FORMAL AND FUNCTIONAL APPROACHES TO THE STUDY OF LANGUAGE-2

A module for a course on 'Language Studies' for the UGC e-PG Pathshala Programme for the Creation of e-Contents for a Post-Graduate Course in Linguistics
-Pramod Pandey, JNU, New Delhi

Objectives:

To familiarize students with the two distinct approaches to language study and to show that there is need to integrate them.

Contents:

1. Introduction

2 The Concepts 'Formal' and 'Functional'

3 Linguistic Approaches

4. Complementariness of the formalist and functionalist approaches

5. Distinctive Feature Theory as an exemplar case of the integration of formal and functional approaches to language study.

6. Some typical areas dominated by the formal and functional approaches

7. Summary

1. Introduction

In this module, we introduce you to two main approaches to the study of language, namely, formal and functional approaches. The differences between them are not well defined from the start. Rather they have grown with time, as linguists came to assume the 'primary' or 'main' nature of language being the formal aspects of linguistic structure or the functional aspects dealing with communication. Linguistic theories since Structural Linguistics can be said to cluster around these two assumptions regarding the essential or primary properties of language. In what follows, we take a look at some of the main aspects of these two approaches. An understanding of the main concerns of the

two approaches will help you to choose a theory or theories that best suit your interest in the study of language.

2   The Concepts 'Formal' and 'Functional'

The terms **formal** and **functional** are used for more than one aspect of linguistic study in current literature in modern linguistics. Three main aspects are prominent prominent. These are (i) the nature of linguistic knowledge, (ii) the goals of linguistic analysis and (iii) types of linguistic explanation. The differences between the two approaches are relatively more clearly drawn with regard to these aspects than others. We will look at the other aspects, too, in a following section.

Towards the end of the module, we will see that there is need to see the standpoints of the two approaches as complementary rather than contending as is sometimes found to guide linguistic studies in the two approaches.

3   Linguistic Approaches

As discussed in the previous module, current approaches to the study of language can be broadly classified into two types: Formal and Functional (see e.g. Newmeyer 1998). An exemplar theory of the formal approach to the study of language is Generative Linguistics, proposed and promulgated by Chomsky in various publications (e.g. Chomsky 1957, Chomsky, 1965, Chomsky 1982, Chomsky 1998). Well-known theories of the functional approach are Functional Sentence Perspective (e.g. Firbas 1992), Systemic Functional Grammar (e.g. Halliday 1985) and Functional Grammar (e.g. Givon 1979, Dik 1989, Foley and van Valin 1985). Comparative studies of the two approaches are available in Darnell et al. (1998), and Newmeyer (1998). Individual studies of the main concerns of the formal approach are found in Chomsky (1959, 1990) and Cook (2007), amongst a plethora of publications. A good analytical review of functional approaches is available in Nichols (1984).

A comparative understanding of the two approaches is of interest not only to linguistics but also to epistemology in general, as they represent two different conceptions of linguistic knowledge. They have analogues in other areas, such as rationalism and empiricism in philosophy and cognitive psychology, capitalism and communism in economic thought, and individualism and socialism in social action. The basic premises and methods of the formalist and functionalist approaches in linguistics are often stated, largely assumed, although not always agreed upon (see e.g. Haspelmath 2000). The following may be stated as the main theoretical issues on which the two approaches arguably differ (see also Pandey 1999).

(1)   THEORETICAL GOALS
        NATURE OF LINGUISTIC KNOWLEDGE
        RESEARCH METHOD
        RELEVANT DATA
        NATURE OF EXPLANATION
        NATURE OF ARGUMENTATION
        THEORETICAL CATEGORIES (CONCEPTS AND DEVICES)

We discuss these issues in simple words briefly below.

3.1   THEORETICAL GOALS

The central concern of the formal approach is the explanation of linguistic knowledge. For example, consider the following sentences

(2)   a.   The cycle was found by the police.
        b.   The cycle was found by the road.

(3)   a.   The police found the cycle.
        b.   The cycle was found by the police.

A speaker-hearer of English understands the two sentences in (2) differently, although they are identical on the surface. In (2a) the police found the cycle, and in (2b), someone found the cycle by the road. In (3), the two sentences are understood as having the same meaning. Opposite of (2), the sentences are different in their structures on the surface. The goal of a formal theory of language is to investigate the knowledge that underlies the similarities and differences in the understanding and production of these sentences. This knowledge is considered to be the native speaker-hearer's COMPETENCE.

The central concern of the functional approach is the explanation of linguistic texts. For instance, in the functional approach, given the sentences in (2) and (3) above, a relevant question would be, what functions do they perform? What determines the choice of active and passive sentences? What is the relation between the verb, on the one hand, and the Subject and the Object of the sentences, on the other?

There are various other concerns with the text in functional approaches. For instance, what devices are used in answering questions in different ways- formal, polite, intimate, impolite etc. (Hymes 1985)? What devices of cohesion and coherence are used in holding discourse among the speakers of a language (Halliday & Hasan 1976)? The nature of linguistic knowledge assumed here has been called COMMUNICATIVE COMPETENCE.

3.2   NATURE OF LINGUISTIC KNOWLEDGE

In the post generative grammar era, that is, post-Noam Chomsky's *Syntactic Structures* (1957), formal theories came to consider the biologically endowed knowledge of language to be the main object of explanation (Chomsky 1986). Formal theories assume that a human being with normal faculties is born with the ability to know language. The human mind/brain comes equipped with the essential properties of grammar, also known as Universal Grammar (Cook 2007). It is the internalized knowledge of language that a formal linguist aims to investigate. The focus is not the utterances on the surface but the knowledge underlying the utterances. With regard to the sentences in (2) and (3) above, the main concern in the formal approach would be to explore the cognitive basis of the relation between them. In so doing, a formal approach aims at explaining a speaker-hearer's intuition guiding his linguistic knowledge. The intuition is abstract and is related to the surface by means of certain cognitive devices. The nature of linguistic intuition regarding utterances and the devices that connect intuition with the surface utterances is of central concern in formal theories of language. You will find these elaborated in the courses on Phonology, Morphology, Syntax and Formal Semantics in many of the papers. It is the far-

reaching results of the formal investigations of language, along the lines argued for by Noam Chomsky, that the discipline of Cognitive Science has come about, drawing researchers from various fields such as linguistics, information science, cognitive psychology and applied linguistics.

In the functional approach, from the time of the Prague Linguistic Circle of the 1920's, linguistic structure was of interest not in itself but as an instrument of communication. Sentence structures were studied from the point of view of the functions they performed. In so doing it is not the linguistic knowledge underlying the sentences but the communicative differences and similarities of spoken utterances and written texts that is the goal of study. We can use the term 'text' to refer to both spoken utterances and written texts.

There are many other aspects of linguistic knowledge that are of especial interest to functional linguists. For instance, in what situations do speakers of a language switch between varieties of a language, such as a colloquial variety, an informal variety, etc.? What are the communicative concerns in the use of different varieties in different linguistic situations? Much work in the field of sociolinguistics (e.g. Labov 1968) is concerned with issues such as these. You find them discussed, for example, in the modules of Paper 4 on Pragmatics and Discourse Analysis and Paper 9(B) on sociolinguistics.

3.3   RESEARCH METHOD: Natural science versus social science

The methods of research employed in the two approaches are different. Whereas the formalist theories use the methods of natural science, functional theories use the methods of social science. Formal theories are based on the formulation of hypotheses, choosing between hypotheses, search for evidence in support of a hypothesis, making predictions based on the evidence in favour of the hypotheses. The predictions involve formal generalizations in terms of unambiguous and verifiable statements. The statements must be refutable in the sense of Popper (1963).

The methods of research employed in the functional approaches involve the research methods of social sciences, which take into account the variables involved in linguistic behavior- speakers, contexts, relation between interlocutors, etc.. Studies in the functionalist approaches also address questions that are of concern in social sciences, such as identities, speech acts (linked to multiple issues such as the ethnography of speaking, social network, politeness theory and stylistics)

The data collected from a set of speakers of a community are then analysed using qualitative and quantitative methods.

3.4 RELEVANT DATA: Intuition versus behaviour

The data considered relevant in formal approaches are the speaker-hearer's intuitions. This involves questions such as the following. Do speakers consider two utterances as having the same meaning or different? Given a set of utterances, which ones do the speakers consider to be grammatical or ungrammatical? What is the nature of language processing with regard to certain phenomena. Much of the data produced in support of formal investigations also involves errors, negative data that speakers consider ungrammatical etc. The study of linguistic behavior is of no concern to formal theories.

The relevant data for functional approaches are ones that relate to linguistic behavior and the use of language in different contexts. The relation of context to data is of main concern in functional approaches (Halliday 1985)

3.5 NATURE OF EXPLANATION: Deductive-Nomological *versus* teleological and statistical.

There does, however, appear to be some sort of a demarcation, not strictly a fence, between the two types. What is the line of demarcation between formal and functional explanations, if any?

a. The basic difference between the two types of explanation can be attributed to the requirement for formal explanations to be stated, using a common conceptual vocabulary, so that they are *falsifiable*, but *non-falsified*. The distinction between the italicized expressions is crucial. A formal statement may include any type of concepts, formal or functional, but the statement should be

refutable. If refuted, however, it must presumably be revised. Many notions and principle in generative grammar have come to be revised in the face of data that are not amenable to analysis. Many rules called transformational rules that were proposed in generative grammar were gradually modified and finally dropped from the theory as they were falsified. Falsifiability is a strict criterion for a formal explanation, but not for a functional explanation. Many functional principles proposed in linguistics are within the context of one of the many functional theories, which are not a part of a universal theory. Linguistic principles in them are proposed such that they are not amenable to falsification. And even when they are falsified, the theory need not modify them.

As an example, let us consider, as illustrations of this point of difference, treatments of a phenomenon in the two approaches. One such topic is the Noun Phrase in English. A formalist treatment of the Noun Phrase is found in Abney (1987), a functionalist treatment of it is found in Givon (1993). Abbney's treatment takes a comprehensive stock of all the possible and impossible types of NPs and how they are predicted by the revised X-bar theory of phrase structures. In contrast, Givon's account of NPs provides a description of the structures involved in terms of his own version of Functional Grammar.

But note: the depth and range of formal accounts is offset by their avowed exclusion of communicative use. Aspects of structure which are dependent on use find a more revealing treatment in functional accounts. Thus an examination of the aspects of reference and definiteness of NPs, which is bound in discourse (such as the knowledge of the world, speaker's intuition, etc.) is found to unfurl a deeper range of facts about the knowledge of NPs in Givon (1993) that a reader of Abbney must remain ignorant of.

b.   A second requirement of a formal explanation, based on the work on formal properties of cognition (e.g. Pylyshyn 1984, Bromberger and Halle 1989), and related to the one discussed above, is that it concern the *computational faculty* of language rather than the *adaptive faculty*, and, by implication, to invariant rather than emergent phenomena. The latter, being bound to contexts, may be unpredictable and thus stand falsified. According to this criterion explanations of sociolinguistic variations cannot be treated as formal, since they

address the adaptive rather than the computational linguistic faculty. On the same grounds, the explanation of gradient phonetic phenomena referring to adaptive or emergent speech using continuous mathematics (e.g. Pierrehumbert et al. 2000) may not be considered formal, unless shown to be related to the computational faculty of speech.

But note: it is worth stating (and for students of linguistics to note) that for an explanation to be formal or functional does not affect its validity for scientific research, contrary to the assumptions of hard core formalists (e.g. Hale and Reiss 2000, van der Hulst 2000). Whether or not one of them is more valuable than the other in linguistic theorizing is controversial at this stage.

3.6   NATURE OF ARGUMENTATION: Deductive and based on negative evidence
            versus inductive and textual.

Like theories of natural science, a formal linguistic theory begins with deductive generalizations, and seeks data to refute the generalizations. For instance, Chomsky claimed that one of the main properties of Universal Grammar is *recursion* or *recursivity*. A general sense in which recursion as a property of language is understood is the property of taking the output of an input as the next input. A constituent is recursive if it embeds "a constituent in a constituent of the same type". (Pinker & Jackendoff 2005: 211). A sentence of this kind that you may be familiar with is *This is the dog [[that chased the cat] that ate the rat] that dug the hole]]]…*

In this sentence a 'that clause' is embedded in another that clause. It is not difficult to see that recursive structures give langue the property of an infinite structure.

As a generalization, it calls for refutation. There hasn't been argument any put forth against the property of recursion in human language. The attestation of a linguistic generalization is sought through negative evidence. For instance, suppose the formal structure of a sentence is proposed to be

    (2)

    i.   S $\rightarrow$ NP + VP
    ii.   VP $\rightarrow$ V + NP

Sentence such as the following will attest the correctness of the rules:

> (3)
> John thanked the cop.
> The young man wearing a blue hat drove the car.

However, when a sentence such as the following is encountered

> (4)   The young man wept.

The rule VP → V + NP must be modified as VP → V (+ NP). Sentences such as *The young man wept for a long time*, further motivate a modification in the rule S → NP + VP. (How? Argue.)

Contrary to a formal method of argumentation, the method followed in functional theories is that of looking at the data and then arriving at a generalization that is stated in such as way that it is not refuted. For instance, a survey of Eastern Hindi dialect may show that a majority its educated speakers lack a post-alveolar sibilant /ʃ/ in their speech. They only have the dental/ alveolar /s/. However, it is likely that some educated speakers of the dialect do have both the sibilants. In the face of this data, the observation regarding the absence of /ʃ/ in educated eastern Hindi variety need not be shown to be wrong. It is assumed that such a generalization has counterevidence.

3.7   THEORETICAL CATEGORIES (CONCEPTS AND DEVICES): Formal categories versus functional categories.

Categorization is one of the essential features of human cognition and thus of language. In linguistic descriptions, a distinction is made between formal categories and functional or semantic categories. Formal categories defined in terms of the formal structure of linguistic units and/or their distribution.   For instance, the categories S, NP, VP, DET, ADVP, PP. Each one of them is defined in terms of their structure. An S is a category that consists of NP + VP. A NOUN, and can be defined formally as a constitute that takes NUMBER and CASE affixes. Formally defined categories were found to be better suited for scientific discussions as were consistent verifiable. Semantic categories on the other hand

could not be defined in a consistent manner. For instance, the semantic definition of a noun in traditional grammar as 'the name of a person, place or thing' cannot be found to apply to words such as 'darkness or 'joy'. It is on these grounds that at the levels of morphology and syntax semantic/ functional categories were found to be problematic. Thus the use of the terms Subject and Object defined in terms of the widely held semantic definition of 'actor' or 'doer' and 'goal', respectively, could not be found to be generally applicable to all Subjects and Objects, as Chomsky (1957) pointed out. Thus *lunch* in the sentence *The lunch pleased the aardvark very much* could not be considered an actor or doer in any of the senses of these terms. The general use of formal categories was practised in many areas of grammar and its use in allied disciplines such as language processing and machine translation. A whole field of semantics called Formal Semantics was developled along the lines of formal grammar. You have Paper 9(A) devoted to the field.

However, in-depth analyses of grammatical properties in specific languages, such as English, and cross-linguistic descriptions of languages, especially in language typology showed that a restriction to either of the two types of grammatical categories could not be used to account for linguistic phenomena. Most theories of grammar today use a combination of formal and semantic categories. Thus the concepts of Subject, Predicate, Topic, Focus, etc. are in use in generative grammar today, which originally rejected the use of semantic categories in its theoretical framework.

4. Complementariness of the formalist and functionalist approaches

Notwithstanding the professed and acknowledged differences between the two approaches, there has been a growing realization of their mutual complementariness, as pointed out at many places in the preceding section. The complementariness of the two approaches is apparent in at least three ways.

4.1.   Differences valid for different domains

Both formal and functional approaches have been found to be valid in different domains. Thus the account of the grammatical principles of syntactic processes has been found to be immensely deepened by generative linguistic accounts, while at the same time certain syntactic phenomena, such as word order universals (e.g. Tomlin 1986), have been found to be best explainable in functionalist terms (e.g. Comrie 1981).

4.2   Language as an Object

Some philosophers, such as Pateman (1989) and Gellner (1998), have shown that language, as an object, is neither only a natural kind (i.e., biologically determined) nor a social kind (i.e. socially constructed), but both a natural and social kind. As such, language is amenable to both formal and functional approaches to research and explanation.

4.3 Growing rise in the mutual use of concepts between the two approaches

Attempts to unify the two approaches have been on the rise on both sides, in the formalist work of North American linguists (see e.g. Newmeyer 2001, for a review), and in the functionalist work of European linguists (e.g. Dik 1989 and Sperber and Wilson 1995). This trend is remarkably noticeable in the core formalist work, where construction-specific rules have been replaced by general principles. As it turns out, many of these principles use functional concepts, such as the universal 'Economy Principle'[2] and the principal of 'Greed'[3] in Minimalist Program (Chomsky 1995), determining the constituent structure of sentences and their movement. Within formal phonology, the rise of Optimality Theory (e.g. Prince and Smolensky 1993) represents a rather extreme step in the direction of the use of universal functional principles alone.

5. Distinctive Feature Theory as an exemplar case of the integration of formal and functional approaches to language study.

It is now considered an axiomatic fact about speech sound segments that they are made up of distinctive features, which commonly have binary (+/-) values, as shown for a five-vowel system below:

	i	u	e	o	a
high	+	+	-	-	-
low	-	-	-	-	+
back	-	+	-	+	+
round	-	+	-	+	-

*Figure-1: Distinctive feature specifications for a five vowel system*

The theory of distinctive features has had a continuous history from the time of Trubebtzkoy (1939) and Jakobson (1968). It has undergone various revisions (see e.g. Jakobson, Fant & Halle 1952, Chomsky & Halle 1968, Clements 1985, McCarthy 1988). The crucial point to note here is that the development of the theory presents itself as an exemplar case of the integration of form and function in linguistic knowledge. Let us look at some important points of the theory.

The concept "distinctive feature" owes its origin to the functional orientation of Prague School. Trubebtzkoy (1939), and perhaps Jakobson (1968 [1932]) before him, proposed it as a phonetic property constituting a unit of distinctive contrast. The phonetic property combines with other distinctive phonetic properties to yield "the inner order or structure of the phonemic inventory as a system of distinctive oppositions" (p. 71). For example, the feature "voice" is in "privative" contrast in /b/: /p/; the feature is present in one and absent in the other segment.

The development of the theory of distinctive features has taken place in the climate of formal linguistics, in the main, Generative Phonology (Chomsky & Halle 1968) and its sub-theories. The significance of the notion of distinctive feature in the phonological analysis of languages was found to extend itself to other aspects of phonological theory, such as a universal theory of phonological oppositions (e.g Jakobson & Halle 1956, Chomsky & Halle 1968), a universal theory of possible speech sounds (e.g. Chomsky & Halle 1968), and the characterization of natural classes of speech sounds (e.g. Chomsky & Halle 1968, Clements 1985). For classic arguments in favour of the formal view presented above, see Halle (1962). Much research in the distinctive feature theory can be

found to have been devoted to the question of the exact number and definitions of such a finite set.

The current view of the organization of the distinctive features can be represented in the following diagram (see Broe 1992):
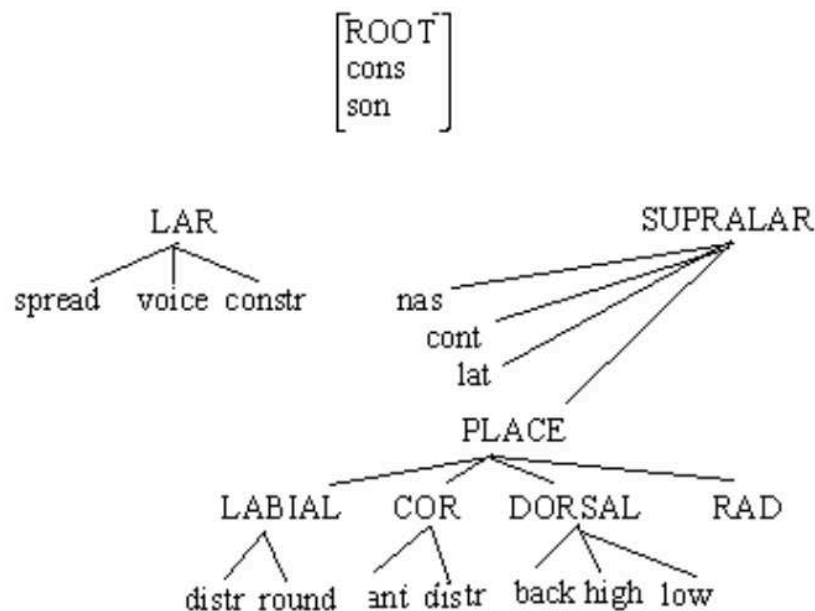
Figure-2: hierarchical organization of distinctive features

The non-linear organization of the features is found to account for all the segment types in world languages and all possible processes of change due to assimilation (i.e. adjacent occurrence). The hierarchical organization of the features in *Figure-2* also implies their autonomous representation, along the lines of the autonomous representation of other phonological units, as claimed by Autosegmental Phonology (see Goldsmith 1976, McCarthy 1979). *Figure-2* thus would not have been envisaged without the advent of the theory of Autosegmental Phonology. Both the theories support each other as theories of phonological representation.

The development of the notion of distinctive features has found formal accounts in the theory of Underspecification. The theory of underspecification deals with the issue of simplifying the grammar by avoiding the specification of all the features at the underlying representation and filling them out by Redundancy rules at later stages in the phonological derivation (e.g. Archangeli 1988, Steriade 1987, Clements 1988).

In addition to the formal issues of the representation of distinctive features in terms of a minimal set, the notion has also been invoked to account for the structure of phonological inventories (see Module 32 in Course 13 'Linguistic Typology and Language Universals' for a detailed discussion.

6. Some typical areas dominated by the formal and functional approaches

Notwithstanding the significance of the integration of the formal and functional approaches, it is useful to see which areas are subject to alone of the approaches predominantly.

Thus, the following areas of study are predominantly **functiona**l:

Computational Linguistics: Machine Translation, Speech Synthesis, etc.

Stylistics

Language Teaching

Language Pathology

Language Variation

Discourse

The following areas of study are predominantly **formal**:

Linguistic knowledge of a native-speaker- Phonological,

Morphological, Syntactic, Semantic etc.

Cognitive issues- nature of linguistic representation, language

processing: phonological, syntactic, orthographic, etc.

It is important to note that an investigation using one of the approaches has a lot of scope for the development of a better theory by taking into account the considerations of the other approach. Thus work in the computational fields of Machine Translation and Speech Synthesis, for example, which is mainly concerned with linguistic texts on the surface, depends on developing a formal grammatical framework that can help make cross-linguistic comparisons and generalizations. Similarly, work in a formal filed such as Optimality Theory has to depend on functional principles that apply cross-linguistically. The dependence is mutual and happening.

7. Summary

In this module, we have tried to discuss in detail the concerns in two main approaches to language studies today. We have tried to see where they differ. However, the main purpose of the paper has also been to show that they are complementary rather than contending. This is so mainly because linguistic knowledge integrates, rather than merely combines, both formal and functional properties of language.

References

Abbney, S. P. (1987). *The English Noun Phrase in its Sentential Aspects.* Cambridge, Mass.: The MIT Press.

Archangeli, Diana. (1988). Aspects of underspecification theory. *Phonology* 5.2: 183-207.

Baker, M. (1988). *Incorporatin: A Theory of Grammatical Function Changing.* Chicago: The University of Chicago Press.

Bates, E. and MacWhinney, B. (1982). Functionalist approaches to grammar. In E. Wanner and L. Gleitman (eds), *Language Acquisition: The State of the Art.* N.Y.: CUP.

Bromberger, S. and Halle, M. (1989). Why phonology is different. *Linguistic Inquiry* 20(1): 51-70.

Burton-Roberts, N., Carr, P. and Docherty, G. (eds) (2000). *Phonological Knowledge: Conceptual and Empirical Issues.* Oxford: Oxford University Press.

Bybee, Joan. (1994). A view of phonology from a cognitive and functional perpective. *Cognitive Linguistics* 5: 85-305.

Carnie, A. and Mendoza-Denton, N. (2003). Functionalism is/n't formalism: an interactive review of Darnell et. Al. (1999). *Journal of Linguistics* 39, 373-389.

Chomsky, N and Halle, M. (1968). *Sound Pattern of English.* NY: Harper and Row.

Chomsky, (1959). "On certain formal properties of grammars". *Information and Control* 2 (2): 137-167.

Chomsky, N. (1976). Problems and mysteries in the study of human of Language. In *Reflections on Language.* New York: Pantheon Books.

Chomsky, N. (1986). *Knowledge of Language.* N.Y.: Praeger.

Chomsky, N. (1990). On formalization and formal linguistics. *Natural Language and Linguistic Theory* 8: 143-147.)

Chomsky, N. (1995). *The Minimalist Program.* Cambridge, MA: The MIT Press.

Chomsky, N. (2001). *New Horizons in the Study of Languageand Mind.* Cambridge University Press.

Comrie, B. (1981). *Language Universals and Linguistic Typology.* Chicago: University of Chicago Press.

Cook, V. J. (2007). *Chomsky's Universal Grammar: An Introduction* (3rd edition). Wiley-Blackwell.

Darnell, M., Moravcsik, E., Newmeyer, F. J., Noonan, M. & Wheatley, K. (eds). (1998). *Functionalism and formalism in linguistics.* Amsterdam: John Benjamins

Dik, S. C. (1989). *The Theory of Functional Grammar (Part I)*. Dordrecht: Foris.

Dummet, M. (1993). Language and communication. In A. George (ed.), *Reflections on Chomsky*. Oxford: Basil Blackwell.

Firbas, J. (1992). *Functional sentence perspective in written and spoken communication.* Cambridge: University Press.

Foley, W. A. and van Valin, R.D. (1985). *Functional syntax and universal grammar.* Cambridge: Cambridge University Press.

Givon, T. (1993). *English Grammar: A Function Based Introduction: Vol. I.* Philadelphia: John Benjamins Publishing Co.

Greenberg, J. (ed.) (1966). *Universals of Language.* Mass., Cambridge: MIT Press.

Halle, M. (1962). Phonology in a generative grammar. *Word* 18:54-72.

Halliday, M. A. K. (1985). *An Introduction to Functional Grammar*. London: Edwin Arnold. [1st edn, 2nd edn 1994].

Jakobson, R. (1968). *Selected Writings I: Phonological Studies.* The Hague Mouton.

McCarthy, J. (1988). Feature geometry and dependency: a review. *Phonetica* 45: 84-108.

Newmeyer, F. J. (1998). *Language Form and Language Function*. Cambridge: MIT Press.

Nagel, E. (1960). *The Structure of Science: Problems in the Logic of Scientific Explanation*. London & Henley: Routledge & Kegan Paul.

Nichols, J. (1984). Functional Theories of Grammar. *Annual Review of Anthropology* 13, 97-117.

Pandey, P. K. (2001). Grammar and 'others'. In Anvita Abbi et al. (eds), *Linguistic Structure and Language Dynamics in South Asia*. [Papers from the Proceedings of SALAXVIII Roundtable , 1997]. Delhi: Motilal Banarasidass. Pp. 277-290.

Patemean: T. (1990). *Language in Mind and Language in Society*. Oxford: Clarendon Press.

 (eds), pp 273-304.

Popper, Karl. (1963). *Conjectures and Refutations: The Growth of Scientific Knowledge.* Routledge & K. Paul.

Steriade, Donca. (1995). Underspecification and markedness. In: J. Goldsmith ((ed.), *The Handbook of Phonological Theory*. Oxford: Blackwell. Pp. 114-174.

Tomlin, R. (1986). *Basic Word Order: Functional Principles.* London: Croom Helm

Trubetzkoy, N. S. (1939 [1969]). *Principles of Phonology,* Tr. C. A. M. Baltaxe. Berkley and Los Angeles: University of California.

###