-centred view of the object. Natural sciences seem to work well with a mathematisation of their concepts. But a study of language loses more than it gains by an appeal to transcendence or a platonic approach by taking recourse to formalisation because of the empirical data that stare at us from the domains of acquisition, borrowing, change and damage. For every sentence seems to have some metaphorical component and metaphor seems to be the rule rather than exception.

No matter how strongly we may push for the superior role of externality in linguistic descriptions, the following aspect of Chomsky's view seems unquestionable. Even if language is seen as consisting of various interacting systems simultaneously at work in the brain, one can imagine that there might be a way, which is not understood so far, of isolating and studying the individual computational system of language. Chomsky conceives the goal of his scientific study of linguistic structure as a theoretical enterprise that aims to provide purely linguistic explanations without giving historical or sociological ones. In this sense, his view clearly echoes the position held by a natural scientist. Realizing very clearly that the thorn in the internalist's flesh is meaning, Chomsky tactfully kept meaning out of the system by defining I-language very specifically in terms of syntactic computation. However, in the spirit of Dasgupta (1988), even if we work with a strict notion that the object of scientific enquiry into language has to do with syntactic computation, the significance of contextually relevant features such as topic and focus in syntax suggests that external factors play a role in syntactic computation.78

Even while conceding that Chomsky's theoretical objective of studying language in an autonomous sense is valid, it gives a very limited view of language. Chomsky himself accepts that when he says that whether one chooses to call his particular programme linguistics or not is merely a terminological choice. As the word 'linguistics' is chosen to mean a comprehensive study of language in this work, we will dwell upon a missing factor at length at the expense of the so-called 'scientific' status of linguistics. This missing factor is metaphor.

The question of metaphor comes into the picture because of the centrality of meaning. If meaning is brought to the centre of language, instead of syntax, one has to confront the problem of metaphors. Metaphors, prima facie, have to do with multiple interpretations because while referring to one thing, they speak of something else. We contend that meaning is central to language because language is understood as pairs of correspondences between sound and meaning and the idea of language is lost or significantly impoverished when it is stripped of its connection to meaning as done by syntactocentric models.79

We will quickly digress and note that Chomsky's stand on the evolution of language is that language probably was a spontaneous evolution in human beings – a system that connects sounds and meanings with no special signs of being perfectly adapted for communication. Some of his later theories such as the minimalist program suggest that language – defined narrowly as a syntactic computational system – is perfectly designed and would have emerged saltationally, and not gradually.80

It is this metaphorical or non-literal nature of meaning which makes

79. It would also be useful to remember that Chomsky's position on the irrelevance of meaning applies only to studies of syntax; he has always discussed meaning as an important part of the study of language.

80. This discussion might lead to larger questions of the purpose of language, such as whether it is for communication or not and questions about evolution, such as whether human language is the product of gradual evolution or whether it came into being as a result of sudden mutation (as Chomsky would propose). See Brady Clark, “Syntactic Theory and the Evolution of Syntax,” *Biolinguistics* 7 (2013): 169–197, for an argument for why the minimalist program is compatible with both a saltational approach and a gradual evolution approach to language.
computationalists like Chomsky keep meaning away from his scientific enquiry into language. The fundamental nature of language is metaphorical, marked by creativity in choices of words and tones, leading to multiple meanings. The associations brought about by words and their combinations connect to the dynamic nature of meaning leading to its affective power and interpretive possibilities.

The question of metaphors fundamentally touches upon the relationship between language and thought. The platonists’ idea of language of thought was that a thought is formed by stringing together referential and relational chunks to produce a sentence-like unit which has a truth value. Cognitive linguists argue against that view by showing the connection between thought on the one hand and metaphor and imagination on the other. Levinson (1983) shows that metaphors cannot be understood by a purely semantic approach, even if it assumes a natural elasticity of words. For example, in a sentence like 'Sally is a block of ice', there is no definite sense in which 'a block of ice' can convey the sense of being unemotional (p 156). Even if it is paraphrased as 'cold', the relationship between 'cold' and 'unemotional' is not at all transparent in a conventional understanding of the word 'cold'. Although semantics provides the literal meaning, the context lets pragmatics supply the metaphorical meaning. Metaphorical meaning often involves making a correspondence between two different domains. For example, an argument is compared to a war or love to a journey.

Levinson’s (1983) view is that pragmatics does the work of making us understand metaphors in a three-step process. First, Gricean maxims make us recognise non-literal interpretations. Secondly, the interpretation has to be distinguished from other tropes by exclusion and by finding the corresponding domains. Thirdly, it calls upon a general

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84 Levinson, *Pragmatics*.
ability to reason by analogy. At a minimum, we have to accept that there are context-related factors and psychological factors such as analogy at work in the way we make sense of metaphors. If we accept that metaphors are ubiquitous in language, it just follows then that linguistic factors cannot be separated from the conceptual domain.

As metaphors are interpreted in a very context-dependent manner taking into account cultural and interpersonal relationships, an approach to language based on metaphors seem more appropriate compared to a merely formalist or computationalist one. As Levinson (1983) suggests, an explanation of metaphors needs psychological theories of analogy and rhetoric. We will add to it Dasgupta's (1988) note on the relevance of mythological and literary aspects in what supplies content to human language.86 Such an approach helps us comprehend the dynamic nature of meaning, which lets myths and ideologies associated with specific communities come into the picture in relation to the individuals who are involved in the act of using language, be it through thought, speech, listening, reading or writing.

Another problem for the science question is that generative linguistics does not seem to have much clarity about how to deal with variations. As studies show, even I-languages are bound to have social and cultural influences and hence they cannot be considered homogeneous and clearly-defined entities. The question of variation in language cannot be ignored although Chomsky's (1965) earlier model tried to keep that out as part of his idealisation.87 If we are working with two simple assumptions that science should be dealing with real objects and that real objects are independent and outside of the enquirer, a serious exploration into language cannot afford to ignore variations within a single language. The emphasis on homogeneity which Chomsky had made at the beginning of the programme followed a well-known theoretical model of abstraction which has been used in physics for a very long time. In chapter 5, we look at the problems posed by variations to the positing of scientific laws in linguistics.

87 Noam Chomsky, “Aspects of a Theory of Syntax”.

190
Another problem with generative linguistics – with its strong scientific claim – is that it assumes a normative view of what constitutes knowledge of language. Right from one of the earliest assumptions of generative grammar – namely that of an idealised native speaker-hearer – to the reliance of intuitions as reflecting the grammaticality and ungrammaticality of sentences in a language or a dialect, the notion of normativity seems to operate as a strong feature of generative grammar.

The problem of the use of intuition in linguistics data gathering is controversial and raises issues about the objectivity of the data. This is because in science, objectivity is a serious consideration. But linguists clarify that the intuitions of grammaticality or acceptability is not collected merely in terms of yes/no judgements. They also use scale ratings and magnitude estimations. Phillips (2010) brings to our notice the claim that linguistic theories have been arrived at from unreliable facts based on informal data gathering methods such as asking for native speakers' intuitions about sentences. After considering the suggestion that carefully controlled experiments involving rating scales and magnitude estimations might help solve the problems, he comes to the conclusion that it is not going to make a remarkable difference because such methods are also fraught with different kinds of problems. However, he notes that there are other problems in the field, such as an increasing lack of consensus in terms of the goals of linguistic theory.

Chomsky uses the analogy with physics to argue for the epistemological worth of an abstract and idealised model of language. He shows the example of how the

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89 Sprouse and Almeida (2010) look at the problem of the data that forms the basis of theorisation in syntax. They show that there was a remarkable convergence between the data given in a standard textbook of syntax and results of yes-no judgements and magnitude estimation studies done on 440 subjects (Jon Sprouse and Diogo Almeida, “A formal experimental investigation of the empirical foundation of generative syntactic theory,” (manuscript, 2010)).
90 The Vienna circle's emphasis on reason, clarity and precision of language was a guiding principle for modern science. The obscurity of Chomskyan theory is of a different type. They still claim to be materialist and scientific, although they reject commonsense notions of science which are based on the mechanical philosophy. Chomsky is fine with his science being obscure in the way quantum physics is obscure because that obscurity seems to arise from precise definitions and idealised treatments; he does not want it to be obscure in the way he judges post-structuralist writing to be obscure.
mechanistic model of physics changed to a more abstract model with Newton's theorisation of gravitation, whose underlying idea was that of a force acting at a distance, an idea opposed to the spirit of the mechanistic model. His argument using the analogy of the changes that physics underwent in the last hundred years shows that it is possible to have high levels of abstract concepts that do not sit well with our everyday and intuitive sense of language. A good theory need not be intuitively appealing, but when a theory becomes both counterintuitive and negligent of robust data, it makes us have doubts about the truth claims of the project.

The ubiquity of metaphors and multiple meanings seem to pose serious problems for scientific treatments of language. One of the problems with multiple meanings can be illustrated using an idea called dhvani in some of the theories of meaning and aesthetics. A fundamental insight of this theory is that meanings operate at different levels. There is a primary signification which is usually the referential meaning, then there are the secondary meanings which are associated with metaphors and poetic interpretations. Dhvani is the third level (and beyond). Even within such interpretations, there maybe different levels and it is not uncommon in human experience. Sometimes secondary or tertiary meaning of an expression might occur at the conversational or reading context. There are also other instances of such meanings occurring to us long after the context of presentation. Such meanings are referred to as the result of the operation of the meaning-making mechanism of dhvani. It has been likened to the multiple circles formed by ripples which result from the dropping of a pebble into a pond. Scientific theories of meaning, including familiar ideas of semantic compositionality, can at best pass over this matter in silence.

**Conclusion**

Language does not seem to be a stable object amenable for scientific investigation the way other scientific objects are. Although we indicated that the seriousness of the study

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of language will not be undermined even if it is not called a science, the syntax-centred biolinguistic programme is a compelling case for a natural science treatment of language. But our criticism of the approach took into account robust features of language not captured by a decontextualised and syntactocentric approach. In the next chapter, we will look at another important element of science – laws – and discuss how this idea works in linguistics.