A TRANSFER GRAMMAR FOR ENGLISH-TAMIL MACHINE TRANSLATION

Prof. Rajendran Sankaravelayuthan
Amrita Vishwa Vidyapeetam University
Coimbatore 641 112
rajushush@gmail.com

Dr. P. Kumaresan
Assistant Professor
SRM Trichy Arts and Science College, Tiruchirappalli
drpkenglish@gmail.com

Coimbatore
April 2020

ABBREVIATIONS

Accusative	Acc/ACC
Adjective	Adj / ADJ
Adjectival Phrase	Adj P
Adverb	Adv/ADV
Adverbial Phrase	Adv P
Approximates	App
Augmented Transition Net work	ATN
Auxiliary	Aux
Be verb	BV
Complement	COMP
Compound verb	CV
Dative	Dat/DAT
Determiner	Det/DET
Demonstrative	Dem/DEM
Dictionary of English Word Analysis	DEWA
Direct Object	DO
Finite	FIN
Genitive	gen/GEN
Human Aided Machine Translation	HAMT
Indirect Object	IO
Instrumental	inst/INST
Intransitive Verb	Vi/VI
Knowledge Based Machine Translation	KBMT
Lexical Functional Grammar	LFG
Locative	LOC/loc
Machine Aided Human Translation	MAHT
Machine Translation	MT
Machine Translation Aid	MTA
Modal	MOD
Natural Language	NL
Natural Language Analysis	NLA
Natural Language Processing	NLP
Natural Language Generation	NLG
Negative	Neg/NEG
Noun	N
Noun Phrase	NP
Number	Num/NUM
Object	O
Ordinal	Ord

Perfect	Perf
Phrase Structure Grammar	PSG
Pre-determiner	Pre-Det
Preposition, Postposition	P
Prepositional/Postpositional Phrase	PP
Programming Language for Natural Language Processing	PLNLP
Person Number Gender	PNG
Progressive	Prog/PROG
Pronoun	PN
Plural	PLU/plu
Quantifier	Quan/Q
Relative participle	RP
Sentence	S
Singular	Sing/SING
Structural and Lexical Transfer	SALT
Subject (specified in the content itself)	S
Tense	T
Tree Adjoining Grammar	TAG
Verb	V
Verb Phrase	VP

TRANCRIPTION FOR TAMIL ALPHABETS

Roman	Tamil
Vowels	உயிரெழுத்துக்கள்
a	அ
aa	ஆ
i	இ
ii	ஈ
u	உ
uu	ஊ
e	எ
ee	ஏ
ai	ஐ
o	ஒ
oo	ஓ
au	ஔ
consonants	மெய்யெழுத்துக்கள்
k	க்
ng	ங்
c	ச்
nj	ஞ்
T	ட்
N	ண்
t	த்
nd	ந்
p	ப்
m	ம்
y	ய்
r	ர்
l	ல்
v	வ்
zh	ழ்
L	ள்
R	ற்
n	ன்

A FEW WORDS

I was involved in machine translation projects promoted by Department of Electronics and Information Technology, Govt. of India for the Technological Development of Indian Languages (TDIL). I was/am associated with the machine translation projects funded by govt. of India since its onset in the form of Anusaraka to its expansion into Indian Language to Indian Language Machine Translation and English to Indian Language machine transition consortia projects. I am party to almost all ventures undertaken by govt. of India on Machine translation. The present material was lying in my lap from 2006 onwards. Let it see the light. Kindly bear with me the lacunae.

S. RAJENDRAN

CONTENTS

CHAPTER - 1
INTRODCTION

1.0. Preamble

The concept of transfer grammar is not a recent phenomenon. Even in 1954 Harris discusses about the importance transfer grammar in the context of translation, machine translation, language teaching and language learning. We became aware of it recently due to our involvement in machine translation (MT). Presently we are interested in preparing a transfer grammar for English Tamil MT. Harris has proposed an elaborate methodology to prepare a transfer grammar (His idea of transfer grammar has been explained below under the heading "Transfer Grammar"). Here we narrow down our efforts just to correlate syntactic structure of English with that of Tamil from the point of view preparing a transfer grammar for English-Tamil machine translation. For this purpose the computable syntactic structures of English and Tamil have been worked out. These computational syntactic structure analyses are different form ordinary syntactic structure analyses in the sense that the computational syntactic structures are viable for computational processing. A transfer grammar for machine translation has to be prepared using these computational syntactic structure analyses. A transfer grammar is an important component in a machine translation system. This helps us to map one language structure into another language structure.

As English and Tamil belongs to two different types of language groups, that is English as predominantly SVO patterned language and Tamil a predominantly SOV patterned language showing unique characteristics which differentiate them drastically from one another, it is possible to manipulate these differences to form transfer rules. These transfer rules can be used to map the English structure into Tamil Structure and vice versa.

1.1. Computationally viable syntactic structurers

The computationally viable syntactic structures of English and Tamil are worked out to facilitate the matching of the two types of structures in order to formulate transfer grammar (transfer rules). The transfer grammar is the core of the present research. Transfer grammar component is very crucial for developing a machine translation system. For this purpose English corpus, especially on tourism, has been downloaded from internet. In the present scenario machine translation systems are produced by preparing parallel corpora of the source and target languages and by making use of statistical methods. The corpus is at first manually annotated for various grammatical features and by using this training corpus rest of the corpus is automatically annotated. By statistical method and by making use of parallel corpora, the transition is executed between the source and target languages. For this purpose the transfer of source language into target language is crucial. This is done by making use of a transfer grammar, which helps in transferring the lexical and structural elements of source language text into target language text. Nearly 5000 sentences in the tourism domain have been collected and translated into Tamil. The translation is a source language faithful translation. As for as possible, information in the source language text are not disturbed. This facilitates the preparation of transfer grammar. Comparison, constrast and correlation are made between the source language and target laguate with the aim to development transfer rules for the sake of MT.

1.2.Contrastive study

Of course, the theory of contrastive study is very relevant in this context. Contrastive study is an analysis, which tries to unearth the typological commonalties found between the languages being compared or contrasted. Theoretically, there is difference between comparative study and contrastive study. Comparative study is made between two genetically related (cognitive) languages of a particular language family in order to bring out their family affiliation. But contrastive study is undertaken between any two languages in order to bring out the corresponding features between them without bothering about their family affiliation, if there is any. It is a common notion that there is logic behind it. When two languages are compared expecting the commonalties, it is quite natural that the two sister languages will share common properties as they have originated from a common source (proto language). But in one sense, it is illogical and unwise to expect similar linguistic traits between two languages that are believed to have been originated from different sources. Chomsky's assumption that there are linguistic universals exists among languages, leads us to expect shared features between two unrelated languages. Contrastive analysis indirectly helps to frame the theory of linguistic universals, although the contrastive study has basically been made for language teaching purpose. However the contrastive study yields many a fruit in the domain of translation too.

Translation is one of the areas studied elaborately by linguists and translators. Traditionally translation was considered as the process of replacement of a text written in a source language by a text written in a target language, the objective being a maximum equivalence of meaning. But in the present day situation, translation is the process of transfer of message expressed in a source language into a message expressed in a target language, with the maximization of the equivalence of one or several levels of content of the message. It is hoped here that the correlation of the grammatical structures of English and Tamil throw some light for the process of machine translation.

In order to prepare a Machine Translation system for translating English texts into Tamil, we need to know the common and contrasting features of English and Tamil. The study which covers up both the aspects of commonness and contrasting feature are referred here as correlative study. The correlative study has to be made at least from the point of view of lexicon and constituent structure. The correlative study of the vocabulary (lexicon) of both the languages is needed for the sake of lexical transfer. The problem has been tackled in the English-Tamil bilingual dictionary and Tamil generation dictionary. We have to concentrate on the constituent structure of the two languages focusing our attention on syntax. Inflectional morphology is taken care of by morphological analysis. Chomsky defined a grammar of a language as a description of the ideal speaker hearers' intrinsic competence. The set of rules, which describes the structure of the sentences of a language are internalized by every speaker of a language and that gives him the competence to distinguish between grammatical and ungrammatical sentence. A native speaker of a language will be able to tell whether a string is deviant because of its meaning (its semantic interpretation) or because of it's from (its syntax). Each language has a stock of meaning bearing elements and these elements are combined to express different meanings. The following two English sentences *Raju called Ramu* and *Ramu called Raju* consist the same meaning bearing elements, but they indicate

two different meanings because the words are combined differently in them. These different combinations fall in the realm of syntax.

The aim of contrastive study of languages is to systematically compare the structures of the two languages. The Basic idea of contrastive analysis is started by Robert Lado (1957) in his "Linguistics across Cultures". His view is:

> The assumption that we can predict and describe the patterns that will not cause difficulty in learning and those that will not cause difficulty, by comparing systematically the language and culture to be learned with the native language and culture of the student. In our view, the preparation of up-to-date pedagogical and experimental materials must be based on this kind of comparison.

The term "contrastive linguistics" is known as

1. "Comparative Linguistics" by M.A.K. Holliday (1965:112)
2. "Bilingual Grammars" by Einar Haugen (1965:41)
3. "Contrastive Grammars" by H.A. Gleason (1955)

Then a more elaborate explanation of the term comes from David Crystal (1971: 24).

> Knowing about a language means being up-to-date with research into the language and with language: in particular it means having a thorough knowledge of structural difference between the languages, the learner already knows and the one he is trying to learn.

In colleges and higher secondary schools instruction is given both in native and target language. The interference of the native language into the systems and structures of the target language is well focused in most cases. At such times the necessity for the application of contrastive linguistics to second language teaching rise up.

> The objectives of contrastive grammars are well stated by Gleason (1955:207):
> Contrastive grammars are most useful in setting up second language teaching materials. They enable an experienced teacher to predict with reasonable success what parts of the language structure will present the greatest difficulties to learners. They commonly define rather precisely the exact nature of those difficulties. This gives the teacher or lesson writer the basis for selecting a strategy to meet or minimize these difficulties.

One way of contrasting the syntactic structure in English and Tamil for effective teaching and learning would be to compare them in a reasonable accurate and objective away. It is to predict the areas of difficulty faced by the second language learners and to suggest suitable remedial measures. The experiment will enable the teacher to prepare their materials accordingly.

Holliday's "Transfer comparison" (1965) describes the grammatical categories of one language in terms of the grammatical categories of another language. The fixed word order of English against flexible word order of Tamil, the use of prepositions in English against the postpositional case markers in Tamil and the use 'and' coordination of verbs in the place of participial coordination in Tamil (*cenRu-vandtaan* "went and came") make them structurally different form each another. For example, it is possible to say "king of England" but not "England's king". "Rama killed a snake" is represented in Tamil as "*raaman paampaik konRaan*" reflecting the structural pattern of English as SVO language and Tamil as SOV

language respectively. The second structure is the normal pattern in Tamil (*ingkilaandtin aracan*). The syntactic feature in the languages is a category, for example English is a prepositional language but Tamil is a postpositional language because the former occurs before nouns the latter is used after nouns in sentence.

1.3.Transfer grammar

A true contrastive analysis should result in a so-called "transfer grammar", which consists of a set of specific rules for transferring from one language to the other, covering all aspects of the structures of the languages involved. Harris (1954) is of the opinion that the difference between the languages can be measured. He proposes a method which enables us to measure the difference in grammatical structure, and to establish what is the minimum difference (or the minimum similarity) between any two language systems. Presumably, any method of specifying difference can contribute toward a classification of structural types among languages (as distinct, say, from a genetic classification). The method is also relevant to a proceduralized system of translation. It can be put in the form routine instructions for machine translations. This is not only because of the inherent connections between transfer and translation, but also because sentence-pairs under translation are used in certain transfer foundation. The method may also be relevant for the learning or teaching of foreign languages; it suggests that it may prove possible to acquire a language by learning only the differences between the new language and the old (leaving those features which are identical in both to be carried over untaught); but here educational and psychological considerations enter in addition to any linguistic technique of minimizing the difference between the languages.

One can construct purely structural transfers between the phonologies of two languages, or their morphophonemics, or their morphologies (only the last is discussed here). And one can construct transfers between paired items in the two languages - paired by some useful criterion. He discusses about sounds paired phonetically rather than purely structurally, and words and sentences paired by translation.

The following paragraph is from Harris (1954) which he has discussed under the heading “DEFINING DIFFERENCE BETWEEN LANGUAGES.” The passage is given as such as the rewiring his idea will hamper our understating of Harris on ‘transfer grammar’.

> We can begin making a transfer grammar by defining difference between languages as the number and content of the grammatical instructions needed to generate the utterances of one language out of the utterances of the other. If A is some large set of utterances in one language, and B is a set in another, then the list of changes that have to be made on A in order to transform A into B will be considered the difference B-A (i.e. it represents what there is in B over and above A; or, given A, how much more has to be done to get from there to B). In certain cases, the list of changes that transform the set B back into the set A may not be simply the reverse of B-A, but may be a different list; this would be A-B (what there is in A over and above B). If among various lists of changes that would transform A into B we find one that is the smallest in number and content (under some way of measuring content), we will call it the least or minimum difference B-A. We will consider whether a least difference exists, how it can be found, and under what circumstances B-A is the reverse of A-B (in which case

the amount of difference is independent of the direction). A grammar may be viewed as a set of instructions which generates the sentences of a language. Since the set of instructions B-A generate sentences (of B) from other sentences (of A), it can be viewed as an appendix to the grammar of A.s That is to say, B can be obtained from the grammar of A plus the added instructions of B-A (which would take us from A to B). This would compare with the independent grammar (or grammars) of B, which generate the sentences of B directly, starting from scratch. Thus the difference
B-A, or the transfer instruction, can be presented as a grammatical appendix to A, or as part of an indirect grammar of B (going via A). It is for this reason that it may be called a transfer grammar. One can also consider a set of grammatical instructions Z, which does not in itself generate any known language, but is so selected that if we add to Z certain additional instructions A-Z we will get the sentences of A, while if we add to Z other additional instructions B-Z will get the sentences of B. Then Z is a grammatical base common to A and to B; and both A and B are obtained by an indirect grammar which goes via Z. One can select Z for various purposes, e.g. for translation or teaching convenience, or for minimality (such that the sum of Z and A-Z and B-Z is least). Then the difference between A and B is the sum of A-Z plus the reverse of B-Z.

1.4.History of machine Translation

Machine translation can be traced back much future. We shall take as starting point the memorandum called 'Translation' written by Warren Weaver in 1949. Weaver was then Director of the Natural Sciences Division of the Rockefeller Foundation. Because of his own intellectual background he was much influenced by the ideas of information theory. Furthermore, one of the earliest uses of computers during the Second World War had been in cryptography – decoding the enemy's secret messages. This led Weaver to a notion of translation as essentially a process of decoding: a text in Chinese was a coded version of an English message. Thus, he was very optimistic about the possibility of using a computer to carry out the decoding.

His letter was circulated to some influential people in the States that produced not only a great interest in machine translation, but also quite substantial research founding for work in the area. Not surprisingly – if rather sadly – much of the interest came from defense and the intelligence authorities, so that the most common source language tacked was Russian, and the most common target language English. It is due to the parallel strong interest arisen in the Soviet block with the languages of English and French.

While considering these early research efforts, it is important to remember that both computer science and formal linguistics were then in their infancy. At that time the high level programming languages had not yet been invented. So the programmer worked very close to the machine, in terms of a few primitive operations. The instructions were written for many times that could be handled by a single program statement which may be automatically translated into a large number of primitive operations without the programmer having to worry about the translation process. Computers had small, limited memories: often 'good' programming came down to finding a way to economize on the number of memory locations used, even if this meant confusing program instruction with data on which the program

should work. In that situation, many of the principles, which are now part of the universal creed of the programmer, simply did not arise: when the chief concern is to Crum as much program as possible in to a limited space. One does not think about program architecture reflecting individual tasks to be done within the program, nor of starting with the top-level task and breaking it down into its components, each in its turn broken down in to independent modules. In essence, this comes down to saying that everything that had to be done was directly programmed in to machine instructions: information about language and the use of that information were inextricably mixed together in the same form.

Generative linguistics, with its insistence on describing language through the medium of a formal description, and its search for generalizations within the description, was also in its very early days. Consequently, is not very surprising that the problem of translation was seen as primarily a problem of dictionary look-up. The text to be translated was scanned from start to finish, each word in turn looked up in a bilingual dictionary, and the target language words substituted for the source language word.

The reader can quite quickly discover the limitations of this technique for himself by taking any sentence on this page and carrying out the same operation towards a language he knows. And, of course, the developers of early systems also quickly began to realize that for more was needed. Various techniques were used in an attempt to improve the quality of the output, ranging from allowing the treatment of one word to influence the translation of the following word, through attempts to resolve part of speech ambiguity by recognizing that certain sequences of parts of speech were illegal for particular languages. Article + verb + noun in English, for example – 'the run cat' cannot be a phrase of English, to the beginnings of developing syntactic analyses capable of determining the structure of the sentence.

But, unfortunately, the research workers proved to be victims of their own earlier enthusiasm and optimism. They had been convinced, in the early days that producing very general translation system, able to deal with a very wide range of texts, doing so without any significant human intervention and producing high quality translation as a result was merely a matter of working very hard, which they were quite prepared to do. They had also made their conviction known: the medicine translation conference at George Town University in 1954 had finished on a very optimistic note: mechanical translation was not only feasible but far closer to realizations than possibly the audience recognized (Reynolds, 1954).

Other quotations show that this was not an isolated view: 'in about two years, we shall have a device which will at one glance read a whole page and feed what it has read into a tape recorder and thus remove all human co-operation on the input side of the translation machines.

> '…… it will not be very long before the remaining linguistic problems in machine translation will be solved for a number of important languages' (Raifles, 1958)

Thus, when the American authorities set up a committee (the Automatic language processing Advisory committee) to evaluate progress in machine translation and to make recommendations for the future, it was only too easy for the committee to conclude that the results so for achieved did not measure up to what had been promised. The committee's report, published in 1966, thus concluded that much more fundamental research was needed

before fully automatic high quality translation could be achieved, adding that, at least for the foreseeable future, it was more economic to use human translators than to use a computerized system and recommended that funding for direct work on machine translation should cease, with available funds being channeled towards basic research – thus, incidentally, giving quite a boost to work in Artificial intelligence, which was then very much at its beginnings.

Many findings of the Alpac report can be challenged. Certainly it reflects the American context where even today translation is regarded as very low-level and therefore ill-paid work, which can be done by any one with one or two years training in the relevant language (quite recently, a reporter commenting on Reagan's work fare Program quoted as typical jobs to be employed by the otherwise unemployed' clerks, street claiming and translating'). It is also ironic that the system on which the evaluation was based – the Georgetown Automatic translation System – was subsequently in regular use in Europe well into the 1970's, thus amply demonstrating the existence of a need and that, within limits, the need was being fulfilled. But fair or unfair, balanced or biased, there was no arguing with the committee's conclusions, and funding for work on machine translation in the States become extremely difficult to find.

However, although this meant that academic work on machine translation became both rare and disreputable, work did not entirely stop. Some of the European groups, especially those who relied on American funding were dissolved, but others, most notably the groups in Grenoble and in Satandburcken managed to keep going and are still active now.

Also there were those who had worked on the discontinued projects who were still convinced that the need for machine translation was there, and that the enterprise was feasible. They reformed themselves into commercial companies: one of the better known commercially available systems, Systran is the product of one such group.

Even within the States, mall pockets of research survived, mostly those independent of government funding, for example at Brigham young university, and at the university of Texas, leading to the metal system, recently marketed by its European sponsors, Siemens, under the name Litras. The Brigham young project was later dissolved but has its intellectual inheritors in two of to-days commercial systems, Alps and Weidener. The two companies producing these systems were both originally based in prove, as is Brigham young, and even though there is no direct link, the influence of the Brigham young Projects in visible.

A shift towards machine translation becomes respectable again. It came with the successful completion of the TAUM-METEO system in 1977. This is the system, which translates the Canadian weather forecasts, and must count as one of the most well-known success stories in machine translation. Around the same time, other systems, by intelligent use of constraints either on the language of the text treated or on the size of the burden placed on the part of the work done by the computer, were successfully developed.

Typical of the first is Titus, in its successive incarnations, developed by the French textile industry for the translation of abstracts, and working via a restricted language. CULT is a system which translates the Acta Mathematica Sinaica (and, more recently, also a Chinese Physics journal) from Chinese into English, and which relies quite heavily on pre-editing, is topical of second.

There is no space here to go into any very great detail on any of these systems. Further details and further references can be found in King (1987). Currently, a number of major projects are under way. The Japanese National Project (MU) has just successfully completed its first four year period, during which a pre-industrial prototype system was developed, and work is just starting an a major development effort. The French National Project is due to produce its first results in the near future. The European community is sponsoring a very large research and development programme Eurotra, designed to produce a system capable of dealing with all the languages of the community.

In parallel too, there is an increasing number of research projects, aiming at longer term results improving the quality of machine translation output. Many of these are in Japan, where there are around twenty such projects, but quite recently, a major research effort has been set up attached to Carnegie Melon. University in the States and the German government is sponsoring research on the use of recent results in theoretical linguistics within translation systems. The Canadian and Swiss governments are also showing renewed interest. Thus machine translation is once again accepted both as an area in which useful, if limited systems can already be developed, and as a legitimate research area.

A computationally viable syntactic structure of English has been worked out with the intention of matching it with the similar structure of Tamil in order to prepare a transfer grammar for machine translation. The computational syntactic structure of English is explained under the following sub headings: Noun phrase, Pre Positional Phrase, Verb Phrase, Adjectival Phrase, Adverbial Phrase and The sentence types based on the structure and function.

A computationally viable syntactic structure of Tamil has been worked to map it against the similar structure in English with the aim of preparing a transfer grammar, which will be utilized for Machine translation between these two languages. The computational syntactic structure of Tamil will be explained under the following subheadings: Noun Phrase, Post positional Phrase, Verb Phrase, Adjectival Phrase, .Adverbial Phrase and The sentence types based on the structure and function.

The fundamental idea of machine translation is to transfer source language text into target language text. For that the source language structure at the level of morphology, syntax and semantics has to be analyzed and the information gathered from the analysis to be transferred into target language by a generator. The analysis and generation are based on certain grammatical formalisms. The predominantly used formalisms are the following: Phrase structure grammar, Context Free grammar, Context sensitive grammar, Government and binding theory, Lexical functional grammar, Paninian grammar, Case grammar, Generalized phrase structure grammar, Head driven phrase structure grammar and Finite state grammar. Each of the grammatical formalism has its own merits and drawbacks. We have to choose one of the formalisms for our purpose.

Translating Languages with Computer – Machine Translation (MT) has been one of the greatest dreams in computer applications. Machine Translation systems acts as a bridge to access cross lingual information by making the documents available in one language to another language. Such systems are inexpensive, instantaneous and multiplicative when compared to human translation. Building such a system across a pair of languages is

nontrivial, fully automatic high-quality translation of an arbitrary text from one language to another is far too hard to automate completely. The level of complexity in building such a system depends on the similarities and difference among the pairs of languages.

And this dream is gradually becoming a reality. Research on MT is an intellectual challenge with worthy motive and practical objective. The challenge is to produce translations as good as those made by human translators. The motive is removal of language barriers. The practical objective is the development of economically viable systems to satisfy growing demands for translations. Contrary to general belief, there is a considerable shortage of human translators even for technical translations. To fill this vacuum there is an increasing demand, worldwide, for MT systems.

We have seen the state of art of MT System development in and outside India. The development of MT systems outside India, especially in European countries and America, is remarkable. India is also making attempts to develop MT system for Indian Language to Indian Language transfer as well as English to Indian languages transfer. Ministry of Communication and Information Technology and Ministry of Human resources give financial support to these programs. Of course we have to travel a lot to achieve this goal. Though such attempts are expensive, at least for the development of Research and Development and from the experimental point of view we have tried to build such systems. The present thesis explores one such possibility.

An exhaustive study of correlation of the computational syntactic structure of English with that of Tamil in the background of lexical and structural transfer of the concerned languages has been made. The computational syntactic structures of both languages have been deeply explored and a transfer grammar for the purpose of developing the machine translation has been worked out. The transfer grammar contains transfer rules, which take care of transferring the structures of source language into target language. The transfer rules will help promoting translation from source text to target text.

The book has been written with its use for further research and its application in machine translation process. The transfer grammar is an important component in the machine translation system. It serves both social and educational needs.

CHAPTER 2
SYNTACITC STRUCTURE OF ENGLISH

2.0. Introduction

In this chapter a computationally viable syntactic structure of English has been worked out with the intention of matching it with the similar structure of Tamil in order to prepare a transfer grammar for machine translation.

English is a configurational language in which the structures of words, phrases, and clauses are more or less fixed, that is, they occur in certain predictable positions in sentences. Compared to Tamil, English is a fixed word order language. The functional interpretations of constituent elements depend more on the positions rather than inflections. English shows the characteristics features of SVO language. It is a prepositional language in which the elements marking the relation between noun and verb come before the noun. Here in this chapter the constituent structure of sentences in English will be elaborated upon to make it available for creating a transfer rules. The rules involved in the analysis of English sentences will be identified so as to compare them with the rules involved in analyzing Tamil sentences and thereby to understand the intricacies involved in the transfer of the source language structure into the target language structure. For the sake of parsing the text in the target language, it is proposed to do the following processes:

1. To analyse the words by assigning them to the word class and giving them lexical, functional, inflectional and derivational meaning depending on the nature of the words.
2. To analyse phrases into words
3. To analyse clauses into phrases
4. To analyse sentences into phrases and clauses
5. To identify the type of sentences

For the sake of computation, the analysis of sentences in English has been dealt under the following headings:

1. Analysis of Word
2. Analysis of Phrase
3. Analysis of Clause
4. Analysis of Sentence

2.1. Analysis of Words

The following form classes have been identified: noun, verb, adjectives, and adverbs. The following functional classes have been identified:

1. Pronouns
2. Prepositions
3. Determiners (Articles, Ordinals, Quantifiers, Demonstratives)
4. Conjunctions (Coordinating conjunctions & Subordinating Conjunctions)
5. Auxiliary verbs (Primary auxiliaries & Modal auxiliary)

The word processor will analyse the words by assigning them to the word class and giving them lexical, functional, inflectional and derivational meaning depending on the nature of the word.

2.2. Analysis of Phrase

The mechanism of building the following types of phrases are dealt under this head.

1. Analysis of noun phrases
2. Analysis of verb phrases
3. Analysis of adjectival phrases
4. Analysis of adverbial phrases
5. Analysis of prepositional phrases

2.2.1. Analysis of noun phrases

The constructions into which nouns most commonly enter, and of which they are the headword, are generally called noun phrase (NP) or 'nominal groups'. The structure of a noun phrase consists minimally of the noun (or noun substitute, such as pronoun). The constructions preceding and following the noun are often described under the headings of premodification and post-modification respectively.

2.2.1.1. Constituants of Noun phrases

The head of a noun phrase is a noun. The head noun may be preceded by some optional elements. An NP may consist of a single noun, pronoun, demonstrative pronoun, etc.

John is lazy. - *John* is a noun
He may come now. - *he* is a pronoun
These are flowers. - *these* is a demonstrative pronoun

The following items may precede the noun in an NP: determiners, ordinals, quantifiers, adjectival phrase, classifier and predetermines. Thus an NP can be parsed as follows:

NP ↔ Pre-det + Det + Ord + Quant + Adj. P + Class + N

Determiners

Determiners are obligatory before non-generic nouns. Pronouns have inherent determiners in them.

2. Elephants are herbivorous animals.
3. He is a good boy.

Determiners are five types:

1. Article: *a/an, the*

2. Demonstrative pronouns: this, that, these, those
3. Possessive pronouns: *his, her, their,*
4. Interrogative pronouns: *whose*
5. Wh-words: *what, which*

They precede nouns.

NP ↔ Det + N

the table, a book, this book, his book, whose book

Ordinals

First, second, third, etc. that denote the order of the items in a series are called ordinals. In an NP, ordinals can follow determiners.

NP ↔ Det + Ord + N

the first class

his third son

Quantifiers

Quantifiers specify quantity or number. E.g. *several, a few, one, two, many*, etc. In an NP, the quantifier can follow the ordinals. If there is no ordinal, the determiner is followed by the quantifier.

NP ↔ Det + Ord + Quan + N

The first three songs

his many mistakes

Approximates (App.)

The approximates introduce approximation to the head noun E.g. *approximately, nearly, almost, etc.* Numeral quantifiers can be approximated by approximates.

Nu-quan. P ↔ App + Nu-quan

Nearly hundred books have been sold.

Approximately five boys came yesterday.

Limitizers (Limit)

Limitizers introduce limitation to the noun phrase that follows. E.g. 'only', etc. Limitizer occurs before quantifier to limit the quantity.

Nu-quan P ↔ Limit + Nu-quan

Only five boys came to see me.

Only Uma appeared before the interview.

Adjectival phrase

Adjectival phrase is phrase that functions as an adjective. A noun can be modified by an adjective phrase.

NP ↔ Adj. P + N

a very nice lady

many beautiful *carved* figures.

Classifier

A classifier is a noun or a sentence that functions as an adjective. A classifier too can come before a noun to modify it.

NP ↔ Class + N

arts College

the do or die slogans

Predeterminers

The terms such as *like, half of, all, all of* are predeterminers. Predeterminers or pre-articles are those items, which precedes the determiner in an NP.

NP ↔ Pre-det + Det + N

half of a dozen

all my sons

all the boys

Genitive observes the arrangement of relative clause with regard to their head; a considerable number of genitive constructions in contemporary English do, follow their head.

the lap of her sister.

her sister's lap.

If genitive, however, are proper nouns, particularly single names, they often precede.

E.g.

John's house.

Yet even single names are often post posed.

E.g.

house of John.

The current status of the genitive in English reflects a change from OV order to VO order. While the favoured order for genitives has been shifted, adjectives still predominantly precede the modified noun.

E.g.

large blue eyes.

Only when they are in turn modified do descriptive adjectives regularly follow their head.

E.g.

They rested on a rock conveniently low.

Limiting adjectives – articles and demonstratives – also stand before nouns, as do numerals; they usually precede descriptive adjectives.

E.g.

I could not hear him at that distance.

I haven't sent the two persons.

I jumped over the first of the six benches.

Parallel to the order of limiting adjectives is that of multiplying numeral combination with nouns representing higher entities: millions, thousands, hundreds, tens in the order of higher to lower (preceded by the simple numerals).

E.g.

Four thousand two hundred and seven.

As with preposed descriptive adjectives, genitives, and relative clauses, preposed limiting adjectives and the cited numerals combinations reflect OV structure. This is the most conservative of the English modifying patterns. In maintaining it as a relic pattern, English provides evidence for the OV structure, which posited for its ancestor language. Yet English nominal phrases for the most part observe the canonical order of SVO languages, maintaining

form early stages OV order only with adjectives and numeral constructions other than the teens.

2.2.1.2. Patterns of noun phrases

Following are the different types of NP patterns.

Type: 1

NP ↔ NP + PP

E.g.

the rebellion of the people

the man of the match

Type: 2

NP ↔ NP + Relative Clause

E.g.

the man who painted the wall

the boy who won the prize

Type 3

NP ↔ Complement clause

E.g.

that he is generous

Type 4 a

NP ↔ NP + to-infinitive Clause

E.g.

attempt to climb

Type 4 b

NP↔ NP + to-infinitive Clause

E.g.

his anxiety to go

Type 4c

NP↔ NP + to-infinitive Clause

E.g.

the house to live in

Type 5

NP ↔ NP + (Preposition) + Interrogative clause

E.g.

the mystery (of) why she left

the knowledge of how to do it

Type 6

NP↔ NP + that-clause

E.g.

the news that she left

Type 7

NP ↔ Det + Compound noun

E.g.

a film star
my ink pen

2.2.2. Analysis of verb phrases

The verb phrase consists of a verb as its head. The term verb phrase is used in two senses. Traditionally, it refers to a group of verbs that together have the same syntactic function as a single verb.

E.g.
is coming
may be coming
get up

In such phrases (verbal groups, verbal clusters), one verb is the main verb (the lexical verb) and the others are subordinate to it (auxiliary verb, catenative verbs). A verb followed by a non-verbal particle is generally referred to as a phrasal verb. In generative grammar, the VP has a much broader definition, being equivalent to the whole of the predicate of a sentence, as is clear from the expansion of S as NP + VP in phrase structure grammar. As the parsing technique we are adopting is based on phrase structure analysis we take the second approach to VP. According to the second point of view, all the elements except the subject NP constitute VP.

2.2.2.1. Constituants of Verb phrases

The constituents which come under VP i.e. that are headed by V can be listed as follows:

1. Adverbial phrase

VP ↔ V + Adv

E.g.
He came very fast.

2. Noun phrase (s)

VP ↔ V + NP + NP

E.g.
He gave her a book

3. Prepositional phrase(s)

VP ↔ V + PP

E.g.
He fell down from the tree

4. to-infinitive clause

VP ↔ V + to-infinitive clause

E.g.
He wanted to buy a computer

5. That-clause

VP↔ V + that-clause

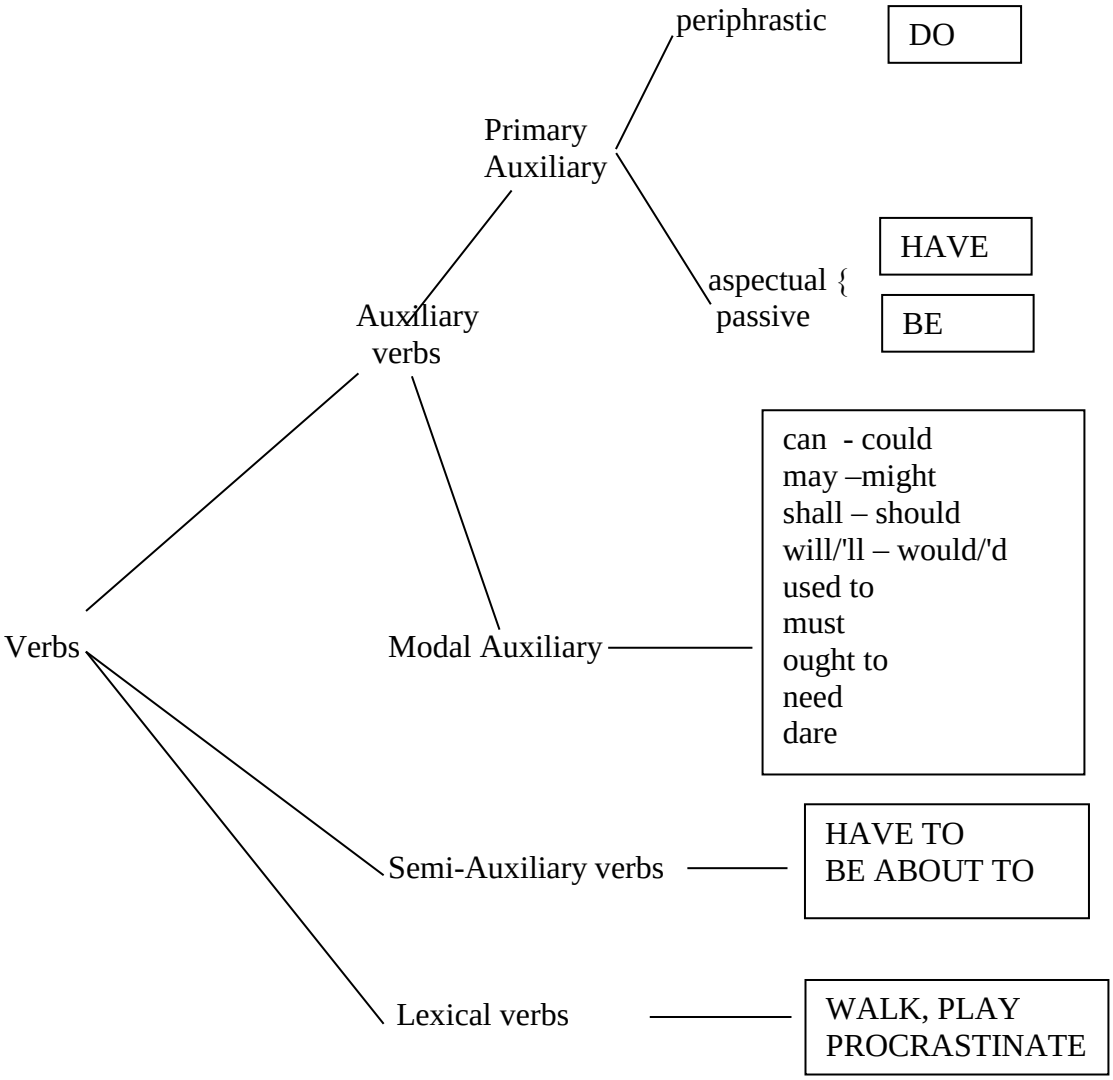
E.g.
He said that he would come home at 6 o' clock.

2.2.2.2. Typology of verbs

The verbs need to be distinguished into two types:

1. Lexical verbs
   . walk, go, run etc.
2. Auxiliary verbs
   will, can, may etc.

The verb that carries the major sense of the predicate phrase is called lexical verb and the verbs that carry secondary meaning such as tense, mood and aspects are called auxiliary verbs. The following diagram shows the typology of verbs (adopted from Quirk et al (1972:69):



2.2.2.3. Inflections in verbs

A typical lexical verb has five forms. The DEWA gives the five forms for each verb. The following table shows the five forms and their symbols and functions with examples:

Form	**Symbol**	**Example**	**Functions**
Base	V/V1	call drink put	1. All the present tense except 3rd person singular: I/You/we/they call 2. Imperative: Call at once! 3. Subjunctive He demanded that I call him. 4.Infinitive: 4.1.the bare infinitive: He may call. 4.2. To infinitive:

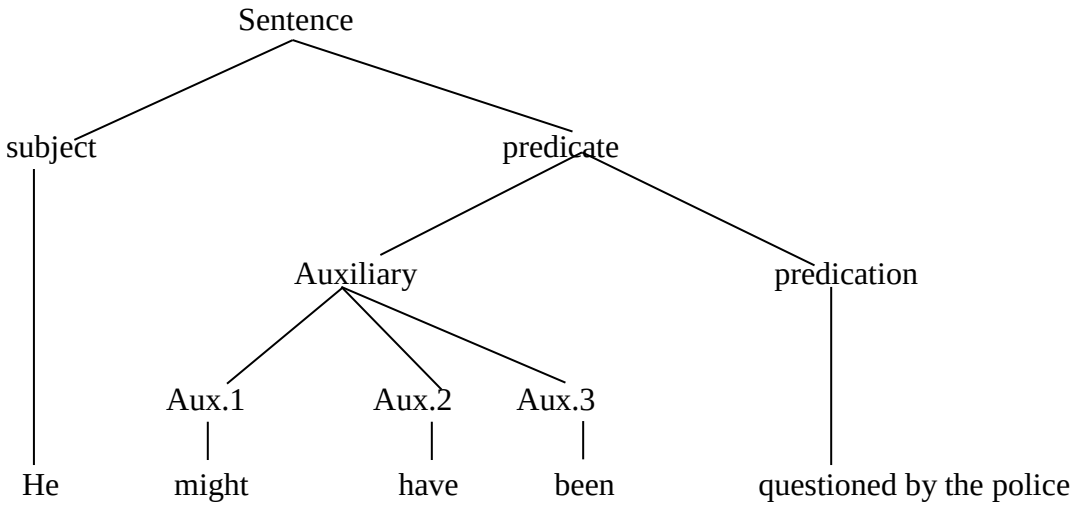
			He wants her to call.
S form (3rd person singular present)	V-s/V1s	calls drinks puts	3rd person singular present tense He/she/it calls
Past	V-ed1/V2	called drank put	***Past tense*** He called yesterday.
ing particle (present participle)	V-ing/V4	calling Drinking Putting	***Progressive aspect*** (BE + V-ing): He's calling you. 2. Non-finite ing –clause: He's calling a spade.
ed participle (past participle)	V-ed2/V3	called drunk put	***Perfective aspect*** (HAVE + V-ed2): He has drunk the water. *Passive voice* (BE+V-ed2): He is called.

2.2.2.4. Compounding of verbs

The auxiliary verbs are compounded with lexical verbs to bring different shades of meaning to the verb. Auxiliary verbs, as their name implies, are helping verbs. They do not have independent existence as verb phrases, but only help to make up verb phrases, which consists of one or more verbs, one of which is a lexical verb. The auxiliary verb makes different contributions to the verb phrase. For example, *DO* is only an empty carrier in certain sentence processes, whereas *BE* and *HAVE* contribute aspect, and modal auxiliaries contribute modality (expressing speech concepts such as volition, probability, and insistence). Although the auxiliaries have different functions in the verb phrase, they have one important syntactic function in common when they occur initially in the finite verb phrase:

Will he ask any questions?
Is he asking any questions?
Has he asked any questions?

The auxiliary of the verb is isolated from the rest of the predicate no matter how the verb phrase is. For this purely syntactic function of the auxiliaries, they can be called by a generic term 'operator'.



Based on the syntactic function and semantic distinction the auxiliary verbs have to be classified into three types:

Primary auxiliary verbs
Modal auxiliary verbs
Semi auxiliary verbs

2.2.2.4.1. Compounding of primary auxiliary verbs

The auxiliary verbs *do, have* and *be* and their different manifestations based on tense, person and number are termed primary auxiliary verbs. The primary auxiliary verbs are inflected for tense, person and number they show concord with the subject. The primary auxiliary verbs can be further classified into the following three types:

1. *Do* auxiliary verbs
2. *Have* auxiliary verbs
3. *BE* auxiliary verbs

2.2.2.4.1.1. Compounding of DO auxiliaries

DO auxiliaries are otherwise called periphrastic auxiliaries. *DO* is the most neutral or 'auxiliary like' of all auxiliaries. It has no individual meaning but serve as a 'dummy operator' in certain sentence processes. The auxiliary *DO* has the following forms:

Tense	Non-negative	Uncontracted negative	Contracted negative
Present	do does	do not does not	don't doesn't
Past	Did	did not	didn't

The following patterns show the different functions of *Do* as an auxiliary verb:

Pattern 1: DO-n't + V1: *DO* is used to form the negative of the present and past simple tense.

E.g.
She doesn't sleep.
She didn't sleep.

Pattern 2: DO…V1?: *DO* is used to form the interrogative of the present and past simple tense (i.e. question tags)

E.g.
Does she sleep?
Did she sleep?
Didn't she?

Pattern 3: DO + V1: *DO* + V1 can be used in the affirmative to give emphasis.

E.g.
You think I didn't play, but I did play.
I do assure that I will persuade him.

Pattern 4: DO so, DO-n't, DO: *DO* is used as a pro-verb to avoid repetition of a lexical verb in short agreements and disagreements.

E.g.
a. He speaks a lot.
b. Yes, he does so.
a. You eat too much.
b. No, I don't.
a. Shall I write to him?
b. Yes, do.

Pattern 5: and so DO… *Do* is used as pro-verb to avoid repetition of lexical verb in a sentence

E.g.
She likes sweets and so does her brother.

Pattern 6: …DO: *Do* is used as a pro-verb in comparisons to avoid repetition.

E.g.
I sing better than he does.

Pattern 7: DO V1-imperative: *Do* is placed before imperative to make a persuasive request or invitation.

E.g.
Do attend the meeting.
Please do come

2.2.2.4.1.2. Compounding of HAVE auxiliaries

The *HAVE* auxiliaries are otherwise called aspect auxiliaries. The aspect auxiliary *HAVE* combines with past participle to form perfective complex verb phrase. *HAVE* has the following forms:

Type	Non-negative	Uncontracted negative	Contracted negative
Base	have, 've	Have not, 've not	haven't
s- form	has, 's	has not, 's not	hasn't
ing-form	having	not having	
ed-form	had (only as a lexical verb)		

The followings show the different distributions and functions of HAVE as an auxiliary verb:

Pattern 1: HAVE + past participle form of the main verb (V3). The functions are listed below:

1. has/have + V3 expresses present perfect

E.g.

She has gone.

2. had + V3 expresses past perfect

E.g.

She had gone.

3. will/shall + have + V3 expresses future perfect

E.g.

She will/shall have gone.

4. would/should + have + V3 expresses perfect conditional
5. E.g.

She would/should have gone.

Pattern 2: HAVE + NP [O] + V3: Express the idea of employing someone to get something done for you.

E.g.

I had my clothes washed.

Pattern 3: had better + to-infinitive clause: Expresses an unreal past.

E.g.

You had better agree to the proposal.

Pattern 4: HAVE + NP [O] + V-ing-clause:

1. Will/shall…have…V-ing expresses future time

E.g.

I 'll have you singing the songs in two days.

2. Has/have … V-ing expresses present time.

E.g.

She has the cuckoo singing a song.

2. had … V-ing expresses past time

E.g.

He had the child playing around him by evening.

Pattern 5: HAVE + to-infinitive clause: Expresses obligation in the affirmative and absence of obligation in the negative.

E.g.

I have to arrange the books in the shelves.

You don't have to work hard.

2.2.2.4.1.3. Compounding of BE auxiliaries

BE is unique among verbs in having eight different forms:

		Non negative forms	**Uncontracted negative forms**	**Contracted negative forms**
Base	Be			
Present	1st person singular present	am, 'm	am, 'm not	(aren't, arn't)
	3rd person singular present	is, 's	is not, 's not	isn't
	2nd person present, 1st and 3rd person plural present	are, 're	are not, 're not	aren't
Past	1st and 3rd person singular past	was	was not	wasn't
	2nd person past, 1st and 3rd person plural past	were	were not	weren't
ing-form	being		not being	
ed-participle	Been		not been	

Based on the function *BE* auxiliaries can be classified into two:

1. Aspect auxiliary
2. Passive auxiliary

The following patterns show the different distributions and functions of BE as an auxiliary verb:

Pattern 1: BE + V-ing: Expresses continuous aspect.

E.g.

She is eating.

Pattern 2: BE + V3: Express passive voice.

E.g.

He was tamed.

Pattern 2: BE + infinitive-clause: Conveys orders and plan.

E.g.

He is to lead the team.

They are to attend the function tomorrow.

Pattern 3: was/were + infinitive clause: Express an idea of destiny.

E.g.

He was to undertake a great responsibility.

Pattern 4: BE about + infinitive clause: Express immediate future

E.g.

We are about to start.

She was about to sing.

2.2.2.4.2. Compounding of modal auxiliary verbs

The modal auxiliary verbs and their alternative forms are given in the following table:

Non-negative forms	**Uncontracted negative forms**	**Contracted negative forms**
can	cannot, can not	can't
could	could not	couldn't
may	may not	(mayn't)
might	might not	mightn't
shall	shall not	shan't
should	should not	shouldn't
will	will not	won't
'll	'll not	
would	would not	wouldn't
'd	'd not	
must	must not	mustn't
ought to	ought not to	oughtn't to
used to	used not to	usedn't to (didn't use to)
(need)	need not	needn't
(dare)	dare not	(daren't)

The model auxiliary verbs listed above expresses various shades of meanings such as ability, permission, possibility, willingness, intension, and prediction, etc.

E.g.

Anybody can do it.

I never could play cricket.

You may go if you want.

2.2.2.4.3. Compounding of semi auxiliary verbs

The set of verbs that show the characteristics of auxiliaries in certain aspects and the characteristics of lexical verbs in certain other aspects are called as semi-auxiliary verbs.

E.g. be about to, be apt to, be bound to, be going to, be liable to, be sure to, be to, had/'d better/best, have to, have got to, come to, fail to, get to, tend to, etc.

2.2.2.5. Interpretation of verbal forms for tense, aspect and mood

The inflection and compounding in verbs lead to the formation of different verbal forms expressing different tense, mood and aspect. The following table depicts the building up of verbal forms to denote tense, mood and aspect. The following table depicts the interpretation of tense, aspect and mood of the verbal forms.

Form	**Meaning**
V-past tense (V2) He wrote.	Past tense
V-present tense (V1, V-s) He writes	Present Tense
will/shall + V1 He will write. I shall write.	Future Tense
may / might + V1 He may/might leave tomorrow.	Future time with modality (In many contexts, modal auxiliaries have inherent future reference, both in their present tense and past form.)
has / have + V3 He has written. I have written	Present perfect aspect
had + V3 He had written	Past perfect aspect
BE-present tense + V-ing He is writing.	Present progressive aspect
BE-past tense + V-ing He was writing.	Past progressive aspect
will/shall + be + V-ing He will be writing.	Future progressive aspect
1. can + V1 He can speak English but he can't write it very well. 2. could + V1 I never could play chess.	Ability = be able to = be capable of = know how to
1. can + V1 Anybody can make mistakes. 2. can + be + V3 The road can be blocked. 3. may + be + V3	I. Possibility = it is possible but / to theoretical possibility may = factual possibility

Form	Meaning
The road may be blocked. 4. may + V1 He may succeed. 5.might + V1 He might succeed.	
1. could be + NP [C] That could be my train. 2. could be + V3 The road could be blocked.	II. Possibility (theoretical or factual, cf. might)
may + V1 He may never succeed ('It is possible that he will never succeed')	III. Possibility = it is possible that /to may = factual possibility (cf. can = theoretical possibility)
1. can + V1 Can I smoke in here (‘Am I allowed to smoke here?). 2. may + V1 May I smoke in here?	I. Permission = be allowed to = be permitted to (‘can’ is less formal than ‘may’ in this sense)
could + V1 Could I smoke in here?	II. Permission
1. may + V1 You may borrow my car if you like. 2. may not + V1 You may not borrow my car. (=You are not allowed to borrow my car.)	III. Permission = be allowed to = be permitted to In this sense may is more formal than can. Instead of may not or mayn’t mustn’t is often used in the negative to express prohibition
might + V1 Might I smoke here?	IV. Permission
will + V1 I'll write as soon as I can. Will you have another cup of tea?	I. Willingness (weak volition) unstressed, especially 2nd person. 'Down toners' like please may be used to soften the tone in requests.
shall + V1 He shall get the money. You shall do exactly as you wish.	II. Willingness on the part of the speaker in 2nd person and 3rd person (weak volition). Restricted use.
would + V1 Would you excuse me?	III. Willingness (weak volition)
1. shall + V1 We shall let you know our decision. We shall overcome.	I. Intention on the part of the speaker only in 1st person (intermediate volition).

Form	Meaning
2. shan't + V1 I shan't be long.	
will + V1 I'll write as soon as I can. We won't stay longer than two hours.	II. Intention (intermediate volition). Usually contracted 'll; mainly 1st person.
shall + V1 You shall do as I say. He shall be punished. The vendor shall maintain the equipment in good repair	Ia. Insistence (strong volition). Restricted use. b. Legal and quasi-legal.
will + V1 He 'will do it, whatever you say ('He insists on doing it...') (cf. He 'shall do it, whatever you say = 'I insist on his doing it')	II. Insistence ('strong volition' = insist on). Stressed, hence on 'll contradiction. An uncommon meaning.
would + V1 It's your own fault; you 'would take the baby with you.	III. Insistence ('strong volition')
should + V1 You should do as he says. They should be home by now.	I. Obligation and logical necessity (= ought to)
1. must + V1 You must be back by 10 o'clock. 2. had to + V1 Yesterday you had to be back by 10 o'clock. Yesterday you said you had to / must be back by 10 o'clock. 3. have to / BE + obliged to You don't have to / are not obliged to be back by 10 o' clock.	II. Obligation or compulsion in the present tense (= be obliged to, have to); except in reported speech. Only had to (not must) is used in the past. In the negative sentence needn't, don't have to, not be obliged to be used (but not must not, mustn't which = 'not be allowed to').
	Prediction Cf. the similar meanings of other expressions for logical necessity and habitual present. The contracted form 'all is common
Will/must/should + V1 The game will/must/should be finished by now.	Specific prediction
Will + V1, V1 Oil will float / floats on water.	Timeless Prediction

Form	Meaning
Will/'all + V1 He'll (always) talk for hours if you give him the chance.	Habitual prediction
1. Must / has to + be There must / has to be a mistake. (Must is not used in sentences with negative or interrogative meanings, can being used instead. 2.cannot + be There cannot be a mistake. 3.mustn't + be (Must, can occur superficially interrogative but answer-assuming sentence.) Mustn't there be another reason for his behaviour.	Logical necessity
ought to + V1 You ought to start at once. They ought to be here by now.	Obligation and logical necessity

2.2.2.6. Patterns of verb phrases

Traditionally verbs have been distinguished into certain patterns based on the constituents that can go along with the verbs. This has been referred as verb patterns. The traditional distinction between verbs as transitive and intransitive is based on this point of view. These patterns come handy to parse sentences.

Verb pattern 1: This represents the patterns of the verb BE. The nominal part of the predicate may be any one of the following items: a noun, a pronoun, a possessive, an adjective or adjective phrase, an adverb or adverbial phrase/adjunct, a prepositional phrase, an infinitive or infinitive clause.

1. NP + BE + NP
   This is a book
2. NP + BE + PN
   It's me
3. NP + BE + Possessive P
   That's mine
4. Interrogative + BE + NP
   Who is that?
5. NP + BE + Adj.

She is clever.

6. NP + BE + Adj. P

The statue will be life size

7. NP + BE + PP

She is in good health

8. NP + BE + Adv

She is here

9. There + BE + NP

There was a large crowd

10. There + BE + NP + PP

There are three windows in this room

11. It + BE + Adj. / NP + to-infinitive (phrase)

It is so nice to sit here with you.

13. How + Adj. / NP + (it + BE) to-infinitive phrase

How nice it is to sit here with you.

14. What + Adj. / NP + (it + BE) to-infinitive clause

What a pity it is to waste them..

15. It + BE + Adj. / NP + gerundial clause

It is so nice sitting here with you.

16. NP + BE + clause

The trouble is (that) all the shops are shut.

17. It + BE + NP / Adj. + clause

It was a pity (that) you couldn't come.

18. NP + BE + to-infinitive clause

This house is to let

19. It + BE + Adj. / NP + for + N/pronoun + to-infinitive (phrase)

It was hard for him to live on his small pension.

20. NP + Vi

The sun was shining

Verb pattern 2: Many verbs may be used without a complement or adjunct. This pattern is for complete intransitive verb, i.e. verbs which may be used without a complement. Adjuncts are optional.

1. There + Vi + NP

   There followed a long period of peace and prosperity.

2. It + Vi + whether-clause

   It does not matter whether we start now or latter

3. It + Vi + to-infinitive Clause

   It only remains to wish you both happiness.

4. It + Vi + that-clause

   It seemed that the day would never end.

5. NP + Vi + for + PP [Adv adjunct]

   We walked for five miles.

6. NP + Vi + Adv. adjunct

   My hat blew off

7. NP + Vi +Adj.

   The leaves are turning brown.

8. NP + Vi + Adjectival past participle

   You look tired

9. NP + Vi + NP

   He died a millionaire

10. NP + Vi + Reflexive pronoun

    You are not looking yourself today

11. S + Vi + Predicative adjunct (i.e. Present participle)

    The children came running to meet us.

Verb pattern 3: There are many verbs that are used with repositions so that the verb and preposition function as a unit. They may be called prepositional verbs. For example, the verb *succeed* is used with *in; rely* and *depend* are used with *on/upon*. Some verbs may be used with two or more preposition (ex. *complain to somebody about something*; *compare one thing to/with another thing*).

1. NP + Vi + preposition + NP (NP = noun, pronoun)

   You can rely on me

2. NP + Vi + preposition + NP + to-Infinitive Clause

   They advertised for a young girl to look after the children

3. NP + Vi + (preposition + (it))+ that-clause

   We will see (to it) that she gets home early.

They decided (on) who should act as Sita

Verb pattern 4: Intransitive verbs are also used with a to infinitive as in verb pattern 7. The pattern is subdivided.

1. NP + Vi + to-infinitive clause (of purpose, outcome, or result)

   He ran to chase the thief.

2. NP + Vi + to-infinitive clause (may be equivalent to a coordinated

   or subordinated clause)

   He turned to see the sun setting.

3. NP + Vi + to-Infinitive clause (infinitive adjunct is used after some verbs)
   She agreed to sing a song.

4. NP + seem/appear + (to be) + Adj. /NP

   This seems (to be) light thing

   She seemed (to be) unable to enjoy it.

5. NP + seem/appear/happen/chance + to-infinitive Clause

   The baby seems to be asleep.

   We chanced to meet in the park that morning.

6. NP + be + to-infinitive Clause

   You are to break the news

Verb pattern 5: The anomalous finites *will, would, shall, should, can, could, may, might, must, dare, need* and *do, does, did*, when used for the interrogative and negative forms and emphatic affirmative are followed by a bare infinitive (without *to*).

1. NP + Anomalous finites + bare infinitives

   You may leave now.

Verb pattern 6: These are patterns for transitive verbs (Vt). In this pattern, a complement or an adjunct may occur but is not essential. The pattern is subdivided.

1. NP + Vt + NP (passivisation is possible)

   Nobody answered my question.

2. NP + Vt + NP (passivisation is not possible)

   She laughed a merry laugh.

3. NP + Vt + Gerundial clause (not replaceable by to-infinitive)

   She enjoys playing tennis

4. NP + Vt + Gerundial clause (replaceable by to-infinitive clause)

The children love playing on the sand.

5. NP + need/want/bare + Gerund (with passive meaning)

The garden needs watering.

Verb pattern 7: In this pattern the verb is followed by a to infinitive which may be preceded by *not* where this makes sense.

1. NP + Vt + (not) + to-infinitive clause
   I prefer not to start early.
2. NP + have/ought + (not) + to-infinitive clause
   You ought not to complain.

Verb pattern 8: In this pattern the object of the verb is an interrogative pronoun or adverb or whether followed by a to-infinitive clause.

1. NP + Vt + interrogative pronoun + to-infinitive Clause

   I don't know who to go for advice.

   She could not decide what to do next.

2. NP + Vt + interrogative Adv. + to-infinitive Clause

   Have you settled where to go for your holidays?

3. NP + Vt + whether + to-infinitive Clause
   She didn't know whether to cry or to laugh.

Verb pattern 9: In this pattern the object of the verb is a that-clause. After such frequently used verbs as *say, wish, hope, think, expect, believe, that* is often (or even usually) omitted. After less frequently used verbs such as *decide, suggest* and *intent* that is rarely omitted in formal style. *Feel* is used in this pattern when it indicates non-physical perception. *Hear* is used when it means *learn* or *be informed.*

1. NP + Vt + that-clause
   He doesn't believe that my intentions are serious.

Verb pattern 10: In this pattern, the object of the verb is a dependent clause or question. The clause may be introduced by a relative pronoun or adverb, by *what* (meaning *that which*) or by *whether*.

1. NP + Vt + Depend Clause/question
   I don't know who she is.
   I don't know who is she.
2. NP + Vt + whether-clause
   She asked whether I took sugar in my tea.

Verb pattern 11: These patterns are of transitive verbs used with a complement or with an indirect object. In this pattern a verb is followed by a noun or pronoun (which must be animate) and a that-clause.

1. NP + Vt + NP + that-clause
   He warned us that the roads were icy.
   The workers told their employers that they wanted more money.

Verb pattern 12: Verbs in this pattern are followed by an NP which is the indirect object and an NP which is the direct object. The indirect object is equivalent to a prepositional adjunct with *to* or *for*. It must be animate.

1. NP + Vt + NP [IO] + NP [O]
   The indirect object can be converted into *to* + NP
   He handed her the letter (= He handed the letter to her)
2. NP + Vt + NP [IO] + NP [O]
   The indirect object can be converted into for + NP
   Are you going to buy me some? (= Are you going to by some
   for me?)
3. NP + Vt + NP + NP
   He struck the door a heavy blow.

Verb pattern 13: Verbs in these patterns are followed by a noun or by pronoun or a prepositional group with to or for. The object of the preposition must be animate**.**

1. NP + Vt + NP [O] + to + NP
   She read the letter to all her friends.
2. NP + Vt + NP [O] + for + NP
   I have bought some chocolate for her.

Verb pattern 14: In this pattern the verb is followed by a noun or pronoun (direct object) and a prepositional phrase.

1. NP + Vt + NP [O] + PP
   We congratulated him on his success.
   Thank you for your kind help.
2. NP + Vt + PP + NP [O]
   I explained to him the impossibility of granting his request.
3. NP + Vt + PP + to-infinitive + that clause
   I must leave it to your own judgment to decide whether you
   should offer your resignation.

Verb pattern 15: In this pattern the verb is used with an adverb or adverbial phrase. The pattern is subdivided.

1. NP + Vt + NP [O] + Adv. P/PP
   Please put the milk in the refrigerator.
   The deductive followed the suspected man for two hours all afternoon.
2. NP + Vt + NP [O]+ Adverbial particle
   Put your shoes on.
   Take your coat off.
3. NP + Vt + Adverbial particle + NP [O]
   Put on your shoes.
   Take off your coat.

Verb pattern 16: In this pattern the direct object is followed by an adverbial adjunct. The pattern is subdivided. In this pattern the adverbial adjunct is a to-infinitive clause (which may be introduced by *in order* or *so as*), which is an adjunct of purpose or intended result.

1. NP + Vt + NP [O]+ to-infinitive clause
   He brought his brother to see me.
2. NP + Vt + NP [O] + as/like/for + NP
   They have hired a fool as our football coach.
   Put it like this.
   She miss took me for my twin sister.

Verb pattern 17: In this pattern the verb is followed by a noun or pronoun and a to-infinitive. The pattern is subdivided.

1. NP + Vt + NP [O] + (not) + to-infinitive clause (can be passivized)
   I warn you not to believe a word he says.
2. NP + Vt + NP + (not) + to-infinitive clause (cannot be passivized)
   He doesn't want anyone to know that he is going away.

Verb pattern 18: In this pattern the verb is used with a noun or pronoun and a bare infinitive. A to-infinitive is used in passive construction. The pattern is subdivided.

1. NP + Vt + NP + infinitive clause (verbs indicate physical perception)
   Did anyone hear John leave the house?
   Did you see anyone go out?
2. NP + Vt + NP + infinitive clause (verbs do not indicate physical perception)
   What makes you think so?
3. NP + have + NP + infinitive clause
   We have computers to do our work.

Verb pattern 19: In this pattern the verb is followed by a noun or pronoun and the –ing form of the verb. These together form the direct object. The pattern is subdivided.

1. NP + Vt + NP + present participle phrase (verbs indicate physical perception)
   He felt his heart throbbing.
2. NP + Vt + NP + present participle phrase (verbs do not indicate the physical perception)
   I can't have you doing that.
3. NP + Vt + NP + *ing* form of the verb (NP = noun, pronoun, possessive)
   I can't understand him/his leaving so suddenly.

Verb pattern 20: In this pattern the verb is followed by a noun or pronoun and an interrogative pronoun or adverb (except why), or whether introducing a to- infinitive.

1. NP + Vt + NP + interrogative pronoun or adverb + to-infinitive clause
   I showed them how to do it.
2. NP + Vt + NP + whether + to-infinitive clause
   Tell him whether to trust him or not.

Verb pattern 21: This pattern is similar to verb pattern 20, except that the interrogative here introduces a dependent clause or a question in place of the infinitive-clause. If may replace whether here (with the same meaning) provided there is no confusion with the use of if to introduce the conditional clause.

1. NP + Vt + NP + Dépendent clause/Question

   Tell me what you name is?
   He told me why he had come.

Verb pattern 22; In this pattern the verb is used with a noun or pronoun or gerund followed by an adjective. The adjective may indicate result or manner.

1. NP + Vt + NP [O] + Adj. (NP = noun, pronoun, gerund)
   We painted the ceiling green.
   The blister on my heal made walking painful.

Verb pattern 23: In this pattern the noun or pronoun following the verb has either an object complement or a subject complement in the form of a noun or noun phrase.

1. NP + Vt + NP [O] + NP [Object complement]
   The team has voted me their new captain.
2. NP + Vt + NP + NP [Subject complement]
   Jill has made Jack an excellent wife.

Verb pattern 24: In this pattern the verb is followed by a noun or pronoun and a past participle. The pattern is sub divided

1. NP + Vt + NP [O] + Past Participle Phrase
   NP [O] = noun, pronoun
   Have you ever heard a pop song in Japanese?
   You must make yourself respected.
2. NP + have + NP [O] + Past Participle Phrase
   NP [O] = noun, pronoun
   She's had her handbag stolen.
   The pilot had his plane hijacked.
3. NP + have/get + NP [O] + Past Participle
   NP [O] = noun, pronoun
   I must have/get my haircut.

Verb pattern 25: Most of the verbs used in this pattern indicate an opinion, belief, supposition, declaration, and mental perception. They all followed by a noun or pronoun *to be* and an adjunct (an adjective or noun). *To be* sometimes omitted. The perfect infinitive *to have been* is not omitted.

1. NP + Vt + NP [O] + (to be) + Adj./NP
   Most people considered him (to be) innocent.

2.2.3. Analysis of adjectival phrase

Adjectives in English can be identified by the following characteristic features:

1. Most of them inflect for comparison three degrees, positive, comparative and superlative.

Positive	**Comparative**	**Superlative**
Good	better	best
Big	bigger	biggest
Beautiful	more beautiful	most beautiful

2. Many are formed by the addition of derivational suffixes to nouns.

Nouns	Adjectives
Snow	snowy
Courage	courageous
Beauty	beautiful

3. They can be preceded by intensifiers such as *very* and *quite*.

very good
Quite right

4. They can precede nouns.
red carpet
sweet words

5. They usually have primary stress on the first syllable.
'clever, 'angry

2.2.3.1. Constituents of adjectival phrases

Traditionally all the nominal modifiers are put under the category of adjective. They are listed below:

Traditional classification of adjectives	**Examples**
Demonstrative	this, that, these, those
Distributive	each, every, either, neither
Interrogative	what, which, whose
Possessive	my, your, his, her, its, our, your, their
Of quality	good, stupid, clever, brave

In the present day analysis the first four types of traditional adjectival categories are put under determiner and only the last type (adjective of quality) is taken as adjective. Both present participle (with *ing*) and participles (with *ed*) can be used as adjectives:

The cinema is interesting.
A tired worker.
Adjectives, which precede their nouns, are called attributive adjectives.
this book.

The distribution and arrangement of adjectives is listed below:

1. Demonstratives and possessives: Demonstratives and possessives occur before nouns. E.g. this book, his book

2. Adjectives of quality: Adjectives of quality, however, can come either before their nouns or after verbs such as *be, seem, become,* etc. Adjectives after the verb are called predicative adjectives.

1.Adjectives occurring before noun:
happy couple, tedious journey

2.Adjectives occurring after verbs:
Uma is clever.
Usha grew impatient.
Kala became happy.
Rani turned pale.

Some adjectives can be used only attributively and some only predicatively and if the position is changed, meaning will change.

1. Attributive adjectives
utter fool, bad sailor, heavy drinker
2. Predicative adjectives
Kannan is afraid. *afraid Kannan Uma is upset. *Upset Uma. Usha is right. *Right Usha.

3. Adjective denoting size (except little), general description, (excluding adjectives of personality, emotions, etc.), age and the adjective little, shape, colour, material, origin, purpose (ex. gerunds in compound nouns: swimming suit, walking stick). A fairly usual order of adjectives of quality is as given below:

size (except little), general description, (excluding adjectives of personality, emotions, etc.), age and the adjective little, shape, colour, material, origin, purpose (ex. gerunds in compound nouns: swimming suit, walking stick)

a red silk saree
around wooden table
a thick metal walking stick

4. Adjectives of personality/emotion, Adjectives of physical description

Adjectives of personality/emotion come after adjectives of physical description. They can precede or follow *young/old*.

a frail frightened girl
an obese angry boss
a young excited lady.
an excited young lady

little, old, and young: *Little*, *old*, and *young*, when used as part of an adjective-noun combination and not to give information, are placed next to their nouns.

a good old man
a nice little child

Old and young: When used to give information, *old* and *young* occur in position given below.

an old Welsh bard
a bulky young lady

fine, lovely, nice + shape etc.: *Fine, lovely, nice* + shape etc., usually express approval of the size, etc.

a fine warm house.
nice thin cloth.

pretty: *Pretty* followed by another adjective with no comma in between is an adverb of degree meaning *very, quite*.

Uma is pretty clever.
Usha is pretty fast.

2.2.3.2. Adjectival comparison

Adjectival comparative construction varies based on the three degrees of comparison. The three types of forms, simple, comparative and superlative forms, of adjectives can be referred from the DEWA.

Positive degree: The positive form is preceded by as and followed by as.
Uma is as beautiful as her mother.
It is not as costly as a diamond.

Comparative degree: Than follows the comparative form
Uma is prettier than Usha.
Kannan's voice is louder than mine.

Superlative degree: The precedes the superlative form
Usha is the most beautiful girl in the class.

2.2.3.3. Patterns of adjectival phrases

The following table shows different types of building of adjectives with reference to their pattern of occurrence.

Type.1a. [… + Adj. + N] NP + V.
A good boy came
Type.1b. NP + BE + [.. + Adj. + N] NP.

He is a good boy

Type.2. NP + BE + Adj.

She is beautiful

Type.3. BE + Intensifier [Adv] + Adj,

She is very beautiful

Type.4a. It+BE+Adj+ to-infinitive Clause

It's easy to please Jim

Type.4b. NP + BE + Adj. + to-infinitive Clause

Jim is eager to please every one

Type.4c. It + BE + Adj. + to- infinitive Clause

It is wrong of Jim to leave

Type.4d. It + Adj. + that-Clause

It is certain that Jim will win.

Type.4e. NP + Adj. + to-infinitive Clause

John was first to arrive

Type.5. NP + Adj. + [preposition + NP] PP

John is anxious for news

Type.6. NP + Adj. + (+ preposition) + Clause

John is glad that you succeeded.

John is anxious about how they got on.

2.2.4. Analysis of adverbial phrases

Many adverbs share the characteristics of adjectives. They form the comparative and superlative with more and most respectively before the positive. Most of them are derived by adding *ly* to the adjectives. They usually follow the verbs and specify manner, place, or time. The following table gives the different kinds of adverbs. These may be broadly classified into three categories:

1. Simple adverbs
2. Interrogative adverbs which are used to frame questions
3. Relative adverbs which are used to combine clauses

Broad classification	**Sub types**	**Examples**
I. Simple	Manner	slowly, quickly, boldly, well, hard
"	Place	here, there, near, up, by
"	Time	then, today, still, soon, now
"	Frequency	always, never, often, once, occasionally
"	Sentence	certainly, definitely, surely
"	Degree	rather
II. Interrogative adverbs which	Interrogative	when, where, why, how

Broad classification	Sub types	Examples
are used to frame questions		
I. Relative adverbs which are used to combine clauses	Relative	when, where, why

2.2.4.1. Patterns of adverbial phrases

The following table shows the building of different types of adverbs and their distribution.

Adverbs of Manner:

NP + Vi +Adv1
Usha ran fast.
NP + Vt + NP [O] + Adv1
I ate banana hurriedly.
Usha welcomed Uma warmly
NP + Adv1 + Vt + NP [O]
Usha warmly welcomed the minister from Chennai.
NP + Adv1 + V + to-infinitive clause
They secretly decided to go to Chennai.
They decided to go to Chennai secretly.
1. NP + V + NP [O] + Adv11
Usha answered the question foolishly.
2. NP + Adv1a + V + NP [O]
Usha foolishly answered the question.
1. NP + V (AV) + NP [O] + Adv12
Kannan paid her well.
Uma treated him badly.
2. NP + BE + Adv12 + V (PV)
She was well paid.
He was badly treated
1. Adv13 + NP + V + (NP)
Somehow Usha did it. Usha did it somehow.
Somehow Uma escaped.
2. NP + V + Adv13
Uma escaped somehow.

Adverbs of place:

NP + V + Adv2
Uma ran away.
Usha waits outside.
Raja sent her aboard.
Write it there.

NP + V + PP + Adv2
Kannan looked for it everywhere.
NP + Vt + NP + Adv2
Keep the book somewhere
NP + Vt + NP + Adv21
Usha has seen it somewhere.
Uma hasn't seen it anywhere.
Kannan has gone somewhere.
Kannan hasn't gone anywhere.
Here/ there + BE/COME/GO + NP [S]
Here's Usha's friend.
There goes my wife.
Here comes Raja.
There comes the elephant.
There/here + NP [=Personal pronoun] + V
There he goes.
Here it comes.

Adverbs of time:

Adv31 + NP + V + NP [IO] + NP [O]
Eventually Usha told Uma the secret
NP + V + NP [IO] + NP [O] + Adv31
Usha told Uma the secret eventually.
NP + V + Adv32
Kala came early.
Uma has gone there before.
Let's start late.
Come immediately
NP + V-perf + Adv33
Uma left Mysore in 1998. I haven't seen her since.
Usha mocked at Kannan and he has been depressed ever since.
1. NP + V + (NP [O]) + Adv34
Usha hasn't come yet.
Uma hasn't seen him yet.
2. NP + Adv34 + Vt + NP [O]
Kala hasn't yet finished the work I gave her a week ago.

Adverbs of frequency:

1.NP + V + Adv4
Usha is usually happy.
2. NP + Adv4 + V

Uma often comes late.
Kala is often late.
Kannan seldom visits Uma.
1. NP + Aux1 + Adv4 + Aux2 + V
Uma has often been warned.
2. Aux1 + NP + Adv1 + V
Has Uma ever been warned?
Adv1+ Adv41 + NP + V
Secretly ever did Uma try to meet Usha?
Adv42 + NP + V ...
Seldom have Usha heard such a speech.
There + BE + Adv4 + NP
There is hardly any money left.
NP + Adv4 + V…
Usha hardly ever visit her friends.

Sentence adverbs: These modify the whole sentence/clause and normally express the speaker opinion.

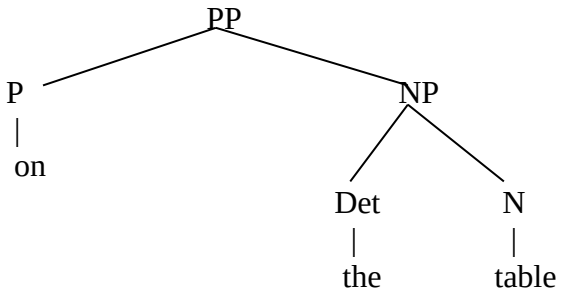
NP + BE + Adv5 + Adj
Usha is certainly right.
Uma is apparently happy.
NP + Adv5 + V …
Kannan definitely looks happy.
Usha perhaps thinks so
NP + Aux1 + Adv5 + Aux2 + V
Uma would obviously have gone.
NP + Aux + Adv5 + V
Usha will surely come.
Adv5 + NP + V…
Apparently Uma looks happy.
NP + V …+ Adv5
Uma looks happy apparently.
NP + V … + V51
Uma will like Usha definitely.
NP + V … + Adv52
Perhaps Uma will like Usha.
Adv53, NP + V …
Honestly, Usha has won the first prize.
Frankly, I disagree with Uma.
Admittedly, Usha is the most beautiful girl in the group.

Adverbs of degree:

NP + BE + Adv6 + Adj
Usha is quite happy.
Uma is extremely beautiful.
NP + BE + Adv6 + V …
Kala was completely covered with mud.
NP + HAVE + Adv6 + V…
Bava had almost reached Chennai.
NP + BE + Adj + Adv61
The knife isn't sharp enough.
That food is not good enough.
NP + Adv62 + V
Uma almost fell down.
NP + V + Adv62
Usha had enough.
NP + Aux + Adv62 + V…
Kala could barely see the picture.
NP + V + Adv63…
Usha ate only banana.
Kala only gave me her pen.
NP + V + NP + PP + Adv63
Kala gave her pen to me only.
NP + Aux + Adb64 + V..
Uma has just gone home.
Usha has just finished her work.

2.2.5. Analysis of prepositional phrases

A prepositional phrase consists of a preposition followed by a prepositional complement that is characteristically either a noun phrase or a clause (wh-clause or V-*ing* clause) in nominal function.



In the most general terms, a preposition expresses the relation between two entities, one being that represented by the prepositional complement. Of the various types of relational meaning, those of place and time are the most prominent and easy to identify. Other relational meanings such as instrument and cause may also be recognized although it is difficult to describe the prepositional meanings systematically in terms of such labels. Seeing the preposition as related to a clause may elucidate some prepositional meanings best.

2.2.5.1. Typology of prepositions

Prepositions can be identified as simple and complex based on the number of words that make up the preposition. The following table depicts the typology of prepositions based on its composition.

Simple prepositions: Most of the common English prepositions consist of one word:

Pure preposition: *Aboard, about, above, across, after, against, along, alongside, amid, amidst, among, amongst, around, at, as, atop, before, behind, below, beneath, beside, besides, between, beyond, but, by, despite, down, during, for, from, in, inside, minus, notwithstanding, off, of, on, upon, opposite, out, outside, out with, over, past, per, plus, re, round, since, than, through, throughout, to, toward, towards, under, underneath, until, till, up, via, with, within, without*.
Prepositions which have affinities with verbs or adjectives: except, excepting, bar, barring, concerning, considering, following, including, granted, pending, less, like, near, save, unlike, worth

Complex prepositions: Most complex prepositions are placed according to their form which can be categorized into one of three:

1.Averb + prepositions: along with, apart from, aside form, as for, as to, away from, into, off of, on to
2.Verb/adjective/conjunction/etc. + Preposition: *owing to, except for, due to, but for, because of*, etc.

3. Preposition1 + noun + preposition2 : by means of, in comparison with, in case of, etc.
Prepositions is preceded by a definite or indefinite article:
in the light of, as a result of
1. in + noun + of
in case of, in charge of, in view of, in need of, in spite of, in front of, in lieu of, in favour of, in place of, in face of, in aid of, in quest of, in respect of, in search of, etc.
2. in + noun + with
in contact with, in common with, in line with, in accordance with, etc.
3. by + noun + of
by means of, by way of, by virtue of, by dint of, etc.,
4. on + noun + of

on account of, on behalf of, on top of, on pain of, on the strength of, etc.

5. Other types

at variance with, in exchange for, in return for, in addition to, in relation to, at the expense of, for the sake of, in/with regard to, with respect to, at the hands of, etc.

2.2.5.2. Prepositional phrases and their interpretations

The following table depicts different PPs and their interpretations.

Preposition	**Prepositional phrase**	**Meaning/ Interpretation**	**Example**
at	at + a set of spatial NPs	Dimension 0	He is standing at the bus stop
at	at + a set pf temporal NPs	Time when Point-of-time	He came at six o'clock
at	at + a set of nouns	Period-of-time	at Christmas
at	at + NP invoking stimulus		I am upset at her behaviour.
in	in + a set of spatial NPs	Dimension ½ Area	There is no fun in the world
In	in + a set of spatial NPs	Dimension 2/3 Volume	in the box
in	in + a set of temporal NPs	Within	in five weeks
in	in + a set of temporal NPs	Period-of-time	in the evening in August
in	in + a set of NPs	Manner	He did it in hurry.
on	on + a set of spatial NPs	Dimension type ½ Area	He sat on the table.
on	on + a set of temporal NP		He came on Monday He came on the following day
above, over, at the top of	above/over/at the top of + Spatial NPs	Superior spatial relation	(It hangs) above his head.
over	over + a set of NPs	position	A lamp hung over the door
over	over + a set of NPs	destination	They threw a blanket over her
over	over + a set of NPs	passage	They climbed over the ball
over		orientation	They live over the road
over	over + a set of NPs	resultative	At last we were over the crest of the hill. The horses are over the fence.
over	over + a set of NPs	pervasive (static)	Leaves lay thick over the

Preposition	Prepositional phrase	Meaning/ Interpretation	Example
			ground
over	over + a set of NPs	pervasive (motion)	They splashed water (all) over me
all over	all over + Spatial NP	Dimension-type ½, especially when preceded by *all*, have pervasive meaning	The child was running all over the flower borders.
over	over + Temporal NPs	Duration (durational meaning parallel to the pervasive meaning with reference to place.)	He camped there over the holiday.
below, under, etc.	Inferior prepositions + Spatial NPs	Inferior spatial relation	The dog sits under the table.
in front of	anterior prepositions + Spatial NPs	Anterior spatial relation	in front of the table
before	before + Spatial NP	Anterior spatial relation	He was standing before the house
before	before + Temporal NP	Anterior time relation	He will come before five o' clock.
before	before +NP deno ting an event	Anterior time relation	He came here before the war.
behind	behind + Spatial NP	Posterior spatial relation	He was standing behind the building
after	after + Temporal NP	posterior time relation	He came after five o' clock
since	since + Temporal NP		He was sick since yesterday.
until, till	until, till + Temporal NP		He was awake till now
to	to + Spatial NP	Goal	(He came) to Chennai
to	to + Temporal NP		He worked from five o' clock to 10 o' clock.
to	to + Benefactor NP	Goal/Benefactor	He gave the ring to her.
from	form + Spatial NP	Source	He came from Chennai.
from	from + Temporal NP	Duration	He worked from five o' clock to 10 o' clock.
from… to	from + Spatial NP + to + Spatial NP	Source & goal	He walked from railway station to bus stand.

Preposition	Prepositional phrase	Meaning/ Interpretation	Example
from...to	from + Temporal NP + to + Temporal NP	Duration.	She worked from 2 to 3 o' clock.
between	between + Spatial NP	Interior spatial relation.	He is standing between two pillars.
between	between + temporal NP	Period	I'll phone you between lunch at three o'clock.
through	through + Spatial NP	Path	He went through the forest.
through	through + Spatial NP	Passage with reference to dimension type ½ or dimension type 2/3.	The ball rolled through the grass.
through	all + through + Spatial NP	Dimension-type ½, especially when preceded by *all*, have pervasive meaning	Chaos reigned all through the house.
across, past	across + Spatial NP	Passage with reference to dimension type ½ or dimension type 2/3.	The ball rolled across the grass.
within	within + Temporal NP	Interior temporal relation	He will finish the work within two days.
up to	up to + set of Spatial NPs	Goal	He went up to bus station.
up to	up to + set of Temporal NPs	Goal	Up to last week, I hadn't received a reply
through out	throughout + Spatial NP	Pervasive	He searched for her throughout Chennai
through out	throughout + Temporal NP	Durative (durational meaning parallel to their pervasive meaning with reference to place)	He studied her lessons throughout night. He camped there throughout the summer.
(all) through	all through + Temporal NPs	Durative (durational meaning parallel to their pervasive meaning	He worked hard all through his life.

Preposition	**Prepositional phrase**	**Meaning/ Interpretation**	**Example**
		with reference to place.)	
with	with + a set of NPs	Accompaniment	He went with her
with	with + a set of NP having instrumental sense	Instrument	He cut the apple with knife
with	with + a set of NPs	Means (= by means of)	He cooked it with fire.
with	with + a set of NPs	Manner	He did it with great care.
without	without + as set of NPs having instrument sense	Instrument	He drew the picture without a ruler.
without	without + a set of NPs	Means (= not by means of)	He decorated it without flower.
by	by + a set of NPs having instrumental sense	Instrument	(He cut the apple) by a knife
by	by + a set of NPs of human instigator	Agent	(He was killed) by her
by	with + a set of NPs	Means	(He cooked it) with fire
by	by + a set of temporal NPs	Point of time	By the time we'd walked five miles, he was exhausted
for	for + NP	Purpose	(He did it) for money.
for	for + NP denoting a benefactor	Recipient	(He bought it) for her. (He laid a trap) for his enemies.
for	for + Temporal NP	During	(He camped there) for summer.
for	for or against + NP	Support or opposition	Will you vote for or against us?
like	like + a set of NPs	Manner	He writes poetry like his brother.
because of, on account of, for fear of, lack of, out of, etc.	because of, etc. + a set of NP	The range or spectrum between cause and purpose	Because of draught, the price of rice was high last year.

Note different meanings elucidated for the prepositions with reference to the context. It is not only the NPs that follow the preposition but also the verbs with which the PP is collocated give different kinds of interpretation to the preposition.

2.2.6. Phrasal co-ordination

In phrasal co-ordination, instead of two sentences, two or more phrases are coordinated.

Venu and Meera make an ideal couple.
Two and two make four.

And and *or* are the main coordinators for phrasal co-ordination. *But* is used only to link adjective phrase and adverb phrases.

A very short but unusually thrilling story.
He worked slowly but steadily.

Most subordinators cannot be used to link phrases, but *if* and *though* are used quite freely to link adjective phrases and adverb phrases.

A very pleasant if long journey.
A simple though efficient system.

There are different types of phrasal co-ordination.

Coordination of noun phrases: NP and/or NP: Noun phrases are commonly conjoined
Ram and Prem are brothers.

Coordination of more than two noun phrases: NP, NP…and/or NP. *And* and *or* can link more than two NPs, and all but the final instance of the conjunctions can be omitted.

We congratulated Ram, Prem, and Beem.

Coordination of determiners: Det and/or Det. Demonstratives can be linked to each other or to other determiners in the NP.

Take this (pen) and that pen.

Coordination of adjectival phrases: Adj P and/or Adj P. Adjectives both predicative and attributive can be conjoined.

She is polite and smart.

The polite and smart girl welcomed us.

Coordination of adverbial phrases: Adv P and/or Adv P. Adverbials and dependent clauses can be conjoined.

I can announce it loudly or by using a speaker.

Coordination of prepositional phrases: PP and/or PP. Prepositional phrases can also be conjoined.

The test in April and in May is postponed.

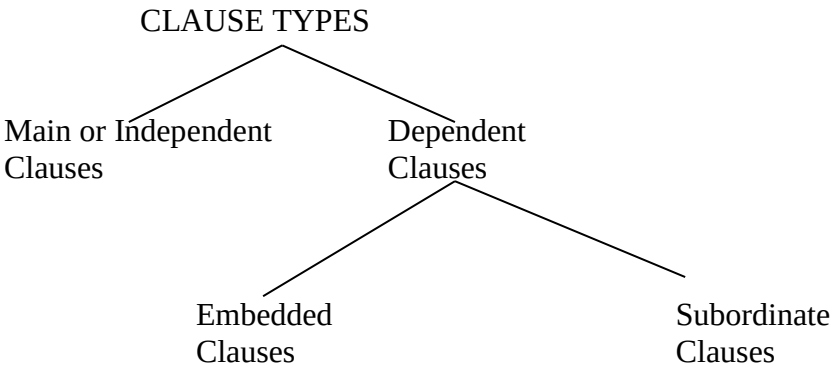
2.3. Clause building Mechanism

Clause building mechanism is dealt under the following heads:

1. Typology of clauses
2. Building of different clauses
3. Co-ordination of clauses

2.3.1. Typology of clauses

The following tree diagram depicts the typology of clauses.



While in co-ordination the conjoins are equals, in subordination one unit or sentence is embedded in another and it is also dependent on the other. Subordination is s non-symmetrical relation, holding between two clauses in such a way that one is a constituent of the other.

If you are ready, I'll join you.

In this sentence *If you are ready* is the subordinate/dependent clauses embedded in main/superordinate/independent clause *I'll join you*. Complementizers and subordinators are associated with the two distinct kinds of dependent clauses: embedded and subordinate clauses. Both kinds of clauses have a special slot before the subject, one in which the complementizer or subordinator occurs. This slot is known as the COMP slot.

Dependent clause may function as subject, object, complement or adverbial.

[That…] NP + VP - Subject
That he is lazy is a fact.
NP V [that…] NP - Direct object
I know that he likes you.
NP BE [that…] NP - Subject complement
The point is that he is your friend.
NP + V interrogative clause {IO}+ NP {O} - Indirect object
I gave whoever it was a cup of tea.
Adv clause + S - Adverbial
When we meet I shall explain it.

The clauses that can occur as subjects or objects and can be the arguments of a predicate like noun phrases are referred to as embedded clause.

For Rajan's car to break down would be unfortunate.
The police reported that Rajan's car had broken down.

This kind of dependent clause is an argument clause, which has been embedded inside a larger clause. That is why it is called an embedded clause. Those clauses that contain embedded clauses are called container clauses or matrix clauses.

Subordinate clause with subordinators in the COMP slot, differ from embedded clauses in that they are not arguments of a predicate. They are thus not used as subject or objects. In many grammars, subordinate clauses are called adverbial clauses. The rationale is that just as adverbs modify verbs, so these subordinate clauses supply additional information modifying the more general content of the verb in the other clause. Subordinators or subordinating conjunctions are perhaps the most important formal indicators of subordination. Most of the subordinators consist of a single word, and there are numerous compound items also.

Simple subordinators: after, as, because, before, if, once, since, that, although, yet, nevertheless, etc.,

Compound subordinators: in that, so that, such that, provided (that), now (that), supposing (that), as far as, as long as, so long as, sooner than, rather than, as if, as though, in case, etc.

Correlative subordinators: if…then, as…so, more/less…than, as…as, so…as, so…that, no sooner…than, etc.

Other indicators of subordination are:

1. wh-element

She knows why I am late.

2. the relative pronoun *that*

I know that he was not a good man.

3. subject-operators inversion as in

Had I been there, I would have helped him

4. nominal *that* clause from which *that* has been omitted

I suppose you're right

5. Comment clause, relatable to the main clause

You're right, I suppose.

Typically, subordinate clauses are classified according to semantic criteria–whether their perspective on the content of the superordinate clause, as indicated by their subordinator, is one of time, location, manner, reason, etc. Here is a listing of subordinate clauses identified as to their perspectives:

Subordinator	**Subordinator + Clause**	**Perspective**
1. After	after Usha met them	TIME
2. Before	before Ramu died	TIME
3. Since	since I last me them	TIME
4. Until	until we meet again	TIME
5. When	when you are in love	TIME
6. While	while they were eating	TIME
7. Where	where Sujatha wrote it	LOCATION
8. Because	because Uma was angry	REASON
9. Since	since You didn't pay me	REASON
10. as if	as if Usha was sick	MANNER
11. as though	as though Kannan hadn't seen him	MANNER
12. so that	so that We'd miss them	PURPOSE
13. in order that	in order that Rajan would confer	PURPOSE
14. so as	so as to avoid the police	PURPOSE
15. in order	in order to avoid the police	PURPOSE
16. as (many) as	as (many) as Uma had	COMPARISON
17. more than	more than Uma had	COMPARISON
18. (tall)er than	taller than Usha was	COMPARISON
19. (al)though	Although they refused	CONTRAST

20. even though	even though she was rich	CONTRAST
21. despite	despite (my) hating eggs	CONTRAST
22. so (that)	so (that) It was a success	RESULT
23. if	if Raju had read it	CONDITION

Three types of main clauses of subordinate clauses can be structurally identified.

Finite clause: A clause whose V element is a verb phrase.
As she is ill, she cannot attend her class
Non-finite clause : A verb whose V element is a nonfinite VP.
Having arrived late, he was disappointed.
Verb less clause: A clause containing no V element.
Although very cheerful, Mary has many problems

Dependent clauses may function as subject, object, complement, or adverbial in the superordinate clause:

Functions of dependent clause	**Example**
Subject:	That she clever is obvious.
Direct object:	I know that she is clever.
Subject complement:	The truth is that she is not intelligent.
Indirect object	She gave whoever came a cone of ice- cream.
Object complement	I found her tied with problems.
Adverbial	When they meet, he will tell her the truth.

Dependent clause may be nominal clauses, adverbial clauses, adjectival/relative clauses, comparative clauses, or comment clauses.

2.3.2. Building of different types of clauses

The following clauses are dealt here:
1. The nominal clauses
2. Adverbial clauses
3. Adjectival clauses
4. Comparative clauses
5. Comment clauses

2.3.2.1. Nominal / complement clauses

The different kinds of nominal/ complement clauses are tabulated below.

1. that clause

a. Functioning as subject

That she is beautiful is true.

b. Functioning as direct object

I told him that she was beautiful.

c. Functioning as subject complement

The truth is that they have won the game.

d. Functioning as oppositive

Your assumption, that things will improve, is understood.

e. Functioning as adjectival complement

I am sure that things will improve.

2. wh-interrogative clause

a. Functioning as subject

What he is searching for is a house.

b. Functioning as direct object

He wants eat whatever is ready.

c. Functioning as subject complement

He is what I thought of.

3. Yes-no interrogative clause

a**.** It is formed by *if* or *whether*.

I don't care if/whether he is available.

4. Nominal relative clause

It can act like nominal wh-interrogative clause. It will be introduced by wh-element.

What he is looking for is a wife.

5. To-infinitive nominal clause

a. to+V1...

For a boy to do that is strange.

6. Nominal V-ing clause

a. BE+V-ing...

His hobby is collecting stamps.

7. Bare infinitive

a**.** infinitive clause without *to*

All he did was press the button.

8.Verbless clauses

a. A clause contains no V element

Mosaic flooring in every room is expensive.

2.3.2.2. Adverbial clauses

Adverbial clauses can occur in a final, initial, or medial position within the main clause. The following are the different kinds of adverbial clauses.

1. Clauses of time: Adverbial clauses of time are introduced by such subordinators as *after*, *since*, *as soon as*, etc.

When I reached college, classes had begun

After I graduated, I went to States.

2. Clauses of place: Adverbial clauses of place are introduced by *where* or *wherever*.

The plants grow where there is enough water.

He accompanied her wherever she went.

3. Clauses of condition:

a. Conditional clauses: It states the dependence of one circumstance or set of circumstances on another. Clauses of condition are introduced chiefly by the subordinators, *if* (positive condition) and *unless* (negative condition). Some compound conditional conjunctions are *provided that*, *on condition that*, etc.

If you wait, (then) you can meet him.

If he performs well, he will win the prize.

Unless if rains, the crops will die.

b. Real and unreal conditions: A 'real' condition leaves unresolved the question of the fulfillment or non-fulfillment of the condition. In an 'unreal' condition, on the other hand, it is clearly expected that the condition, on the other hand, it is clearly expected that the condition will not be fulfilled**.**

a. Real condition

If she comes, I'll talk to her.

If it rains, the picnic will be cancelled.

b. Unreal condition

If she came, I'd talk to her.

Had I been there, I'd have congratulated you.

4. Clauses of Concession: Concessive clauses imply a contrast between two circumstances, i.e., the main clause is surprising in the light of the dependent one. Clauses of concession are introduced chiefly by *though* or *although*. Other conjunctions include *while, whereas*, etc.

Although he tried hard, he failed.

Although he's poor, at least he's happy.

5. Clause of reason or cause: Clauses of reason or cause are most commonly introduced by the conjunctions because, *as*, or *since*.

I could not help her since I didn't have money.

6. Clauses of circumstances: Clauses of circumstances express a fulfilled condition or relation between a premise (in the subordinate clause) and the conclusion drawn form it (in the main clause). *Because*, *since* and *as* are the conjunctions used.

Since the rain has stopped, we shall go out.

As it was dark, she hesitated to go out.

***7.* Clauses of purpose**: Clauses of purposes are adjuncts, introduced by (in order) (for_N) to, so as to Finite clauses of purpose may be introduced by so that, so, or in order that..

He walked fast, to catch the train

She studied hard, so as to get the scholarship.
He worked hard, so that he could succeed.
We eat well, in order that we may be healthy.

8. Clauses of result: Result clauses are factual and are introduced by so that, such…that, so…that.

He practiced well, so that he could perform well.
The dog barked so loudly that the thief fled.

2.3.2.3. Adjectival clauses

Adjectival clauses or relative clauses are clauses linked to a noun in their container clause, frequently with a WH form like the relative pronoun *which* and *whom*. As relative clauses qualify an NP and hence perform the function of an adjective. Thus, the relative clause in the following sentence

The girl who is clever

does the function of the adjective *clever*, in the following phrase

The clever girl.

It is introduced by a relative pronoun (*who, whom, whose, which, that*) or relative adverb (*where, when, why*).

This is the boy who wrote the story
Show me the book that you bought yesterday.

The noun/pronoun to which the clause is related is called its antecedent, as the boy and the book in the sentences given above. The relative pronoun/adverb is sometimes omitted.

Show me the book you bought yesterday.
This is the boy I met at the party.

English makes use of relative pronouns to form relative clause. The relative clause is an example of post modification. The head noun will be modified by the following relative clause. The relative clause together with the noun it modifies forms a noun phrase. The relative pronouns *who* and *which* are followed by a verb or verb phrase. The agreement is on the basis of a two-term gender system, personal and non-personal.

Joan, who…
The boy who…
The people who
The human being who…
The fairy who…
London, which…
The box which…
The animals which…
The human body which…

The unicorn which…

The position of relative construction is determined by the VO constituent. They regularly follow nouns, avoiding in this way disruption of the verb-object constituent. The relationship of relative constructions to their antecedents is so clear that if an object is the shared noun of the relative clause no marker is needed; *which* or *that* is often omitted, as after rules in the following examples:

All because they would not remember the simple rules their friends had taught them.

English relative constructions may be restrictive, as in the first in the following example, or descriptive, like the second.

> The only two creatures in the kitchen, that did not sneeze, were the cook, and a large cat, which was lying on the hearth and grinning from ear to ear.

The distinction between restrictive and descriptive relative clauses is maintained for other nominal modifiers as well, such as the participles in the following examples:

> There stood the Queen in front of them, with her arms folded, frowning like a thunderstorm. (Descriptive)
> With tears running down his cheeks, he went on again. (Restrictive)

The contrast also applies to adverbial clauses. The temporal clause in the first sentence is restrictive, while *that* in the sentence is descriptive.

2.3.2.3.1. Restrictive and non-restrictive relative clauses

Relative clauses typically differ from other embedded clauses in having one constituent missing or, if it includes a relative pronoun, out of its expected order. There are two major types of relative clauses in English. Restrictive relative clauses are embedded clauses used to identify a noun phrase referent by providing further information to narrow down the reference; apposite or non-restrictive relative clauses also provide additional information about a noun phrase referent that has already been adequately identified, so the new information is not needed for identification.

1. Restrictive relative clauses
   Men who live in villages are healthy
   My brother who is in Delhi is an architect.
2. Non restrictive relative clauses
   Men, who are mortal, often forget it.
   My brother, who is in Delhi, is an architect.

2.3.2.3.2. Case in relative clauses

Case is used to indicate the status of the relative pronoun in relative clause There are two situations to consider. First, if the pronoun is in a genitive relation to a noun head, the pronoun can have the form *whose.*

The woman whose daughter you met is Mrs. Brown
The house whose roof was damaged has now been repaired.

Secondly, with a personal antecedent, the relative pronoun can show the distinction between who and whom, depending on its role as subject of the relative clause or as the object of verb or preposition in it.

The girl who spoke to him.
The girl whom he spoke.
The girl who (m) he spoke to.
The girl who (m) he met.

2.3.2.3.3. Relative pronoun as adverbial

The relative pronoun can have a special form as adjunct of place, time, and cause in the relative clause.

That is the place where he was born.
That is the period when he lived here.
That is the reason why he spoke.

2.3.2.4. Comparative clauses

In a comparative construction a proposition expressed in the superordinate clause is compared with a proposition expressed in the subordinate clause, by a correlative sequence, equational like as…as, or differentiating like *less…than*, *more…than*.

Rosy is as healthy as her sister.
Jasmine is less healthy than her sister.

There are comparative constructions with *enough* and *too*, which convey the contrasting notions of 'sufficiency' and 'excess' and which are related through negation. Paraphrases pairs may be constructed, as follows:

This shirt is too small for me (to wear)
This shirt is not big enough for me (to wear).

The following list shows the different types of comparative elements used in English.

As…. as, so…as: Similarity
She is as clever as her brother.
Than: Dissimilarity
She is cleverer than her brother.
Less…than: Dissimilarity
She is less clever than her sister.
More …than: Dissimilarity
She is more intelligent than her friend.

2.3.2.4.1. Comparative clauses of quality

The following list shows the different types of comparative clauses of quality.

1. NP + BE + as + positive form of adjective + as + NP: Similarity Positive degree

Uma is as beautiful as Usha.

2. NP + BE + more + adjective + than + NP: Dissimilarity, Comparative degree

Uma is more beautiful than Usha.

3. NP + BE + Comparative degree form of adjective + than + NP: Dissimilarity, Comparative degree

Raja is taller than Ramesh.

4. NP + BE + the + Superlative degree form of adjective + among all: Dissimilarity, Superlative degree

Raja is the tallest among all.

2.3.2.4.2. Comparative clauses of quantity

The following list shows the different types of comparative clauses of quantity.

1…NP…+ HAS + as + many + NP + as …: Positive degree, Clause of similarity

Ram has as many shirts as Sam has.

2. NP…+ HAVE + more + NP + than + NP + HAVE: Comparative degree, Clause of difference

Ram has more shirts than Sam has.

2.3.2.4.3. Comparative clauses of adverbs

Adverbial comparative construction varies based on the three degrees of comparison. The three forms of adverbs, positive, comparative and superlative forms, can be referred from the DEWA.

1. With the positive form *as...as* in the affirmative and *as/so...as* in the negative are used: Positive degree
Uma shouted as loudly as she could.
It didn't cost her so much, as she feared.
2. With comparative form *than* is used: Comparative degree
Uma walks faster than Usha.
Kannan screamed louder than I expected.
3. Superlative degree: With superlative it is possible to use *of* + noun: Superlative
Usha worked hardest of the labourers.

2.3.2.5. Comment clauses

Comment clauses are somewhat loosely related to superodinate clauses, functions as disjuncts or conjuncts. They may occur initially, finally or medially, and have separate tone units. They occur in various forms.

1. A main clause
I believe, nobody was there.
2. An adverbial clause
He is a rebel, as you know.
3. A nominal relative clause
What's more, they were robbed.
4. A to-infinitive clause
I am innocent, to be honest.
5. An ing-clause
I fear, speaking as an expert, if this is right.
6. ed-clause
Stated bluntly, he has no manners.

2.3.3. Clausal co-ordination

There are three coordinators in English, *and*, *or*, and *but*, used for linking clauses or sentences together. The clause coordinators occur clause initially.

Sam sings well and his sister dances well.

The clause beginning with coordinator cannot be moved in front of the preceding clause.

They are aboard on a tour, or they are at home.

The clause beginning with *or* cannot be moved to front *and* and, *or* can link more than two clauses, and all but the final one can be omitted.

Sam will come, do this work, and rest here.

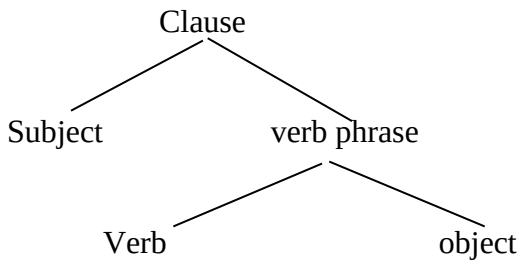
2.4. Sentence analysis

The sentence analysis is dealt under two heads:

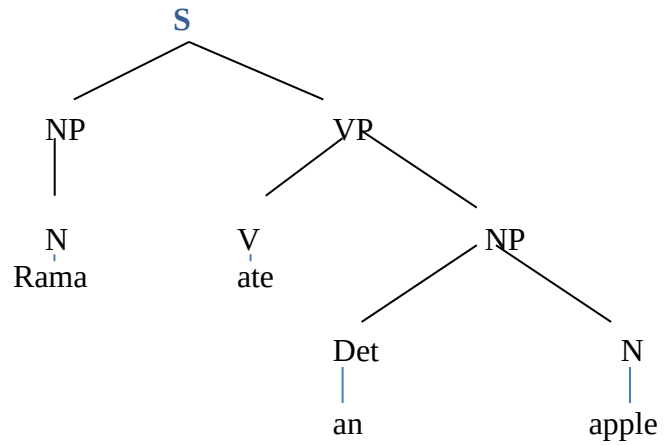
1. Word order
2. Forming different types of sentences

2.4.1. Word order

Word order is a term used in grammatical analysis to refer to the sequential arrangements of words or linguistic units. English relies on word order as a means of expressing grammatical relationships within constructions. English has fixed word order and so is called configurational language. The core of the configurationality issue is about the question of special grammatical relation of subject and a different one of object, whatever these relations correspond to different positions in the hierarchy of the sentence. It has been established well that in English there is a syntactic VP node and the object is decided by its position.



Rama ate an apple



The order of morphemes in word structure tends to be fixed. Morphemes tend to be positionally bound. The higher we move in the hierarchy of units, the more freedom we have in the ordering of constituents. Word order refers to the order of constituent structure of linguistic units. Each constituent represents a complex set of features. The ordering of the constituents may be linear or sequential, discontinuous or fused.

1. SVO linear
Mohan has read this book.
2. Aux. + SVO order which is discontinuous
Has Rajamani read this book?

3. Fused order
read = 'V + Past participle' is fused into *read*

English is an SVO language, meaning that the verb tends to come between the subject and object. The illustration exemplifies that English sentence which is in SVO order becomes Aux. + SVO which is a discontinuous order.

English is a highly consistent SVO language shows the following characteristics:

1. English being an SVO language has prepositions.
2. The government constructions observe SVO patterns, as do the nominal modifying constructions – with the exception of descriptive and limiting adjectives in an archaic order.
3. As a consistent language, English exemplifies characteristic features of SVO languages, such as many patterns that have been developed in the verbal modifying constructions, the wide use of substitutes, and the grammatical processes used to highlight elements of sentences.
4. The verbal patterns make heavy use of auxiliaries, which are also involved as substitutes and in interrogative and negative constructions. The grammatical process involves function words, again in distinctive constructions like clefting.

5. Simple, unmarked clauses in English agree with the SVO pattern, and require representations for the three constituents: subject, verb, and object. Neither the subject nor the verb nor the object of a transitive verb may be omitted.

    Uma folded her hands.
    *Her hands Uma folded.

6. English does not permit any order other than the above in unmarked sentences occurring as single utterances. This constraints applies also in subordination, as in the following sentence:

    Kannan shouted while Uma folded her hands.

7. The verbal qualifiers must precede verbs. This position conflicts with the optimum position for subjects. To express negation, for example, the negative element might be prefixed to the verb.

    Uma does not fold her hands.
    *Uma folded not her hands.

8. Government operates strongly in English, both in predicates and in other government constructions.

    Her hands are folded.
    Two of her hands are folded.

9. In comparison of inequality the adjective precedes the standard.

    Uma is more beautiful than Usha.

10. In titles, the name follows, functioning like a standard for the 'variable' title.
    Queen Diana.
11. In personal names, the surname follows as standard to the given name.
    John F. Kennedy.
12. In numerals in the teens, the form of ten follows, as in the other constructions of this kind furnishing a standard for the simple numerals from three to nine.
    thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen.
13. English has been characterized by functional syntacticians as a language in which the initial segment, or theme, often using old material, sets the scene for the new material, or rhyme.
    Uma folded her hands.

14. The subject *Uma* is one of the important elements of the preceding discourse, while the predicate *folded her hands* introduces a new action. SVO order provides a convenient basis for such organization of sentences.

Seven types of basic sentential structures can be identified in English.

1. SVA pattern
Arul is in the hall.
2. SVC pattern
Arul is clever.
3. SVO pattern
Arul threw the ball.
4. SVOA pattern
Arul kept the ball on the table.
5. SVOC pattern
Arul has proved her wrong.
6. SVIOO pattern
Arul taught her music.
7. SV pattern
The baby cried

(Here in this context A = Adjunct, C = Complement, IO = Indirect Object, O = Object, S = Subject, V= Verb,)

2.4.2. Building of different types of sentences

Traditionally sentences in English have been classified based on the complexity of the clauses and also on the basis of the function. Though this traditional classification can be set aside in a rigorous structure oriented analysis, the classifications do have indirect bearing on our understanding of word building mechanism in English. That is why they have been dealt here.

2.4.2.1. Sentence types based on the complexity of clauses

Traditionally sentences are classified as simple, compound and complex. This distinction is based on the criterion whether the sentence contains a single verb or verb phrase or more than one verb or verb phrase. It has been explicated traditionally that a simple sentence contains at least one verb or verb-phrase; compound and complex sentences contain more than one verb or verb phrase. Accordingly simple sentences have only one finite verb, compound sentences have two or more finite verbs and complex sentences have one finite verb and one or more non-finite verbs.

1. Simple sentence

He goes to market
2. Compound sentence.
He went to market and bought some vegetables.
3. Complex sentence
He is going to market to buy vegetable.

A simple English sentence is built of two primary constituents, NP and VP. So a sentence in English can be parsed as consisting of NP and VP.

S ↔ NP + VP

In a compound sentence one sentence is coordinated with another sentence and in a complex sentence one or more sentences are subordinated under a matrix sentence. Coordination and subordination have been dealt earlier.

2.4.2.2. Sentence types based on their function

Traditionally sentences have been classified into five types based on their function.

1. NP + VP: Affirmative or assertive sentences
He went to market.
2. Question word/ auxiliary + NP + VP: Question or interrogative sentences
Is he going to market?
3. NP + not + V: Negative sentences
He is not going to market.
4. V1: Imperative or command sentences
Go to market.
5. Exclamatory words: Exclamatory sentences
How beautiful the building is!

This traditional classification of sentences into assertive, interrogative, negative imperative and exclamatory has been dealt elaborately in speech art theory, where various communicative functions have been identified and classified accordingly. We have not elaborated this communicative function here.

2.4.2.2.1. Analysis of affirmative or assertive sentences

Assertive statements follow the regular order of subject, verb and object in English. The phrase structure of assertive sentences can be given as NP + VP in English as they have only one finite verb. They may be called minimal sentences. Minimal sentences can be distinguished into two types:

1. Equative type
She is a beautiful girl.
2. Non-equative type
She bought a book.

2.4.2.2.1.1. Analysis of equative sentences

In equative type of sentences, a linking verb (LV) links the subject and the complement. The equative sentences can be parsed as follows.

S ↔ NP+LV+NP/Adj./Adv.

The link verb (LV) could be a BE verb (abbreviated as BV; ex. *is, am, are, was, were, will be, shall be*) or copulative verb (abbreviated as CV; ex. b*ecome* etc.)

S ↔ NP + BV + NP /Adj. / Adv.
She is a pilot.
Kamala is intelligent.
She is there.

S ↔ NP + CV + NP / Adj.
He became a teacher
He remains poor
The mango tastes sweet.

The verbs such as *become, remain, taste,* etc., which equate the subject with adjective, have been classified as equatives.

2.4.2.2.1.2. Analysis of non-equative sentences

The following are the different types of non-equative sentence patterns:

1. S ↔ NP + Vi
The butterfly flies.
2. S ↔ NP + Vi + Adv.
The car reached late.
3. S ↔ NP + Vt + NP
John wrote a letter
4. S ↔ NP + Vt + NP + NP
John gave her a purse.
5. S ↔ NP + V (have type) + NP
Kamala has three airplanes.
(Vi = intransitive verb; Vt = transitive verb)

2.4.2.2.2. Analysis of interrogative sentences

It is expressed by inverting the order of words, using interrogative words that are often classified as interrogative adjectives, interrogative adverbs, and interrogative pronouns.

E.g. Is he going?

Apart from word order even tone also expresses interrogation.

E.g. You have my address?

In writings, either the word order + the question mark at the end or merely the question mark denotes the interrogative sentences. Based on the reply, the question evokes, the interrogative sentences can be classified into two types.

1. Those that may be answered with *yes* or *no* (yes-no question)
2. Those that introduces 'wh' words. (Wh- questions).

2.4.2.2.2.1. Yes-no interrogatives

Yes-no interrogatives are those questions for which the answer is either *Yes* or *No* i.e., affirmation or rejection. Yes-no question is formed by fronting the auxiliary and giving the sentence a rising intonation. The auxiliary (the tense and the auxiliary element that immediately follows it) is moved from the position after the subject NP to the front of the subject NP by the inversion of the subject and the auxiliary. Only the auxiliary element (modal, *have*, or *be*) to which the tense is attached moves with the tense to the front of the subject NP. Yes-no questions can be classified into three types and can be assigned three types of parsed structures. The following list gives the type and patterns of yes-no interrogative sentences with examples.

1. 'Be' verb questions: BE + NP + VP

Is she a teacher?
Is her voice sweet?
Was he there?

2. Questions with modal Auxiliaries: Modal + NP + VP

Can she sing?
Should I go?
Must I sing?
Dare you question me?
May I use your pen please?
Can he be a doctor?

3. Questions without 'be' verbs and modals: DO + NP + VP

Did Uma go to school?

When no optional element has been picked from the auxiliary and the main verb is not 'be', we must use slightly different version of the yes-no question switch rule. In this version, the only thing that is moved to the first position of the sentence is the tense. The traditional transformational generative grammarians called this as 'do insertion transformation'. According to this version, two types of transformations are applied. The first is 'Tense + Auxiliary Fronting Transformation' and the second is 'Do Insertion Transformation'.

He comes.
Does he come?
Uma went to Belgium
Did Uma go to Belgium?

2.4.2.2.2.2. Wh-interrogatives

'Wh' questions are introduced by interrogative pronouns, adjectives or adverbs. For all such questions the answers expect a piece of information. Such questions are called pronominal questions.

1. Who goes to college?
2. Whom do you want?
3. Whose question is this?
4. What is your problem?
5. Which is the correct answer?
6. How much is the apple?
7. Why did he do that?
8. Where did he go?

Wh-questions are so named because they contain question words that, with the exception of *how*, begin with WH. The wh-question word occurs normally at the beginning of the clause and may be part of the question phrase.

For what reason?
Whose apple?

In contrast to yes-no questions, which ask about an entire proposition, equative questions ask information about an argument of a predicate or about semantic domains like time, place, and manner. Following list shows some of the semantic domains along with 'wh' words and phrases, which are used to ask for information about them.

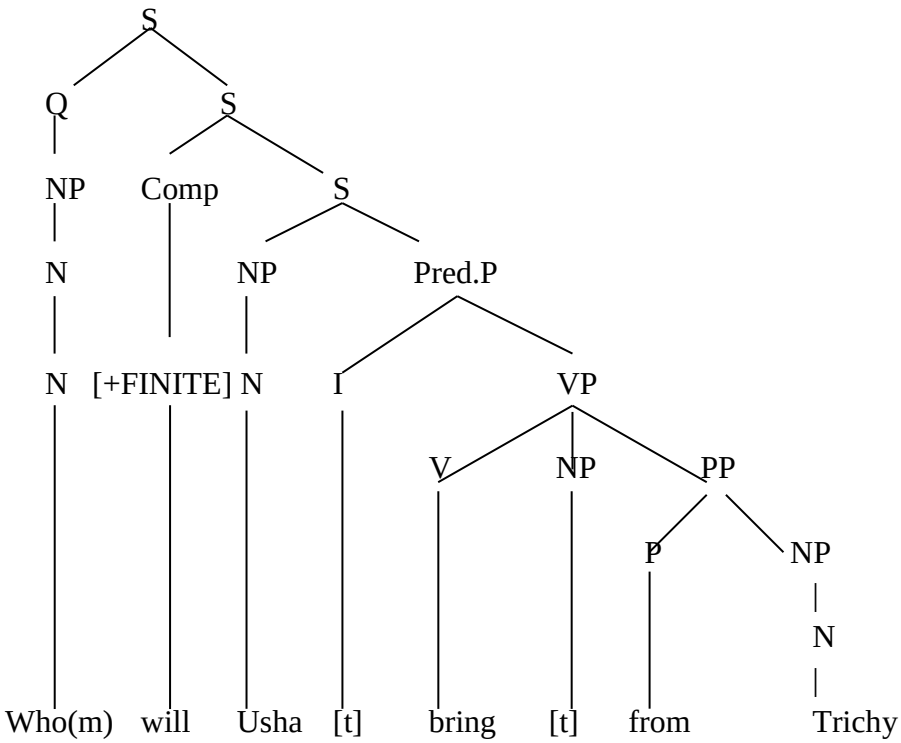
Time	**Place**	**Person**	**Non-Human**	**Manner**	**Reason**	**Quantity**
when, at what time, on which day	Where, at what place, in which town, to which country etc.,	Who, by whom, with which friends, whose have etc.	What, which, with what etc.	how, in what way. in which way, by what means, etc.	why, for what and which reason etc.	how much, how long, how many, how clear, etc.

The structure of 'wh' question sentences can be understood by comparing the structure of declarative sentences with that of 'wh' question sentences.

Usha will bring her mother from Trichy.
Usha will bring who (m) from Trichy?
Will Usha bring who (m) from Trichy?
Who will usha bring from Trichy?

The present day generative paradigm considers the formation of 'wh' question sentences from a deep structure by 'wh' movement. This can be depicted by a constituent called trace (t) as follows.

Figure: 6



In the similar manner, the structure of following sentences can be understood by comparing their respective declarative sentences that is their deviant structure can be understood from the representation of the deep structure in terms of core structure.

Where will Usha (t) bring her mother from (t)?
↓
Where will Usha bring her mother from?
Who will (t) (t) bring her mother from Trichy?
↓
Who will bring her mother from Trichy?

Note that in the second type, although the linear order of the constituent is exactly the same as if neither the operator nor the 'wh' word had moved, the hierarchical structure is different.

2.4.2.2.2.3. Interrogative determiners and pronouns

In the noun phrase, the interrogatives *which* and *what* can act as both determiner and pronoun and can have both personal and non-personal reference. The different interrogative determiners and pronouns are given in the following table.

	DETERMINERS	PRONOUNS	
	Personal and non-personal	Personal	Non-personal
Subjective case	What, Which	Who, What, Which	What, Which

Objective case		Whom	
Genitive case	Whose		
Interrogative …+ Preposition	What, Which … + preposition	Who, whom …+ preposition	What, Which …+ preposition
Preposition + interrogative	Preposition + What, Which	Preposition + whom	Preposition + What, Which

2.4.2.2.2.4. Interrogative adverbs and conjunctions

Besides interrogative determiners and pronouns, there are interrogative adverbs and conjunctions. The following table gives the different types of interrogative words used as adverbs and conjunctions.

Meaning	**Interrogative words**	**Examples**
Place at or place to	Where	Where is he staying? Where are you going on your vacation?
Time	When	When are you leaving?
Cause, reason and purpose	Why	Why are you going there?
Manner, means and instrument	How	How often does he see her? How much money do you have?

2.4.2.2.3. Analysis of negative sentences

Negative is a process or construction in grammatical and semantic analysis, which typically expresses the contradiction of some or all of a sentence's meaning. In English grammar, it is expressed by the presence of the negative element *not* or no. In Lexis, there are several possible means of negation. For example, the prefixes such as *un, non, in, dis* are used to derive negative words from positive words.

Positive words	**Negative words**
tolerable	intolerable
popular	unpopular
human	non-human
obey	disobey

2.4.2.2.3.1. 'Not' negation

Not is an important negative element in English. To bring negative meaning *not* has to be placed after the auxiliary verb or 'be' verb. When there is no other auxiliary, *do, does, did* have to be used with *not*.

Type	**Positive**	**Negative**
I	Her parents are in Madras.	Her parents are not in

With 'be' verb	He is angry.	Chennai. He is not angry.
II With auxiliary verb	I have eaten an apple. I will see 'Hay Ram'. I can buy a car. She is teaching.	I haven't eaten an apple. I will not see 'Hay Ram'. I cannot buy a car. She is not teaching.
III Without auxiliary verb	He went to Chennai. He goes to market. You pay the fees.	He did not go to Chennai. He does not go to market. You don't pay the fees.

For negative questions, negative *not* appears at the beginning of the sentence; with modal auxiliary, *BE* verbs and *DO* forms. In the negative yes / no questions the auxiliary along with negative element is placed first by applying fronting movement. In the case of negative 'wh' questions. It will be as same as the 'wh' question with the introduction of 'wh' element.

Type	**Positive question**	**Negative question**
Yes-no question with auxiliaries	Is he coming today? Has he done the work? Will he come tomorrow?	Isn't he coming today? Is he not coming? Hasn't he done the work? Has he not done the work? Won't he come tomorrow? Will he not come tomorrow?
Without auxiliary	Did Usha go home?	Didn't Usha go home?
Wh-question	Who will approve it? Whose mother came here?	Who will not approve it? Whose mother did not come here?

2.4.2.2.3.2. Negation by negative pronouns

Negative sentences can be formed by making use of negative pronouns and determiners. The following table will show the use of negative pronoun and determiners.

Number	**Function**	**Count**		**Mass**
		Personal	**Non – personal**	
Singular	Pronoun	No one, nobody None (or)	Nothing	None (of)
	Pronoun and determiner	Neither (or)		
Plural	Pronoun	None (or)		
Singular and Plural	Determiner	No		

Use of no one / nobody

Positive	**Negative counterpart**
He knows when is she going.	No one / nobody knows when is she going
He has finished the work	No one / Nobody has finished the work

Use of none

None (not one) is used as a countable as well as uncountable (not any) pronoun.

	Positive	**Negative**
Countable	One of us speaks Malayalam	None of us speaks Malayalam
Non Countable	He looks fresh It is ripe He has arrived	None looks fresh None is ripe None has arrived

To express addition negatively

Nobody has come yet
No one has come yet
None has come yet
None have / has come yet
None of the students has / have failed
Neither of the (two) students has failed
Nothing has happened yet
Nothing of this has come about
Neither of the accusation is true
That is none of your business

2.4.2.2.4. Analysis of imperative sentences

Imperative sentence is one with no overt subject noun phrase. It usually contains imperative form of a verb. The imperative is used in request, which according to circumstances may range from brusque commands to humble entreaties, the tone generally serving as a key to the exact meaning. The following table shows the expression of imperatives in different contexts:

1. V1: In the second person by the imperative form of verb or by *shall* with the infinitive. Emphasis is conveyed by *do* with the infinite.

   Get lost.
   Cook well.
   He shall cook
   Shut the door, please.
   Do read your lesson well.

2. V1… (third person): In the third person with virtually the second person meaning.

Come here John.
Wash and dry the clothes, please.

3. Let + third person + V1: In the third persons by *let* with the infinitive

Let us fly away.
Let him study abroad.
Let there be light.

3. Negative word + you + V1: With negative adverbs and negative words
Never you mind
Don't you do it?

The colloquial phrase *mind you* can be added list of imperative types. It functions like a tag to another sentence. In the example cited above the subject pronoun follows the imperative.

I have no money to spend extra, mind you.

Conclusion

Here in this chapter the computational syntactic structure of English has been worked out. The constitutional structure of English has been analysed and there by identified the ways by which parsing can be performed on the English text to get the needed parsed tree structures which could be used for lexical and structural transfer. The computational syntactic structures have been worked at the levels of word, phrase, clause and sentence. All the sentential patterns of English have been identified to make them viable for computational analysis. With the help of these patterns, it is hoped to parse an English sentence in terms of words, phrases and clauses. The resulting parsed trees can be matched with Tamil parsed trees to formulate structural and lexical transfer rules.

CHAPTER 3

SYNTACTIC STRUCTURE OF TAMIL

3.0. Introduction

In this chapter a computationally viable syntactic structure of Tamil has been worked to map it against the similar structure in English with the aim of preparing a transfer grammar, which will be utilized for Machine translation between these two languages.

Tamil is a verb final language. It shows the characteristic features of SOV language. Tamil nouns are inflected for case markers. So the noun phrases can be shuffled before the predicate verb. Unlike English that is a prepositional language Tamil is a postpositional language. When compared with English, Tamil is a word order free language. Here in this chapter the constitutional structures of Tamil will be elaborated so as to compare them with the constituent structures of English. The sentential structures of English and Tamil will be correlated so as to understand the mechanism of transferring the source language structure into target language structure. The syntactic structure of Tamil will be dealt under the following headings.

1. Analysis of Words
2. Analysis of Phrases
3. Analysis of Clauses
4. Sentence

3.1. Analysis of Words

The following form classes have been identified in Tamil:

1. Noun
2. Verb
3. Adjectives
4. Adverbs

The following function classes have been identified:

6. Pronouns
7. Prepositions
8. Determiners (Ordinals, Quantifiers, Demonstratives)
9. Conjunctions (Coordinating conjunctions &Subordinating conjunctions)
5. Auxiliary verbs

From the lexical information available in terms of meaning of the content word (stripped of from inflectional and productive derivational suffixes) and the inflectional and derivational meaning, words will be built for Tamil. For example, *went* of English will have the following

information available for lexical transfer:

Went = go + past + third person neuter singular

The transfer dictionary (i.e. bilingual dictionary) gives the equivalent the core of the inflected word *go* as *poo;* the inflectional meaning 'past' will be added with *poo* resulting in the form *poon-*; the agreement information 'third person neuter singular' results in the formation of *poonatu* 'it went'. A transfer dictionary consisting of a bilingual dictionary of core words complemented by rules to derive both inflectional and derivational forms from the semantic features has been built to serve our purpose.

3.1.1. Analysis of inflected forms of nouns

Nouns can be inflected for number and case. An inflected noun form may be the phonemic realization of the three morphemes, the formation of which can be given as follows:

Noun+(Number)+(case)
Maram+kaL+ai > marangkaLai 'tree_Plural_ACC

The correct representation of an inflected form of a noun involves the following pattern of formation.

Noun stem+ (plural suffix) + (oblique suffix) + euphonic suffix+case suffix
maram+ *kaL*+Euphonic+aal
tree_Plural_Oblique_Instrumental
mara-tt-in-aal
tree_Oblique_Euphonic_Instrumental

The following table depicts the case forms Tamil:

Case form	**Case suffix/bound postposition**	**Example**
Nominative	Zero	*maram* 'tree'
Accusative	-ai	*maratt*-ai
Dative	-ukku~ -kku ~ -ku	*mara*-tt-ukku
Instrumental	-aal	*mara-tt-aal*
Sociative	-ooTu, -uTan	*mara-tt-ooTu*
Locative	-il, -iTam	*marattil, avan-iTam*
Ablative	-irundtu	*mara-tt-il-irundtu*

3.1.2. Analysis of inflected forms of verbs

Verbs in Tamil inflect for tense, negation, person, number, gender, adjectival form and adverbial form. There are three tenses in Tamil, past tense, present tense and future tense. Tamil makes use of tense markers for expressing tense. There are a set of past tense markers, a set of present tense markers and a set of future tense markers. The alternate markers are conditioned, phonologically and morphologically. The finite verbs and non-finite verbs in Tamil are inflected forms and the following patterns emerge out.

Finite verb
1.Verb root + tense marker + PNG
2. Verb root + negative + PNG

Non-Finite verbs
Verb + infinite marker

Past participle forms
Verb + tense + past participle
Verb + negative + participle
Conditional
Verb + conditional marker

Relative Participle forms
Verb + past tense + relative participle
Verb + present tense + relative participle
Verb + future tense + relative participle
Verb + negative + relative participle

Pronomilized forms
Verb + past tense + relative participle + PNG
Verb + present tense + relative participle marker + pronoun
Verb + future tense + relative participle marker + pronoun

The following is the verb paradigm table for the verb *ezhutu* 'write':

Person	*Present*	**Past**	**Future**
First person	*ezhutu-kiR-een*	*ezhutu-in-een*	*ezhutu-v-een*
Second person	*ezhutu-kiR-aay*	*ezhutu-in-aay*	*ezhutu-v-aay*
Third person masculine	*ezhutu-kiR-aan*	*ezhutu-in-aan*	*ezhutu-v-aan*
Third person feminine	*ezhutu-kiR-aaL*	*ezhutu-in-aaL*	*ezhutu-v-aaL*
Third person	*ezhutu-kiR-atu*	*ezhutu-in-atu*	*ezhut-um*

neuter			
Third person masculine, feminine	*ezhutu-kiR-aar*	*ezhutu-in-aar*	*ezhutu-v-aar*
First person plural	*ezhutu-kiR-oom*	*ezhutu-in-oom*	*ezhutu-v-oom*
Second person plural	*ezhutu-kiR-iirkaL*	*ezhutu-in-iirkaL*	*ezhutu-v-iirkaL*
Third person plural masculine, feminine	*ezhutu-kiR-aarkaL*	*ezhutu-in-aarkaL*	*ezhutu-v-aarkaL*
Third person plural neuter	*ezhutu-kinR-ana*	*ezhutu-in-an*	*ezhut-um*

The transfer dictionary takes care of the transfer of V + inflections/derivation from English into Tamil.

3.2. Analysis of Phrases

The building mechanism of the following five major phrases along with their coordination has been dealt here.

1. Analysis of noun phrases
2. Analysis of verb phrases
3. Analysis of adjectival phrases
4. Analysis of adverbial phrases
5. Analysis of postpositional phrases
6. Analysis of Coordination phrases

3.2.1. Analysis of noun phrases

An NP may be built up of a noun, pronoun or demonstrative pronoun, which forms the head of the construction.

raajan irukkiRaan - *raajan* is a noun

'Rajan is there'
avan ippozhutu varallam - *avan* is a pronoun
'he may come now
ivaikaL puukkaL aakum - *ivaikaL* is a demonstrative pronoun
'these are flowers'

3.2.1.1. Constituents of noun phrases

The following items may precede the noun that heads an NP:

1. Determiners
2. Ordinals
3. Quantifiers
4. Adjectival phrase
5. Classifier

Predeterminers that come before determiners are not found in Tamil. Of course in Tamil the relative clause can come before determiners.

Determiners

The demonstrative pronouns (*indta* 'this', *andta* 'that') possessives (*en 'my', un* 'your', *avaLuTaiya* 'her') and the wh-words (*endta* 'which') are grouped under determiners (only when they precede nouns).

NP ↔ Det + N
andta meejai 'that table'
oru nduul 'a book'
avanuTaiya nduul 'his book'
indta nduul 'this book'

Ordinals

OnRaavatu 'First', *iraNTaavatu* 'second', *muunRaavatu* 'third', etc. which denote the order of the items in a series are ordinals in Tamil. *mutal* is synonymous with *onRaavatu* 'first'. In an NP ordinals can follow determiners.

NP↔ Ord + N
mutal vakuppu 'the first class'
avaruTaiya muunRaavatu makan 'his third son'

Quantifiers

Pala 'many, several', *cila* 'a few', *onRu* 'one', *iraNTu* 'two' are quantifiers which specify quantity or number in Tamil. In an NP the quantifier can follow the ordinals. If there is no ordinal, the determiner is followed by the quantifier.

NP ↔ Ord + Quan + N
mutal muunRu paaTalkaL 'first three songs'
avanuTaiya pala tavaRukaL 'his many mistakes'

Approximates

In Tamil approximates (Appr.) such as *kiTTattaTTa, eeRakkuRaiya*, etc. come quantifiers to approximate the quantity.

NP ↔ Appr + Quan + N
eeRakkuRaiya aayiram peer andat pooTTiyil pangkeRRaarkaL
'Approximately thousand persons participated in the competition'

Limitizers

In Tamil the limitizers such as *maTTum, maattiram,* etc. occurs after nouns to limit the nominal reference.

NP + *maTTum*
umaa maTTum ndeeRRu vandtaaL 'Uma only came yesterday'

Adjectival phrase

Adjectival phrase is a phrase that functions as an adjective.

Adj P + N ↔ NP
rompa azhakaana peN 'a very nice lady'
pala azhakaan vaLaindta vaTivangkaL 'many beautiful carved figures'

Classifier

The classifier, which is a noun or a sentence that functions as an adjective as found in English is found in Tamil too.

NP ↔ Class + N
kalaik kalluuri 'Arts College'

Relative Clause

An NP in Tamil may be built of a relative clause (i.e. a clause that has an adjectival function) and N.

NP ↔ RC + N
ilaiyai varNampuuciya manitan 'the man who painted the last leaf'
paricu venRa paiyan 'the boy who won the prize'

Thus an NP can be built in the following way.

Det + Ord + Quant + Adj P + Class + N ↔ NP
andta mutal pattu aRivuLLa paiyankaL 'that first ten clever boys'
andta mutal pattu ciRandta kalaikalluurikaL 'that first ten good arts college'
anta azhakaana puukkaL 'those beautiful flowers'
ellaa pukazhpeRRa manitarkaL 'all the famous men'
andta kaTavuLaal capikkappaTTa iTam 'that God-forsaken place'

3.2.1.2. Patterns of noun phrases

At least the following patterns can be identified in Tamil.

1. NP ↔ Poss P + NP
ennuTaiya maaman makaL 'my uncle's daughter'
2. NP ↔ Relative clause + NP
neeRRu ndaan paartta paiyan 'the boy whom I saw yesterday'
3. NP ↔ *enRu*-clause
avaL paTittavaL enRu elloorukkum teriyum
'that she is educated is known to all'
3. NP ↔ *enpatu*-clause
avan ndallavan enpatu elloorukkum teriyum
'that he is good is known to all'
4. NP ↔ *enRa*-clause
avaL pooyviTTaaL enRa ceyti 'the news that she had left'
5. Det + Compound noun ↔ NP
oru cinimaa ndaTikai 'one film female star'

3.2.2. Analysis of verb phrases

The verb phrase is built up of a verb, which is the head of the construction. Verb occurs as predicates in the rightmost position of a clause. As predicates they select arguments (ex. subject, direct object, indirect object and locative NPs) and assign case to their arguments and adverbial adjuncts. Another syntactic property of verbs in Tamil is that they can govern subordinate verb forms. Verbs occurring as finite verbs in clause final position can be complemented by non-finite verb preceding them. The latter with respect to the interpretation of tense or subject governs these non-finite forms, being subordinate to the finite verb form. If we follow the traditional idea of having a VP node for Tamil, then all the elements, except the subject NP, will have to be grouped under VP.

3.2.2.1. Constituent structure of verb phrases

The constituents which come under VP i.e. that are headed by V can be listed as follows:

1. Adverbial Phrase
avan veekamaaka vandtaan
he fast come_PAST_he
'he came fast'
2. Case Phrase
kaNNan raataiy-aip paarttaan
Kannan Radha_ACC see_PAST_he
'Kannan saw Radha'
3. Post Positional Phrase
puli avaL meel paayndatu
tiger she on jump_PAST_it
'The tiger jumped over her'
4. Verbal participial Clause
caappiTTuviTTuc cenRaan
eat_PAST_PAR_leave_PAST_PAR go_PAST_he
'having eaten food he went'
5. Infinitive Clause
caappiTac cenRaan
eat_INF go_PAST_he
'he went to eat'
6. Conditional Clause
veelai irundtaal varuvaan
work be_PAST_CON come_FUT_he
'he will come if there is any work'
7. Concessive Clause
mazhai peytum puumi ndanaiyavillai
rain rain_PAST_CON earth wet_INF_not
'even though it rained, the earth is not drenched'
8. Complement Clause
avan veelai muTindtuviTTatu enRaan
he work finish_PAST_PAR_leave_PAST_it say_PAST_he
'he said that the work is finished'

Tense, mood and aspect are conveyed by auxiliary verbs and the inflections on verbs. Though they can be compartmentalized theoretically, they depend on one another and so need to be dealt in a single package.

3.2.2.2. Typology of verbs

At least two types of verbs can be identified in Tamil: lexical verbs and auxiliary verbs. The lexical verbs, as we noted already, carries the primary meaning of the predicate. The auxiliary verbs carry the secondary meaning such as tense, aspect, mood, voice and attitude. The auxiliary verbs can be classified as follows (Lehmann, 1993:205):

Category	**Auxiliary verbs**
Aspect	*aaku, aayiRRu, iru, viTu,*
Mood	*-aam, aakaatu, iru, kuuTu, aTTum, paar, poo, vaa, maaTTu, muTi, veeNTu*
Passive voice	*paTu*
Causation	*vai, cey, paNNu*
Negative polarity	*illai*
Attitude	*kiTa, kizhi, taLLu, tiir, tolai, poo, pooTu*
Non-attitude	*azhu, koTu, koL, paar, vai*

3.2.2.3. Compounding of verbs

Building of verbal forms for denoting tense, mood and aspect is referred here as compound verbs. Compounding leads to tense-aspect-mood (TAM) system, which is crucial to verbs. The auxiliary verbs added to non-finite and gerundial forms of the main verb (MV). The aspectual verb forms (in 3.2.2.3.2.) depict the complex process of verbal compounding.

3.2.2.3.1. Analysis of tensed forms

The morphological generation of finite and non-finite forms of verbs has been discussed under the word building mechanism or morphology.

3.2.2.3.2. Analysis of aspectual forms

Aspectual auxiliaries express aspect in Tamil. The aspectual auxiliaries not only express aspectual distinction but also other semantic concepts depending upon the context. Lehman (1989) identifies the following five aspects in Tamil.

1. Inceptive aspect
2. Progressive aspect
3. Durative aspect
4. Iterative aspect
5. Perfective aspect

1. Inceptive aspect: The verb *aaku* occurs as an auxiliary verb in Tamil finite past tense form after *al* suffixed adverbial nouns expressing inceptive aspect.

V-*al* +*aaku* + PNG
avaL avanaik kaNTatum paaTalaanaaL'She started singing immediately after seeing him'

2. **Perfective aspect**: The perfective aspect in Tamil is expressed by the auxiliary verbs iru, *aayiRRu* and *viTu* which are added to the past participle form of a main verb.

MV in past participle form + *iru* + PNG
MV in past participle form + *aayiRRu*
uSaa cennaikkup pooy irukkiRaaL 'Usha has gone to Chennai'
uSaa camaiyal ceytaayiRRu 'Usha has finished cooking'

The auxiliary *viTu* added after past participle form expresses perfect aspect, that is an action or event that has been completed within a point or period of time. Thus *viTu* indicates a complete action.

MVin past participle form + *viTu* + PNG
uSaa anta ndaavalaip paTittu viTTaaL 'Usha has read the novel'
umaa tanjcaa uurai viTTu pooy viTTaaL 'Uma has left Thanjavur'

Progressive aspect: Progressive aspect in Tamil is expressed by auxiliary *koNTiru*. With stative main verbs *iru* expresses progressive aspect.

MV in past participle form + *koNTiru/ iru* + PNG
umaa paaTik koNTirukkiRaaL 'Uma is singing'
uSaa ndaaRkaaliyil uTkaarntu irukkiRaaL 'Usha is sitting on the chair'

Durative aspect: The compound auxiliary verb *koNTuvaa* (a combination of the past participle form, *koNTu*, of the verb *koL* and vaa 'come') following a main verb in verbal participle expresses durative aspect. In durative aspects an on going action or event is related to a period of time.

MV in past participle form + *koNTuvaa* + PNG
avaL peeca peeca avan mozhipeyarttukkoNTu vandtaan
'He went on translating as she was speaking'

Iterative aspect: The same compound verb koNTuvaa with following a main verb in verbal participle form denotes iterative aspect too. Iterative aspect is the repeated or regular occurrence of an action or event during a period of time. In this case the part of the compound auxiliary verb koNTu can be dropped.

MV in past participle form + *koNTuvaa* + PNG
kazhindta oru vaaramaaka kaalaiyil mazhai peytu koNTu varukiRatu 'For the last one week it rains in the mornings'

3.2.2.3.3. Analysis of modal forms

The auxiliaries such as *aam, aakaatu, iru, kuuTu, TTum, paar, poo, vaa, maaTTu, muTi,* and *veeNTu* express mood in Tamil.

Internal obligation:

MV in past participle form + *veeNTum*
uSaa inRu maalai madurai pooka veeNTum
'Usha must go to Madurai this evening'

Negation of external obligation:

MV in past participle form + *veeNTaam*
ndii inRu paLLikku kaNTippaaka pooka veeNTaam
'You must not go to school today'

Desideration:

MV in past participle form + *veeNTum*
umaa ooyvu eTukka veeNTum 'Uma should take rest'
ndiingkaL kuzhandtaiyaikkuk kaRpikkaveeNTum
'You should teach the child'

External obligation imposed by outer circumstances or authority.

1.MV in infinitive form + *veeNTiyiru* + Tense + Neuter
2. MVin infinitive form + *veeNTivaa*+ Tense + Neuter

umaa inRu maturai pooka veeNTiyirukkum
'Uma has to go to madurai today'
uSaa ndeeRRu cennai pooka veeNTi vandtatu
'Usha had to go to Chennai yesterday'

Negative obligation

1. MV in infinitive form+ *kuuTaatu*
2. al suffixed verbal nouns.+ *aakaatu*

ingkee yaarum kuLikkak kuuTaatu. 'No one should take bath here'
ndii ingkee varalaakaatu 'You should not come here'

Probability:

MV in infinitive form + *kuuTum*.
avan inRu varakkuuTum 'He may come today'

Ability and possibility:

1. MV in infinitive form + *muTiyum/ iyalum*
2. MV in infinitive form + *muTi* + Pres. / Past + *atu*

umaavaal ndaTakka muTiyum 'Uma can walk'
uSavaal ndanRaaka malayaaLam peeca iyalum
'Usha can speak well in Malayalam'
ennaal ndeeRRu paTikka muTindtatu 'I could study yesterday'

Circumstantial possibility and conjectural possibility:

V-*al* + aam
paTaiviiran kutiraiyil eeRalaam
'The soldier may claim upon the horse' (Circumstantial possibility)
Umaa ipootu caappiTalaam 'Uma may eat now' (conjectural possibility)

Positive Ability:

1.MV in Infinitive form + *muTi + Tense + Neuter*
2.MV in infinitive form + *iyalum*
enaal ndeeRRu ndanRaaka tuungka muTindtatu
'I was able to sleep well yesterday'
ennaal cariyaaka aangkilam peeca iyalum
'I can speak in English clearly'

Negative ability:

MV in Infinitive form + *muTiyaatu* / *iyalaatu (negative)*

ennaal aangkilam peeca muTiyaatu / iyalaatu 'I cannot speak English'

Permission :

V-al + *aam*
ndii pookalaam 'You may go'

Hortative or optative and desiderative:

***MV in infinitive form* + aTTum**
umaa meeTaiyil paaTaTTum 'Let Uma sing on the stage'
avarkaL makizhcciyaaka vaazhaTTum 'May they live happily'

Hortative (if the subject NP of the clause is the first person inclusive pronoun.):

V-*al* + *aam*

vaarungkaL (ndaam) caappiTalaam 'Come, let's eat'

Intention and prediction (Speaker's prediction or subject's intention of the performance of the action denoted by the verb.):

1.MV in infinitive form + *poo* + Tense + PNG
2.MV in infinitive form + *vaa* + Tense + PNG
3.MV in infinitive form + iru
umaa oru viiTu kaTTap pookiRaaL 'Uma is going to build a house'
mazhai peyyap pookiRatu 'It is going to rain'
ndaan ammaaviTam uNmaiyaic colla vandteen
'I was going to tell mother the truth'
uSaa ndaaLai cennai cella irukkiRaaL
'Usha indents/plans to go to Chennai tomorrow'

Intentional attempt:

MV in infinitive form + *paar*
uSaa pattu maNikkuL camaiyalai muTikkap paarttaaL 'Usha tried to finish cooking before 10 O' clock' (but did not complete it)'

Positive permission and suggestion:

V-al + *aam*
ndii viiTTukku pookalaam 'You can go home

Negative permission:

V-al + *aakaatu*
kaiy kazhuvaatu caappiTal aakaatu
'One should not eat without washing the hands'

Negative willingness:

Main verb in infinitive form + *maaTTu*
umaa ndaaLaikku cennai pooka maaTTaaL
'Uma will not go to Chennai tomorrow'

3.2.2.3.4. Analysis of other forms with auxiliary verbs

Passive:
MV in infinitive form + *paTu* + Tense + PNG
vaali iraamanaal vatam ceyyappaTTaan 'Vali was killed by Raman'

Causative:

MV in infinitive form + cey/vai/paNNu + Tense + PNG
aruL umaavai veelai ceyya vaittaan 'Arul made Uma do the work'
celvam kalaavai paaTac ceytaan 'Selvam made Kala sing'

3.2.2.3.5. Summing up of verbal compounding

The fallowing table depicts the entire TAM system of Tamil. (The table is prepared by taking into account the descriptions given in (Annamalai (1982), Asher (1982), Stever (1983) and Lehman (1989) giving credence to my own innovation.)

Meaning (arranged keeping in view of the source language)	**Form in Tamil**
Past tense	V + past tense + PNG *avan kaTitam ezhutinaan* 'He wrote a letter'
Present Tense	V + present tense + PNG *avan kaTitam ezhutukiraan* 'He writes a letter'
Future Tense	V + future + PNG *avan kaTitam ezhutuvaan* 'He will write a letter'
Future time with modal auxiliaries. In many contexts, modal auxiliaries have inherent future reference, both in their present tense and past form.	V-*al* + *aam* *avan ndaalai pookalaam* 'He may go tomorrow'
Present perfect aspect	V + past participle + *iru* + present + PNG *kaNNan kaTitam ezhutiyirukkiRaan* 'Kanna has written a letter'.
Past perfect aspect	1. V + past participle + iru + past + PNG *kaNNan kaTitam ezhutiyirundtaan* 'Kannan had written a letter' 2.V + past participle + *aayiRRu* *umaa camayal ceytaayiRRu* 'Uma completed cooking'
Present progressive	V + past participle + *koNTiru* + present + PNG *kaNNan kaTitam ezhutik koNTirukkiRaan* 'Kannan is writing a letter'
Past progressive aspect	V + past participle + *koNTuiru* + past + PNG *avan ezhutikkoNTirundtaan* 'He was writing'
Future progressive aspect	V + past participle + *koNTiru* + future + PNG *avan ezhutikkoNTiruppaan* 'He will be writing a letter'
Inceptive aspect verbal noun + aaku is equal to	V-al + *aaku* + Tense + PNG *umaa paaTalaanaaL* 'Uma started singing'

Meaning (arranged keeping in view of the source language)	**Form in Tamil**
toTangku 'start' which is added to the infinitive form of a main verb.	*umaa paaTat toTangkinaaL* 'Uma started singing'
Durative	V + past participle + vaa + Tense + PNG *umaa peeca kaNNan mozhipeyarttu vandtaan* 'Kannan kept on translating while Uma was talking'
Iterative	V + past participle + *vaa* + Tense + PNG *kazhindta oru vaaramaaka aruL kaalaiyil ezhundtu paTittu varukiRaan* 'For the last one week Arul is studying (regularly) by getting up early in the morning'
Ability	1.V + infinitive + *muTiyum / iyalum* (positive) *avanaal aangkilam peeca muTiyum/iyalum* 'He can speak English'
Negation of ability	2.V + infinitive + *muTiyaatu / iyalaatu kaNNanaak indta muuTTaiyai tuukka muTiyaatu/iyalaatu* 'Kannan cannot lift this package' 3.V + infinitive + *muTiyavillai* *enaal caturangkam aaTa muTiyavillai* 'I could not play chess'
Possibility: circumstantial possibility	1. V-*al* + *aam* *avarkaL koopurattil eeRalaam* 'They can climb up the tower' 2.V + infinitive + *kuuTum* *indta kuLattil ndiiccal aTikkak kuuTum* 'One can swim in the pond' 3.V + infinitive + *muTiyum* *indta caalaiyil vaakanangkaL cella muTiyum*'The vehicles can ply in this road'
Possibility: conjectural possibility	*avaL ippozhutu viiTTukkup pookalaam* 'She may go home now'
Permission	1. V-al + aam *ndaan pukai piTikkalaamaa*? 'May I smoke?'
Negation of permission	1. V-al + *aakaatu* *indta aRaiyil pukai piTkkalaakaatu* 'One must not smoke in this room' 2. V-al + *kuuTaatu* *indta kuLattil ndiical aTikkak kuuTaatu* 'One should not swim in this pond'

Meaning (arranged keeping in view of the source language)	**Form in Tamil**
Willingness	V + future tense + PNG *epootu muTikiRatoo apootu ndaan kaTitam ezhutuveen* 'I will write a letter when it is possible to write one' V + present tense + PNG-aa *innoru kooppai teeniir kuTikkiRaayaa?* 'Will you take another cup of tea?'
Willingness on the part of the speaker in 2nd person and 3rd person ('weak volition') Restricted use.	V-*al* + *aam* *avan paNam peRalaam* 'He can get money' *ndii virumpuvatu pool ceyyalaam* 'He can do as he wish'
Willingness ('weak volition')	V + future tense + PNG + *aa* *ndii ennai mannippaayaa?* Will you excuse me?'
Negative willingness	V + infinitive + maaTTu + PNG *kaNNan inRu veelai ceyya maaTTaan* 'Kannan won't do work'
Refusal	V + infinitive + maaTTu + PNG *ndaan kaNNanuTan peeca maaTTeen* 'I will not talk to Kannan'
Intention on the part of the speaker only in 1st person ('intermediate volition').	1. V + future tense + PNG *ndaangkaL ungkaLiTam engkaL tiirmaanattait terivippoom*. 'We will inform you our decision' 2. *aakaatu* *enakku mandtiriyai paarttu peeca ndiiNTa ndeeram aakaatu*.It will not take long time for me to meet minister.
Insistence ('strong volition'). Restricted use. Legal and quasi-legal.	V-al + *aam* *ndaan colkiRa paTi ndii ceyyalaam* 'You shall do as I say' *avan taNTikkappaTalaam* 'He shall be punished' viyaapaari tannuTaiya karuviyai ceppam ceytu vaittirukkalaam 'The business man shall maintain the equipment in good repair'
Insistence ('strong volition').	1.V + future tense + PNG ndiingkaL colvatai avan ceyvaan 'He will do what you say' V + past participle form + *iru* + infinitive + *veeNTum* *atu un tavaRu. ndii kuzhandtaiyai unnuTan eTuttuc cenRirukka veeNTum* 'That is your mistake. You should have the child along with you'
Obligation: internal obligation	V + *infinitive* + veeNTum

Meaning (arranged keeping in view of the source language)	**Form in Tamil**
	avanukku avacaramaaka viiTTukkup pooka veeNTum 'He has to go home immediately'
Obligation: external obligation	1.V + infinitive + *veeNTivarum* / *veeNTiyatu varum* *avanukku ndaaLai madtiriyai candtikka veeNTi varum* 'He has to meet the minister tomorrow' 2.V + infinitive + *veeNTi* / *veeNTi* irukkiRatu *avanukku ndaaLai mandtiriyaic candtikka veeNTi /veeNTiyatu irukkiRatu* 'He has to meet the minister tomorrow'
Obligation: negation of external obligation	*ndii ndaaLai mutal kalluurikkup pooka veeNTaam* 'You don't need to go to college tomorrow onwards'
Obligation: negative obligation	1. V + infinitive + *kuuTaatu* *ndiingkaL caalaiyin mattiyil ndaTakkakkuuTaatu* 'You must not walk on the centre of the road' 2.V-al + aakaatu *matu arundtutal aakaatu* 'One should not drink liquor'
Prediction: specific prediction	V + future + PNG *viLaiyaaTTu indndeeram muTindtirukkum* 'The game will be finished by now' V + infinitive + *veeNTum* *viLaiyaaTTu indndeeram muTindtirukka veeNTum* 'The game should be finished by now'
Prediction: timeless prediction	V+future+PNG *eNNai taNNiiril mitakkum* 'The oil will float in water'
Prediction: habitual prediction	V + future +PNG *avanukkuc candtarppam koTuttaal avan (eppozhutum) maNikkaNakkaakap peecuvaan* 'He always talks for hours if you give him the chance'
Logical necessity	1. V + infinitive + veeNTum *tavaRu irundtirukka veeNTum* 'There has been a mistake' 2. *muTiyaatu* *tavaRu irundtirukka muTiyaatu* 'There cannot be a mistake' 3. V + infinitive + *veeNTaam* *avanuTaiya parimaaRRattiRku veeRu kaaraNam irundirukka veeNTaam* 'There mustn't be another reason for his behaviour'
Obligation and logical necessity	V + infinitive + veeNTum *ndii uTanee puRappaTa veeNTum* 'You ought to start

Meaning (arranged keeping in view of the source language)	**Form in Tamil**
	at once' *avarkaL ipootu ingkee irukka veeNTum* 'They ought to be here by now'
Desideration: duty, advise, suggestion	V+infinitive + *veeNTum* *ndii inRu viiTTuppaaTam ezhutaveeNTum* 'You should write your home work today' *umaa ndnRaakp paTikka veeNTum* 'Uma should study well' V+infinitive + *aTTum* *avan tinamum atikaalaiyil ezhundtu paTikkaTTum* 'Let him study by waking up early in the morning'
Negative desideration	1.V+infinitive + kuuTaatu *ndii iravil atika ndeeram kaN vizhittup paTikkak kuuTaatu* 'You should not study your lessons by keeping awake late in the night' 2.V-*al* + *aakaatu* i*ravil veku ndeeram kaN vizhittal aakaatu* 'One should not remain awake late in the night'
Intention	V+infinitive + *poo* + tense + PNG *kaNNan umaavai maNakkap pookiRaan* 'Kannan is going to marry Uma'
Intention (with restricted set of verbs)	V + infinitive + *vaa* + tense + PNG *kaNNan umaavai keeTka varukiRaan* 'Kannan is going to ask Uma'
Passive	V + infinitive + *paTu* + tense + PNG *avan kaNNanaal kollappaTTaan* 'He was killed by Kannan'
Causation	V + infinitive + *vai* + tense + PNG *avan kaNNanai tuungka vaittaan* 'He made Kannan sleep' V+ infinitive + *cey* *avan kaNNanai tuungka ceytaan* 'He made Kannan sleep'
Negation	V + infinitive + *illai* *avan viiTTiRku pookavillai* 'He did not go home'
Negation in future	V + infinitive + *maaTTu* + PNG *kaNNan ndaaLai vara maaTTaan* 'Kannan will not come tomorrow'
Volition, willingness, reflexive	V + past participle + koL + tense + PNG *katavu taanee tiRandtu koNTatu* 'The door opened on its own'

Meaning (arranged keeping in view of the source language)	**Form in Tamil**
	kaNNan tan kuzhadntaiyai tan maTiyil vaittukkoNTaan 'Kannan kept his child on his lap' *kaNNan tannait taanee meccikkoNTaan* 'Kannan praised himself'
Assessment	V + past participle + *paar* + tense + PNG *avaL ceelaiyai uTuttup paarttaaL* 'She wore the saree (in order to see whether it suit her or not)'
Anticipated consequence	V + past participle + *vai* + tense + PNG *avaL (kaaRRukkaaka) katavai tiRandtu vaittaaL* 'She kept the window open (so that the wind could blow inside)'
Benefaction	V + past participle + *koTu* + tense + PNG *avaL kaNNanukku veelai ceytu koTuttaaL* 'She worked for the benefit of Kannan'

3.2.2.4. Analysis of the Patterns of verb phrases

The following shows the different types of VP patterns/predicate patterns (and sentential patterns) based on the characteristic features of verbs.

Pattern 1:

a. NP + NP
atu puttakam 'that is a book'
avan maaNavan 'He is a student'
b. NP-*ukku* + NP
avan-ukku talaivali 'He has head ache'
c. NP + relative clause + NP
itu vaaTakaikku viTum vaNTi 'This is a car to let'
d. NP + pronominalized clause
avan indta kalluuriyil paTittavan
'He is one who got educated in this college'
e. *atu*-clause + NP
tinamum uTaRpayiRci ceyvatu avaciyam
'It is important to do exercise daily'
f. *atu*-clause + NP-*ukku* + NP
avan viiTTukku varuvatu enakku makizhcci
'I am happy that he is coming home'
g. *atu*-clause-*il* + NP-*ukku* + NP
avan teervil veRRipeRRatil enakku makizhcci
"I am happy that he has passed in the examination'
h. V-*atu* clause

yaarai ndoovatu 'Whom to blame'

Pattern 2:

a. NP + BV (*iru, uNTu, illai*)
kaTavuL irukkiRaar 'God exists'
b. NP + NP-*aaka* + BV
avan paci-aaka irukkiRaan 'He is hungry'
c. NP-*ukku* + NP-*aaka* + BV
avanukku paciyaaka irukkiRatu 'He is hungry'
d. NP-*iTam* + NP + BV (*iru, illai*)
enn-iTam paNam irukkiRatu 'I have money'
e. NP-*il* + NP + BV (*iru, illai*)
kuLatt-il taamaraip puu illai 'There is no lotus in the pond'
f. NP + Adv [Adv A] + BV (*iru, illai*)
anta puttakam ingkee illai 'That book is not here'
g. NP + NP-*il* [Adv A] + BV (*iru, illai*)
andta puttakam kaTaiyil illai 'That book is not in the shop'
h. NP + PP [Adv A] + BV (*iru, illai*)
puttakam meejai meel irukkiRatu 'The book is on the table'
i. NP-*ukku* + *atu*-clause + NP-*aaka* + BV (*iru, illai*)
enakku unnuTan iruppatu makizhcciyaaka irukkiRatu
'I am happy to be with you'
j. aal-clause + NP-*aaka* + BV (*iru, illai*)
avarkaL kalyaaNam ndaTandtaal nanRaaka irukkum
'It will be good if their marriage takes place'
k. NP + *atu*-clause-*pool* + BV
e1laam ndii viTTuccenRatu pool appaTiyee kiTakkiRatu
'All lise as you left'
l. ataRku clause-a set of locative postpositions denoting different dimensions of temporal relations + NP + Adv A + BV (*iru, illai*)
avan varuvataRRku munnal ndaan ingku irundteen
' I was here before he came'

Pattern 3:

a. NP + NP + BV (*aaku, alla*)
avan maaNavan aavaan 'He is a student'

Pattern 4:

a. NP-*ukku* + Vi (a set of verbs of feeling)
enakku pacikkiRatu 'I feel hungry' *enakku talaivalikkiRatu* 'I feel headache'

Pattern 5:

a. NP + Vi
ndaam vaazhkiRoom 'We live'
b. NP + NP-*ukku* + Vi
avan viTTukkup poonaan 'He went home'
c. NP + NP-*il* + Vi
avan viTutiyil tangkinaan 'He stayed in a lodge'
d. NP + PP + Vi
eli vaLaikkuL nduzhaindtatu 'The rat went inside the hole'
e NP + Adv A + Vi
avan pattumail ndaTandtaan 'He walked for ten miles'
f. NP + NP-*aaka* + Vi
ilaikaL manjaL niRamaaka maaRiyatu 'The leaves turned yellow' *avan oru paNakkaaranaaka iRandtaan* 'He died a rich man'
g. NP + *enRu*-clause + *teri*
avan varuvaan enRu terikiRatu 'It seems that he will come'
h. atu-clause-*pool* + *teri*
mazhai varuvatu pool terikiRatu 'It appears as if it is going to rain'
I .tu-clause-*aaka* + *teri*
avan avaLaip paarttu makizhcciyaTaindtataakat terikiRatu
'It appears that he felt happy by seeing her'
j. NP + Infinitive clause + Vi
avan engkaLai candtikka vandtaan 'He came to meet us'
k. NP + Past participle clause + Vi
avaL tan kuzhndtaiyaip paarttu makizhciyaTaindtaaL
'She felt happy by seeing her child'
l. NP + *atu*-clause-*ukku* + Vi
avar atai avaniTam colvataRku veTkappaTTaar
' He felt shy to tell that to him'
m. NP + *atu*-clause-*ukku*-*aaka* Vi
avaL avan varuvataRkaaka kaattirundtaaL 'She waited for him to come'

Pattern 6:

The basic case-marking pattern of a Tamil transitive clause is the 'nominative-accusative' pattern. All transitive verbs show this pattern.

a. NP + NP-*ai* + Vt
avarkaL avanaip paarttaarkaL 'They saw him'
b. NP + NP-*ai* + NP-*il* + Vt
avar paNattaip peTTiyil vaittar 'He kept the money in a box'

c. NP + NP-*ai* + NP-*poola* + Vt
avar avanai oru eezhaiyaip poola ndaTattinaar
'He treated him as a poor fellow'
d. NP-*ai* + NP + NP-*aaka* + Vt
avaL paalaic cuuTaak kuTittaaL 'She drank the milk hot'
avarkaL avanai aracanaaka ndaTattinar 'They treated him a king'
e. NP + NP-*aaka* + NP-*ai* + Vt
avaL avan veRRikkaaka avanaip paaraaTTinaaL
'She praised him for his success'
f. NP + Infinitive clause + Vt
avan avaLaip paarkka virumpinaan 'He wanted to see her'
g. NP + Infinitive clause + Vt
avan taan amerikkaa poovatai yaarum aRiya viruumpavillai
'He did not want anybody to know that he is going to America'
h. NP + infinitive-clause + NP-*ai* + Vt
avan ennaip paarkka tan tampiyai azhaittaan
'He called his brother to see me'
i. NP + Verbal participle clause + NP-*ai* + Vt
avar maRaindtu ndinRu avaLaip paarttaar 'He saw her hiding himself'
j. NP + V-*aamal* clause (i.e. neg. verbal participle clause) + NP-*ai* + Vt
avar avaLaip paarkkaviTaamal ennait taTuttaar
'He obstructed me not to see her'
k. NP + *aal*-clause + Vt
avan paNam kiTaittaal celavazhippaan
'If he gets money he will spend it'
keeTTaar 'He listened to what she said'
ndaan kaLLan ooTuvataip paartteen 'I saw the thief running'
l. NP+ *atu*-clause-ai + Vt
avar avaL kuuRuvataik
m .NP + *atu*-clause-*ukku* + Vt
avar avaLaip paarppataRku virumpavillai 'He did not want to see her'
n. NP + *atu*-clause-*ukku*-*aaka* + Vt
avar angku tangkuvataRkaaka viiTu kaTTinaar
'He built a house to stay there'
o. NP + *enRu*-clause + Vt
ndaan avaL vavruvaaL enRu ndinaitteen
'I thought that she would come'
p. NP + *enpatu*-clause-*ai* + Vt
avar angku pooka veeNTum enpatai avaLiTam kuuRavillai
'He did not tell her that he should go there'

Pattern 7:

The first deviation from the basic pattern of transitive verb is 'Dative-accusative' pattern. The verbs of mental experience (ex. *teri* 'know', *puri* 'understand', etc.), verbs of emotional experience (ex. piTi 'like', etc.) and verbs of physical and biological experience show this pattern.

a. NP-*ukku* + NP-*ai* + *teri*
enakku avaLait teriyum 'I know her'
b. enRu-clause + NP-*ukku* + *teri*
peerundtu eppootu varum enRu enakkut teriyaatu
'I don't know when the bus comes'
c. NP-*ukku* + NP + *veeNTum*
enakku paNam veeNTum 'I need money'

Pattern 8:

This is the typical pattern of trivalent verbs receiving three arguments, subject, object and indirect object.

a. NP [S] + NP-*iTam* [IO] + NP(-*ai*) [O] + Vt
avaL enniTam paNam koTuttaaL 'She gave me money'
b. NP + *enRu*-clause + NP-*iTam* + Vt
avaL unpeyar enna enRu enniTam keeTTaaL
'She asked me what is my name'
c. Interrogative clause + Vt
un peyar enna kuuRu 'Tell me what is your name'
d. NP + NP-*ukku* + NP + Vt (*koTu* type of verbs)
avaL avanukku oru utai koTuttaaL 'She gave him a kick'
e. NP + NP-*ukku* + Verbal participle clause + Vt
avar avanukku miTTaay vaangkik koTuttaar
'He bought sweets and gave him'
f. NP + NP-*iTamirundtu* + NP + Vt (*vaangku* type of verbs)
avaL enniTamirundtu paNam vaangkinaaL 'She got money from me'
g. NP + NP-*ukkuaaka* + NP [O] + Vt (*vaangku*-type of verbs) *avar avanukkaaka puttakam vaangkinaar* 'He bought a book for him'

3.2.3. Analysis of adjectival phrases

The adjectival phrases are headed by an adjective. In Tamil adjectival phrase always precedes head noun in NP. The adjectives in Tamil come to attribute noun. They are traditionally classified as follows:

Traditional classification of adjectives	**Examples**
Demonstrative	*indta* 'this', *andta* 'that'

Distributive	*ovvoru* 'each'
Interrogative	*endta* 'what, which', *enna* 'what', *evvaLavu* 'how much'
Possessive	*ennuTaiya* 'my', *unnuTaiya* 'your', *avanuTiya* 'his', *avaLuTaiya* 'her', *atanuTaiya* 'its', *ndamuTaiya* 'our', *unnuTaiya* 'your', *avarkaLuTaiya* 'their'
Of quality	*ndalla* 'good', stupid, *puttiyuLLa* 'clever', *viiramuLLa* 'brave'

The arrangement of items coming under adjectival phrase has been discussed under NP. In the present day analysis all except the last one are kept under determiner.

3.2.4. Analysis of adverbial phrases

Modern Tamil makes use of a number of noun and verb forms categorically reanalysed to a closed set of adverbs in the same way a number of uninflected and inflected noun and verb forms are syntactically reanalysed to a close set of postposition.

3.2.4.1. Constituents of adverbial phrases

The following table shows the different types of adverbs in Tamil with examples.

Broad categories	**Sub types of adverbs**	**Examples**
Simple adverbs	1. Manner	*metuvaaka* 'slowly', *viraivaaka* 'quickly', *tairiyamaaka* 'boldly', *'ndanRaaka* 'well', *kaTinamaaka* 'hard'
"	2. Place	*ingkee* 'here' , *angkee* 'there', *arukee* 'near', meelee 'up'
"	3. Time	*inRu* 'today', *ituvarai* 'still', *ciikkiram* 'soon' , *ipootu* 'now'
"	4. Frequency	*eppozhutum* 'always', *orupootum* 'never', *aTikkaTi* 'often', *orutaTavai* 'once', epootaavatu 'occasionally'
"	5. Sentence	*ndiccayamaaka* 'certainly', *kaTTaayamaaka* 'definitely', surely
Interrogative adverbs that are used to frame questions	6. Interrogative	*eppootu* 'when', *engkee* 'where', *een* 'why', *eppaTi* 'how'
Relative adverbs that	7. Relative	*eppootu* 'when', *engkee* 'where', *een* 'why'

are used to combine clauses		

The adverbial phrase generally comes immediately before the head verb. The adverbial phrase has an adverb as a head, which can come alone or proceeded by a sequence of words.

avaL mella ndaTandtaaL
she slowly walk_PAST_she
'she walked slowly'
avaL mika viraivaay ndaTandtaaL
she very fast walk_PAST_she
'she walked fast'

In the first sentence *mella* is a simple phrase, which comes alone to attribute the head verb. In the second sentence *mika viraivaay* is a complex phrase containing an adverb preceded by an intensifier (adjective).

Based on the formation and the structure, adverbs can be classified as follows:

Types of adverbs	**Items**	**Example**
Simple adverbs	*mella* 'slowly'	*avan mella caappiTTaan* 'He ate slowly'
Verbal participial form	*viraindtu* 'fast'	*avan viraindtu vandtaan* 'He came fast
Infinitive form	*urakka* 'loudly'	*avan urakka peecinaan* 'He talked loudly'
Noun + *il* form	*viraivil* 'soon'	*avan viraivil ingku varuvaan* 'He will come here soon'
Nouns denoting location/Time + *tooRum*	*ndaaL tooRum*	*avaL ndaaL tooRum koovilukku varuvaaL* 'She comes to temple daily'
Noun + Dative case + Noun	*ndaaLukku ndaaL* 'day by day'	*avaL ndaaLukku ndaaL melindtaaL* 'She became lean day by day'
Reduplicated infinitive form	*cuTa cuTa* 'very hot'	*toocai cuTa cuTa irundtatu* 'the dosa was hot'
Reduplicated adverbial form	*mella mella* 'very slowly'	*avaL mella mella ndaTandtaaL* 'she walked very slowly'
N + *aaka*	*veekam-aaka* 'fast'	*kaNNan veekamaaka ooTinaan*

		'Kannan ran fast'

3.2.5. Analysis of postpositional phrases

Asher (1985) defines postposition in Tamil as 'an element that can be added to a nominal to form a postpositional phrase standing in a functional relationship with a verb'. They can be seen as a somewhat heterogeneous class with members ranging from fully bound to free forms. All postpositions in Tamil are formally uninflected or inflected noun forms or non-finite verb forms. To express, for example, locative functions, Tamil uses nouns denoting various locations as locative postpositions. When a closed set of noun and verb forms occur as postpositions, they follow a noun phrase and form with the preceding noun phrase a postpositional phrase:

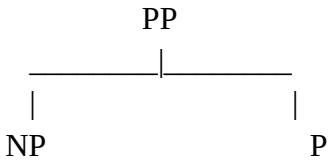
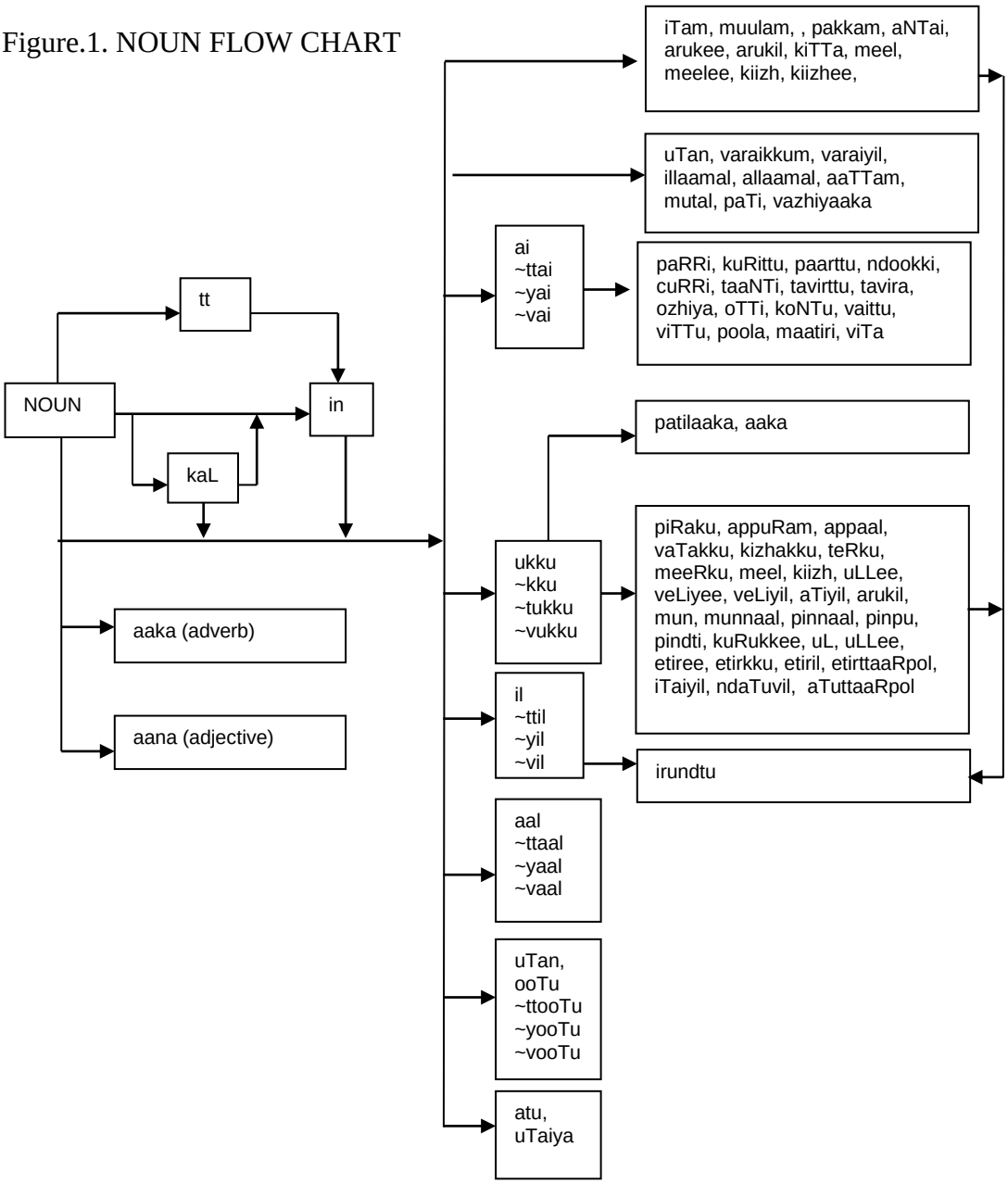


Figure.1. NOUN FLOW CHART



The noun flow chart shows the postpositional phrases.

3.2.5.1. Typology of postpositions

Depending on the case form of the preceding noun phrase, the postpositions can be classified as tabulated below:

Case of the noun phrase preceding the postposition	**Postpositions which follow the noun phrase concerned**
Nominative case	*allaamal* ‘except’, *aaka* 'like', *illaamal* ‘without’, *enRu* 'as

	such', *ennum* 'as such', *enRa* 'as said', *maatiri* 'like', *muulam* 'with', *varai/varaikkum/varaiyil* 'until', *vazhiyaaka* 'through'
Oblique form	*pakkam/aNTai/arukil/kiTTee* 'near', *kiizh* 'under', *aaTTam* 'like', *mutal* 'from', *paTi* 'according to'
Dative case	*aTiyil* 'under', *aTuttu* 'next', *aTuttaaRpoola* 'next', *aNTai* 'near', *appaal* 'beyond', *appuRam* 'after; behind', *arukee/arukil* 'near', *aaka* 'for', *iTaiyil* 'between', *uL* 'inside', *uriya* 'belong to', *etiree/etirkku/etiril* 'opposite', *etirttaaRpoola* 'opposite', *kiTTee* 'near', kiiz 'below', *kuRukkee* 'across', *ndaTuvil* 'in the middle of', ndeeril 'in front', ndeeraaka 'straight', pakkattil 'near', *patilaaka* 'instead of', *piRaku* 'after', *pin/pinnaal/pinpu/pindti* 'behind; after', *mattiyil* 'at the centre of', *mun/munnaal/munpu/mundti* 'before; in front of', *meel* 'above; after', *meeRku* 'west', *teRku* 'south', *vaTakku* 'north', *veLiyee* 'outside',
Accusative case	*oTTi* 'in connection with', *ozhiya* 'except', *kaaTTilum* 'than', *koNTu* 'with', *kuRittu* 'about', *cuRRi* 'around', *taaNTi* 'across', *tavirttu/tavira* 'except', *ndookki* 'towards', *paRRi* 'about', *paarttu* 'towards', *poola* 'like', *maatiri* 'like', *viTa* 'than', *viTTu* 'from', *vaittu* 'with'
Locative *il*, etc.	*irundtu* 'from', vaittu 'at'

Some of the above listed postpositions denoting spatial and temporal relations can be considered as adverbials. They could take more than one categorical host as anchor and can be inflected further for directional and locational case markers. There is even an overlap of word forms that are postpositions and adverbs. Through these 'adverbial postpositions' need to be distinguished from the 'regular postpositions' for the sake of computation, such difference is ignored. For the purpose of contrast the case inflections also dealt along with postpositions.

3.2.5.1.1. Nominative case + postpositions

The following table shows different postpositions occurring after nominative case with certain descriptive details along with examples.

Postposition	***Descriptive Details***	**Casal relations/ meaning**	**Example**
muulam	The postposition muulam can be translated as 'by means of, through (the agency of), under the auspices of'. *muulam* also expresses instrumental	through-relation and instrumental relation	*pativaaLar muulam* 'Under the auspices of the registrar' *kaNNan caavi muulam katavai tiRandtaan*.'Kannan

Postposition	***Descriptive Details***	**Casal relations/ meaning**	**Example**
	case relation noun by denoting the meaning 'with'.		opened the door with a key'
varai, varaikkum, varayil	As postpositions *varai, varaikkum* and *varayil* express anterior location of limit 'up to' and duration 'up to, until.	`up to' relation	*kaNNan viiTu variai/varaikkum /varaiyil / ooTT-in-aan* 'Kannan drove up to the house' *campaLam vaangkukiRa varaikkum* 'Until (one) draws (one's) pay'
illammal	*illaamal* as a postposition it expresses negative instrumental and negative commutative relation.	Negative instrumental and negative commitative	*kaNNan katavai caavi illammal tiRantaan*. 'Kannan opened the door without a key.'
ceerndtu	*ceerndtu* as a postposition expresses commitative relation. *ceerndtu* is added to the noun phrase cliticized by *um*.	Commitative	*avarkaL iraNTu peerum ceerndtu vandtaarkaL*'The two of them came together (i.e They arrived simultaneously)'
allammal	*allaamal* as a postposition expresses negative commitative relation.	Negative commitative	*ciitai allamal elloorum vantaarkal.*'Everybody except Sita came.'

3.2.5.1.2. Oblique form + postpositions

The postpositions which are added after oblique form of a noun and their case relations along with meaning are tabulated and summarized as under'

Post position/case suffix	**Descriptive details**	**Casal relation or meaning**	**Examples**
-ai	The accusative suffix is	Objective	*aNNan-ai* 'elder brother.'

Post position/case suffix	**Descriptive details**	**Casal relation or meaning**	**Examples**
	-ai and is obligatory with human nouns. Accusative marker is optionally used with neuter nouns. When the object noun is modified by some determiners *ai* is obligatorily used even with neuter nouns.		*enn-ai* 'me.' *ndaan paTam paartteen* 'I saw a picture' *ndaan ndeeRRu paartta paTattai inRu paartteen* 'I saw the picture which saw yesterday' *andta paTattai avaL paarkkavillai* 'She did not see that picture'
-aal koNTu payanpaTutti vaittu	The instrumental case suffix is *aal.* It denotes the tool used by the agent in performing the action identified by the verb. It is largely the noun denoting the tool such as *katti* 'knife', *peenaa* 'pen' , *taTi* 'stick' etc.alone occur in tool instrumental relation. The tool instrumental case suffix *aal* can be substituted by the postposition *koNTu* and verb particle form *payanpaTutti*	instrumental relation	*kaNNan kattiyaal pazhattai ndaRukkinaan.* 'Kannan cut the fruit using knife.' *kaNNan kattiyai koNTu/payanpaTutti pazhattai ndaRukkinaan.* 'Kannan cut the fruit using knife.'
-ukku	*ukku* is the dative case form in Tamil.	The dative case expresses experiences, benefactive, possessive, genitive, allative, time, comparative and purposive relations.	*avan aaciriyarukku paricu koTuttaan* 'He gave a presentation to the teacher.' *avan avaLukku evvaLavoo ndallavan* 'Comparing with her, he is for better.' *avan cennaikkuc celkiRaan.* 'He goes to Chennai.'
-atu	According to	Possessive	*en-atu tozhil* 'my duty'

Post position/case suffix	**Descriptive details**	**Casal relation or meaning**	**Examples**
uTaiya	Tolkappiyam *atu* is a genitive marker. Genitive case marker is optional after demonstrative pronoun and sometimes after human proper nouns. Thus a oblique form stands to denote genitive case. Some times –*in* which is *caariyai* 'inflectional increment' can be considered as oblique case marker may stand to represent genitive case. The post position *uTaiya* too donote genitive case.		*un uur* 'your village' *raaman-atu raaman-in/ raaman/ raamanuTaiya peenaa* 'Raman's pen.'
-il	Locative meaning is expressed by the suffix *-il*	`at/in' Locative	*avan cennaiyil paTikkiRaan*.'He studies in Chennai.'
pakkam aNTai aruku kiTTa	*pakkam*, pakkattil, *aNTai, aNTaiyil, arukee, arukil and kiTTa* as postpositions to express proximate location 'near' .	'near' Locative	*andta viTTu pakkam/aNTai/arukee/kiTTa aalamaram irukkiRatu.* There is banyan tree near our house'.
kuuTa -uTan -ooTu	*kuuTa* as a postposition it expresses commitative case relation. It is synonymous with the case suffixes, *ooTu* and *uTan*, which also denote commitative case relation. It is to be noted that *kuuTa* also means 'also,	Commitative	*en kuuTa vaa* 'come with me'

Post position/case suffix	Descriptive details	Casal relation or meaning	Examples
	too'.		
meel *meelee*	*meel* and *meelee* as a postposition after nouns in oblique form to express superior location 'on' in which case the two entities are in contact	Superior	*ceekar mecaiyin meel(ee) uTkaarndtukkiRaan* 'Sekhar is sitting on the table'
kiizh *kiizhee*	The postposition *kiizh* can be translated as 'under'. The noun *kiiz* 'inferiority', optionally with the euphonic clitic *ee* (i.e. *kiiz* (*ee*) occurs as a postposition after nouns in oblique form to express inferior location 'under'. kiiz can also co-occur with the bound postposition *irundtu*.	Inferior	*marattin-kiizee maNal irukkiRatu* 'There is sand under the tree'
aaTTam	The noun *aaTTam* which means 'motion' occurs as a postposition to express comparison 'like'.	Similarity	*kaNNan panRiyaaTTam kattinaan* 'Kannan cried like a pig'
mutal	*mutal* with temporal nouns as expresses posterior duration 'since, from'. The postposition can also express the starting point of a series when an NP followed by the postposition *varai* 'upto' which expresses the end point of a series, co-occurs in the sentence.	Source	*kaalai mutal mazhai pey-kiRatu* 'It has been raining since morning'
paTi	The noun *paTi* 'manner,	Manner	*raam jaati kaTTu ppaaTu*

Post position/case suffix	Descriptive details	Casal relation or meaning	Examples
	way' occurs as a postposition expressing the sense 'according to'.		*paTi kaliyaanam ceyya villai.* 'Ram didn't marry according to caste rules.
vazhiyaakka	The postposition *vazhiyaaka* can be translated as 'through'. The noun *vazhi* 'path, way' with the so-called adverbalizing suffix *aaka* occurs as postposition expressing motion through an object.	Path	*ciinnu tooTTam vazhiyaaka vantaan* 'Seenu came through the garden.
ooTu, uTan, kuuTa	The sociative suffixes in Tamil are *oTu/ooTu, uTan* and *kuuTa*. Their meaning corresponds to 'with' in English. Accompaniment is the decisive feature in the meaning of the sociative case.	Sociative	*un-oTu/ -ooTu/ uTan/ kuuTa* 'with you' *raaman kaNNan-ooTu/uTan/kuuTa vandtaan*. 'Raman came with Kannan.'
poruTTu	*poruTTu* is synonymous with aaka added to dative NP. It gives benefactive sense.	Benefactive	*avaL avan poruTTu paNam vaangkinaaL* 'She got the money for him'

In the above sentence it gives the concept 'simple location'. Sentence 2 describes the concept of goal. Thus the case suffixes in Tamil are *ai, aal, ooTu, ukku* and *il* denoting accusative, instrumental, associative, dative and locative respectively. The suffixes *-in, an* and *atu* signify the genitive. The nominative is unmarred in Tamil. The accusative and datives can be realized only by case-suffixes. All the rest can be realized either by the case-suffixes or by the postposition. It is large number of case relations are represented by the postpositions. And hence if the case system in Tamil is analysed on the morphological point of view, many cases will go unrepresented.

3.2.5.1.3. Dative case + postpositions

The following table shows different postpositions occurring after dative case with certain descriptive details along with examples.

Postposition	**Descriptive detail**	**Case relations /meaning**	**Example**
piRaku	The noun *piRaku* 'posteriority' occurs as a postposition expressing posterior location in time 'after'.	Posterior location	*kaNNan caapaaTTiRku-p piRaku tuungkukiRaan* 'Kannan is sleeping after lunch'
appuRam	*appuRam* occurs as a postposition to express posterior location in time and space. *appuRam* can be translated as 'after, behind'.	Posterior location	*kaNNan oru maatattiRku appuRam vandtaan.* *'Kannan came after one month.*
appaal	*appaal* occurs as a postposition which expresses ulterior location 'beyond'. *appaal* can also occur with the bound postposition *irundtu* which has ablative case function.	Ulterior location	*aaRRiRku appaal oru kiraamam irukkiRatu.* 'There is a village beyond the river'
meel *meelee*	The postposition *meel*(*ee*) when occurring after a noun in dative case, expresses superior location, 'above' and non-contact of the two entities involved. When following a time in dative case, *meel*(*ee*) expresses superior location in time 'after'.	Superior location	meecaikku meel(ee) oru viLakkut tonkukiRatu 'A lamp is hanging above the table' *muraLi aindtu maNikku meel(ee) vandtaan*'Murali came after 5 o' clock
kiizh *kiizhee*	The postposition kiizh(*ee*) when occurring after a noun in dative case, expresses inferior location 'below' and non-contact of two entities involved.	Inferior	*meecaikku-k kiizh(ee) oru peTTi irukkiRatu* 'A box is below the table'
vaTakku *teeRku*	The four directional nouns vaTakku,	Directional location	*uurukku-k kizhakkeekaTal irukkiRatu* 'East of the town is

Postposition	**Descriptive detail**	**Case relations /meaning**	**Example**
meeRku kizakku	kizhakku, *teeRku*, and *meeRku* which denote the directions north, east, south, west respectively occur as postpositions to nouns in dative form expressing the four directional location.		the sea.
uL, uLLee	*uL* (*Lee*) occurs as a postposition express interior location in space 'inside, into' and time 'within, by'. Frequently *uL*(*Lee*) occurs as bound form especially with time nouns.	Interior location	*Raji viiTTukkuuL (Lee) poonaaL* Raji went into the house.' *rameeS indta vaarattiRkuL veelaiyai muTikka veenTum.* 'Ramesh has to finish the work within this week.'
veLiyee	*veLiyee* as a postposition expresses exterior location 'outside'.	Exterior location	*viiTTukku veLiyee oree cattamaaka irukkiRatu* 'There is a lot of noise outside the house'
pin, pinnal pinpu, pindti	*pin, pinnaal, pinpu,* and *pindti* as postposition to express posterior location in time and space 'behind, after'. The ablative case marker *irundtu* can occur with *pinnaal*.	Posterior location	*raam virundtukup pin/ pinaal/ pinpu/ pindti vandtaan.* 'Ram came after the feast.'
kuRukee	*kuRukkee* as a postposition to express motion to an ulterior location 'across'.	Transverse location	*oru eli meecaikku kuRukee oTiyatu* A mouse ran across the table.'
iTaiyil	*iTaiyil* and *ndaTuvil* as postpositions express medial location 'between, in the middle of'.	Medial location	*uuruku ndaTuvil oru aaRu irukiRatu* 'There is a river in the middle of the town.
mun, munnaal, munpu,	*mun, munnaal, munpu* and *mundti* as postpositions express	Anterior location	*iraNTu maNikku munaal vaa.* 'Come before 2 'o' clock'. *enakku munpu ninRaan.* 'He

Postposition	**Descriptive detail**	**Case relations /meaning**	**Example**
mundti	anterior location in time and space 'before, in front of'.		stood in front of me'
etiree	*etiree*, *etirkku*, and *etiril* as postpositions express citerior location 'opposite'.	Citerior location	*viTTuku etiree orukoovil irukkiRatu* 'Opposite that house is a temple'
etirkku, etitiril, etirttaaR poola	*etirttaaRpoola* occurs as a postposition to express citerior location 'opposite'.	Opposite	*koovilukku ettirtaaRpoola taNNiir toTTi irukiRatu.* Opposite the temple there is a tank.
patilaaka	*patilaaka* occurs as a postposition to express 'instead of'.	Substitution	Cinimaavukku-p patilaaka-k kaTaRkaraikkup poovoom 'We will go to the beach instead of cinema'
aTuttaaR poola	*aTuttaaRpoola* occurs as a postposition to express adjacent location 'next'.	Near	*anta viiTTukku aTutaaRpoola oru kaTai irukkiRatu* 'Next to that house is a shop.
aaka, veeNTi	*aaka* and *veeNTi*	Purpose	*avaLukku aaka/ veeNTi avan puttakam vaangkinaan* 'He bought book for her'

3.2.5.1.4. Accusative case + postpositions

The following table shows different postpositions occurring after accusative case their descriptive details and case relations along with examples.

Post *Position*	*Descriptive details*	**Case relations**	**Examples**
kuRittu paRRi	*paRRi* and *kuRittu* function as postpositions expressing 'about'.	About-relation	*raamu mozhiyiyalai kuRittu/paRRi peecinaan*.'Ramu talked about linguistics'
cuRRi	*cuRRi* and *cuRRilum* occur as postposition expressing circumferential	Around-relation	*viiTTaic cuRRi caakkaTai irukkiRatu 'There is a gutter around the house'*

Post *Position*	*Descriptive details*	**Case relations**	**Examples**
	location 'around'.		
paarttu *ndookki*	*paarttu* and *ndookki* occur as postpositions expressing the direction of verbal or mental activity towards something denoted by NP to which they are postposed.	Towards-relation	*raji raajavaip paarttu/ ndookki peecinaan.* 'Raji talked towards Raja'
taaNTi	*taaNTi* occurs as a postposition expressing ulterior location 'across'.	Across-relation (ulterior location)	*enkaLviiTu koovilai-t taaNTi irukkiRatu* 'Our house is located across the temple'
tavirttu *tavira* *ozhiya*	*tarvirttu, tavira* and ozhiya as postpositions expressing the meaning 'except, besides'.	Except-relation	*vikaasaittait tavirttu/ tavira/ ozhiya veeRu yaarum varavillai*. 'Except Vikash no one else came'
oTTi	*oTTi* occurs as a postposition expressing the meaning 'in connection with, regarding'.	'In connection with' relation	*rameeS aaraayciyyai oTTi veLindaaTTukuc cenRaan* 'Ramesh went abroad in connection with research'
viTTu	*viTTu* occurs as a postposition to express source of motion 'from'	From	*kumaar viiTTai viTTu ooTinaan* 'Kumar ran away from the house'
viTa	*viTa* occurs as a postposition to express comparison 'than'	Than-relation	*rakiim raajaavai viTa uyaram* 'Rahim is taller than Raja'.
poola *maatiri*	*poola* and *maatiri* occur as postpositions to express comparison 'like'	Like-relation	*raajaa kuzhandtaiyai-p poola azhutaan* 'Raja cried like a child.'
koNTu *vaittu*	*koNTu* and *vaittu* express instrumental	Instrumental relation	*kumaar kattiyaik koNTu/ vaittu*

Post *Position*	*Descriptive details*	**Case relations**	**Examples**
	function otherwise expressed by the case suffix *aal*.		*pazhattai veTTinaan.* 'Kumar cut the fruit with a knife.
munniTTu	*munniTTu* as a postposition expresses the meaning 'for, for the purpose of', in connection with'.	For- relation	*avaL kalyaaNattai munniTTu uurukkup pooyirukkiRaaL* 'She has gone to village for marriage'

3.2.5.1.5. Locative case + postpositions

The following table shows different postpositions occurring after accusative case their descriptive details and case relations along with examples.

Postposition	**Descriptive etails**	**Case relations**	**Examples**
irundtu	*irundtu* added after locative *-il* and other locative post positions gives the meaning 'from'	Source	*avan viiTTilirundtu veLiyeeRinaan* 'He left the house' *avan marattin meelirundtu iRangkinaan* 'He got down from the tree'
vaittu	*vaittu* added after locative *il* gives the meaning 'at'	Locative	*avaL maicuuril vaittu avanaip paarttaaL* 'She saw her in Mysore'

3.2.5.2. Occurrence of postpositions and case markers denoting multiple argument relations

From all the above instances, it can be found that some of the postpositions occur more than in one context. The following chart will illustrate this.

S.No	**Post Positions**	**Argument Relations**
1.	*peril*	Topic, place, cause.
2.	*meel*	Place, topic, time
3.	*mattiyil*	Place, time, event
4.	*munnaal*	Place, time, event
5.	*pinnaal*	Place, time, event
6.	*uL*	Place, time, event
7.	*vaittu*	Place, instrument

S.No	Post Positions	Argument Relations
8.	*appuRam*	Place, time, event
9.	*piRaku*	Time, event
10.	*iTaiyil*	Time, place, event
11.	*ndaTuvil*	Time, place, event
12.	*koNTu*	Instrument, agency

3.2.5.3. Postpositions, cases and clitics

Some linguistics form function both as clitics and postposition depending on the situation. For example the form *kuuTa* may either be a postposition or a clitic. Consider the following sentences.

kamalaa tan aNNan kuuTa cinimaavukku vandtaaL.
'Kamala had come to cinema with her brother.'
kamalaa kuuTa cinimaavukku vandtaaL
'Kamala also came for the picture'

kuuTa in the first sentence show commutative relation and in the second sentence it is mere a clitic denoting emphasis. *kuuTa* in the first sentence can be replaced by the commutative markers *ooTu* and *uTan*, whereas in the second sentence it can be replaced only by the clitic *um*.

kamalaa tan aNNan-ooTu/uTan cinimavukku vandtaaL.
'Kamala came to cinema with her brother.'
kamalaavum cinimaavukku vandaaL
'Kamala too came to cinema'

The above can be rewritten as given below:

kamalaavum avaL aNNanum cinimaauukku vandtaarkaL.
'Kamala and brother came to cinema.'

kuuTa in the second sentence gives the sense also and it cannot be paraphrased as the sentence in commitative sense.

Function of clitics is as follows:

1.Temporal
avaL vandta uTan ndaan pooneen. 'I went immediately after she came.'
2.Emphasis
ndaan taan ceyteen 'I myself did'
3.Co-ordinator
ndaanum avaLum poonoom. 'I and She went'

4.Concessive
avaL kuTac ceyvaaL 'Even she can do.'

Thus, a clitic may roughly be said as following: A clitic is a linguistic form which can occur with almost all constituents of a sentence, except noun attributes and which has varied function such as emphasis, concession, co-ordination etc.

3.2.5.4. Summing up of postpositions and their meaning interpretations

The following table depicts different postpositions and their interpretations.

Preposition/case suffix	**Case/ postpositional phrase**	**Meaning Interpretation**	**Example**
-ai	NP-oblique	Objective case relation	*avaL avan-aip paarttaaL.* 'She saw him'.
-aal	A set of NPs containing human instigator + *-aal*	Agent	*avan avaLaal kollappaTTaan.* 'He was killed by her'.
-aal	A set of NPs containing natural force, etc. + *-aal*	Means	*avan atai tiiyaal veekavaittaan.* He cooked it with fire.
-aal	A set of NP having instrumental nouns + *-aal*	Instrument	*avan kattiyaal aappiLai ndaRukkinaan.* He cut the apple with knife.
koNTu/ vaittu	A set of NPs having instrumental nouns + *koNTu/ vaittu*	Instrument	avan aappiLai katti koNTu/vaittu veTTinaan 'He cut the apple by a knife'
-ukku 'to'	Oblique NP + *ukku*	Goal	*avan cennaikku vandtaan* 'He came to Chennai
-ukku 'at'	Oblique NP + *ukku*	At-temporal relation Dimension 0	avan *pattumaNikku paLLikkuuTam cenRaan* 'He went to school at 10 o' clock.
-il	A set of spatial oblique NPs + *-il*	At-spatial relation Dimension 0	*avan pas ndiRuttumiTattil ndiRkiRaan* 'He is standing at the bus stop'
- il	A set of spatial oblique NPs + *il*	In-spatial relation Dimension ½ Area	*ivvulakil candtooSam illai* 'There is no fun in the world'
-il	A set of spatial NPs oblique NPs + *-il*	Into-spatial relation Dimension 2/3 Volume	*peTTiyil paNam illai* 'There is no money in the box'
	A set of temporal	Within	*avan oruvaarattil andta*

Preposition/case suffix	**Case/ postpositional phrase**	**Meaning Interpretation**	**Example**
	oblique NPs + *-il*		*veelaiyai ceytu muTittuviTuvaan* 'He will complete the work within five weeks
-il	Temporal NP + *il*	During	*avan veyyal kaalattil kuuTaarattil irundtaan* 'He camped there for summer'.
meel 'on'	A set of spatial NP in oblique NP+ *meel*	Superior spatial relation	*avan penjcin meel uTkaarndirukkiRaan* 'He is sitting on the table'
ϕ	A set of spatial NPs + ϕ	On-temporal relation	*avan tingkaL kizhamai vandtaan* 'He came on Monday'
-ukku	A set of temporal oblique NPs + *ukku*	At-temporal relation	*avan aaRu maNikku vandtaan* 'He came at six o'clock'
meel 'on, above'	NP–*ukku* or oblique NP + *meel*	Superior spatial relation	*atu avan talaikku meel tongkukiRatu* 'It hangs above his head.'
kiizhee 'under, below'	NP–*ukku* or oblique NP + *kiizh/ kiizhee/ aTiyil*	Inferior spatial relation	*meecaikku aTiyil ndaay uTkaarndu irukkiratu* 'The dog sits under the table.'
mun, munnaal `in front of'	Spatial NP-*ukku* or oblique NP + munnaal	Anterior spatial relation	*meecaikku mun/munnaal ndaay uTkaarndtu irukkiRatu.* 'The dog sits in front of the table'.
mun, munnaal 'in front of'	Spatial NP-*ukku mun/ munnaal* +	Anterior spatial relation	*avan viiTiRku munnaal ndiRkiRaan* 'He was standing before the house
mun / munnaal munnar 'before'	Temporal NP-*ukku* + *mun* / *munnaal* +	Anterior time relation	*avan aindtu maNikku mun/ munnaal/ munnar vandaan* 'He will come before five o' clock.'
pin, pinnaal 'behind'	behind + Spatial NP	Posterior spatial relation	*avan andta kaTTiTattiRkup pinnaal / pin ndiRkiRaan.* He was standing behind the building
pinnaal, pin piRaku 'after'	NP-ukku + *pin/ pinnaal piRaku*	Posterior time relation	*avan aindtu maNikkup piRaku /pinnaal/ pin vandtaan* He came after five o' clock
il + irundtu 'since'	NP-*il* + *irundtu*		*avan ndeeRilirundtu uTalndalamillaamal irukkiRaan* 'He was sick since yesterday.'

Preposition/case suffix	**Case/ postpositional phrase**	**Meaning Interpretation**	**Example**
varai 'until, till'	Temporal NP + *varai*	Until-temporal relation	*avan panniraNTu maNi varai vizhittirundtaan* 'He was awake till ten o' clock'
iTam 'to'	Oblique NP + *iTam*	Goal/Benefactive	*avan avaL-iTam mootiram koTuttaan* 'He gave the ring to her.'
irundtu 'from'	1. oblique NP-*il* + *irundtu* 2. oblique NP + locative postpositions + *irundtu*	Source	*avan cennaiyil irundtu vandtaan* 'He came from Chennai' *viiTTin kuurai meel irundtu* 'From the roof of the house'.
irundtu 'from'	Temporal NP-il or NP + *irundtu*	From-temporal relation	*avan pattu maNiyilirundtu veelai ceykiRaan* 'He worked from five o' clock to 10 o' clock.'
iTaiyil between	NP-ukku + *iTaiyil* 'between'	Interior spatial relation.	*tuuNkaLukku iTaiyail avan ndiRkiRaan* 'He is standing between two pillars.'
vazhiyaaka 'through'	Spatial NP + *vazhiyaaka*	Path	*avan kaaTuvazhiyaa* cenRaan. 'He went through the forest.'
uL 'within'	Temporal NP-*ukku* + *uL*	Interior temporal relation	*avan andta veelaiyai iraNTu ndaaTakaLukkuL muTituuviTuvaan* 'He will finish the work within two days.'
muzhuvatum 'through out'	Spatial NP + *muzhuvatum*	Pervasive	*avan avaLai cennai muzhuvatum teeTinaan* 'He searched for her through out Chennai'.
muzhuvatum 'throughout'	Temporal NP + *muzhuvatum*	Pervasive	*avaL tan paaTangkaLai iravu muzhuvatum paTittaaL* 'She studied her lessons through out night.'
ooTu, uTan	a set of NPs + *ooTu/ uTan*	Accompaniment	*avan avaL –ooTu/ uTan/ kuuTa cenRaan* 'He went with her'
aaka	NP-*ukku* + *aaka*	Purpose	*avan paNattiRk-aaka ataic ceytaan* 'He did it for money.'

Preposition/case suffix	**Case/ postpositional phrase**	**Meaning Interpretation**	**Example**
aaka	NP-*ukku* + *aaka*	Recipient	*avan avaL-ukk-aaka puntakangkaL vaangkinaan* 'He bought the books for her.'
aaka	NP-*ukku* + *aaka*	Support	*avaL en-akku-aaka pazhangkaL vaangkinaaL* 'She bought mangoes for me'

3.2.6. Coordination of phrases

Coordination as we have seen in the case of English, refers to the process of conjoining two or more elements of equal categorical status of the three syntactic levels – word, phrasal, sentential - to one conjoined structure, in which all elements have equal status or rank.

N + N ↔ N
NP + NP ↔ NP
S + S ↔ S

Tamil employs two types of coordinators

1. The clitics *um* 'and' and *oo* 'or' and *aa* (whether) or', all of which occur after each element conjoined.
2. Free forms, that is co-coordinating conjunctions occurring in-between the elements conjoined:
   allatu 'or', *illaiyaanaal* 'or' , *aanaal* 'but'

For the convenient of discussion the following three types of co-ordination can be distinguished:

1. 'and' coordination – unmarked conjunction
2. 'or' coordination - disjunction
3. 'but' coordination - adversative conjunction

3.2.6.1. 'And' coordination

The 'and' coordination in Tamil can be represented as follows:

X-um + X-um → X

X represents the lexical categories such as nouns, verbs, postpositions, and adverbs and

phrasal categories such as noun phrases, postpositional phrases and clauses such as infinitive clauses and verbal participle clauses.

1. Noun coordination:

NP ↔ N-*um* + N-*um*
umaavum uSaavum paLLikkup poonaarkaL
'Uma and Usha went to school'

2. Postposition coordination:

PP ↔ NP-ukku + P-*um* + P-*um*
viiTTukku munnaalum pinnaalum marangkaL niRkinRana
'There are trees in front and at the back of the house'

3. Adverb coordination:

Adv-*um* + Adv-*um* ↔ AdvP
kaNNan angkum inngkum alaindtaan 'Kannan walked here and there'

4. Noun phrase coordination:

NP ↔ NP-um + NP-um
kaNNan oru toocaiyum iraNTu iTTaliyum caappiTTaan
'Kannan ate one dosa and two idlies'

5. Postpositional phrase coordination:

PP ↔ NP-*ukku* P-*um* + NP-*ukku* + P-*um*
koovilukku munnaalum paLLikku pinnaalum aaTkaL ndiRkiRaarkaL
'There are people in front of the temple and at the back of the school'

6. Infinitive clause-coordination:

NP…V-INF-*um* + V-INF-*um* V-FIN
KaNNan meeTaiyil aaTavum paaTavum toTangkinaan
'Kumar started dancing and singing on the stage'

7. Verbal participle clause coordination:

NP + Verbal participle-*um* + Verbal participle-*um* ....V-FIN
kamalaa meeTaiyil aaTiyum paaTiyum pizhaikkiRaaL

'Kamala earns livelihood by dancing and singing on the stage'

3.2.6.2. 'Or' coordination

There are five 'or' coordinators in Tamil:

1. The co-ordinating conjunction word *illaiyenRaal* 'or'
2. The coordinating conjunction word *allatu* 'or'
3. The clitic *oo*
4. The clitic *aavatu*
5. The interrogative clitic *aa*

The coordination can be represented by the following rules.

X + illaamal + X ↔ X
X + allatu + X ↔ X
X-oo + X-oo ↔ X
X-aavatu + X-aavatu ↔ X
X-aa + X-aa ↔ X

Nouns, postpositions, adverbs and quantifiers can be coordinated by the four types of coordinators listed above. Adjectives can be conjoined with the two coordinating conjunctions *illaiyenRaa*l and *allatu.*

Noun coordination:

NP ↔ N + Coord N
kaNNanin tangkai illaiyenRaal/allatu tampi ingkee varuvaarkaL
'Kannan's sister or brother will come here'
kaNNanin tangkaiyoo tampiyoo ingkee varuvaarkaL
' Kannan's sister or brother will come here'
KaNNanin tangakaiyaavatu tampiyaavatu ingkee varuvaarkaL ' Kannan's sister or brother will come here'

Adverb coordination: Type of 'or' coordination

AdvP ↔ Adv + Coord + Adv
kaNNan ingku illaiyenRaal/allatu angku varuvaan
'Kannan will come here or there'
Quantifier coordination
Quan + Coord + Quan ↔ Quan P
avaL konjcam illaiyenRaal/allatu atikam caappiTuvaaL
'She will eat less or more'

3.2.6.3. 'But' coordination

The 'but' coordinator in Tamil consists of the conjunction word *aanaal* 'but', which occurs in-between the two elements conjoined, as represented by the following:

X *aanaal* X → X

X represents adjectives, nouns+aaka, postpositional phrases, adjectival clauses, and finite clauses.

1. Adjective coordination:

Adj P ↔ Adj *aanaal* + Adj
avaL azhakaana aanaal aapattaana peN
'She is beautiful but dangerous woman'

2. Noun-*aaka* coordination:

Adv P ↔ Adv + *anaal* + Adv
avaL viraivaaka aanaal kavanamaaka ndaTandtaaL
'she walked fast but carefully'

3.Postpostional phrase coordination

PoP ↔ NP-*ukku* + Po + *aanaal* + NP-*ukku* + Po
avaL aindtu maNikkup piRaku aanaal aaRu maNikku mun vandtuviTuvaaL 'She will come after five but before six o'clock'

4. Adjectival clause coordination:

V-RP + *aanaal* + V-RP ↔ [V-RP + *aanaal* + V-RP] Adj Cl
enakku ndalla pazhutta aanaal azhukaata pazhangkaL piTikkum
'I like well ripped but not rotten fruits'

5. Finite clause coordination:

NP…V-FINITE + *aanaal* …V-FINITE ↔ [NP…V-FINITE +
aanaal …V-FINITE] S
avaL ingku vandtaaL aanaal enniTam peecavillai
'She came here, but did not talk to me'

3.3. Constituent structure of clauses

Tamil resorts to coordination and subordination for building compound and complex

constructions. Tamil has a large system of complex sentence formation involving the embedding or adjoining of a clause into another sentence. When a clause is embedded into or adjoined to the structure of another sentence in Tamil, it is either embedded as co-constituent or complement to the left of a head constituent (i.e. complementation) or it is embedded into a noun phrase as sole constituent of the noun phrase (nominalization).

3.3.1. Complementation

Four types of complementation can be distinguished in Tamil

1. Noun phrase complementation
2. Postpositional phrase complementation
3. Predicate complementation
4. Adjoined complementation

The following table depicts the four types of complementation with description, pattern and example.

Noun phrase complementation :

A clause can be embedded into a noun phrase as complement to the left side of a head or head noun phrase.

NP ↔ S + NP
[[*kuTiyirukka*]S [*vacatiyaana viiTu*]NP]]NP
'the house to live comfortably'

Postpositional complementation:

A clause can be embedded into a postpositional phrase as complement or argument to the left side of the postpositional head.

PP ↔ S + P
[[*avanai paartta*]S *pinnar*]]PP

Predicate complementation:

A clause can also be embedded into a sentence as complement to the left side of the verbal predicate.

S ↔ NP + S + V
[[*avan*]NP [*marattilirundtu oru maangkaay vizhak*]S [*kaNTaan*]VP]]S

Adjoined complementation:

A clause can be adjoined to the left side of the matrix sentence.

S ↔ S + S
[[*kaNNan kallaal aTikka*]S [*maratilirundtu maangkaay vizhundtatu*]S]S

Tamil employs the following devices to mark complementation:

1. Non-finite and nominalized verb forms

umaa jappaan pooka virumpukiRaaL
Uma Japan go_INF like_PRES_PNG
'Uma wants to go to Japan'
ndeeRRu avaL paaTinatai ndaan keeTTeen
yesterday she sing_PAST_RP_NOM I hear_PAST_PNG
'I heard her singing yesterday'

2. Complementizing verbs

KaNNan ndeeRRu vandtaan enRu aRindteen
Kannan came_PNG COM know_PAST_PNG
'I heard that Kannan came yesterday'

3. Complementizing nouns
Most of the complementizing nouns belong to the semantic category of time, manner, or measure and express thus various temporal, manners, etc. relations between the embedded clause and the matrix clause

3.3.2. Nonfinite clauses

There are four types of non-finite clauses in Tamil.
1. Infinitive clause
2. Verbal participle clause
3. Conditional clause
4. Adjectival clause

3.3.2.1. Infinitive clauses

Infinitive form has been introduced by adding the infinitive marker *a* to the verb stem. As a tense less verb form, the infinitive form is an appropriate verb form to occur in complements whose time reference is determined by the meaning or time reference of the complement taking predicate.

NP + [….V-INF]S + V-FINITE
kaNNan viiTukkup pooka virumpinaan.
'Kannan house_DAT go_INF wanted_he
'Kannan wanted to go home'

The infinitive clauses, which are headed by an infinitive form of a verb, are embedded in a number of combinations in the formation of sentences.

Complement to verbs:

The infinitive clause occurs as a complement to verbs and depending on the matrix verb with which it is collocated it imparts meaning to the combinations.

kaNNan amaiccarai azhaikka virumpinaan
'Kannan wanted to call the minister'

Complement to elocutionary verbs:

The elocutionary verbs such as *col* 'say' complement an infinitive clause.

NP + Infinitive clause + *col* type of verbs
kumaar avaLai varac connaan 'Kumar asked her to come'

Complement to verbs of perception:

Certain verbs of perception, complement an infinitive clause.

NP + Infinitive clause + certain verbs of perception
kaNNan avaL ankee ndiRkap paarttaan
'Kumar saw her standing there'

Complement to certain auxiliary verbs denoting mood, aspect, etc:

The infinitive verbal form of the infinitive clause is collocated with a number of auxiliary verbs such as *paTu, cey, paNNu, vai, poo, iru, veeNTu, kuuTum* to impart secondary meanings such as aspect, mood etc.

NP + Infinitive clause + a set of auxiliary verbs
avaL kuzhandtaiyai tuungka ceytaaL/ paNNinaaL
'she made the child sleep'

Complement to noun phrases:

A noun phrase can also complement an infinite clause.

NP+Infinitive clause +NP
kaNNanukku avaLaip paarkka neeram illai
'Kannan did not have time to see her'

Infinitive clause as adverbial:

The infinitive clause containing the infinitive form of a verb as its head can be adjoined to or embedded into a main clause with adverbial function. The adverbial function could be purpose, cause, time and result.

NP + Infinitive clause + V
avan avaLaip paarkka eNNinaan`He thought of seeing her.'

Purpose
kaNNan caappiTac cenRaan 'Kannan went to eat food'
Cause
kal eRiya kani vizhundtatu
'As the stone was thrown at the fruit, it fell down'
Time
kaNNan tuungka raatai paaTinaaL
'While Kannan was sleeping, Radha sang.'
Result
vaay valikka avaL peecinaaL 'She talked so that her mouth pained'
Infinitive as Optative

The infinitive form can occupy the final position of a sentence i.e. infinitive clause can occur as a finite clause while expressing optative sense.
Infinitive clause
avaL talaiyil iTi vizha 'Let the thunder fall on her'
Infinitive with Interrogative words

The infinitive form can occupy the final position in a sentence, that it can function as a finite clause when collocated with interrogative words.

… Interrogative word + Infinitive
ndaan enna ceyya? 'what should I do'
Infinite clause+*aa*

Infinitive added with the interrogative suffix can occupy the final position in a sentence.**Infinitive clause-*aa***
ndaan varavaa? 'Shall I come?'
Immediateness in an action followed by another action

Infinitive form can express that an action is followed by another action immediately or as a consequence of the first action.
ndaan tara avan vaangkikkoNTaan
'As soon as I gave him, he received it'
Simultaneity in the action

The infinitive clause can be embedded in a matrix clause in such a way that the event expressed both by the embedded verb and the matrix verb occurs simultaneously.
Infinitive clause + S
avan paaTa avaL aaTinaaL 'While he sang, she danced'
Infinitive+*um*

When the clitic *–um* is added to the infinitive form of a verb of an infinitive clause, it will express that the event denoted by the matrix verb follows the event denoted by the infinitive verb immediately.
Infinitive clause-*um* + S
talaivar varavum vizhaa toTangkiyatu 'As soon as the president came the function was started'
Repetitive action

The infinitive form of an infinitive clause can be reduplicated so that the event can be visualized as if they are repeated
maram veTTa veTTa tuLirttatu 'Even though the tree is cut repeatedly, it sprouted'

3.3.2.2. Verbal participle clauses

The Verbal participial clauses are those whose head is a verb in verbal participle form. The verbal participial form is having the following morphological structure:

Verb+PAST/Negative +Verbal participial suffix

There are two types of verbal participles: a positive and a negative. The structure of the postive verbal participle has been represented as given below:

verbs stem + past tense marker + verbal participle suffix.

umaa avanaip paarttu cirittaaL
'Having looking at him Uma smiled'

The structure of the negative verbal participle is as given below:

1. verb stem + negative suffix *aa* + verbal participle suffix *mal*
2. verb stem + negative suffix *aat* + verbal participle suffix *u*

.
kalaa viiTTukkup pookaamal koovilukkuc cenRaaL
'Having not gone to house, Kamala went to temple'

A simple verbal participle clause shows the following structural pattern

NP + [… V-PART]S + V-FINITE

Verbal Participle as adverb: Certain verbal participle forms of the verbs have lexicalized as adverbs

varai 'go fast' *viraindtu* 'fast'
kaTi 'reprove' *kaTindtu* 'reprovingly'

Verbal participle form with auxiliary verbs*:* Verbal participle form of a main verb combines with one or two or a series of auxiliary verbs such as iru, koL, poo, viTu, aruL, aaku, paar, etc. denoting aspectual meaning, modal meaning, etc. (see verbal compounding for details).

avan viiTTukku vandt-irukkiRaan 'He has come home'

Sequential events: Verbal participle form can be used to link one are more events expressed by verbs. The participle forms can be given side by side or can be separated by other words. Even the auxiliary verbs take verbal participle form to link with other verbs.

kaNNan uurukkup pooy vandtaan
'After having gone to village, Kannan came back'

Verbal participle form as the part of an event: There are instance in which the verbal participle form is the part of an event.

avan puttakattai eTuttuk koTuttaan
me''After having taken the book, he gave

Simultaneous event: Verbal participle form can link verbs, which denote events that take place simultaneously**.**

avar vaNTiyai ooTTic cenRaar 'He went by driving the cart'

Reason or cause: Verbal participle form can be used to link an event which is a cause with another event which the effect of the first event.

avan paampu kaTittu iRandtaan 'Having bitten by snake he died'

State: The verbal participle forms can be used to denote the state of the subject of an event.

kuLam taamarai puuttu, alli malarndtu kaaNappaTTatu
'The pond is seen with blossomed lotus and Lilly'

Repetitive event: The reduplicated verbs can be linked by verbal participle forms to the main verb and the event will be shown as being repeated for many times.

avan ceTiyai veTTi veTTi eRindtaan
'He cut the plants repeatedly and threw them out'

Condition: The verbal participle forms, *inRi* and *anRi* of the negative verb *il* and *al* respectively function as postpositions expressing the meaning 'without' and 'except'.

ndii inRi andtak kaariyam ndaTaipeRaatu
'Without you that matter will not be promoted'

Negative verbal participle form (..V-*aamal*) implies different shades of meaning depending on the contextual use of it. The structure of the clause is:

[…V-*aamal*]S

Reason/Cause: […V-*aamal*]S implies reason or cause in certain contexts.

mazhai peyyaamal payirkaL karukina
'The crops withered as it did not rained'

Manner: […V-*aamal*]S implies manner in some contexts.

taNNiiraic cindtaamal eTuttuvaa 'Bring the water without spilling'

State: […V-aamal]S implies a state in certain contexts.

avar kaNNaaTi aNiyaamal vandtaar
'He came without wearing spectacle'

Accompaniment: […V-aamal] S implies the non-occurrence of an event when collocated with another event as if they are co-occurring.

kaNNan paTikkaamal uTkaarndtirukkiRaan
'Kannan is sitting without studying'

Condition: […V-*aamal*]S can imply condition in certain context. The conditional meaning will be felt only if the matrix verb is in interrogative form or negative form.

paTikkaamal teervil veRRi kiTTumaa?
'Can one get success in the examination without studying?'

4.3.2.3. Conditional clauses

A simple conditional clause shows the following pattern.

[…V-COND] S

Tamil distinguishes between positive and negative conditional forms. The structure of the positive conditional form is as given below:

1. Positive conditional clause:

Verb stem + Past tense suffix + conditional suffix *aal*
umaa kuuTa vandtaal ndaan cinimaavukkup pooveen
'If Uma accompanies me, I will go to cinema'

2. Negative conditional clause

Verb stem + negative suffix *aa* + conditional bound form *viTTaal*
umaa kuuTa varaaviTTaal ndaan cinimaavukkup pooka maaTTeen. 'If Uma does not accompany me, I will not go to cinema'

The following table shows different types of conditional clauses:

Conditional clause with question words: Conditional clause can be followed by question word like *enna*

ndii ennooTu vandaal enna? 'Why don't you come with me?'

Conditional clause with clitic *taan+ee:* Conditional clause can be complemented by a combination two clitics, *taan+ee*, whose function is emphasis. The first conditional clause functions as an adverbial clause and the second conditional clause denote non-occurrence of the event denoted by the verb of the main clause.

ndaan connaal avaL keeTTaal taanee
'If she has only listened when I told her'

Probable and improbable conditional clauses: Conditional clauses are generally interpreted to mean the probability of occurrence of the events denoted by verbs in conditional form. A conditional clause can also be interpreted as a hypothetical situation that does not occur.

mazhai peytaal tuNi ndanaiyum 'If it rains the cloth will become wet'
ndaan oru mandtiriyaayirundaal paNakkaaran aayirupeen
'If I were a minister I would have become a rich man'

Counter factual conditional clause + S: Conditional clause can refer a counter factual situation when the conditional verb is of the form V+PAST/NEG+PAR+*iru*+PAST+COND.

kaNNan paTittirundtaal teervu ndanRaay ezhutiyiruppaan
'Had Kannan studied he would have written the examination well'

Conditional Clause + elliptical main clause: An elliptical main clause can embed a conditional clause.

avaL angkee poonaal avamaanam 'It is a shame if she goes there'

Conditional + *taan:* The clitic *taan* added to the conditional will emphasize on the condition.

avaL paaTindaal taan kuzhandtai tuungkum
'Only if she sings the child will sleep'

Conditional clause + *aavatu :* The clitic *aavatu* added to the conditional clause may imply that the subject of the embedded clause is unwilling to perform the event denoted by the conditional verb.

avaL vandaalaavatu avaLiTam koTukkalaam
'It would have been given to her if she had come'

Conditional + *ozhiya:* The postposition *ozhiya* added to the conditional clause express negative conditionality.

kaNNan ingku vandtaal ozhiya onRum ndaTakkaatu
'Nothing will happen unless until Kannan came'

Conditional clause+ *um:* When clitic *-um* is added with conditional clause, it will be interpreted as concessive conditional.

avaL ingku vandaalum kaariyangkaL onRum ndaTakkaatu
'No matter will be settled even if she comes here'

Indefinite concessive clause*:* When conditional clause carries the verb of the form V+PAST+COND+um collocated with a subject in interrogative pronominal form, it will imply indefinite concession.

yaar vandtaalum ndaan payappaTamaaTTeen
'Who so ever comes, I will not be afraid'

Alternative condition: Two conditional clauses can be conjoined by the clitic *um*.

avaL vandtaalum avan vandaalum enakku nallatutaan
'Whether she comes or he comes, it is good to me'

Appellative conditional clause : Conditional suffix can be added with the appellative verb *al* to form *allaal/allaamal* which can be added to a noun as a postposition.

ndii allaal/allaamal teyvam illai 'Except you there is no other god'

S + *enRaal:* The conditional form, *enRaal*, of the verb en 'say', when added to a sentence will embed a sentential statement as a condition.

mazhai peyyavillai enRaal payirkaL karukiviTum
The crops will wither if it does not rain'

Concessive clause + S: When clitic *-um* is added to verbal participial form, it will imply the non-occurrence of the event denoted by embedded clause in spite of the occurrence of the event denoted by the main clause.

mazhai viTTum tuuRal niRkavillai
'Though the rain is over it does not stop drizzling'

Conditional concessive clause + S: When clitic is added to conditional form, it will imply the non-occurrence of the event in the past denoted by the embedded clause. *If* may imply the non-occurrence of the event in the future.

kaNNan paTittaalum teervil veRRi peRavillai 'Even though Kannan studied well he did not get success in the examination'
mazhai vandtaalum vizhaa ndaTaipeRum
'Even if it rains, the function will be held.

3.3.2.4. Adjectival/relative clauses

A simple adjectival/relative clause shows the following structural pattern.

[[…V_TENSE/NEG_RP]Adj P + NP]NP

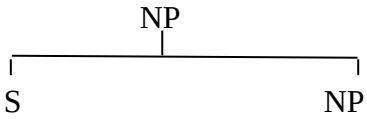
Tamil distinguishes four types of adjectival participles: three marked for the three tenses and a tenseless negative one. The structure of these adjectival participles is given below:

Verb stem + Past/Present/Negative suffix *aat* + adjectival suffix a

In the case of future adjectival participle the following is the structure:

Verb stem + suffix *um*

um represents both future tense and the adjectival morpheme. The adjectival participle is thus only tensed non-finite verb form. Syntactically, an adjectival clause occurs always in noun phrase complementation. As a complement, the relative clause comes at the left side of a head noun.

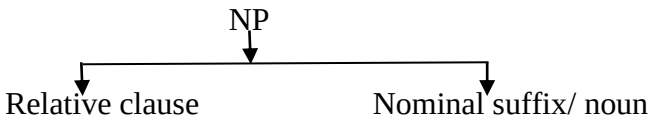


ndeeRRu ingkee vandta antdap paiyanai ndaan ndeeRRu paartteen
Yesterday here come_PAST_RP boy_ACC I yesterday saw_I
'I saw the boy who came here yesterday'
ndiingkaL kaalaiyil vaangkina paalai kuzhndtai kuTittuviTTatu
you_PL morning_LOC buy_PAST_RP milk_ACC child drank_PNG

3.3.3. Nominalized clauses

There are two types of nominalization in Tamil: nominalization on relativized forms and nominalization on non-relativized forms (i.e. directly to the verb stem).

1. The relative clause is nominalized by a noun or nominal suffix
2. The non-relativized forms nominalized by a noun or nominal suffix



1. Relative clause + noun ↔ NP
ndaan vaLartta ndaay
I bring up_PAST_RP dog
'the dog brought up by me'

2. Relative clause + nominal suffix *atu* ↔ NP
[*avan vandatu*]NP *enakkut teriyaatu*
he come_PAST_RP _NS know_not

'I did not know that he came'

3. Relative clause + pronominalizer (*avan, avaL, atu, avai/ana*) ↔ NP
neeRRu vandtavan
yesterday come_PAST_RP_he

'one who came yesterday'
ndeeRRu vandtatu
yesterday come_PAST_RP_it
2. The verbal stem (untensed stems) are nominalized by the suffixes *tal, al, kai,* and *mai*.
varu 'come' + *tal* > *varutal* 'coming
varu 'come' + *al* > *varal* 'coming'
varu 'come" + kai > varukai 'coming'
varu 'come' + aa (negative suffix) + *mai* > *varaamai* 'not coming'

All the nominalized forms are capable of embedding a sentence. Though they mean 'the act or process of doing something', they differ in their distribution.

kaalaiyil ezhundu kuLittal ndallatu 'It is good to bathe early in the morning'
kaalaiyil ezhundtu kuLikkal-aam 'One can bathe in the morning'
kaalaiyil ezhundtu kuLikkal veeNTum
'One should take bathe in the morning'
avaL kaalaiyil ezhundt kuLikkaiyil avan avaLai paarttaan
'He saw her while she was taking bath'

3.3.4. Verbal complement clauses

The verbal complement clauses will be complemented by the verbs such as *en, col, kuuRu, ndinai*. These verbs will be conjoined to the embedded clause by complementizers such as *enRu, ena,* and *aaka*.

***enRu* and *ena* can complement an S in finite clause.:**

NP + Finite clause + *enRu/ena* + *kuuRu*-type of verbs
kaNNan ndaaLai varukiReen enRu/ena kuuRinaan
'Kannan said that he would come tomorrow'

The complementizer *aaka* can embed a sentence when the verb is changed into gerundial form (i.e. V-*atu* clause). The gerundial form to which *aaka* is added has the constraint that only those gerundial forms inflected for past and present tense can be complemented by *aaka*. The gerundial forms inflected for future tense cannot be complemented by *aaka*. The defective verbs which are inherently inflected for future tense suffix *-um* such as *kuuTum, veeNTum, teriyum, piTikkum* cannot take *aaka* as a complementizer**.**

NP + V-*atu* clause+*aaka* + *kuuRu* type of verbs

kaNNan ndaaLai varuvataakak kuuRinaan

'Kannan said that he would come tomorrow'

Like the quotative verbs such as *kuuRu*, *col* and *en*, other verbs also can embed a complement clause with finite verb with the help of a complementizer *enRu*.

NP+ *enRu* + S

avan kaTTurai ezutalaam enRu uTkaarndtaan
'He sat down so that he can write an article'

***enRu* can complement a noun.:**

NP+ enRu + S
kampan enRu oru kavi irundtaan 'There was a poet named Kamban'

enRu can complement an elliptical sentence having only dative form of a noun or only defective verbal forms such as *veeNTum*.

NP-*ukku* + *enRu* + S
avarukku enRu onRum illai
'There this nothing for him'
eezhai enRu yaaraiyum kuRaivaaka ndinaikkaatee
'Do not think bad of one who is poor'
veeNTum enRu avan itai ceyyavillai 'He did not do it intentionally'

The verb en can be a finite verb embedding an S:

NP + S + *en*
kaNNan ndaaLai varukiReen enRaan
'Kannan said that he would come tomorrow'

3.3.5. Comparative clauses

In Tamil comparison is brought out by making use of simply postpositions like *poola* and *viTa/kaaTTilum*. *poola* is used for bringing out similarity and *viTa* and *kaaTTilum* for dissimilarity. Tamil makes use of pronominalized forms of adjectives instead of adjectives.

rooci avaL cakootiriyaip poola aarookkiyamaanavaL
'Rosy is as healthy as her sister'
rooci avaL cakootiriyaik kaaTTilum/viTa kuRaindta aarookkiyamaanavaL

'Rosy is less healthier than her sister'

poola, *poonRu*, *maatiri*, *viTa*, *kaaTTilum* as complementizers can complement a

sentence for bringing out comparison. There are two sets in this category of complementizers: complementizers for expressing similarity and (ii) complemntizers expressing difference. The complementizers, *poola*, *poonRu* and *maatiri* belong to the first type and the complementizers, *viTa* and *kaaTTilum* belong to the second type.

3.3.5.1. Complementing similarity

The complementizers such as *poola*, *poonRu* and *maatiri* can be used to express similarity. The verb of the complement clause will be in gerundial form, which could be inflected for all the three tenses.

avaL maan ooTukiRatu poola/poonRu/maatiri ooTukiRaaL
she deer run_PRES_it_ACC similar run_PRES_she
'she runs like a deer'

The verb in the embedded clause can be deleted.
avaL maan poola/poonRu/maatiri ooTukiRaaL
she deer similar run_PRES_she
'She runs like a deer'

Among the three complementizers mentioned above, *maatiri* can be collocated with verbs in relative participle form.
avaL maan ooTukiRa maatiri ooTukiRaaL
she deer run_PRES_RP similar run_PRES_she
'She runs like a deer'

poola and *poonRu* can be collocated with the verbs in conditional form marked with -aal and inflected for past tense.

avaL maan ooTinaaRpoola ooTukiRaaL
she deer run_PRES_RP similar run_PRES_she
'she runs like a deer'

There are instances in which the comparison is metaphorical or simile in which the verb denoting the embedded event differs from the verb denoting the matrix event.
avan iTi iTittaaRpoola uNarndtaan
he thunder thunder_PAST_COND similar feel_PAST_he
'he felt as if it has thundered'

avan vandtatu teyvamee vandtaaRpoola irundtatu
he come_PAST_it god_EMP come_COND_similar be_PAST_it
'His coming is like that of the coming of the god'

avanukku teeL koTTiya maatiri irundtatu
he_DAT scorpion bite_PAST_RP similar be_PAST_it
'he felt as if he was bitten by a scorpion'

3.3.5.2. Complementing difference

The complementizers such as *viTa* and *kaaTTilum* can bring out the difference These complementizers are added to the embedded clause containing the verb in gerundial form, which are further inflected for accusative case.

kaNNan ooTiyatai viTa/kaaTTilum raaman veekamaaka ooTinaan
Kannan run_PAST_GER_ACC more than Raman fast run_PAST_he
'Kannan ran faster than Raman'

Here also the verb in the complement clause can be deleted.

kaNNanai viTa/kaaTTilum raaman veekamaaka ooTinaan
Kannan_ACC more than Raman fast run_PAST_he
'Kannan ran faster than Raman'

3.3.6. Adverbial clauses

A good number of postpositions come after non-finite forms of verbs or nominalized forms of verbs forming adverbial clauses. They show various types of temporal relations as well as manner. The following table illustrates the point.

Anterior time relation:

V-FUT-*atu*-clause + *mun/ munnar/ munnaal/ munpu*
iraaman varuvataRku mun/munnar/munnaal/munpu kaNNan vandtuviTTaan 'Kannan had come before Raman came'

Posterior time relation:

1. Adjectival Clause + *pin/ pinnar/ pinnaal/, pinpu/piRaku*
which can be glossed as 'after' added to past expresses
raaman vandta pin/pinnar/pinnaal/pinpu kaNNan vantdaan
'Raman came after Kannan came'
avan caappiTTataRku appuRam avaL caappiTTaaL 'She ate after he a te'

2. V-PAST-atu-clause-DAT to express the same temporal time relation discussed above. V+PAST+*atu*+ACC + *aTuttu/toTarndtu*
avaL paaTalai aTuttu/toTarndtu avan paaTinaan.

'He sung immediately after she had sung'

Simultaneous time relation:

1.Adjectival clause + *pootu/pozhutu*
ndaan paaTum pootu/pozhutu avaL paaTuvaaL 'she will sing while I sing'
2.Adjectival clause + *ndeerattil/ camayattil* denoting the first event
ndaan paaTum atee camayattil avaL veenai vaacittaaL
'When I sang she played veena'.

Consecutive time relation:

1.Infintive clause + *uTan*
talaivar vandtavuTan kuuTTam toTangkiyatu
'The meeting was started as soon as the president came'
2.V+PAST+atu-um
talaivar vandtatum kuuTTam toTangkiyatu
'the meeting was started as soon as the president came'

Interposal time relation:

V-FUT-*atu*-clause+DAT + *iTaiyil*
avan paaTuvataRkum avaL paaTuvataRkum iTaiyil ndaan paaTineen
'I sang in between the performances of his singing and her singing'

Interior time relation:

V-FUT-*atu*-clause-DAT + uL/uLLee
avan caappiTuvataRkuL avaL vandtuviTTaaL 'she came before he finished eating
.

Inceptive time relation:

V-PAST-a*tu*-clause +LOC + *irundtu*
raaman vandtatilirundtu kaNNan avanuTan peecikkoNTirukkiRaan
'Kannan is talking with Raman from the time when Raman came'

Terminative time relation:

1.V-FUT-RP clause + *varai*
avaL tan kaNavan varum varai kaattirundtaaL
'she waited for her husband to come'
2.V-FUT-*atu* clause + *varai*
avaL tan kaNavan varuvatu varai kaattirundtaaL
'She waited for her husband to come'

Manner 1:

1.Infinitive-clause + *paTi/ maatiri/ vaNNam/ aaRu*
avaL conna paTi/ maatiri/ vaNNam/ aaRu avan keeTpaan
'he will act as she said'
2.atu-clause + *poola*
avaL connatu poola avan keeTpaan 'he will act as she said'

Manner 2 :

1.Infinitive clause + *paTi/ vaNNam/ aaRu*
avaL azhuta paTi/ vaNNam/ aaRu irundtaaL 'she remained crying'
2. Infinitive clause + *maatiri*
avaL varukiRa maatiri terikiRatu 'It appears that she is coming'

Compulsion:

Verbs of Expression, it will be implied that the event denoted by the embedded verb is demanded.
avaL avanaip paTikkum paTi/ aaRu vaRpuRuttinaaL
'she compelled him to study'

Purpose:

um-adjectival clause + *paTi*/*aaRu*
With certain matrix clause *paTi* and *aaRu* may imply purpose.
mandtiriyai paarkkum paTi/aaRu avan vandtaan 'He came to see minister'

Extent:

V-PAST-RP clause + *aLavu/ maTTum/ varai*
avaL tannaal muTindta aLavu/ varai/ maTTum muyaRci ceytaaL
'She tried to her maximum extent possible'

3.4. Analysis of sentences

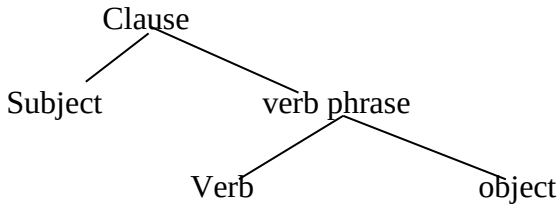
The building of sentences is dealt under the following heads:
1. Word order
2. Types of sentences
3. Coordination of sentences

3.4.1. Word order

In languages like Tamil, word order is more flexible, as grammatical relations are signaled by inflections. In generative linguistics, languages with fairly free word order are

non-configurational languages. The core of the configurationality issue is about the question of special grammatical relation of subject and a different one of object, whatever these relations correspond to different positions in the hierarchy of the sentence. In Tamil there is little or no evidence for a hierarchy as given below.

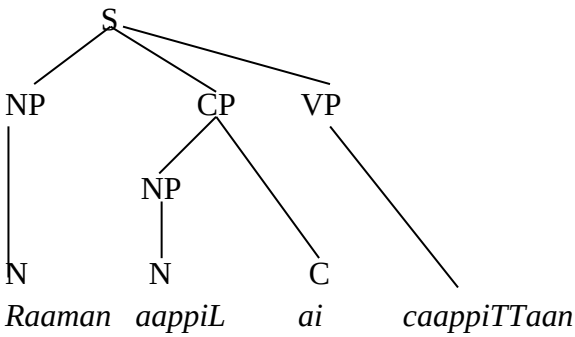
Figure 4.



It is generally believed that Tamil lacks of VP constituency. So, generally Tamil sentences are given flat structures without placing VP at a different hierarchical level. Tamil is an SOV language in which 'S' and 'O' can be shuffled. Tamil is not strictly a configurational language. In Tamil case markers decide the object.

raaman aappiLaic caappiTTaan
'Rama ate an apple'

Figure. 2.



Here CP = case phrase and C is case. The ordering of the constituents may be linear or sequential in Tamil

1. SOV linear order

kajeesvari indta puttakattai paTittirukkiRaaL
'Gajeswari has read this book'
2. Fused order
paTittirukkiRaaL
read_PASTP_she

In Tamil, the interrogation does not change the word order.

Many interesting points will be revealed for the purpose of transferring English language structure into Tamil, if we look at the correlating features of the two languages from the point of view of their typological characteristics as SOV and SVO languages respectively. Syntactically, English and Tamil are perhaps most saliently different in the basic word order of verb, subject, and object in simple declarative clauses. Tamil is an SOV language, meaning

that the verb tends to come at the end of basic clauses. Tamil being SOV language has postpositions.

Tamil is a typical (S) OV language in which the verb occurs at the final position of a sentence. Word order in the sentence is relatively free, as long as the sentence ends with a main verb. For example, the sentence *Kannan introduced Uma to Raja* in Tamil can have the following word-order variants.

1. S O IO V
kaNNan umaavai raajavukku aRimukappaTuttinaan.
2. S IO O V
kaNNan raajaavukku umaavai aRimukappaTuttinaan.
3. O IO S V
umaavai raajaavukku kaNNan aRimukappaTuttinaan.
4. IO O S V
raajaavukku umaavai kaNNan aRimukappaTuttinaan.
5. IO S O V
raajaavukku kaNNan umaavai aRimukappaTuttinaan.
6. O S IO V
umaavai kaNNan raajavukku aRimukappaTuttinaan.

ai and *kku* are accusative and dative case markers and nominative is unmarked in Tamil. The above sentences are identical in logical content, but are different in discourse presupposition in a very subtle way. Ordinarily, constituents that represent older information precede those that represent newer information. The subject-initial sentence pattern is the most common among the various word order patterns. In declarative sentence with nominal subject and object, the dominant order is almost always one in which the subject precedes the object. The freedom of word order extends to adverbial adjuncts. For example, the sentence which means *He will come to see her tomorrow*, *tomorrow* can come anywhere before the verb.

1. *ndaaLai avan avaLai paarkka varuvaan*
2. *avan avaLai ndaaLai paarkka varuvaan*
3. *avaLai ndaaLaip paarkka avan varuvaan*
4. *ndaaLai avaLaip paarkka avan varuvaan*

3.4.2. Analysis of different types of sentences

Sentences can be differentiated into different types based on their structure and function.

3.4.2.1. Sentence types based on the complexity of clauses

Traditionally sentences are classified as simple, compound and complex. This distinction is based on the criterion whether the sentence contains a single verb or verb phrase or more than one verb phrase. It has been explicated traditionally that a simple sentence

contains at least one verb or verb-phrase. Compound and complex sentences contain more than one verb or verb phrase. Accordingly simple sentences have only one finite verb, compound sentences have two or more finite verbs and complex sentences have one finite verb and one or more infinite verbs.

1.Simple sentence
avan maarkeTTukkup pookiRaan
'He goes to market'
2.Compound sentence
avan maarkeTTukkup poonaan. kaaykaRikaLai vaangkinaan.
'He went to market and bought some vegetables'.
3.Complex sentence
avan kaaykaRivaangka candtaikkup pookiRaan
'He is going to market to buy vegetable'

A Tamil sentence can be analysed as containing either NP and VP or NP and NP.
S↔ NP+VP
S ↔ NP+NP

Tamil sentences need not have a verb always.

1. S ↔ NP + VP
avan paaTam paTittaan
he lesson read_PAST_PNG
'He read the lesson'
2. S ↔ NP + NP
avan oru maaNavan
he one student
'He is a student'

The equative sentence denoting existence does not contain a verb in Tamil. The verbless existential sentences are possible while denoting present existence, but to denote a past and future existence, the be-verb *iru* which can carry tense is being used in Tamil, the noun complement will take the adverbial *aay* / *aaka*.

avar oru aaciriyaraay irundaar
he one teacher_ADV be_PAST_PNG
'He was a teacher'

This point has to be noted down while transferring the information in English into Tamil.

3.4.2.2. Sentence types based on their function

Traditionally sentences have been classified based on its function into the following

types:

1. Affirmative or assertive sentences
avan candtaikkup poonaan
He went to market
2. Question or interrogative sentences
avan candtaikkup pookiRaana?
Is he going to market?
3. Negative sentences
avan candtaikkup pookavillai
He is not going to market
4. Imperative or command sentences
candtaikkup poo
Go to market
5. Exclamatory sentences
aa! evvaLavu azhakaana kaTTiTam itu!
'How beautiful the building is!'

In Tamil word order does not play a crucial role while transforming an affirmative into an interrogative sentences, it makes use of clitics.

3.4.2.2.1. Analysis of affirmative or assertive sentences

In Tamil, we can visualize assertive sentences as having at least five elements namely subject, predicate, attribute to subject, expansion of predicate particles and particles. In Tamil, as in English, minimal sentence can be classified into equative type and non-equative type.

3.4.2.2.1.1. Analysis of equative sentences

Equative sentences can be distinguished into:
1.Sentence having no verbs (verb less clauses)
2.Sentences having verbs
There is a type of equative sentences in which 'S' can be expanded into two noun phrases.
S ↔ NP + NP
kajeeSvari mikavum ndalla peN
'Gajeswari is a very good girl

Semantically, verb less clauses represent an identification or attribution.

1. Equate for identification

avan oru maaNavan 'He is a student'
2. Equate for attribution
avaL azhakaanavaL 'She is a beautiful girl'

There are equative type of sentences in which BE verbs (*uNTu* 'is/are', *iru* 'be', *illai* 'be not', *alla* 'be not' and copula verbs (*aaku* 'become, be' for the sake of are used for marking tense or emphasizing positive or negative existence. The different types of equative sentences using these verbs are tabulated below:

Equative verb	**Pattern**	**Example**
uNTu	NP + *uNTu*	*kaTavuL uNTu* 'God exists'
iru	NP + *iru*+TENSE+PNG	*kaTavuL irukkiRaar* 'God exists'
iru	NP-*iTam* + NP + iru+TENSE+PNG	*enniTam paNam irukkiRatu* 'I have money'
illai	NP + *illai*	*kaTavuL illai* 'God does not exist'
illai	NP + NP-*illai*	*avaL ndallavaL illai* 'She is not a good lady'
alla	NP + NP-*alla*	*avaL ndallavaL alla* 'She is not a good lady'
aaku	NP + NP-*aaku*+FUT+PNG	*avan ndallavan aavaan* 'He is a good man'
aaku	NP + NP-*aaku*+PRES/PAST+PNG	*avan mandtiri aanaan* 'He became a minister'

3.4.2.2.1.2. Analysis of non-equative sentences

Non-equative sentences in Tamil contain a verb unlike the equative sentences which do not contain verb.

kamalaa kaTitam ezhutukiraaL 'Kamala wrote a letter'

So non-equative sentences can be expanded as NP (headed by an N) followed by VP (headed by a verb).

S ↔ NP + VP
kaamaakshi ezhutukiRaaL 'Kamakshi is writing'
paRavaikaL paRakkinRana 'The birds are flying'

3.4.2.2.2. Analysis of interrogative sentences

Like English, Tamil has also two types of question sentences. As we noted under English the first kind can be referred as Yes or No question type. The following sub types of interrogative distinguished in Tamil.

1. Yes-no questions
2. Information or question word questions
3. Alternative questions

3.4.2.2.2.1. Yes-no questions

Yes-no questions are asked to know whether the contents of the proposition supplied by the speaker are true or not. Yes-no question in Tamil is formed by the suffixation of interrogative clitic *aa* to a constituent of a sentence. This clitic can be added to any constituent; except modifiers (noun modifier).

umaa oru paaTTup paaTinaaL
'Uma sang a song'
umaavaa oru paaTTup paaTinaaL ?(The subject is questioned)
'Did uma sing a song?'
umaa paaTTaa paaTinaaL? (The object is questioned)

Is it song, did Uma sing?
umaa paTTup paaTinaaLaa? (The whole sentence is questioned)
'Did Uma sing a song?'
umaa azhakaakavaa paaTTup paaTinaaL?
'Did Uma sing well?'

Note that if the interrogative clitic is suffixed to the sentential final position (i.e. to the inflected verb or to the nominal predicate), the question is interpreted as a neutral one in which the scope of the clitic *aa* is the whole S, that is, it interrogates the whole of the sentence.

kaNNan oru vazhakkaRinjar 'Kannan is an advocate.'
kaNNan vazhakkaRinjaraa? 'Is Kannan an advocate?'
kaNNan neeRRu uSaavai aTittaan 'Kannan beat Usha yesterday'
kaNNan neeRRu ucaavai aTittaanaa? 'Did Kannan beat Usha yesterday?'

If the interrogative clitic *aa* is placed on some other constituent of the sentence, a focussed yes-no question results. That is, the constituent to which clitic *aa* is added is interrogated. The remainder of the proposition is presupposed.

uSaa ndeeRRu umaavaiyaa aTittaaL?
'Was it Uma, did Usha beat yesterday?'
uSaa ndeeRRaa umaavai aTittaaL?
Was it yesterday that Usha beat Uma?
uSaavaa neeRRu umaavai aTittaaL?

Was it Usha that beat Uma yesterday?

3.4.2.2.2.2. Wh-questions or information questions

Information questions, which are otherwise known as question word questions, presuppose a proposition and interrogate the proposition for particular information. Such questions interrogate only a constituent of the sentence. Information questions are formed in Tamil by an interrogative pro-form and by realizing the constituent to be questioned with an interrogative pro-form that is referentially undetermined. Unlike English the devices such as movement of constituents etc are not used. Tamil has a number of interrogative proforms such as pronominal, pro-adverbial, pro-numerals, pro-adjectival, etc. All expect one (*yaar* 'who') contains the interrogative morpheme *e*. The different proforms used in Tamil are tabulated below.

Reason	**Person**	**Dietic**	**Things**	**Place**	**Time**	**Manner**	**Quantity**
een	*yaar* *evan* *evaL* *evar* *evarkaL*	*endta*	*etu* *evai* *evaikaL* *enna*	*engku* *engkee*	*eppozhutu* *eppootu* *enRu*	*eppaTi*	*evvaLavu* *ettanai*

The following table shows the usage of the above listed interrogative words.

Type	**Statement**	**Question**
Time	*uSaa neeRRu vandtaaL* 'Usha came yesterday'	*uSaa eppootu vandtaaL*? 'When did Usha come?'
Place	*uSaa angkee vandtaaL* 'Usha came there'	*uSaa engkee vandaal* 'Where did Usha come?'
Quality	*uSaa ndalla peN* 'Usha is *a good* girl.'	*uSaa eppaTippaTTa peN*? 'What type of a girl Usha is?'
Serial Order	*uSaa pattaavatu vakuppil paTikkiRaaL* Usha is studying in tenth standard.	*USaa ettanaiyaavatu vakuppil paTikkiRaaL*? 'In which class usha is studying?'
Reason	*kaNNan avaLaip paarkka vandtaan* 'Kannan came to see her'	*kaNNan een vandtaan?* 'Why did Kannan come?
Person	*kaNNan vandtaan* 'Kannan came'	*yaar vandatu?/vandaar?* 'Who came?'
Deictic	*kaNNan andta puttakattaip paarttaan* 'Kannan saw that book'	*kaNNan endta puttakattaip paarttaan?* 'What book did Kannan see?'
Thing	*kaNNan puttakattaip paTittaan* 'Kannan saw the book'	*kaNNan etaip paarttaan?* 'What did Kannan see?'
Manner	*uSaa ndanRaakap paTikkiRaaL*	*uSaa eppaTip paTikkiRaaL*? 'How is usha

Type	Statement	Question
	'Usha is studying well.'	studying?'

3.4.2.2.2.3. Alternative questions

Alternative question provides either two alternative propositions or one proposition and its negation. The addressee is requested to commit himself to one of the alternatives to the two propositions and its negation. In Tamil alternative questions are formed by the coordination of two sentences with deletion of some identical material from the second sentence. The alternative questions are formed by the interrogative clitic *aa* which occurs as 'or' coordinator after each element conjoined. Like the coordinating clitics *oo* and aavatu, the clitic *aa* occurs with nouns, postpositions, adverbs, and quantifiers, but not with adjectives.

avan ndallavanaa keTTavanaa enRu teriyavillai?
He good_he_clitic bad_he_clitic know_not
'It is not known whether he is good or bad'
ungkaLukku peenaavaa pencilaa veeNTum?
you_DAT pen_clitic pencil_clitic want
'Do you require pen or pencil?'

3.4.2.2.3. Analysis of negative sentences

Negation is expressed by the following three ways:

1. Morphologically by a negative verbal suffix
2. Lexically by a negative verb
3. Syntactically by a negative auxiliary verb

There are however no negator likes *not* or negative quantifiers, or adverbs like *no one* and *nowhere* in Tamil. Negative morpheme occurs always in the inflected verb constituent, either incorporated in the verb itself or in the inflectional part.

Type	Sub types	Example
I.Morphological negation by negative verbal suffix: The negative morpheme is realized by two allomorphs *aa*, *aat* occurring as suffixes after the verb stem, and also by a zero morph.	1. V+Negative suffix+ Third person, singular number, and neuter gender suffix V+*aa*+*tu*	*pas ingkee varaatu* 'The bus will not come here' *enakku hindi varaatu* 'I cannot talk in Hindi'
"	2.V+Negative verbal	*avaL neeRRu ennai paarkkaamal*

Type	**Sub types**	**Example**
	participle suffix V+*aa-mal/aat-u*	/ *paarkkaatu poonaaL*.'Yesterday she went without seeing me'
The negative suffix *aat* occurs in the following three verb forms.	3.V+Negative singular / plural imperative suffix V+*aat-ee* V+*aat-iirkaL*	*ingkee varaatee* 'Don't come here' *ingkee varaatirrkaL* Don't come here'
"	V+Negative adjective participle suffix V+*aat-a*	*ndaan paarkaata peN pookiRaaL* 'There goes a woman I did not see'
"	5.V+Negative suffix + Nominalising suffix V+*aat+atu*	*uSaa varaatatu ndallatalla* 'That usha did not come was not nice'
"	6.In periphrastic construction the model auxiliary *maaTTu* meaning 'will' is inflected for PNG expressing negative polarity. The negative morph is realized by zero morph. Thus, PNG suffix is directly added to the verb stem. *maaTT u*+ Zero negative + PNG	*Usha varamaTTaaL* Usha won't come
II.Use of negative lexical verb: Negative lexical verbs *illai* and *alla* used for negating a proposition.	1. *illai* meaning 'be not'whose function is existential and copula. 1.1. Negation in locative sense express by the negative be-verb *illai* NP-il + *illai* 1.2. Negation in existential sense expressed by *illai* (as against positive *uNTu* 'be') NP + *illai* 1.3.Negation in copula sense expressed by *illai* (against positive *aaku* 'be' or zero) NP + *illai*	1.1.*uSaa viiTTil illai* 'Usha is not in the house' 1.2.*kaTavuL illai* 'God is not there' meaning 'be not' 1.3.*umaa oru maruttuvar illai 'Uma is not a doctor'*

Type	**Sub types**	**Example**
	2.*alla* meaning 'be not' whose function is copula only.	*avan maaNavan alla* 'He is not a student'
III Use of negative verb as an auxiliary verb:	1.Negative verb *illai* can be added after a main verb in infinite form, there by negating a proposition. V+infinitive + *illai*	*avan neeRRu kalluurikku varavillai.*'He did not come to college yesterday'
"	2.The negative verb *maaTTu*, which can be inflected for PNG added after infinitive form of a main verb functions as an auxiliary expressing the meaning 'will not'. V+infinitive + *maaTT*-PNG	*umaa kalluurikkup pookamaaTTaaL*'Uma will not go to college'

3.4.2.2.4. Analysis of imperative sentences

In Tamil the imperative may have the root of the verb. Modern Tamil distinguishes between singular and plural imperative forms. Both the singular and plural imperative forms are further distinguished into positive and negative forms. One of the imperative forms is also overtly marked for the category of person, second person. The various imperative forms can be analysed as phonological realization of the following morphemes underlined structure. As noted earlier imperative sentences are instructions, commands, and directions to second person.

Verb + imperative + person (negative) (plural)

The following table shows different types of imperatives:

1.Positive singular imperative: It is identical with verb stem and there is no marker. This shows that imperative and second person morphemes are not overtly expressed and are realized by zero morph each

V+ϕ
tuungku 'sleep' , *keeL* 'ask', *ndaTa* 'walk'

2.Negative singular imperative: The negative singular imperative form consists of the verb stem, to which the negative morph *aat* is suffixed, followed by clitic *ee* (euphonic suffix). In these forms the imperatives and second person morphemes are also realized by zero morph. Only the negative morpheme is overtly realized by the negative morph *aat* and the clitic *ee*

V+*aat+ee*

tuungkaatee 'Don't sleep' , *keeTkaatee* 'Don't hear',
ndaTakkaatee 'Don't walk'

3. Positive plural imperative: It consists of the verb stem and the plural suffix *ungkaL*. Plural suffix *ungkaL* can integrate both the singular number and honorable status. This imperative form can be used to address either a single individual of honorific status or group of individuals.

V+*ungkaL*

tuungkungkaL 'Please sleep', *keeLungkaL* 'Please hear'
ndaTangkaL 'Please walk'

4.Negative plural imperative: It consists of the verb stem followed by the negative allomorph *aat+iirkaL*

V+*aat+iirkaL*
tuungkaatiirkaL 'Please don't sleep', *keeTkaatiirkaL* 'Please don't hear'
ndaTakaatiirkaL 'Please don't walk'

3.5. Conclusion

A computational syntactic structure of Tamil has been worked out in this chapter. The word level computational analysis helps to facilitate lexical transfer at level. The computational analysis of major phrases such as noun phrase, verb phrase, adjectival phrase, adverbial phrase and postpositional phrase helps to work out transfer at the phrase level. The clause level computational analysis helps to work out trasfer at the clause level. The nature of subordination and different types of dependent and independent clauses have been identified and their structural patterns have been designed to facilitate transfer mechanism. The coordination of phrases and clauses has been dealt in detail. The structures of different types of Tamil sentences and their word order have been studied with the aim of transferring the English sentences into Tamil and vice versa.

CHAPTER 4
GRAMMATICAL FORMALIM AND SYNTACTIC PARSING

4.0. Introduction

This chapter gives an outline of the formal grammars commonly used for syntactic parsing in Machine Translation Systems. The choice of the formalism decides upon the parsing technique to be used. For transferring English texts into Tamil, syntax plays a crucial role. English being an SVO language and Tamil being an SOV language differs crucially from each other in their syntactic make up. For example, English has postpositions, where as Tamil has prepositions. So syntactic parsing is a must to transfer English into Tamil and vice versa. For this various types of grammatical formalisms are used. The CFG (context free Grammar) formalism is the most exploited one. The fundamental idea of machine translation is to transfer source language text into target language text. For that the source language structure at the levels of morphology, syntax and semantics have to be analysed and the information gathered from the analysis have to be transferred into target language by a generator.

The parsing techniques to be adopted for the analysis and generation of a language text rely upon the choice of the grammatical formalism. The widely used formalisms are context-free grammar (CFG), phrase structure grammar (PSG), government and biding (GB) grammar, generalized phrase structure grammar (GPSG), lexical functional grammar LFG), tree adjoining grammar (TAG) and so on. A few of them of are discussed here.

4.1. Context-free Grammar Formalism

Context-free grammar is a widely used formalism for describing languages. It has been widely used because of its simplicity and clarity. A formal linguist describes the structures of a language by devising a collection of rules, called a grammar that can be used in a systematic way to generate the sentences of a language. The form and functioning of these rules differs among different forms of generative grammar. A context-free grammar provides an especially simple way of describing the structures of a language and of setting up a correspondence between the knowledge structures, the structures generated in producing or recognizing a sentence and the processes of recognition and production.

Context-free grammars are also known as immediate constituent grammars (by traditional linguists), Backus normal form (by programming language designers), and recursive patterns (in some computer applications). They are one particular kind of a more general class of phrase structure grammars, which are the basis for generative linguistics and for most computer systems that manipulate either natural language or computer languages.

As a background against which to view the details of context-free grammar, the first part introduces phrase structure and raises some general issues about how structures can be described. The second part gives a formal definition of context-free grammars and presents

the concept of derivation. Section third deals with the problem of recognizing and parsing sentences using a stored knowledge base of context-free rules. Those sections lay out the basic dimensions of parsing strategy and give examples of a number of parsing techniques that have been developed.

Difficulties arise in applying the basic ideas of phrase structure to complex languages (including all natural languages) but in this chapter we will ignore these and concentrate on what can be done with the formalism. Some of the extensions that have been proposed to handle real languages will be dealt later. These extensions gain the power to describe more of the properties of language, often at the price of losing the simplicity of pure context-free grammars.

4.1.1. Three Approaches to Structure

The patterns described by the simple transition networks have a kind of "flat" quality. Our institutions about language call for some kind of constituent structure that is not captured by describing a sentence as matching a sequence of arcs through a network. Sentences are made up of "chunks" or "phrase", and this structuring is important for how they communicate meaning.

One of the major themes of linguistics throughout its history has been an attempt to describe these structures and the ways in which they fit together. There have been many different formulations of the rules for language structure and their details depend on a basic attitude towards how structures are best described. These views of structure are not particular to linguistics. They apply equally well to any study of objects (physical, mental or social) that are describable as being made up of parts that in turn are made up of smaller parts.

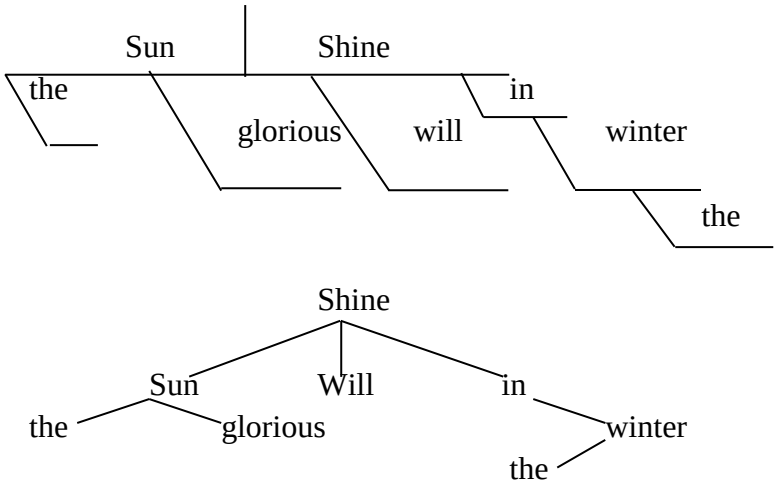
4.1.1.1. The Head and Modifier Approach

Many traditional presentations of grammar describe structures in terms of a basic simple pattern that is elaborated, or modified. For example, the underlying structure of a sentence can be thought of as a noun followed by a verb, with additional words (such as articles and adjectives) modifying the noun and others (such as adverbs) modifying the verb Modifiers can themselves be modified (by words such as adverbs) to produce a multi-layered structure. At each level, there is *a* head, which is a single word and which may have one or more modifiers.

The figure (1) given below shows two different diagrams of a head and modifier analysis of the sentence: *The glorious sun will shine in the winter*. The first is a traditional grammar school *sentence diagram* using a formalism devised towards the end of the last century by Reed and Kellogg. The second is a dependency structure based on a formalism called dependency grammar, which was originally developed in connection with early

programs for machine translation. In both the diagrams of figure 1, modifiers are placed below the word they modify and are connected to it by a line. In the dependency grammar version, even the subject of the sentence is viewed as a modifier. The head of the sentence is the verb *shine*, which conveys what it is that happens. The fact that the sun does the shining is a modification.

Figure 1: Head and modifier structures for a simple sentence



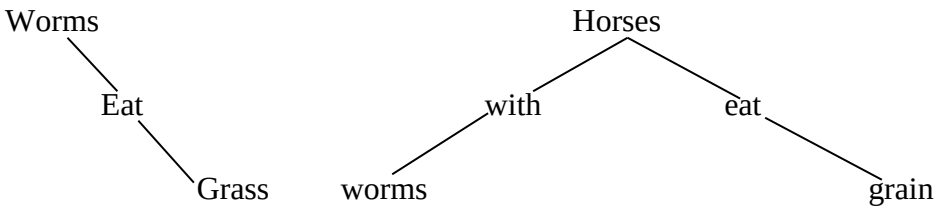
The head and modifier approach has held an important position in linguistics for reasons involving both meaning and syntax. In trying to associate word patterns with meanings, we find that the concept of modification corresponds well to our intuitive notions of description. A noun tells what an object basically is, while adjectives provide further description. A verb tells what happened, while adverbs tell the manner, time, place and other details of how it was done. This correspondence between word structure and conceptual structure is very useful in looking at language as an integrated system for conveying meaning.

The head and modifier approach, as formalized in dependency grammar, formed the basis for some early approaches to question answering, such as Protosynthex I (Simmons, Klein and McConlogue, 1964). It also influenced some of the current approaches to natural language, including Schank's (1975) *conceptual dependency* and Wilks' (1975 a, b) *semantic templates*. Protosynthex I stored the sentences of a children's encyclopedia and when asked a question, it tried to retrieve an appropriate sentence as the answer. Both the stored sentences and the question were parsed into dependency structures. For example, the two sentences *Worms eat grass and* Horses with *worms eat grain* were represented by the structures of Figure 2. In the Protosynthex version of dependency grammar, the main verb depended on the subject rather that the other way around.

When asked the question *What do worms eat?* Protosynthex I found (by means of an index) all the sentences containing the two words *worms* and *eat*. It then checked to see if in any of them the word *eat* depended on the word worms, as in the leftmost tree of figure given

below, since a sentence whose word *worms*, as in the leftmost tree of figure 2, since a sentence whose dependency structure matched that of the question would be more likely to provide a relevant answer. In this case, the sentence *worms eat grass* would be printed out, but *Horses with worms eat grain* would not, since its dependency structure does not match. This was an extremely simplistic form of question answering. It could work only if the relevant answer appeared directly in the stored knowledge, and even then it knew only roughly whether the selected sentence was appropriate. But the use of dependency structures enabled the system to be more selective than a simple keyword search.

Figure 2: Dependency structure used for question answering



At a more purely syntactic level, many phenomena of language follow closely along the lines of head-modifier structure. Most languages have rules of agreement or concord that are conveniently expressed in terms of modification. For example, in Spanish both the adjective and determiner depend for their form on the number and gender of the noun they modify, as in: la *vaca morado, las vacas morados, el caballo morado, los caballos morados* (*the purple cow, the purple cows, the purple horse, the purple horses).* In each of these sentences, the determiner (*la*, *las*, *el*, *los*) and the ending on the adjective *morad*-are selected to match the noun. This feature of head and modifier analysis was a motivation for its use in the early programs for machine translation. It provided a direct handle on the choices that needed to be made in forming the detailed word structure and endings in the target language.

The formal theory of dependency grammar has emphasized ways of describing structures rather than how the system's permanent knowledge is structured or how a sentence is processed. It does not address in a systematic way the problem of finding, the correct dependency structure for a given sequence of words. In systems that use dependency as a way of characterizing structure, the parsing process is generally of an *ad hoc* nature, as will be discussed latter.

4.1.1.2. The Immediate Constituent Approach

The simplest uniform way to describe constituent structures is to extend the notion of pattern as developed by making patterns *recursive.* The elements of a pattern are not limited to words and lexical categories, but can also include the names of other patterns. This allows common sequences to be factored out and provides a kind of nesting that captures some of the structure visible in the head and modifier approach. It could be written as:

(Determiner) Adjective * Noun Verb {{Determiner} Adjective * Noun}

By creating a pattern for *noun phrase* (labeled 'NP'), we can define a sentence ('S') as:

NP = {Determiner} Adjective * Noun
S= NP Vern {NP}

In matching a set of patterns like these against a sequence of words, we are in effect assigning the sentence a *phrase structure*, due to the nesting of sequences within one another. The sentence *The little orange ducks swallow flies* have three constituents: *the little orange ducks* (an NP), *swallow* (a VERB), and *flies* (another NP). In this case, each of these constituents is either a word or in turn made up of individual words. However, immediate constituent grammars allow any constituent itself to be a constituent structure. Figure 3 illustrates three different notations for representing constituent structure, using a more complex set of patterns. The bracketed text notation is used when for typographical reasons it would be inconvenient to use a two-dimensional form. A pair of brackets is labeled with the name of the pattern (appearing just after the opening bracket) and contains all of the elements that make up the instance of the pattern. When a pattern element is matched by a single word, that word appears. When it is matched by another whole pattern, the matching of that pattern is laid out within its own set of brackets.

The box notation illustrates graphically the fact that one pattern is made up of elements each of which can be another pattern. The more usual graphical notation uses *trees*, a formal structure with general applicability for representing a recursive organization based on two relationships – *constituency* and *order*. Each object bears the constituency relationship to a single object called its *parent*. Lines connect objects upward to their parent (or, conversely, down-wards to their children). In this case, the children are the immediate constituents of their parent. The children of any one parent are ordered by the order relationship, in this case corresponding to the left-to-right order in which they appear in the sentence.

Figure 4 gives a formal definition of tree structures that will be used in the rest of this chapter. It includes a role for the 'contents' for each node, as well as its parent and children. In using tree structures to represent immediate constituent structure, each node corresponds to a word or phrase. The contents are a *label* indicating which pattern it corresponds to. Its children are its *immediate constituents*, which in turn represent words or other phrases made up of constituents.

4.1.1.3. The Slot and Filler Approach

The motivation for analyzing the structure of sequence of words is that the result is to be used in some further analysis or processing, such as translation or comprehension of meaning. The fact that there is a particular sequence of recognizable elements is one aspect

of structure, but this does not capture *functional* relationships. For example the pattern 'NP VERB NP' for sentences does not specify that the two instances of NP play in different *roles* – one is the subject, and the other is the direct object.

In a slot and filler (or *role structure*) approach, the pattern for each kind of phrase is described as a sequence of named *slots* or *roles*, each of which corresponds to a *filler* in the sequence to which it is matched. Each pattern element specify the kind of words or phrase it can match (as with the constituent structure approach) and also the name of a role that the word or phrase play in the pattern as a whole. A role name can appear only ones, but the object filling different roles may be of the same kind. A slot and filler pattern lists all of the potential elements and will match phrases containing any combination of them in the right order. Pattern can have roles (such as describers, classifiers and qualifiers of a noun phrase) that are filled by a sequence of items, rather than by a single item.

Figure 5 illustrate a slot and a filler pattern for English noun phrases. It makes use of an asterisk to indicate that a single slot is filled by a sequence of elements of the same type. Although it is still a simplification compared to the full range of English constructs, it covers a wide variety of phrases, including those with all slots filled, such as *All the last three successful game* show contestants from lowa, and those with only some slots filled, such as a *tree* and *three blind mice*.

It is important to recognize that in a slot and filler analysis, role names are different from phrase type. Thus a word that is a Noun can be the HEAD of a noun group or one of its CLASSIFIERS. However, for classes such as ORIGINAL and CARDINAL that have only one function, we have chosen for simplicity to use the same name for both the class and the role.

In a slot and filler analysis, there is still a recursive constituent structure. For example, in analysis of the sentence *the glories sun will shine in January*, there is a slot for SUBJECT filled by an NP, which in turn has slots filled for DETERMINES (*the*), DESCRIBERS (*glories*) and HEAD (*sun*). If there were a simple one- to -one correspondence between slots and sequence of elements in the constituent structure, this approach would be different only in providing a convenient way of referring to elements of the structure without mentioning their position. However, it is often useful to postulate sets of slots along different dimension, with the same element filling a slot in each dimension. Even along a single dimension, we may want to describe an element as filling more than one slot. In this sense, a slot and filler analysis deals with *roles*, rather than *parts.*

The slot and filler approach has served as a standard form of linguistic description in traditional grammar and in much of the structural paradigm. Transformational linguists have not generally dealt with functional consideration (the explicit analysis of roles structure) arguing that they add no syntactic information that is not already expressed in the constituent structure. Other formalism, such as systemic grammar has made extensive use of a slot and

filler approach. The computational paradigm, with its emphasis on integrating the analysis of different levels languages structuring, has reintroduced slot and filler notions in several forms. For the purpose of studying basic syntactic analysis strategies in this chapter, we will use context – free grammars, which deal only with immediate constituent structure.

4.1.1.4. Summary of Structure Types

Figure 6 summarizes the different kind of structuring, extending the basic formal definition of trees (figure 4) by specifying the contents of the node in each of structure. Only phrase structure trees are given a full DL definition in this chapter (figure 7), since we will be using them in defining in procedures for recognition and parsing. A version of role structure nodes will be defined and used for parsing with augmented transition networks.

The labels associated with nodes in a phrase structure tree are either words or *syntactic categories* a formalization of pattern names (like S and NP). Every word or phrase can be assigned to one or more syntactic categories. Figure 8 gives a DL definition, which has a little formal content, but specifies the existence of the class.

4.1.2. Rules and Derivation

A context-free grammar consists of a set of rules, each representing a labeled pattern to be matched against a sequence of constituents. In the most commonly used notation, the pattern name is followed by an arrow, followed the sequence of symbols (syntactic categories or words) that make it up, as illustrated in figure 9.

Figure 9. A simple grammar

S → NP VP
NP → Determiner NP 2
NP → NP2
NP2 → Adjective NP2
NP2 → Noun
VP → Verb
VP → Verb NP

It includes patterns for sentence (S), noun phrase (NP) and verb phrase (VP), making use of the standard syntactic categories from transformational grammar. In addition, a separate pattern (NP2) is used to stand for a structure containing nouns and adjectives but no determiner. Rules for constituents like this one that are parts of the more traditional constituents are needed in writing a grammar that fully characterizes a language. A general definition for rules and context-free grammars appears in Figure 10.

4.1.2.1. The Derivation of Sentences

Figure 11 gives a schema for the generation of a phrase structure tree whose leaf nodes contain the words of a sentence. It is a schema, not an algorithm, because it includes steps that call for making arbitrary selections – different sentences will be derived for different choices. It is not intended as a model of the process that actually goes on in generating a sentence for communication, but more as a form for 'proof' that sentence is in the language defined by the grammar. Just as the rules of proof specify what the legal steps are but do not say what steps to try, a grammar can be used to derive sentences. Each application of a rule corresponds to the use of an axiom or rule of inference in going from one step of a proof to the next. The result is a formal demonstration that the sentence is grammatical. This idea of abstract generation is essential to the generative paradigm and its approach to a language as a set of mathematical objects.

Figure 12 illustrates how a structure for the sentence. *The decorated pie plate contains a surprise* could be derived using the grammar of Figure 9. Notice that the generation as defined in Figure 11 is complete when all of the leaf nodes have terminal symbols of the grammar as their labels. In order to produce a sentence, an additional node would be produced for each of these, containing a word belonging to the lexical class indicated by the label.

The sequence of trees in Figure 12 represents the first few steps of the derivation, based on a sequence of arbitrary decisions as to which unexpanded node should be worked on and which rule for it should be used. The rule is shown on the arrow between the trees representing steps in the derivation. The order of steps is partially determines, since a node must be expanded before any of its children, but there is some freedom, and the same sentence could have been produced by choosing to expand symbols in a different order. For example, the top level NP could have been expanded before its sibling VP.

The schema of Figure 11 builds up a tree structure, which can be filled in with words to produce a sentence. It is also possible to generate sentences of the language without keeping a structural description as in Figure 13. The working structure is a sequence of symbols, which includes both symbols of the grammar and words. AS each rule is applied, one of the symbols is replaced with another symbol or sequence of symbols, eventually leading to a sequence containing only words. Figure 14 shows the steps of a derivation of the same sentence as in 12 in which we have chosen always to expand the leftmost symbol at each step.

In this example, the filling in of words for lexical classes is included as though there were rules such as 'Determiner – *the'* In working with context free grammars, it is sometimes convenient to think of the dictionary as a set of such rules. For each word, there is one rule for each word class (lexical category) to which it belongs. The left-hand side of the rule is the category and the right hand-side is the word itself. This allows the association of words with lexical categories to be carried out by the same mechanisms as the association of sequences of constituents with composite categories. However, in this chapter we will write the algorithms

and schemas on the assumption that there is a separate dictionary associating words with word classes. This calls for slightly more complex definitions, but greatly simplifies the traces used to demonstrate their operation. We do allow a symbol on the right-hand side to be a word, so that words with special syntactic functions, such as *that, to,* by and *which,* can be included directly in rules.

4.1.2.2. Choices and Repetitive Structures

Previously we added facilities of looping and choice to the basic pattern mechanism by using transition network. In a context-grammar, the same effects are achieved by creating appropriate rules.

Figure 13: Schema to derive a sentence without a tree structure.

Generate a sentence (non-deterministic)
Purpose: produce a sentence using a context-free grammar without deriving a tree structure. Background: *a context-free grammar* and *a dictionary* Results: a sequence of words that is a sentence in the language Working Structures: Derived sequence: a sequence. Each member of which is either a syntactic category or a word; initially consisting of one occurrence of the distinguished symbol of the grammar Basic Method: Keep repeating: ❖ If the derived sequence contains only words, return it as the result. ❖ Choose any position in the derived sequence that contains a syntactic category ❖ If the category is ❖ A lexical category then chooses any word in the dictionary belonging to that category, and replaces the symbol at that position with the word. ❖ A composite category, then choose any rule in the grammar having the symbol as its left-hand side, and replace the derived sequence with a new sequence that consists of: ❖ The part of the sequence that was before the chosen position ❖ The sequence of symbols specified by the right hand side of the rule ❖ The part of the sequence that followed the chosen position.

Figure 14: Derivation of a sentence without producing a tree

Rule applied			**Derived sequence**
			S
S	→	NP VP	NP VP
NP	→	Det NP_2	Det NP_2 VP
Det	→	the	the NP_2 VP
NP_2	→	Adj NP_2	the Adj NP_2 VP
Adj	→	decorated	the decorated NP_2 VP
NP2	→	Noun	the decorated Noun VP
Noun	→	pieplate	the decorated pieplate VP

VP	⟶	Verb NP	the decorated pieplate Verb NP
Verb	⟶	contains	the decorated pieplate contains NP
NP	⟶	Det NP_2	the decorated pieplate contains Det NP_2
Det	⟶	a	the decorated pieplate contains a NP_2
NP2	⟶	Noun	the decorated pieplate contains a Noun
Noun	⟶	surprise	the decorated pieplate contains a surprise

By having more than one rule for a single symbol, we can account for choices and optional elements. For example, the rules of Figure 3-9 allow a noun phrase to contain a determiner or omit it, depending on the choice of the rule 'NP → DETERMINER NP2' or 'NP → NP2'. By allowing a rule to contain its own label as part of its right-hand side we can describe structures with repetition. The rule 'NP2 → ADJECTIVE NP2' can be expanded to produce an adjective followed by an unexpanded node that is still an NP2. This can be repeated any number of times to produce a string of adjectives before finally applying the rule 'NP2 → NOUN' to end the recursion.

A number of abbreviations have been developed to make it easier to combine similar patterns. One common abbreviation is to group together all rules with the same label, using vertical bars to separate their right-hand sides. Thus the two rules 'NP → DETERMINER NP_2' and 'NP → NP_2' could be written as 'NP → DETERMINER NP2 / NP2'. Another abbreviation allows the use of parentheses to indicate optional elements, as in 'VP → VERB (NP)' which replaces the two VP rules of Figure 9. Although such notations are convenient for writing complex grammars we will not use them for the simple grammars in this chapter.

4.1.3. Parsing With Context-Free Grammars

The schemas for sentence generation given in section two are not directly applicable to the problem of how people (or computers) would go about generating sentences. To extend the abstract generation process to a model of sentence production, we would need formalism for describing the factors that control the choice of individual rules. There is little that can be done on a purely syntactic level and discussion of this problem will have to wait for the theories of semantics developed in the volume on meaning.

The problem of *parsing* (recognizing sentences and assigning them structures) can be dealt with more directly as a syntactic problem. Many techniques have been developed to apply generative grammars in a uniform way to analyse the structure of sentences. Figure 15 illustrates the relationship between stored knowledge and assigned structures in the use of a parser. It is a more specific example of the general organization.

A parser uses a parsing algorithm, along with a grammar and dictionary, to produce a phrase structure tree that corresponds to a given sequence of words. There is a direct correspondence between the rules of a grammar and the structures it assigns. As in the derivation trees of Section 2 each non-leaf node in the parse tree (the phrase structure tree

produced in parsing) corresponds to a single rule in the grammar, whose left-hand side is the label of the node and whose right-hand side corresponds to the children. Each leaf node is a word in the sequence. A recognizer is like a parser in its use of a grammar, but it does not produce a tree representing the analysis of the word sequence. Instead, it simply succeeds or fails for a given sequence of words, depending on whether it is or is not a sentence of the language defined by the grammar. Recognizers are, of course, not as useful since the reason for parsing is usually to get the resulting analysis. However, in our description of parsing algorithms in the rest of this chapter, we will often first present a related recognition algorithm, and then add the additional steps needed to produce the parse tree.

The problem in designing a context-free parser is to use the correspondence between rules and structures as the basis for organizing the analysis process. Many different parsing procedures have been devised, each with its own kind of working structure and with particular properties of efficiency (in time and storage). In designing a specific procedure, one must make choices along a number of different dimensions of parsing strategy, laid out in the rest of this section.

4.1.3.1. General Issues in Parser Design

To begin with many issues in designing a parsing procedure are not technical choices, but have to do with the overall approach to language and grammar. This chapter deals with context-free grammars and adopts a mathematical idea of grammaticality. This leads to a number of consequences.

Uniformity of Processing: There is no inherent reason why the parsing process must correspond directly to the form of the grammar. By writing a procedure based on specialized knowledge of the language being parsed, it might be possible to do things more efficiently. On the other hand, if there is a simple uniform procedure for applying a set of rules, the job of writing a language under stander is simplified. Once the rules have been put into the knowledge base, no further knowledge is needed for parsing. The correctness of the parsing procedure and the correctness of the grammar can be tested separately. Ideally the same rules would be used in a uniform way for generation as well, although this has rarely been the case in practical systems. This chapter describes only uniform procedures.

Separate Processing of Levels: The stratified model of language structure does not imply a stratification of processing. It is possible to design systems in which the parsing of syntactic structure is intermixed with other processing levels such as word recognition and the analysis of meaning. Much of the difficulty of choosing rules in parsing can be avoided by letting knowledge from the other levels take part in the selection. Some of the more sophisticated computer systems for natural language understanding use a mixed strategy and a number of experiments support the intuition that a human language under stander operates on many levels simultaneously. All of the procedures in this chapter, however, are based on the assumption that the input is a sequence of words and that the parsing is completed without

any appeal to meaning. The strategies for purely syntactic parsing will provide a framework for understanding more sophisticated procedure.

Precision: An obvious property of human language is that we can understand sentences that do not precisely fit a grammar. Even when we recognize a sequence of words as not being grammatical, we are often able to assign a structure to it anyway and figure out its meaning. Some computer systems for natural language are designed with an emphasis on this sort of flexibility. By looking for key words and using fairly unspecific patterns, they can accept a wider range of sequences than would be formally allowed by a grammar. The price they pay is in never producing a complete analysis that could be used to dig out the subtleties of meaning that can play such a large part in communication. They are limited to a rather vague notion of what a sentence is about, and as a result often make blunders in deciding on responses. The generative paradigm is based on an attempt to be precise and our approach here is to follow that path first, looking at flexibility later as a way to relax the precision when forgiveness is called for, rather than eschewing it from the beginning.

4.1.3.2. Dimensions of parsing strategy for context-free grammars

Within the boundaries of purely syntactic, uniform, precise, context-free parsing, there are three major dimensions along which parsing strategies differ. In presenting the details of each, we will begin with a non-deterministic schema, in which one dimension of choice has been fixed but the others are still open. Any actual parsing procedure must make specific choice along all of these dimensions.

Parallel versus sequential treatment of alternatives: There are two different procedures for recognizing sentences with a transition network. One followed multiple possibilities in parallel, keeping track of a set of simultaneous possible states. The other tried them in sequence, backtracking when its choices led to failure. This is one of the fundamental dimensions of strategy for every kind of procedure involving choices, and applies equally to procedure for reasoning and for the analysis of meaning.

Top-down versus bottom-up analysis: Parsing and recognition procedures for context-free grammars are similar to those of earlier discussion. In that we try to match successive elements of patterns (in this case, the right-hand sides of rules) to successive elements of the input sequence. The different is that instead of a single pattern being matched to the entire sequence, a number of rules must be used with elements of one rule calling for the application of another. This leads to the problem of deciding which rules to try, and in what order. There are two basic strategies, corresponding to two different ways of finding answers to the question '*What should I do next*?'

Basically, a top-down procedure begins by looking at rules for the desired top-level structure (usually a sentence), sees what constituents would be needed to make it up, looks for rules for those constituents, and in this way proceeds down the structure tree until it reaches words. A bottom-up procedure begins with the words and looks for rules whose

right-hand sides match sequences of adjacent words that can then be combined into a constituent as identified by the left-hand side. It then tries to combine these with each other and the remaining words into larger constituents and proceeds up the structure tree until it is able to combine constituents covering the entire input into a single structure labeled with the distinguished symbol.

The same structures are found by top-down and bottom-up parsing, but the amount of work done and the nature of the working structures is quite different. We will look at the advantages and disadvantages of each. The distinction between top-down and bottom-up strategies applies in a very general way to any kind of processing. It can be characterized as the difference between goal-directed processing, which is guided by the goal it is trying to achieve (in this case the recognition of a sentence) and data-directed processing, which is guided by the availability of specific data (in this case the words of the input sequence).

Choice Of Nodes To Expand Or Combine: Within the context of working basically top-down or bottom-up, there are still decisions to be made as to which nodes to work on first, either by expanding them (in a top-down procedure) or by combining them (in a bottom-up procedure). There are two basic organizations used to make these decisions; moving systematically through the input in one direction (usually from left to right), or systematically taking chunks of increasing size. There are mixed strategies in which a basically directional organization has a size-oriented substructure. How much work will be done with a given grammar on a given input depends significantly on the details of this choice.

We generally can use a left-to-right strategy with top-down procedures and a chunk-building strategy with bottom-up procedure. This is the simplest combination but not the only one. Many parsers for programming languages use left-to-right bottom-up procedures, which can take advantage of special properties of the grammars. Some parsers used in speech understanding systems operate top-down but look for islands from which they work in both directions. For example, in looking for an NP they first look for a noun (which tends to be more clearly enunciated and more predictable from meaning) and then work to the left looking for adjectives and determines and to the right looking for modifying phrases.

Even in working across in a single direction it is possible to go from right to left instead of from left to right, and some parsers adopt this ordering. As far as the formalism is concerned, there is no privilege to either direction, but it seems more natural to proceed in the same order that the words would be heard in spoken language. Parsers that operate primarily in this direction are more likely to be good psychological models than those that need to have the entire sequence of words available before beginning processing. Of course, the use of the term ‘left-to-right’ for temporal order is specific to the writing conventions of English and other European languages. A Hebrew or Arabic parser would naturally operate ‘right-to-left’.

4.1.3.3. The Problem of Ambiguity

An obvious feature of natural language is their ambiguity. The same sequence of words often has more than one interpretation. In those cases where this is due simply to polysemy (multiple meanings) of individual words, it does not present a problem for parsing. The sentence *she walked towards the bank* must be interpreted in a context that makes it clear whether it is the bank of a river or a financial institution, but the syntactic structure is identical in the two cases.

However, there are many cases of ambiguity where the syntactic structure is ambiguous. A classical example is the phrase *the old men and* women, in which the modifier *old* can be associated with either *men* or *men* and women. Conjunctions such as *and* are a major source of structural ambiguity. The attachment of modifying phrases is another common problem, as in the sentence multiple word classes, as in the two parsings of I saw that gasoline *I saw the man on the hill with a telescope*. There are at least three different ways to interpret the phrase, differing in whether I used a telescope, 'there is a telescope on the hill, or the man had a telescope. Other ambiguities arise from words that are in multiple word classes, as in the two parsing of *I saw that gasoline* could explode.

A context-free grammar is said to be *ambiguous* if it can be used to derive two different trees that have the same sequence of leaf node. A classical case of ambiguity is illustrated in Figure -16. Note that *time* is listed in the dictionary as a noun (*Time passes slowly*), a verb (*We are timing the marathon*) and an adjective (*Show me the time cards*).

A parsing procedure can be based on either of two basic attitudes towards ambiguity; it can search for a single interpretation and quit as soon as it has found one or it can return all of the possible interpretations. In general parallel procedures are better suited to returning all of the interpretations since they work on them all simultaneously. Back tracking procedures naturally stop as soon they find a single parsing, but it is easy to produce all the parsings by forcing them to back track each time they succeed. In describing the procedures below, we will assume that the parser should stop as soon as one parsing is found. It is an easy exercise to modify them to continue until all parsings have been found.

4.2. GB Formalism

We begin by posing a question: Why in spite of being the dominant linguistic theory, Government and Binding (GB) has been comparatively less popular with computational linguists? Basically there are two reasons:

1. GB does not address itself to either the problem of natural language parsing or of generation. Its goal is to identify the innate structure in human mind, which enables a child to acquire the language so effortlessly. As a result it proposes its formalism in a form for which neither existing parsing tools developed by computer scientists can readily be used, nor is it clear how new efficient parsing techniques will be designed in a straight forward manner. In other words one has to begin, in one sense, ab-initio.

2. The GB theory has not yet reached a stable enough from "where one would invest the effort in building a complete GB parser. It has been commented, "TG is a field whose very foundations shift as remorselessly as quicksand" (Radford, 1988).

The next question that comes up naturally is: If the above reasons hold why should NLP workers invest their time and effort in studying GB? The answer goes as follows: 1. If one is interested in the task of accepting only grammatical sentences then at least for languages like English where movement plays a crucial role, examples are known, for which, "there is no natural way to capture their effects in any of the well-known logic grammars or extensions of them" (Stabler, 990). It is not being claimed here that GB has satisfactory solutions to these problems but at least a very large number of leading linguists are working on these problems in GB framework and one would like to get benefit of their efforts and insights.

Whereas many other grammatical formalism either do not address the problems of anaphora resolution and quantifier scoping or assume that they are best handled by pragmatics, GB linguists invest most of their efforts in attempting to solve these problems using the same machinery which GB has developed for handling wh-movements. Of course it must be admitted here that they address a very small fraction of the anaphora resolution problem.

Because for implementing GB parser one has to start ab-initio, one tends to tailor the parser according to the need of the natural language, e.g., due weight age is given to the lexical properties of heads of constituents early enough in the parser along with principles for case assignment and thematic role assignment, which in turn enables one to properly address the problem of ambiguity in an appropriate manner (see Wehrli (1988). In other words, because the theory is silent or neutral to parsing or generation, particularities of the natural language concerned can be made use of while designing a parser without coming in conflict with the theory. Having seen the goal and the concerns of GB and why NLP researchers should look at GB, at least while working on English like languages, we will first give an overview of the GB model. In the next section we will look at GB in more detail, in particular, at each of the principles and modules. In Section 3, we will suggest how GB can be used computationally for parsing English.

The basic organization of GB grammar can be seen in Fig. I. It has three levels of representations of a sentence: D-structure, S-structure and LF-representations. PF-representation is the sentence itself.

In GB model a crucial role is played by interacting systems of principles, which are listed in Fig.18. These systems of principles place constraints thus filtering out ungrammatical representations.

Fig. 17: GB Model

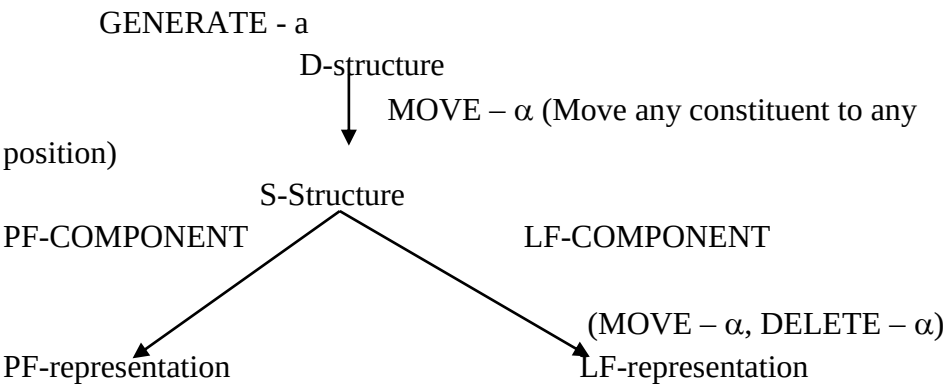


Fig.18: GB Principles

X – bar theory
Thematic theory (theta theory)
Government (Definitions)
Case theory
Bounding theory
Binding theory
Control theory

Typically, various principles have some parameters associated with them. These parameters are meant to make the grammar flexible enough to account for all the different languages.

4.2.1. The GB Modules

In what follows is a very brief summary of GB principles. It is based, primarily, on Duarte (1990).

4.2.1.1. X-bar theory

X-bar theory gives the structure of phrases in GB. It replaces the phrase structure rules of earlier transformational grammars. It says that if there is a head Xo, it has a maximal projection termed as X. The maximal projection is a phrase optionally containing a complement and a specifier as determined by the head and also possibly adjuncts. This can be stated in terms of rule schema as follows, where curly brackets indicate the optionality of constituent.

X ------▶ adjunct X……. (1)
X ------▶ X adjunct…… (2)
X ------▶ {spec} X ……...3)
X ------▶ Xo {Comp}…….. (4)

X ⟶ adjunct X …… (5)
X ⟶ X adjunct…….. (6)

The order of constituents on right hand side of rules (3) and (4) may be language dependent, e.g., in Hindi Comp will precede Xo. This is a simple example of a choice of parameter. The order shown here is for English. Xo is termed head X and is its maximal projection. Xo can be a lexical category like N (noun), V (verb), A (adjective) or P (preposition) or it can be a functional category like infl, COMP etc. Spec, COMPl and adjunct must be maximal projections. Head controls the choice of Spec and Compl both semantically as well as syntactically. Projection Principle: Lexical properties must be represented by categorical structure at every level of syntactic representation (i.e., D-and S-structure, and LF representation). This principle, which is not, a part of any one of the seven systems of principles listed in fig. 2.ensures that lexical requirement information is present at each level of representation and moreover, it also insists that the information must be coded in terms of configurational positions, a choice which is natural for English – like languages.

4.2.1.2. Theta Theory

θ-Criterion:

1. If α is an argument of β then the position P occupied by α is assigned one and only one θ-role R.
2. If β has a θ-role R to assign, then this θ-role is assigned to a position P and P is occupied by one and only one argument.

Note that in GB theory θ-roles are assigned to syntactic positions and not directly to arguments.

One of the main consequences of the θ-criterion is that constituents are allowed to move to non – thematic positions only. (This is a simple example illustrating constraints on movement imposed by system of principles.)

4.2.1.3. Government

Before we define government, we will define some structural relations.

Def. C-Command: α c-commands β iff
(a) α does not dominate β and
(b) the first branching node that dominates α dominates β

Def. M-Command: α m-commands β iff
(a) α does not dominate β and
(b) every maximal projection that dominates α also dominates β.

Def. Intervene: S intervenes between α and β iff
S dominates α and does not dominate β.

Initial definition of government: α governs β iff:
(a) α is a head;
(b) α in – commands β, and
(c) there is no intervening maximal projection between α and β

Revised definition and one we will use is as follows:
Def. Government: α governs β iff:
(a) α is a head;
(b) α m-commands β; and
(c) there is no intervening barrier between α and β

Where barrier is defined as follows:
Def. Barrier is a maximal projection such that
(a) it is non - θ - marked;
(b) is fully specified (i.e. its spec position is filled); and
(c) its head is a functional category.

Remark: The crucial idea behind government is to define the domain of influence for a head.

Def. Proper Government: α properly governs β iff
(i) Either it is a lexical government i.e.
(a) α governs β; and
(b) α is a lexical head
(ii) or it is an antecedent government, in which α governs β except it does not α require to be a head, it can be a maximal projection. However, α must be co-indexed with β.

4.2.1.4. Case Theory

Case Filter:

(i) Every NP with phonetic content must be case marked.
(ii) Every argument NP (distinct from PRO) must be case marked.
Case Assignment: certain heads assigns Case e.g.
1. Verb assigns accusative case
2. Preposition assigns oblique case
3. infl (+AGR) assigns nominative case

Principle**:** Case is assigned under government

4.2.1.5. Bounding theory

Subjacency: No instance of Move-α can cross more than one barrier

Empty Category Principle (ECP)

All traces must be properly governed.

4.2.1.6. Binding theory

Def. Binding α binds β.

(a) a c-commands β; and

(b) a and β are co-indexed

Binding Principles:

(a) An anaphor must be bound in its governing category.

(b) A pronominal must be free in its governing category.

(c) An R – expression must be free everywhere.

Note: free means it should not be bound by a potential argument position.

Def. Governing Category: α is the governing category for β iff

α Is the minimal maximal projection containing

(a) β

(b) the governor of β, and

(c) a SUBJECT

Def. SUBJECT. A SUBJECT is either

AGR with respect to infl or

A subject NP with respect to NPs and small clauses.

The tables given below indicate what items are anaphor and what are pronominal. They include lexical categories as well as empty categories.

Lexical categories
Pronominal

	+	-
+	-	himself etc
-	him etc	proper noun - etc

Empty Categories
Pronominal

	+	-
+	PRO	NP-trace
-	PRO	wh-trace Q-trace

4.2.1.8. Constraints on movement

Based on the above principles, this is what we can say about movements (Duarte, 1990):

1. What can be moved?
Only heads and maximal projections are free to move.
2. Where can these be moved?
   - The landing site has to be a non-thematic position.
   - A head can only be moved to another head position and a maximal projection can only be moved to a maximal projection position.
3. By what process can a movement occur? If the target position is an empty spec or head position then the process is of substitution else it will be by adjunction.
4. How far apart a moved constituent and its trace can be? This is answered indirectly be the following conditions:
   - Subjacency: In a single step no movement can cross more than one barrier.
   - ECP: All the traces must be properly governed.

Binding theory: An NP trace must be bound in its governing category and a wh-trace (in general, a variable) must not be bound in its governing category.

4.2.2. How can GB help in parsing?

In English like language where primary information about thematic roles is coded in terms of relative position and yet it also permits movements for topicalization etc., it is not difficult to see the importance of various constraints on movement, which directly follow from various principles of GB theory.

To begin with one might suggest the following steps for parsing an English like language.

1. Using X-bar system of principles, form phrasal categories on the basis of lexical heads. This step may again be broken up in following sub-steps:

- Recognize lexical heads
- Search for the longest well-formed sequence of specifiers and attach it (i.e., make it a sister) to the phrasal category dominating the lexical head.
    - Non-deterministically propose possible Xs as complements.

2. Using θ-criterion and projection principle identify the needed empty categories in the s-structure.

To decide the type of empty-category one may use the facts of following kind.

- If the position is not properly governed it must be a PRO (from ECP).
- If the position has a case assigned to it, it must be a variable trace. (from non NP-movement).

3. Using binding theory (in case of PRO, using control theory) find the co-indexed phrase.

In case of a trace, determine its governing-category, and then depending on the fact whether it is an NP-trace or a variable look for the antecedent in the governing-category or outside it, respectively.

Note that the domain of search need not cross more than one barrier.

Following are some examples from Saint-Dizier (1990) with some-what simplified S-structure, which illustrate the approach.

4.2.2.1. Relative Clause construction:

Take the following example:

The boy who Mohan met yesterday is coming tomorrow

S-structure of relative clause in the above is:

$\{_{COMP}$ who $_i$ Mohan met $\{NP\ t_i\}$ yesterday$\}$

Note the empty category is not a PRO because it is properly governed and it is not an NP-trace because it has accusative case assigned by the verb. So it cannot be bound by an argument position. Co-indexing it with 'who' satisfies all the constraints.

4.2.2.2. Passive Construction:

In case of passives, the following additional assumptions are made:

- A passivized verb cannot assign case to its object NP.

- θ -grid requirement of a passive verb differs in following manner from that of active verb.

(a) No θ -role is assigned by a passive verb to its subject-NP in d-structure
(b) A 'by-complement' with the θ -role of the subject NP of the active verb can be optionally present at d-structure.

Consider as an example:

A book was thrown.

[[$_{NP}$a book] $_{i}$ [was thrown [$_{NP}$ ^{t} $_{i}$]]

In this case, the trace is an NP-trace because it is in a position, which is properly governed but does not have a case. So it must be bound in its governing category, which is the sentence itself. So the NP in subject position binds it appropriately.

4.2.2.3. Subject-to-subject raising

Consider the example sentence below with its S-structure:

Mohan seems to be on time.
[$_{Infl}$ Mohan $_{i}$ seem [$_{COMP}$ trace $_{I}$ [$_{VP}$ to be on time]]]

Again this is a case of NP-movement because it cannot get case from an infl with-AGR feature, so it moves to a non- θ -marked position. Note 'seem' does not θ -mark its subject position. (it seems Mohan is on time.)

4.3. Lexical Functional Grammar

Lexical Functional Grammar (LFG) has been designed by Kaplan and Bresnan (1982) with a view to provide a computational formalism for analyzing sentences in natural language. The main problem it addresses is how to extract grammatical relations from a sentence. It postulates two levels of representation: one based on constituent structure and the other on grammatical functions such as subject, object. A particular source of difficulty in English is the fact that positions are used for coding both theta relations as well as topicalization etc. Considerable effort has gone into design of LFG so that it can deal with and separate these two kinds of information. LFG also indicates how the grammatical functions can be mapped onto theta roles. But here, it offers no theory; the mapping must be enumerated exhaustively in the lexicon.

A major strength of LFG is that it gives explicit algorithms for extracting grammatical functions. It uses context free grammar (CFG) for specifying constituent structure. Efficient parsing algorithms for CFG are well known (e.g. Early (1970), Cocke, Younger, Kassami algorithm (in Younger (1967), Tomita (1986). LFG uses the powerful unification mechanism

for specifying mapping to grammatical relations. The same mechanism uniformly handles constraints across constituents in the constituent structure. More importantly, algorithms that solve these constraints are completely specified.

A weakness of LFG is that it does not offer any theory regarding lexical ambiguity, adjuncts and optional theta roles, and mapping from grammatical relations to theta roles. These tasks are left for the lexicon with LFG offering no linguistic insight as to how to do them. In fact, if one were to exhaustively enumerate the possibilities, in the lexicon the solution would be computationally expensive too.

Here we will focus on some selected aspects of English, namely two types of movements, and see how LFG handles them. Again this is a case of NP-movement because it cannot get case from an infl with-AGR feature, so it moves to a non- θ -marked position. Note 'seem' does not θ -mark its subject position. (it seems Mohan is on time.)

The following are the movements of interest here:

1. active-passive and dative constructions
2. wh-movement in wh-questions

Before going into the LFG formalism, it is appropriate to make a few observations on the phenomena to be explained.

Active-Passive and Dative Constructions

As examples of active-passive construction, consider the sentences (1) and (2).

(1) A boy gave a book to the girl
(2) A book was given to the girl by a boy.

Sentence (2) can be thought of as a sentence that has been obtained from its active counterpart (1) by moving the object 'a book' to the subject position, and converting the subject 'a boy' as a prepositional phrase and moving it to after verb. Moreover, optionally, the latter can be dropped altogether as shown by sentence (3). In fact, in the passive sentence, both object and the 'by' prepositional phrase can be dropped.

(3) A book was given to the girl.
(4) A book was given, yesterday.

In dative construction, there are double objects.

(5) A boy gave the girl a book.

This can again be considered to be obtained by movement of 'to' prepositional phrase as the object, and earlier object as object 2. Another passive form is possible on dativization. Example sentences with the passive form are given in (6) and (7).

(6) The girl was given a book by the boy.
(7) The girl was given a book.

Wh-movement in Questions

In a wh-question, the wh-phrase containing the questioned element moves from its normal position to the front of the sentence. Examples are sentences (8) to (12).

(8)* Ram killed who?
(9) Who did Ram kill?
(10)* Mohan said Ram killed who?
(11) Who did Mohan say Ram killed?
(12) Who did Mohan say Shyam believed Ram killed?

As sentence (12) shows, wh-element can move (arbitrarily) long distance in case of (arbitrarily deep) embedded sentences.

4.3.1. LFG - Overview

LFG assigns two representations (at two different levels) to a sentence. They are called c-structure (for constituent structure) and f-structure (for functional structure). The former is a tree structure, which shows word order, and hierarchical structure of constituents. The letter is a structure containing a set of attribute value pairs, and it may also be hierarchical. Consider sentence (5) as an example.

(5) A boy gave the girl a book

Its c-structure is shown in Fig.1a. It has the usual syntactic and lexical categories. The tree encodes hierarchical as well as word order information. The corresponding f-structure is given in Fig.1b. It has the attributes subj, pred, tense, obj, obj 2, spec, etc. The values of the attributes are shown next to them. Subj, obj and oibj2 are called grammatical functions because they are specified by the grammar and not by the lexicon. Pred is a special attribute that maps to semantic representation from the f-structure. From the above f-structure, we can obtain the following predicate argument representation (ignoring spec and tense):

give (boy, book, girl)

If we take the passive sentence (6)

The girl was given a book by a boy.

the final predicate-argument representation must remain the same as before: give (boy, book, girl) indicating that the 'gross' meaning of active and passive remains the same. This holds in spite of the different c-structure and f-structure from the active sentence: As the f-structure in Fig.2 indicates (see values of pred) there would be at least two lexical entries for give: one corresponding to the active use and the other to passive use in dative construction. (In fact, there will be two more lexical entries for normal active and passive and several more to take care of optional object and prepositional phrases in case of the passives).

Figure 19: C-structure

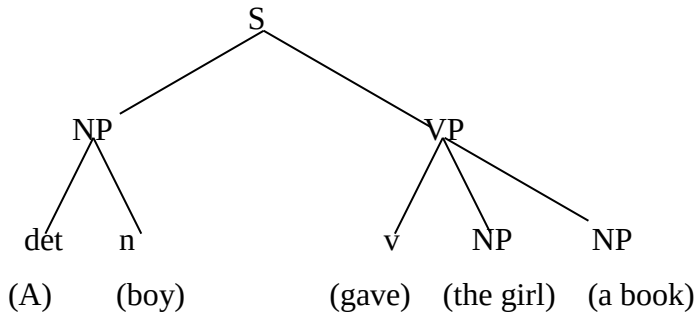
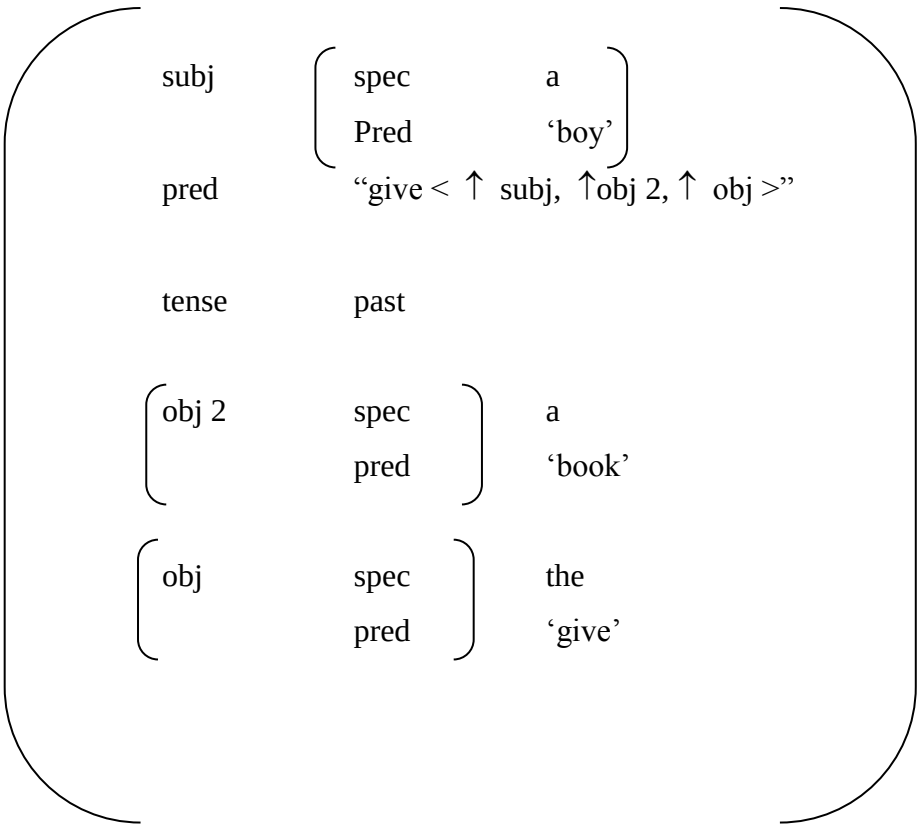


Fig. 20: f-structure



4.3.2. LFG Formalism

LFG formalism has two major components: a context free grammar and a functional specification. The former gives the c-structure for a sentence, and the latter gives the f-structure. The two components are inter-related, however, and using functional specification together with the c-structure produces the f-structure.

The functional specifications usually consist of equalities associated with each non-terminal on the right hand side of the context free (CF) rule. In the example grammar from Kaplan and Bresnan (1982) given below, there are two special symbols: up-arrow and down -arrow (called as meta-variables). The down-arrow in a functional specification associated with a non-terminal refers to the f-structure with the non-terminal, while the up-arrow refers to the f-structure associated with the symbol on the left-hand side of the CF rule.

(R1) S → {NP} VP
↑ subj = ↓ ↑ = ↓

(R2) VP → V {NP} {NP} PP*
↑ obj =↓ ↑ obj 2 = ↓ ↑
(↓pcase)= ↓ obj

(R3) PP → prep NP
↑ obj = ↓

(R4) NP → det noun | pronoun

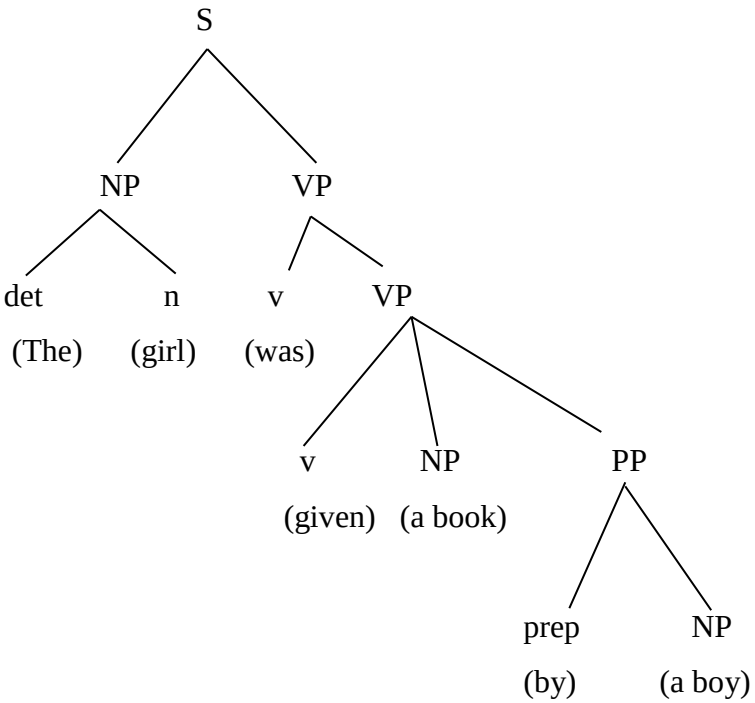
Rule RI says that a sentence (S) consists of a noun phrase (NP) followed by a verb phrase (VP). The functional specification associated with the NP says that the f-structure for S has an attribute subj whose value is the f-structure for NP. The second specification says that the f-structure for VP and S are equal.

In rule (R2), both NPs are optional, which are followed by prepositional phrase (PP) repeating zero or more times. The NPs contribute to object or object2, in the f-structure of the sentence, PPs are stored as adjunct.

To obtain the f-structure, we must use the functional specification along with the c-structure. Consider as an example, sentence (5) whose c-structure is given in Fig. 19. Let f1 be the f-structure of the sentence and f2 that of the NP. Therefore, on using the subject specification of the c-structure we get:

f1 subj = f2

Fig.21: C-Structure and f- structure for passive sentence (6)



$$\begin{bmatrix} \text{subj} & \begin{bmatrix} \text{spec} & \text{the} \\ \text{pred} & \text{‘give’} \end{bmatrix} \\ \text{pred} & \text{‘give’ } (\uparrow\text{by obj } \uparrow \text{ obj, } \uparrow\text{subj,)’} \\ \text{tense} & \text{past} \\ \text{obj} & \begin{bmatrix} \text{spec} & \text{a} \\ \text{pred} & \text{‘book’} \end{bmatrix} \\ \text{by} & \begin{bmatrix} \text{spec} & \text{a} \\ \text{pred} & \text{‘boy’} \end{bmatrix} \end{bmatrix}$$

Similarly other equations can be written down. The terminals also yield equations, using the lexicon. Solution to the equations is an f-structure shown in Fig.1b. It is associated with the root node S in the c-structure.

Some example lexicon entries are:

the, det

↑spec = the

boy, noun
↑pred = 'boy'
↑num = singular

4.3.3. Well-formedness Conditions

F-structure assigned to a sentence must satisfy certain well-formed ness conditions. If and of these conditions are violated the assignment is rejected and an alternative structure explored.

The first condition that must be satisfied by an f-structure is that of *uniqueness*, says that an attribute in an f-structure can have at most one value. For example, if it required that the following f-structure (corresponding to 'boys' and 'a') is made equal.

Fig. 22: F-structures for 'boy' and 'a'

$$\begin{pmatrix} \text{num} & \text{plural} \\ \text{pred} & \text{boy} \end{pmatrix} \qquad \begin{pmatrix} \text{num} & \text{singular} \\ \text{spec} & \text{a} \end{pmatrix}$$

it will fail to yield a consistent f-structure because of the clash in the value of attribute num. Note on the other hand that the following:

$$\begin{pmatrix} \text{num} & \text{singular} \\ \text{pred} & \text{boy} \end{pmatrix} \qquad \begin{pmatrix} \text{num} & \text{singular} \\ \text{spec} & \text{a} \end{pmatrix}$$

can be made equal by the following f-structure.

Fig. 23: A simple f-structure on unification

$$\begin{pmatrix} \text{num} & \text{singular} \\ \text{pred} & \text{boy} \\ \text{spec} & \text{a} \end{pmatrix}$$

This process of making two f-structures equal is called unification. It will be discussed in detail later. The uniqueness condition is a general method for specifying cooccuse restrictions including agreement.

The second condition is that of *completeness.* Approximately, an f-structure is plete if it contains all the attributes named in the arguments of its predicate. For example if we have the attribute pred with the value:

give < (↑ Subj, ↑obj2, ↑obj)>

the f-structure must contain values of the attributes subj, obj and obj2. This condition would cause the following sentences to be rejected for example:

*A boy gave the girl.
*A boy gave.

Note that these would not otherwise be rejected by the grammar rules.

The third and final condition relates to coherence. It states that if there is a grammatical function in the f-structure, it must also occur in the predicate-argument combination. For example, if there is a grammatical function obj2, then it must also occur in the value of pred. This would cause the following sentence to be rejected:

*The boy slept the book.
*The boy ate the apple the girl.

because predicate for sleep has only one argument (relating to subject), and that for eat has only two arguments.

The second and third conditions correspond to theta criterion of GB (Chomsky, 1981) or akanksha-yogyata principle of Panini (Bharati et al., 1990). They capture sub categorization and theta-role assignment.

4.3.4. Handling Wh-movement in Questions

To handle long distance movement, there are bounded met variables notated as down and up arrows with double-edged tails (⇧, ⇩). They are respectively called controller and controllee. Here, we will consider wh-movement related to questions only.

To handle the fronting of wh-phrases we will change rule R1 to R1'. Also the gap left behind by the movement will be handled by allowing empty noun phrase (see R5).

(R1) S → {NP} NP VP
↑ wh = + ↑subj = ↓ ↑ = ↓
↑ Quest = ↓
↑= ⇩

(R5) NP → e
↑ = ⇧

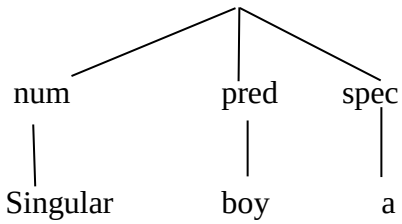
By defining the f-structure of the moved wh-phrase as a controller, and that of the empty NP as a controllee, we indicate that the f-structures are the same.

Thus, controller and control lee have a special meaning in LFG. The closest nested matching controller and control lee are made equal. (This is equivalent to co indexing in other grammars.) Other rules about agreement etc. continue to hold. As an illustration consider the following sentences.

*Which boys$_i$ e$_i$ comes to school in time?
Which boys$_i$ e$_i$ come to school in time.

The former sentence is bad because of agreement violation of the empty element with the verb

Fig. 24: Graph representation of a f-structure



4.3.5. Computational Aspects: Feature Structures and Unification

As mentioned in the introduction, a major strength of LFG is that it gives explicit algorithms by which c-structure and f-structure can be obtained for a sentence. As it uses CFG, the parsing problem namely arriving at a c-structure from a sentence is a solved problem. Several efficient algorithms are known and their implementations are available "off-the-shelf."

F-structure of a sentence can be obtained using its c-structure and functional specifications in LFG. Here, use is made of unification, a powerful operation. We discuss the nation of feature structure and unification below. The discussion is based on Reyle and Rohrer (1988: Introduction).

4.3.5.1. Features and Feature Structures

Features have been used in Linguistics since long at nearly all levels of linguistic description. A simple example of features associated with a noun phrase has been given in Fig.23 in the form of matrix representation. It can be expressed in the form of a graph representation in Fig.24. It is simple in the sense that each attribute (or feature) has an atomic value that it can take out of a fixed finite set. If we relax atomicity, the value of an attribute can be a feature structure and we can build hierarchical structures. Suppose we were to group num and person into one feature called agreement, and then its value would be non-atomic (see Fig.25). In f-structures in LFG, we have been using such complex structures.

Feature structures can simply be viewed as complex symbols or complex categories. GPSG by Gazdar et al. (1985) which uses features extensively, in fact, can be shown to be equivalent to a CFG by this (and other) argument(s). To illustrate the argument, suppose we want to say using features that subject must agree with the verb in number:

S → NP VP

(↑ subj = ↓) (↑subj num = ↓ num)

Suppose further that num can take one of two values s(ingular) and pl(ural). Now number agreement can be expressed without features by suitably adding new categories and rules:

S → NP-S VP-S I NP-PL VP-PL

where NP-S stands for singular noun phrase etc.

4.3.5.2. Unification

Feature structures or complex categories form a lattice based on subsumption also called extension (notated as ⊆) It can be defined as follows:

Definition: A ⊆ B iff

Case (i) A and B are atomic values:

Then A = B

Case (ii) A and B are feature structures:

Then if there is a pair (a, u) in A, there is a pair (a, u) in B such that u ⊆ v.

For every attribute value, the bottom element of the lattice is the empty feature structure and the top element T is an artificially introduced element for which X ⊆ T for all X. Subsumption is a partial order which, roughly speaking, expresses whether two structures are consistent and whether one contains more specific information than the other.

Two feature structure FS1 and FS2 are *consistent* if there is a feature structure FS (other than T) such that FS ⊆ FS1 and FS ⊆ FS2.

Unification of FS1 and FS2 is the least upper bound of FS1 and FS2 over the subsumption lattice. (Unification is said to succeed if a least upper bound (other than T) exists.)

The notion of unification, while it has been borrowed from logic, is more general here. A term in logic has fixed number of arguments, whereas in feature graphs the number of features is open. For example, in Prolog we may express the NP 'a boy' from Fig. 23b as:

np (boy, a, singular)

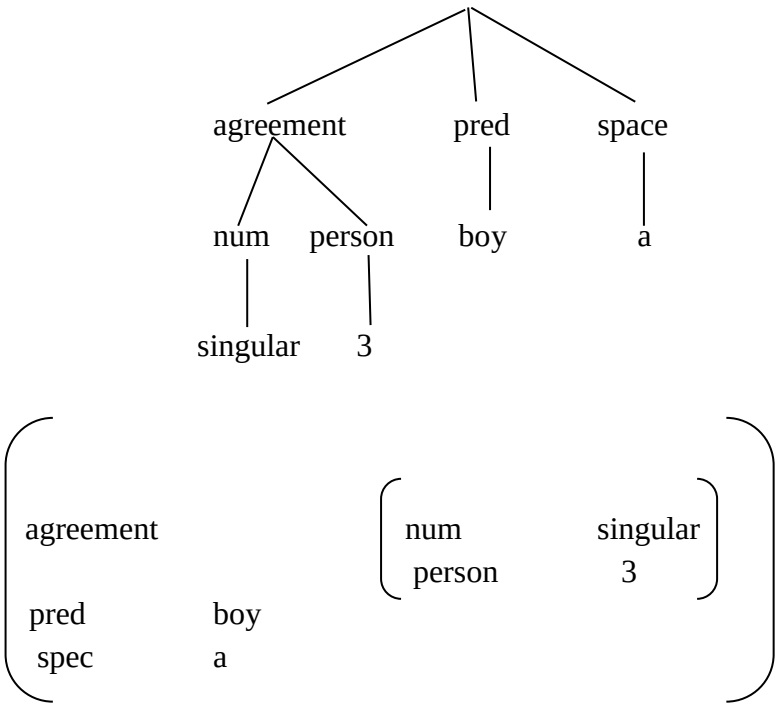
Here, the arguments correspond to pred, spec and num, respectively. It can be obtained by unification from the following two terms for 'boy' and 'a' corresponding to Fig. 23a:

np (boy, ---, singular)
np (- - - -, a, - - -)

If we now wanted to add some additional information with the term for 'boy, say, about height it is not easy as changes have to be made for all kinds of other np terms.

As opposed to above, it is a relatively minor matter in feature structures to add a new feature. Absence of a feature in a feature structure simply means that the structure does not restrict the value of the feature in any way. It can be said that the feature structures assume an open world while the terms assume a closed world.

Fig.25: Graph and matrix notation for a complex feature structure



Thus, feature structures and their unification gives flexibility to the linguists in that they do not have to specify in advance how many features can show up and in what order they should appear.

In unification grammar of Kay (1979), LFG, GPSG etc. the context free rules specify how the constituents are to be built up, and the constraints on features indicate restrictions that hold across constituents (between daughter nodes or between mother and daughter nodes). Informally speaking, constraints provide the possibility to transport information along

the branches of a syntactic tree. (If we get rid of the constraints and encode them into complex categories in context free rules, the information transport across categories is "compiled" by increasing the number of categories).

If we compare with attribute grammars we find that in those grammars, synthesized features percolate from bottom to top of the tree, whereas inherited attributes flow down the tree. Unification, on the other hand, is order free. The same result is obtained irrespective of top-down or bottom-up processing. Of course, completeness and coherence can only be checked at the end after final f-structure is obtained.

Unification over feature structures has the advantage that it gives considerable freedom to the linguist in specifying restrictions across constituents. It also gives freedom to the implementor to perform the checks at whatever stage in whatever order he wishes. But there is a price to be paid. It results in an inefficient operation for two reasons:

1. No order is implied, and in fact, as there is no way to assert that something, say, some important feature should be checked first, it results in inefficiencies. Structures are built and only much later an important feature may cause failure and undoing of work.
2. Because of the flexibility it provides, unification is an expensive operation.

4.3.5.3. Other Constraints

LFG also permits existential constraints. It is used to express that an attribute must have a value without specifying the value. For example,

(↑ tense)

is an existential constraint in the CF rule R6 for yes-no questions:

(R6)	S→	V	NP	VP
		↑ aux = c +	↑ subj = ↓	↑ = ↓
				(↑ tense)

It asserts that the attribute tense must have a value in VP. This constraint can only be checked at the end after the f-structure has been built.

A negative existential constraint is also available, which in contrast to above, asserts that the named attribute must not be present.

Finally, there is another type of constraint that expresses necessity of existence of a particular value. For example,

(↑ aux = c +)

in rule R6, expresses the necessity that the attribute aux must have the value '+'. Unlike unification (for normal equality) this constraint only checks the value, it does not add it to the

f-structure if not already present. Purpose of this device is to avoid putting default value of an attribute everywhere when the non-default value is needed only at a few places. In the example above, if we did not have the necessity constraint, we would have to say with every non-auxiliary verb that the value of attribute aux is '-'. Now, that is not necessary: when nothing is stated about aux, the default value is '-'. It should be noted that if for an attribute only this kind of constraint is used, it overrides the open world assumption.

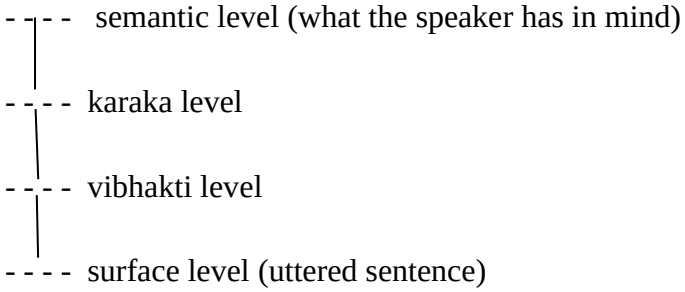
4.4. Paninian Formalism

The problem that has intrigued the generative linguists is how a human child is able to acquire natural language without any formal training simply by exposure to a miniscule amount of 'positive' language data. They postulate that there must be a universal grammar every child is born with, and which gets instantiated to a particular grammar for the language to which the child is exposed. The grammar allows the child to determine the grammaticality of sentences.

The goal of the generative enterprise is to characterize the initial state of knowledge of language that allows a human child to acquire the language so effortlessly (by his or her intimate association with a speech community). This is assumed to be distinct from other cognitive structures in the mind.

In contrast to above, the question that has intrigued Paninians is how is it that a speaker is able to convey information to a hearer by means of natural language. How is the information that a speaker wants to convey, represented or coded in language and how is the hearer able to extract the information? The goal of the Paninian enterprise is to construct a theory of human communication using natural language. Grammar, a part of such a theory of communication, is a system of rules that establishes a relation between what the speaker decides to say and his utterance, and similarly, the utterance and the meaning a hearer extracts. The following figure (26) shows the levels in Paninian model (Akshar Bharati et al 2004: 191)

Figure. 26: Levels in the Paninian model



The major task for the theory in generative enterprise is to correctly classify sentences as grammatical or ungrammatical. Meaning comes in through coindexing or theta

assignment. But, at times, meaning and grammaticality may be at variance. For example, in anaphora, coindexing shows what the grammar permits; on the other hand there are known contexts when native speakers accept a coindxing not permitted by the theory. (See Zribi-Hertz (1989) for examples.) Such instances are neither interesting nor relevant for the theory according to Wasow (1979). The implication of such a position is that a NL parser based on the theory may reject and thus block further processing of a sentence, which might be acceptable in the given context.

The main task for the Paninian theory is to assign a meaning to a sentence, which is the same as that assigned by the hearer. Sub-division into separate levels is a theory internal matter as long as the meaning assignment remains the same. There is certainly no separate autonomous syntactic level postulated by the theory. In fact, the Paninian Theory views the range from the sentence to the meaning as consisting of levels of meaning each level more refined than the previous one. The early levels, call them vyakaran levels, make minimal use of world knowledge and greater use of morphological or karaka knowledge. The later levels make greater use of world knowledge, intentions of the speaker and hearer etc. It is important to mention however, that even the vyakaran levels use the notion of vivaksha or speaker viewpoint, which has a relation to intentions or pragmatics. Shows the vyakaran levels in detail, and besides these shows only the final meaning level as perceived by the hearer/speaker.

There is a significant difference between the two models, which is sometimes missed in the details of levels. In the GB model, it seems that it is tacitly assumed that meaning is an 'objective' event or entity out-there in the world which is represented by means of the three levels of representations. In the Paninian model, the meaning is mental object in the mind of the speaker relating the "objective" event or entity with the speaker's viewpoint of the event or entity. This comes about with the way theta roles and karaka roles are conceived of in the two models.

It is instructive to try to compare the levels across the two models. To do so it is important to identify relationships between some key categories and relations across the models. The task is harder than it seems because the terminology and the model for the generative enterprise is inspired by a positional language such as English, whereas that for the Paninian enterprise is inspired by a "free" word order language. In fact, incorrect equivalences between terms have been a major source of confusion while comparing the two models. First, karaka roles are different from thematic roles. For examples, karta karakas gets mapped to agent, instrument and patient in sentences (1), (2) and (3), respectively.

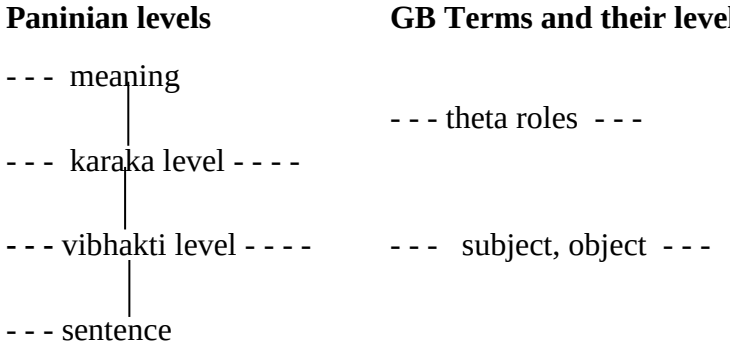
(1) The boy opened the lock.
(2) The key opened the lock.
(3) The lock opened

Karaka relations combine the notion of vivaksha or speaker viewpoint with theta roles.

Second, according to us the so-called grammatical functions subject, object etc. are at vibhakti level in the Paninian model. They have been frequently sought to be defined as a distinct level between case and theta roles The following figure (27) shows the difference in

relationships between Paninianlevels and TB terms and their levels ((Akshar Bharati et al 2004: 193).

Figure 27: Relationships between terms in the two models



It should be noted that subject, object have arisen out of positional languages like English where they have an intuitive appeal as well as natural and simple definitions and tests. In "free" word order language like Indian languages, the same information is contained in case endings or postpositional or prepositional markers. Concepts of subject, object as a distinct level are not only unintuitive but also it is very difficult to come up with criteria or tests for deciding when something is a subject. Most attempts try to define them configurationally for free word order languages, at which point the grammar building runs into serious difficulties.

If we draw a picture incorporating the above insights, we have the picture shown in Fig.28. It should be mentioned here that many GB theorists working on Indian languages define subject in such a way that it turns out to be more or less the same as karta.

There is another difference in the concerns the two models have towards formal power of grammars. Since the generative enterprise wants to characterise the universal grammar that every human is born with, there is an attempt to use grammar formalism with as little formal power as possible. This would ensure that it generates only the grammatical sentences in natural languages, and no more. The Paninian approach is neutral to such concerns.

Paninian model focuses on karaka roles, while major research effort in GB is on anaphora and quantifiers. So they both have something to offer. It should be noted however that GB includes only reflexives and reciprocals out of all the possible anaphora. These are a tiny fraction of the total. Moreover, the theory does not give the referent of this restricted class of anaphora, but rather identifies a domain within which the referent has to be found.

A comparison of GB and Panini approaches is given below in tabular format (Akshar Bharati et al 2004: 194).

Topic	Generative Enterprise	Paninian Approach
Question	How is the child able to acquire language?	How is the speaker able to convey information to the hearer using language?
Goal	Study of innate and autonomous structures in the human mind relating to language faculty as distinct from other cognitive structures	Study of language as a means of communication
Task	Theory should classify sentences as grammatical and ungrammatical	To explain the process of going from meaning to sentences and vice versa.
Focus	Isolates and studies syntax	Combines syntax, semantics and pragmatics in an overall framework
Model	Indirect connection between surface form (PF-repr.) and meaning (LF-repr.)	Direct connection between surface form and meaning.
Language types.	Principles and terminology inspired by positional languages	Inspired by 'free' word order languages.

4.5. Conclusion

In this chapter we have given outlines of different types of formalisms used for the syntactic paring of texts for the sake of Machine Translation System. The parsing techniques to be adopted for parsing of a text depend on the formalism we chose.

Chapter 5
MACHINE TRANSLATION SYSTEM

5.0. Introduction

"Translating Languages with Computer" – Machine Translation (MT) has been one of the greatest dreams in computer applications. Machine Translation systems acts as a bridge to access cross lingual information by making the documents available in one language to another language. Such systems are inexpensive, instantaneous and multiplicative when compared to human translation. Building such a system across a pair of languages is nontrivial. Fully automatic high-quality translation of an arbitrary text from one language to another is far too hard to automate completely. The level of complexity in building such a system depends on the similarities and difference among the pairs of languages.

But the dream of building a deployable MT system is gradually becoming a reality. Research on MT is an intellectual challenge with worthy motive and practical objective. The challenge is to produce translations as good as those made by human translators. The motive is the removal of language barriers. The practical objective is the development of economically viable systems to satisfy growing demands for translations. Contrary to general belief, there is a considerable shortage of human translators even for technical translations. To fill this vacuum there is an increasing demand, worldwide, for MT systems.

5.1. Computational Linguistics and Natural Language Processing

Theoretical issues in Computational Linguistics (CL) concern syntax, semantics, discourse, language generation and language acquisition. Historically, it included the study of natural languages as well as artificial (Computer) languages. Applied work in computational linguistics, however, includes computer aided instructions, database interfaces, machine translation, speech understanding etc.

NLP recently emerged a major area of research and the progressive developments have made it possible to provide computer aids for text processing, writing grammar and electronic dictionaries, construct efficient parsers and even to build systems for machine aided translation, speech recognition ect.

5.2. Machine Translation

MT comes under a generic heading of Natural Language Processing (NLP). At the same time, because the technology involves many complex tasks, it is often seen as a category unto itself. This special status of MT also stems from the fact that it was the earliest kind of NLP. The theoretical and methodological bases of MT are computational linguistics theories and NLP technologies. Application of these theories and methodologies involve many issues such as dictionaries/lexicon, terminology banks, analysis of source sentences,

transfer of intermediate representations, generation of target sentences, computer environments for developing and examining machine translation systems, operational environments, pre-editing of source sentences, post editing of target sentences and so on.

5.2.1. Historical Background

Hutchins traces the history of machine translation very elaborately in a number of his works (Hutchins 1986, 2003, 2010). One of the early literary uses of computers is said to be the computer-generated concordance of the Bible in 1957. Thereafter it continued to help literary scholars to develop new ways to use computers for analyzing text, generate rhyme list, frequency counts and reverse in dicing. With the advent of accurate Optical Character Readers (OCR) in 1960's, computers were being used in comparing texts. OCRs also became increasingly popular with lower costs and richer performance over the years as they offered machine-readable texts, saving the drudgery of manual text entry work.

Most of the early work on Machine translation, also known as automatic translation, mechanical translation, or simply MT is reported from USA and then USSR. Some work was also done in UK, Italy and Israel. These efforts were based on word-to-word translation schemes as it predates the important work in linguistics and computer science on syntax, grammar formalisms and parsing.

During 1950's there were several research projects on MT in USA. One of the famous systems is Georgetown University-IBM joint project for translation from Russian into English. US Govt. invested significant amount of research funds in late '50s and early '60s, mainly, to develop Russian-English MT systems. In 1964 an Automatic Language Processing Advisory Committee (ALPAC) was constituted by US Government to advise Department of Defence, Central Intelligence Agency and the National Science Foundation on research and development in the general field of mechanical translation of foreign languages. This committee in its report (1966) stated impracticability of such systems, which resulted in suspension of Government funding in this field. As a consequence, there has been very little specific research in MT conducted in higher Institutions in US. However, the experts who had been working in this area moved over to private sector and succeeded in developing a workable system 'SYSTRAN' which was productionised in 1969 and was adopted at several places by 1973 with additional improvements made afterwards. These achievements elsewhere, once again stimulated interest and also large scale funding by US Government.

In Japan research in MT began as early as 1957 at Denki Shikenjo (presently Electro Technical Laboratory, Tsukuba) and universities. The attempt was largely limited to basic research without any practical application.

In France, a Study Group for Machine Translation GETA was founded in 1971, although isolated research in MT was going on since 1961. Using their past experience, the

goal of "Perfect machine translation" was abandoned in favour of "human aided machine translation" (HAMT).

European Community was also becoming interested in MT since 1960s and sponsored GRENOBLE Project and number of other projects. The involvement of European Community led to some kind of renaissance, which helped to overcome the disastrous consequences of ALPAC report. EUROTRA Co-ordination group was established in 1978 with participation from competent university Institutes of all member states of the commission of the European Community (There are twelve member states and nine official and working languages). The duration of the programm was set at five and half years and the community budget was to be 16 million ECUs. This was to be complemented by 10 million ECUs of direct National contributions, as EURPTRA is a cost-sharing programme. Yet another programme "Multilingual Action Plan (MLAP) was also initiated in Europe in 1977 for productivity of EC translation services and Trans European Information flow.

Canada is a bilingual country with English and French as their official languages. Canadian Government had also been supporting several R&D Projects in the area of MT. One of the most successful Machine Translation systems TAUM METEO was put into operation since 1977 and provide translation of weather forecasts sentences in English and French. It has no pre-editing or post-editing and is fully automatic.

These were some of the early attempts towards MT all over the world. Intense activities in this area have been witnessed in 80s and 90s, with advances both in computational linguistics and computer science, stimulating large scale funding by Government agencies in the United States and elsewhere. It is a testimony to this intense interest in the area of MT worldwide.

5.2.2. Machine Translation Process

A typical machine translation process is shown in figure-1

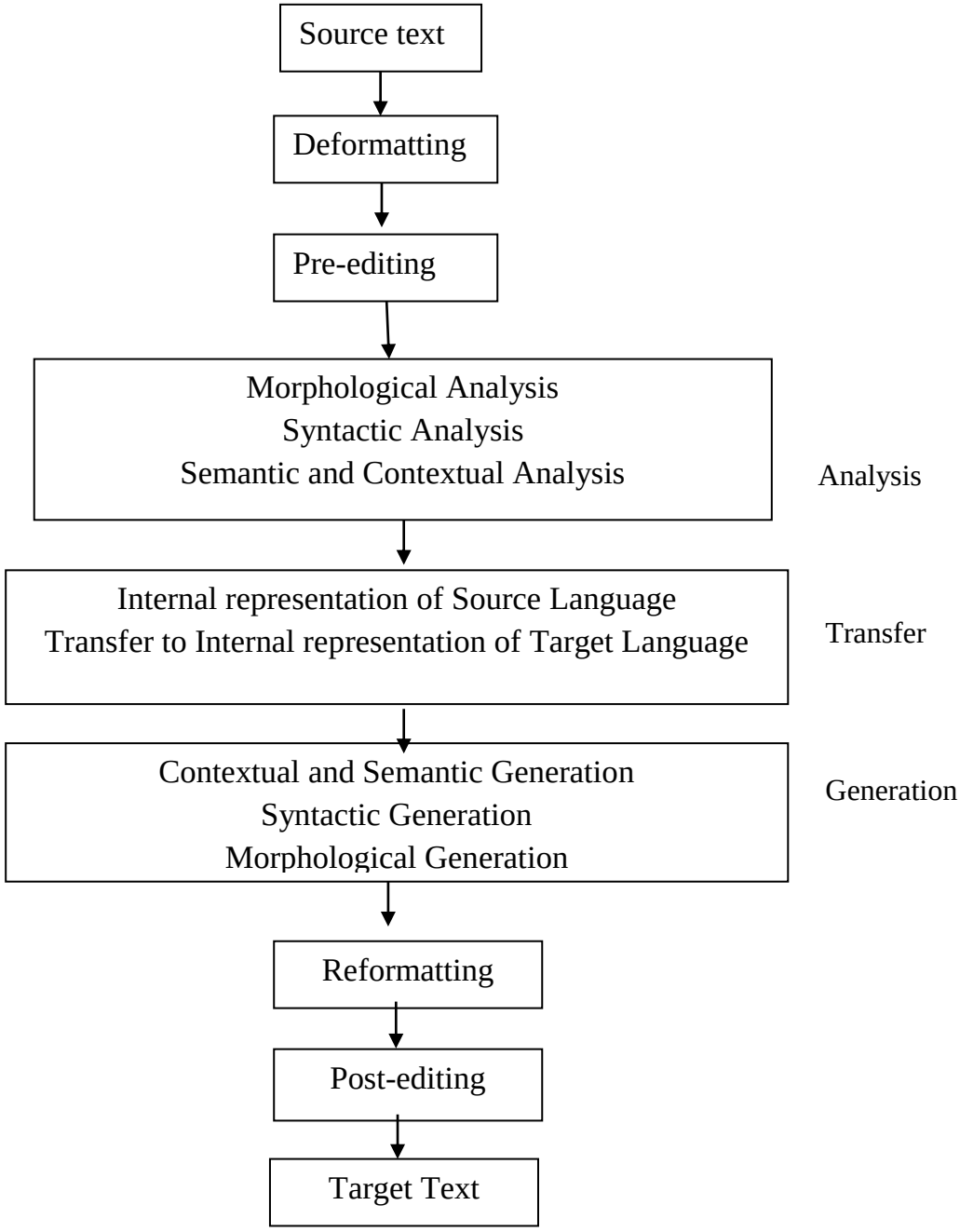
Morphological analysis determines the word form including inflections, tense, number, part of speech and so on. Syntactic analysis determines which word is the subject which one is the object, and so on. Semantic and contextual analysis determines a proper interpretation of a sentence from plural results produced by the syntactic analysis. Syntactic and semantic analysis is very often a combined operation and is executed simultaneously to produce syntactic tree structure and semantic network. The result is an internal representation of a sentence. The internal representation of the target language is often the same as that of source language, but sometimes the change of internal representation is required. The sentence generation phase is just the reverse of the analysis process.

5.2.2.1. Machine Translation System

A typical machine translation system considered this way could be viewed as depicted in Figure 2. Central portion of the figure, viz. inference engine is nothing but a knowledge base which stores various rules of source language as well as target language, dictionaries and grammar supplemented by common sense rules for translation.

Thus machine translation is basically a knowledge information processing system and is a large scale Artificial Intelligence problem. FGCS project in 1982 by MITI in Japan did not directly include machine translation. However one of the focal research themes of the project was identified as NLP and it was recognized that high level machine translation systems are likely to be the future application of FGCS technology (Rajendran 2019).

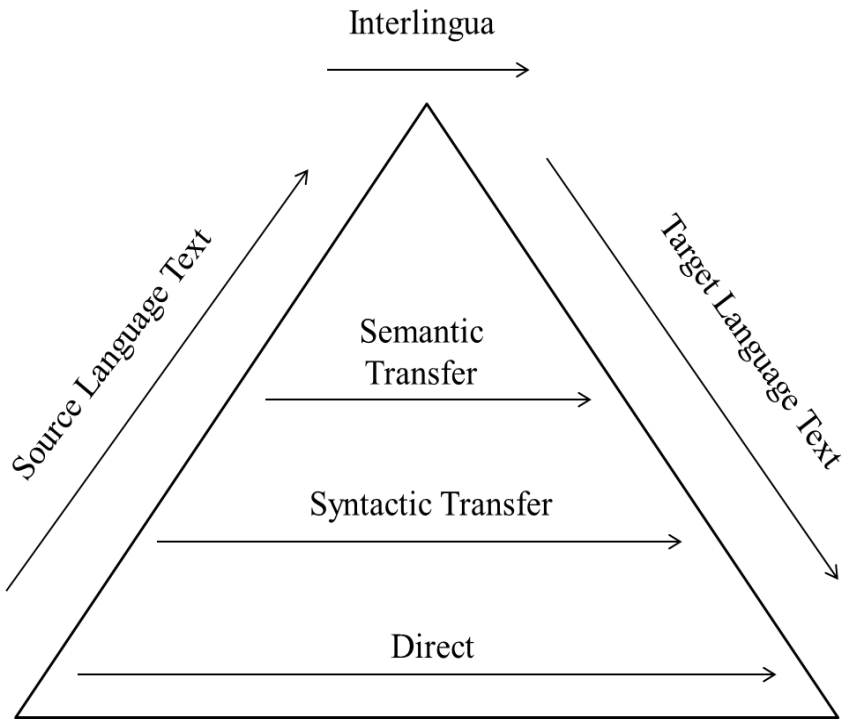
FIG 1: MACHINE TRANSLATION PROCESS



5.2.3. Evolution of Various Approaches

Research in the area of machine translation started much earlier to that in the area of Natural Language Processing. Various approaches for machine translation have been suggested and tried out. With the advances in computational linguistics and availability of powerful computers further refinements in these approaches were noticed, besides the emergence of newer approaches. These are reviewed in the following sections.

Figure 3: Approaches to Machine Translation



5.2.3.1. Direct Approach: First Generation

The very first proposals of the "first generation" of MT for using computers to translate till about 60s were called "direct" approach. These were essentially dictionary driven methods with no or low-level syntactic analysis and use of semantic features. These efforts came to an end with the publication of ALPAC report in 1966. There was a very little activity for about a decade thereafter.

5.2.3.2. Transfer Approach: Second Generation

The interests were revived in 1976 with the installation of SYSTRAN, a weather forecast translation system in Canada. Increasing activities followed throughout the world and rule based, syntax oriented abstract representation approaches became the "Second generation" of MT. Examples are Ariane, of the GETA Project in France, EUROTRA of the commission of European Communities and Mu of the Kyoto University, Japan. At the same time, considerable work was also going on rule based Inter-lingua models. In machine translation systems, an intermediate representation is necessary to express the results of sentence analysis. This represents syntactic and semantic structures of an input sentence given as a character string. Syntactic structure is shown as tree and semantic structure as a network. This intermediate representation of inter-lingua approach is called inter-lingua. Notable amongst the inter-lingua models was the CMU project at Carnegi Mellon University in USA and multilingual machine translation project at Centre of International co-operation for computerization in Japan.

Around this time commercial systems began appearing on the marked scene, most of them being for translations from English to Japanese and vice-versa. They also migrated from main frames to PCs and became popular.

5.2.3.3. Corpus Based approach: Third Generation

By about 1989, a new era and the "third generation" began in MT research with the emergence of wide range of collectively called "Corpus based" approaches. This represented a new departure in MT research. The corpus-based approaches include two categories, the first one uses direct information derived from corpora for analysis, transfer and generation of translations. This category includes statistics based, example based and connectionist approaches. Second category makes an indirect use of corpora as a source of information for deriving or compiling lexical, grammatical and knowledge databases. This second category consists of a range of activities such as database compilation, lexical and knowledge acquisition and statistical information to aid or complement rule based methods.

Essence of statistics based method is the alignment of sentence in the two languages and the calculation of the probabilities that any one word in a sentence of one language corresponds to two, one or zero words in the translated sentence in target language. The IBM-candide research project based on a large corpus of the Canadian Hansrad, records of parliamentary debates in English and French is an example.

Example based method was first proposed in 1980s but was implemented only a decade later. The basic philosophy in this method is that translation is often a matter of finding analogues examples. The method essentially relies on a bilingual database examples derived from a large corpus of texts and their translations. Example based machine translation approach has been extensively used in ATR project of Japan for spoken language translation. Another example is knowledge base machine translation (KBMT) at Carnegi Mellon University in USA.

Connectionist approach is a result of research in parallel computation, neural network or connectionism. Being the latest, these developments have attracted the MT researchers also. Connectionist method computes the distance between input text segments and bilingual text data in example based MT model. It offers the prospect of systems "learning" from past successes and failures. Previously, learning has meant that systems suggest changes on the basis of statistics about corrections made by users at the post-editing stage.

5.2.3.4. Hybrid Approaches on the Horizons

The hybrid approaches are also on the horizons. In some such approaches, corpus information is used for tuning analysis and transfer grammar. In others a standard transfer based MT approach is followed using traditional analysis and generation technique but

having transfer component based on aligned bilingual corpora. In yet others, statistical information is used as the source of preference assignment during text disambiguation.

5.3. Components in MT System

5.3.1. Electronic Dictionaries and Lexical Databases

In figure 2, a typical machine translation system; Dictionary is one component in the central portion. This implies monolingual / bilingual / multilingual, machine-readable dictionaries for a particular pair of pairs of languages which the machine is required to translate. The dictionaries provide definitions of words, their syntactic categories and at times usage by way of examples. They are, however, a poor source of much needed information for sophisticated semantic processing, i e. how a word is used in relation to other in a sentence.

The electronic dictionary is not simply a machine-readable dictionary; it is a dictionary containing all the information necessary for computers to understand natural language. Thus an electronic dictionary must contain meanings of words, i.e., concepts expressed by words, their grammatical characteristics when they express concepts, and knowledge necessary for understanding concepts. Large-scale electronic dictionaries are being developed for machine translations in each of the MT projects currently under way at several places. Small-scale electronic dictionaries are used for question answering and speech recognition systems.

5.3.1.1. EDR project

Development of a large-scale electronic dictionary was taken up by the Japan Electronic Dictionary Research Institute, commonly known as EDR project. The aim of the project is

(i) To develop a dictionary that can be easily processed and recompiled with computers into various forms for specific purposes.
(ii) To develop a dictionary by utilizing to a full extent the current computer and NLP technology.
(iii) To develop a dictionary for computer to process and to understand languages.

The project was initiated in April1986 by joint funding from the Japanese Govt. and eight private corporations. Japanese and English are the two languages chosen as target languages. Specification of EDR electronic dictionary and other related information is being made available to the public. The entire set of concepts and headwords are also being made available on request by EDR.

5.3.1.2. Dictionary Projects in Europe

There are similar initiatives in Europe. European Commissions Language Projects show a surprising variety of programmes and project types. Notable multilingual dictionary / lexicon research projects are:

(i) GENELEX under EUREKA programme
(ii) ACQUILEX under ESPRIT programme
iii) MULTILEX also under ESPRIT programme
(iv) LEXICALISTE under EUROLANG programme

The objective of GENELEX is to construct a generic electronic dictionary in various European languages (currently for French, Italian and Spanish). The dictionary is considered as a large lexical database with no direct connection to any NLP application. The dedicated lexicons to particular application will be obtained by extracting data designed from the generic dictionary in a form adapted to needs.

ACQUILEX project is concerned with the acquisition of lexical knowledge for NLP systems, semi-automatically, from machine-readable versions of conventional dictionaries for English, Spanish, Italian and Dutch. Work on Acquilex is divided into two areas viz .i) development of methodology and construction of software tools to create lexical databases from machine readable dictionaries, and ii) subsequent construction of illustrative, theoretically motivated lexical knowledgebase designed to integrate, enrich and formalize database information.

Aim of the MULTILEX project is to propose and experiment standards for multilingual lexical databases. These standards are; standards on linguistic information (what is the databases) and architecture (how the entries in the dictionaries are organized), standards on tools (how to manipulate database), logical structure (how the information is represented) and the software architecture (how the tools are organized)

LE LEXICALISTE is a dictionary generator. This was originally developed to meet in house needs for large translation and document processing jobs. Le Lexicaliste is generic in nature. Lexical entries can be imported from various sources (other dictionaries, files, terminology lists etc.). When lexical zed data is required for a given application, a dictionary can be generated and exported to that application. Le Lexicalists runs under oracle RDBMS on sun workstations with X windows motif user interface.

5.3.2. Study of Corpus

It has now been well recognized that a large text corpus is very useful and is much informative in the construction of electronic dictionaries, lexical databases and allows testing of grammar formalism etc. Many NLP and MT projects have acknowledged the need of a

large corpus. Japan's EDR project and multilingual machine translation projects have built their corpora fist and thereafter started development of electronic dictionaries etc. Founding of Linguistic Data Consortium (LDC) in 1992 by the US Govt .for large scale development and widespread sharing of resource for research in linguists technology is yet another acknowledgement of importance of study of corpus. Goal of LDC is to collect, create and disseminate corpora of texts as well as speech to the researchers in NLP, MT and speech recognition. Yet another use of corpus is found in evaluation of machine translation system itself.

5.3.3. Morphological Analyser and Generator

Computational morphology deals with the recognition, analysis and generation of words. Most regular and productive morphological process a cross languages is inflection, while other aspects such as derivation, affixes and combining forms etc. are also included. In many languages nouns and adjectives vary according to number, gender, and case. Inflection alters the form of the word in number, gender, mood, tense, aspect, person and case. Similarly the verbs also take different forms depending upon person, tense etc.

A morphological analyser or generator supplies information concerning morphosyntactic properties of the words it analyses or constructs. In principle, there are two ways to deal with morphologically related forms. One is to store all the word forms with associated relevant properties, for example, walk (verb present plural), walks (Verb present singular), walking (verb present progressive) and walked (verb past). The other way is to store one base form walk (verb) with rules to relate variants. These options will have to be chosen depending upon how expensive the storage will be. Further, languages are creative and hence new words enter the language. So storing all variants is likely to become an intractable proposition.

5.3.4. Grammars and Their Characteristics

Grammar formalism so far proposed by the researchers include the following (Some of them have been discussed under the heading "Language formalism):

(i) Phrase structure Grammar (PSG): There are quite a few variants in this Category, such as, context free PSG, context sensitive PSG, Augmented Transition network Grammar (ATN), Definite clause (DC) Grammar, Categorical Grammar, Lexical Functional Grammar (LFG), Generalized PSG, Head driven PSG, Tree Adjoining Grammar (TAG).
(ii) Dependency Grammar
(iii) Case Grammar
(iv) Systematic Grammar
(v) Montague Grammar

Which grammar would suit a particular language depends on many factors specific to that language. For example, PSG has a serious problem in the analysis of sentences in Japanese. On the other hand Dependency Grammar has been very popular for Japanese but its draw back comes out clearly in disambiguation. Case grammar offers certain advantage as sentence representation is done by case frames. Advantage is that, a sentence in different languages, which express same contents, may have the same case frames. Due to this advantage many MT systems seen to have adopted it for sentence analysis and also form sentence generation. However, the difficulty arises in a situation where different usages of same verb of noun have to be distinguished. And if in language such usage is large, the number of semantic markers also becomes large.

A sentence includes lot of information such as syntactic, semantic, textual, inter personal and so on. Grammar formalisms are just a framework to explain basic structure of a language and any one-grammar formalism may not apply across the languages.

5.4. Evaluation of MT Systems

With various machine translation systems currently available commercially, evaluation of these systems is attracting the attention of many users as well as researchers. There have been some trials for evaluating the machine translation systems in Japan. Japan Electronics Industries Development Association (JEIDA) is actively engaged in this area. Various methodologies and strategies are being suggested. Some of them are briefly discussed below.

Machine Translation evaluation needs to be approached from several viewpoints. First being the technology, which relates to the design and development of MT System, involving issues on Lexicon, grammar, terminology bank, parsing and generation, system integration, human interface etc. Second point concerns guidelines for users, which will help them to select cost effective system and the third is the identification of future technical problems, which will contribute to the improvements or upgrades. Given the range and complexity of the factor to be considered, it would be unreasonable to look for common or simple evaluation technique.

European commission sponsored EAGLES group on evaluation and assessment has suggested three types of evaluation viz. Adequacy evaluation, Diagnostic evaluation and Progress evaluation. Adequacy evaluation concerns assessing the system with respect to intended use and how well it will do and at what cost. This is very much oriented towards specific requirement. Diagnostic evaluation is to discover where the system fails and why. This kind of evaluation requires intimate knowledge of a system. Progress evaluation however can be used to compare like to like systems and measuring predetermined performance criteria.

Yet another methodology being suggested for quality evaluation of the translation is designing a test corpus for checking accuracy. List of technical terms and their scoring criteria will also be included in the test corpus.

5.5. Obstacles in MT

5.5.1. Text Input

The first module in any MT systems is Text Input of source language as shown in Figure 2. If machine-readable text in source language is available the process can be started by inserting a floppy disc. But if printed pages are to be input, either manual typing or optical character reader (OCR) is to be used. In manual typing speed and the cost of typists are to be accounted for. In case of OCR proof reading and error correction by human are to be managed.

5.5.2. Deformatting and Reformatting

An operative machine translation system is expected to do much more than simply translate individual sentences. Most of the text, which needs translation quickly, e.g. technical documentation, is heavily formatted. In some texts major portion on a page may be non-translatable material in the form of figures, flow charts of tables. Therefore, specific modules have to be built into the MT system, which will identify text portion to be translated and generate a template of that page. The individual translation units, usually sentences, but in case of headlines or table entries, single word or phrases, are automatically recognized and numbered consecutively. These are written into a text file and transferred for translation. After translation, the file containing the target language text units is returned to the user. This text has now to be reformatted after making appropriate correction (Post editing) etc. This reformatting step takes care of ensuring that the target language text is available with same layout as original including figures, flow charts, tables etc.

5.5.3. Pre-Editing and Post Editing

At times, segmentation of long sentences into two or more short sentences is also required which is often done manually at the pre-editing stage. Pre-editing and Post editing has a certain correlation. When a heavy of elaborate pre-editing is performed, very simple post editing may be sufficient and vice-versa. Post editing is generally unavoidable and hence many machine translation users do only post editing. It is essential to avoid ambiguities and also to improve the quality and style of translation. There may be words unknown to the system and difficult to analyse. In such cases post editing provides a facility to update the system lexicon. Post editing the machine output is not the same as revising a "human" translation. While the machine will make severe errors in syntax, human translator will make fewer but random errors, which are less predictable.

It is reported after a mail in poll conducted by Word Perfect magazine in June 1993 of the MT software now available on PCs, that the Pre editing is basically division of long sentences into shorter ones, fixing up punctuation marks and blocking material that does not require translation. Hence not much time is spent on it. Some users of Japanese to English system however, reported that pre-editing takes about 40% of total translation time.

On the other hand the poll reports that post editing, generally, accounts for larger share of production time and also the cost. Some language combinations are reported to give better results and consequently require lesser post editing. There is also another important factor, which require consideration at the time of post editing and that is the quality of expected output. A few may require very high quality output e.g. insurance contracts. Some others may require editing for accuracy but not for style. Yet others may require "information only" for "understanding only" and much time may not be spent on post editing.

5.5.4. Introduction of MT Systems in an Organization

The state of the art in computational linguistics does not permit the perfect translation of random texts. Therefore, if a text is translated with an aim of publication, post editing by human translation will remain a necessity, even if a system is tuned for specific subject area. The quality of translation does not hinge only on MT system but is equally dependent on the quality of source text. One also has to consider intended purpose of text, expectations of readers and even stylistic preferences of post editor.

Therefore, the introduction of MT system into an existing organization, whether it is a large company or a translation bureau, requires several steps. First, purpose of translation usage must be clearly established. Then kinds of documents must be specified and the expected quality, speed and cost must be clarified. In-appropriate use is likely to lead to frustration. For productive use of MT system, an initial training period of about two weeks will be necessary. At least two specialists, one for pre editing and other for post editing will have to be assigned. They are required to have some background in linguistics or languages, which the machine will translate. They must be trained for operations such as pre editing, post editing, dictionary changes and enhancements. Sentential styles of input and output documents must be carefully studied and translation equivalents must be determined. The documents must be translated by trial basis for sufficient volume and the dictionary and grammar must be tuned to the environment. Second training for about a week after a few months of trial translations may be beneficial as it can answer questions, which had arisen during actual application.

5.6. Some Findings on Usage

Commercial systems became available in Japan from about 1979 and few reports are available from the users about their efficacy. These systems are mainly for the language pair English – Japanese and vice versa. These reports indicate that there is 30% decrease of

translation costs by machine as against human translators. Speed up of 30% on the overall translation time has also been reported. Translation costs depends heavily on how much post editing is required. They are found to be proportional to the post editing time. A volume of 2000 pages per year is found to be break-even point for profit making by machine translation.

Another study by the Commission of European Community SYSTRAN System reports productivity increase by about 300%; speed up by about 500% and cost reduction by about 50%. It must be noted here that SYSTRAN was put into operation in 1977 and adapted thereafter at many installations. It has also undergone several cycles of improvements.

5.6.1. Classification of Categories of Output

It is possible to classify the sentence categories by the degree of difficulty of translation. Sentences, which express facts alone, are very clear for machine to be understood and translate. Sentences, which include time relations, expectations, assumptions, and conditions, are the next difficult category. Then come the sentences, which include speaker's intention and mental state. These are very difficult to translate for a machine because interpretation requires discourse analysis. Present day system translates sentences one by one independently. They do not have the ability to see the inter-relationship among adjacent sentences. Hence translation of sentences, which required contextual information, is imperfect.

Another factor, which affects the degree of difficulty to the highest, is the world knowledge, everyday life knowledge or common sense knowledge. As an example "fish eats cat" would be a perfect translation grammatically, syntactically and semantically. But the everyday life knowledge would have it marked as a wrong translation and would be corrected at the post editing stage as "cat eats fish".

There are many sentences, which include metaphors and culture specific expressions. Current MT systems do not know how to handle them.

5.7. Machine Translation Summits

Japan Electronic Industries Development Association (JEIDA) since its establishment carried out annual investigation of overseas machine translation technology and reported information on international technology standards in this area. They also organized international workshops in 1982, 84 and 85. As a result researchers of machine translation throughout the world came together and a first Machine Translation Summit was organized in Japan in 1987. This was followed up by Second MT Summit in Germany and the third in Washington USA. In July 1993 fourth MT Summit was held again in Japan.

These summits are held with specific goals such as elucidating the current technological level of MT Systems and technological problem that require attention of

researcher, to make the potential users aware of the current level of the research and reasons for imperfections etc.

5.8. Associations for Machine Translation

Intense activities witnessed in the last two decades have given rise to collaborative research not only in the field of Machine Translation but also in Speech related activities and in the generic field of NLP. In last four years, it has led to formation of machine translation associations in different parts of the world. These are,

(i) Asia-Pacific Association for Machine Translation (APAMT) covering Asian Countries with its Secretariat at Tokyo.
(ii) European Association for Machine Translation (EAMT) with secretariat at Geneva.
(iii) American Association for Machine Translation (AAMT) with Secretariat at Washington DC; and
(iv) International Association of Machine Translation (IAMT) with Secretariat at Washington DC.

5.8.1. Objectives and Activities of IAMT

The specific objectives of IAMT are collection of information, exchange and dissemination of the same and standardization. To meet these objectives IAMT under-takes the following activities:

(i) To convene biennial General Assembly
(ii) Sponsor workshops, symposia and conferences on MT and related technologies and applications.
(iii) Organize tutorials and training courses.
(iv) Establishment of technical committees, special interest groups and study teams.

5.8.2. Membership

Membership of IAMT is open to active potential MT users, developers and researchers and also to any individual, institutional or corporate entities. There are three categories of membership i) Individual ii) Corporate iii) Institutional

5.9. Implications and Spin Offs of MT Research

Besides Machine Translation, computerized analysis of natural languages can be used in automatic indexing, in data retrieval, and also in facts retrieval. Indexing has been carried

out from times immemorial, especially for texts of high prestige. In the past it must have involved tremendous efforts. Today such tools are produced readily by computer programmes used in MT research. Keyword in Context (KWIC) indexing has indeed developed skillful techniques. But these techniques yield only that information which can be derived from identification of word forms. These can be further enhanced by NLP technologies.

Research in MT has made and will continue to make contributions to other facilities as well. The system proto types are today available with which one can enter into a dialogue with the machine as question – answer session. Speech recognition and synthesis coupled with progressive advances in NLP has made it possible to access relatively homogeneous databases to answer queries on air ticketing, banking and medical fields. Combined with large lexical databases, they may be extended to provide access to wide variety of information. Network access can be provided not only for bilingual translations but also for multilingual jobs involving users overseas.

5.9.1. Future of Machine Translation

With the increasing interest in NLP and Machine Translation all over the world, there will be continuous improvements in the existing systems with a view to make them more robust and easily adaptable to the needs of the users. Certain areas have been already identified by the researchers in these directions. These are enumerated below:

(i) **Development of dictionaries and lexical databases using Corpora:** Methods for producing dictionaries even from untagged texts have been presented in seminars and conferences. Lexical databases are being prepared by organizations, such as Microsoft corporation, USA, Institute of Machine Translation at the University of Stuttgart etc.

(ii) **MT for specialized applications:** Large corporations with multinational operations are devoting considerable efforts to develop MT systems for in house use in specific domains. Examples are "Simplified English" developed and being used by Boeing Corporation for translation of maintenance manuals of Boeing aircrafts. General Motors are also working in developing similar systems.

(iii) **MT with human intervention:** This is a paradigm shift with realistic attitude, which is gaining ground. It was a dominant theme at the conference "Language Technology 2000" held in Germany in 1993.

(iv) **MT on Network:** Availability of MT software on a network appears to be a distinct reality in near future.

(v) **Information retrieval:** Some researchers have suggested that MT should be introduced in information retrieval systems and databases systems so that users all over the world can have access to any on information source.

5.10. Machine Translation in India

Attempts are going on at national level in developing MAT system from English to Indian languages. NCST, Mumbai has developed an MAT system named "MATRA" for Translation of English News stories to Hindi. An MAT system for translating documents/reports used for the campaigns of Public Health was made available by IIT, Kanpur, CDAC, Pune has come up with a system called "MANTRA" translates domain specific Government of India appointment letters. IIIT, Hyderabad is involved in developing an MAT system from English to Hindi on the lines of Anusaarka system that they have developed already. Universal Networking Language based translation system is also available from IIT, Mumbai.

Thanjavur Tamil University was involved in the development of Russian to Tamil Machine Translation System, a pioneering work in Machine Translation. Dr. Vasu Renganathan of University of Pennsylvania has developed an MT system from English to Tamil. The AU-KBC Research Centre, Chennai has developed an MAT system from Tamil to Hindi as well as a prototype for English to Tamil MAT. Mr. Durai Pandi of Ultimate Software Systems, Dindigul, TN has developed a preliminary version of English to Tamil MT system. This list is not exhaust as there are also other people who are involved in similar activities.

5.10.1. Issues in MT involving Tamil

Machine Aided Translation systems from and to Tamil involve various levels of processing over the Tamil language. Each level has its own complexity and let us discuss a few among them.

5.10.1.1. Morphological Analysis

This involves the identification of root and its associated grammatical features of words to be translated. As Tamil is rich in inflection this analysis is complex when compared to English Morph analysis. Sandi rules make this process more cumbersome and needs special rules to handle them apart from the morphological rules. Care should be taken to extract all the necessary grammatical information from the word, which are required for further processing. The following is an example of this:

Tamil word: "paNattiRkkaakattaanee"
Money-sake-only
Morphological split up: paNam+kku+aaka+taan+ee
The contents of the word are:
Root (paNam-money)
Dative case (kku)
Benefactive case (aaka)

Emphatic marker (taan)
Emphatic marker (ee)

While translating this word to English it has to be translated to a phrase like "for the sake of money only" rather than a single word.

5.10.1.2. Part of Speech Tagging

Part of Speech Tagging is the process of assigning the best part of speech for the constituents of the sentence. This is very important to generate or identify the structure of the sentence.

Tamil Sentence: *avan paTi eeRinaan*
He staircase climbed
The above sentence will be tagged as
avan<PRO>
PaTi<N+NOM>
eeRinaan<V+PST+3SM>
Where,
PRO -> Pronoun
N => Noun
NOM => Nominative
V=> verb
PST => Past tense
3SM => 3rd person, Singular, Masculine

The root word *paTi* can be a noun meaning 'staircase' or a verb meaning 'read'. The POS tagger using lexical and contextual information can resolve this kind ambiguity. Noun tag is assigned to the word *paTi* in this sentence.

5.10.1.3. Syntax Analysis

The sentence structure is identified when it is parsed during syntax analysis. By parsing, the clause boundaries, the prepositional attachments, the modifiers will be identified and associated with their respective components. Tamil is a relatively free word order language. This makes the parsing process complicated. The case markers of the NP's help us in identifying the role of each constituent in the sentence. But the lack of case markers may create structural ambiguity. For example the following Tamil sentence has two parsing.

Tamil sentence: "avaL akkaaL viiTTiRkku cenRaaL"
She/her sister house-dative go+pst+2sf

The two parses:
(avaL) NP (akkaaL viiTTiRkku)NP (cenRaaL) V
(avaL akkaaL) NP (viiTTiRkku)NP (cernRaaL) V

If any one of the NPs has a genitive case marker *uTEya* then there won't be any ambiguity.

5.10.1.4. Semantic Analysis

For words having multiple senses, the right sense for that specific context has to be identified. The target language equivalent would be selected based on the disambiguated sense.

Tamil sentence 1:	avan	paTi	eeRinaan
	He	staircase	climb+pst+3sm
Tamil sentence 2:	avan	paTiyaal	aLandtaan
	He	vessel+inst	measure+pst+3sm

In the above sentences the word "paTi" has two senses in noun form.

1. Staircase
2. A vessel used to measure rice and wheat

By using the collocation word '*eeRinaan'* 'climb', we can resolve that the word *paTi* of the first sentence refers to 'staircase' and not the 'vessel' and using the collocation word '*aLandtaan'* we can resolve that the word 'paTi' of the second sentence refers to 'vessel'.

5.10.1.5. Syntactic Transfer

This component will be needed if transfer approach is used for Translation process. The structure of the input sentence has to be mapped to the appropriate structure in the target language.

Tamil Sentence:	Raaman	puttakam	paTittaan
	Raman	book	read
Structure :	Noun	Noun	Verb

The English equivalent for the above sentence would be

English Sentence:	Raman	read	a book
Structure :	Noun	Verb	Noun

In this translation the structure of the Tamil sentence "Noun Verb" has been transformed to "noun Verb Noun" to from its English equivalent. This is a trivial example for understanding but it is vital for sentences involving complex structure.

5.10.1.6. Dictionary Mapping

Using a bilingual dictionary the source language root words are mapped to its equivalent in the target language. For a source language root word there may be multiple words in the target language. The appropriate word has to be chosen based on the context. The dictionary will also contain the grammatical features of the root word.

5.10.1.7. Morphological Generation

Here the inflected form of word is generated from the root and its grammatical features.

Tamil root word: "paTi"
Grammatical features: "Past tense"+ "3rd person, Singular, Masculine"
The word form: "paTittaan"

In Hindi each inanimate object has a gender and the predicate that corresponds to the inanimate object takes the appropriate gender. But in Tamil we follow neuter gender for inanimate objects. Hence while developing translation system, this kind of differences has to be taken care while synthesizing the target language words.

5.10.2. Resources and Tools required for Tamil language processing

5.10.2.1. Tools

5.10.2.1.1. Morphological Analyser

A robust Morphological analyzer using latest state of the art technology with coverage of over 95% is required. Latest morphological analyzers follow paradigm approach and Finite state automata.

5.10.2.1.2. Tagger

Fully automated or semi-automated, rule based or statistical based Tagger is needed to tag the sentences. This kind of tagging will be useful not only for Machine Translation purpose but also for variety other applications like Information Extraction, Information retrieval, Text summarization and so on.

5.10.2.1.3. Parser

A Parser that gives the parse tree for the sentences based on any grammar formalism say dependency grammar, Phrase structure grammar or Tree adjoining grammar and so on is

the need of the hour in Tamil language processing. This involves developing rules and a parsing engine.

Some other NLP applications don't even require a full parse; partial parsing is sufficient for them. Even Noun phrase identification or clause identification will help those applications very much.

5.10.2.1.4. Semantic Analyser

The work on developing a word sense disambiguation tool is on its very elementary stage. This work needs lots of focus and serious efforts. Moreover it requires a huge tagged corpus for collecting the collocation information.

5.10.2.1.6. Morphological Generator

Once we have a well-structured finite state machine for Morphological analysis, without or with little modification the same machine can be used for Morphological generation. The morphological generators that have been developed shows satisfactory results.

5.10.2.2. Resources

5.10.2.2.1. Dictionary

Even though there exist good dictionaries for Tamil they are not available in e-form. Those dictionaries could be useful for computational purposes only if it is made available in machine-readable form.

5.10.2.2.2. Cross-lingual dictionary

This doesn't refer to normal cross lingual dictionary. What we want for Machine translation purpose is cross lingual root dictionaries. Individuals and institutions are developing bi-lingual dictionaries for their own purpose; this should be shared with other researchers in this area.

5.10.2.2.3. Corpora

A corpora for a language is a representation of the language style, word usage etc. It also acts as a test bench for evaluating morph analyzers, parsers and generators. CIIL has generated 3 million words corpus for each of about 15 languages. It has also partially tagged a few of them. Mass program should be activated to collect corpus for various languages through all available means. Internet is a good resource for collecting such corpus apart from

books, magazines, journal etc.

5.10.2.2.4. POS Tagged corpus

Pos tagged corpus is one in which all the sentences are annotated for part of speech. This corpus will be useful to develop statistical part of speech tagger. By means of various analyses over this resource, we can generate the computational grammar for the language. Such a corpus rarely exists for Tamil.

5.10.2.2.5. Parallel corpora

A parallel corpus is a valuable resource to generate transfer rules between a pair of language. It would also be useful to develop Statistical or Example Based Machine Translation systems. Alignment tools are required to align paragraphs, sentences and words of the parallel corpora before it could be used to develop such systems. Some publishers and government departments has such corpora. Those corpora should be made available to the researchers to develop productive systems.

5.10.2.2.6. Transfer grammar

The transfer grammar captures the contrastive difference between the syntactic structures of a pair of languages. Developing such transfer component is mandatory for developing translation systems based on transfer approach. Linguists who have sound Linguistic knowledge about the languages can develop this kind of resource.

5.10.2.2.7. Collocation dictionary

Collocation dictionary contains the collocations for ambiguous words of the language. Such dictionary is an important component for a sense disambiguation. Few groups are developing such resource for Tamil.

5.11. Conclusion

We have seen the state of art of MT System development in and outside India. The development of MT systems outside India, especially in European and America is remarkable. India is also making attempts to develop MT system for Indian Language to Indian Language transfer as well as English to Indian languages transfer. Ministry of Communication and Information Technology and Ministry of Human resources give financial support to these programs. Of course we have to travel a lot to achieve this goal. Though such attempts are expensive, at least for the development of Research and Development and from the experimental point of view we have try to build such systems. The present thesis explores one such possibility.

CHAPTER - 6
TRANSFER GRAMMAR FOR ENGLISH TO TAMIL MACHINE TRANSLATION

6.0. Introduction

This is the core of the present research. Transfer grammar component it is very crucial for developing a Machine Translation system, which translates English into Tamil and vice versa. For this purpose English corpus, especially on tourism, has been downloaded form internet. In the present scenario machine translation systems are produced by preparing parallel corpora of the source and target languages and by making use of statistical methods. The corpus is at first manually annoted for various grammatical features and by using this training corpus rest of the corpus will be automatically annoted. By statistical method and by making use of parallel corpora the transition is executed between the source and target languages. For this purpose the transfer of source language into target language is crucial. This is done by making use of a transfer grammar, which helps in transferring the lexical and structural elements of source language text into target language text. Nearly 5000 sentences in the tourism domain have been collected and translated into English. The translation is a source language faithful translation. As for possible the information in the source text are not disturbed much. This helps in facilitate the preparation of transfer grammar. Impotence is given the development of transfer rules.

This chapter aims to explicate the transfer grammar behind rendering English text into Tamil while preparing a machine translation aid. Of course, the theory of contrastive study is very relevant in this context. Contrastive study is an analysis, which tries to unearth the typological commonalties found between the languages being compared or contrasted. There is minute difference between comparative study and contrastive study. Comparative study is made between two genetically related (cognitive) languages of a particular linguistics family in order to bring out their family affiliation. But contrastive study is undertaken between any two languages in order to bring out the corresponding features between them without bothering about their family affiliation, if there is any. It is a common notion that there is logic behind it. When two languages are compared expecting the commonalties, it is quite natural that the two sister languages will share common properties as they have originated from a common source (proto language). But in one sense, it is illogical and unwise to expect similar linguistic traits between two languages that are believed to have been originated from different sources. Chomsky's assumption that there are linguistic universals exists among languages, leads us to expect shared features between two unrelated languages. Contrastive analysis indirectly helps to frame the theory of linguistic universals, although the contrastive study has basically been made for language teaching purpose. However the contrastive study yields many a fruit in the domain of translation too.

Translation is one of the areas studied elaborately by linguists and translators. Traditionally translation was considered as the process of replacement of a text written in a

source language by a text written in a target language, the objective being a maximum equivalence of meaning. But in the present day situation, translation is the process of transfer of message expressed in a source language into a message expressed in a target language, with the maximization of the equivalence of one or several levels of content of the message. It is hoped here that the correlation of the grammatical structures of English and Tamil throw some light for the purpose of machine translation.

In order to prepare a Machine Translation Aid (MTA) for translating English texts into Tamil, we need to know the common and contrasting features of English and Tamil. The study which covers up both the aspects of commonness and contrasting feature are referred here as correlative study. The correlative study has to be made at least from the point of view of lexicon and constituent structure. The correlative study of the vocabulary (lexicon) of both the languages is dealt here. The problem has been tackled in the English-Tamil bilingual dictionary and Tamil generation dictionary; the architecture of them is discussed. Here we are concentrating on the constituent structure of the two languages focusing our attention on syntax. Inflectional morphology is taken care of by morphological analysis. The transfer of grammar English into Tamil can be dealt under the following heads.

1. Transfer of words
2. Transfer of phrases
3. Transfer of clauses
4. Transfer of sentences

6.1. Transfer of words

The words of the source language that are derived, inflected and uninflected have to be transferred into Tamil. The information given by the English analysis dictionary is transferred into Tamil by using Tamil analysis and generation of dictionaries.

6.2. Transfer of phrase

The transfer processes of the following phrases have been dealt here.

1. Transfer of Noun Phrase
2. Transfer of Verb Phrase
3. Transfer of Prepositional Phrase
4. Transfer of Adjectival Phrase
5. Transfer of Adverbial Phrase

6.2.1. Transfer of noun phrases

A typical noun phrase in English can be analysed as follows, which in turn can be transferred into Tamil by making use of the transfer rule.

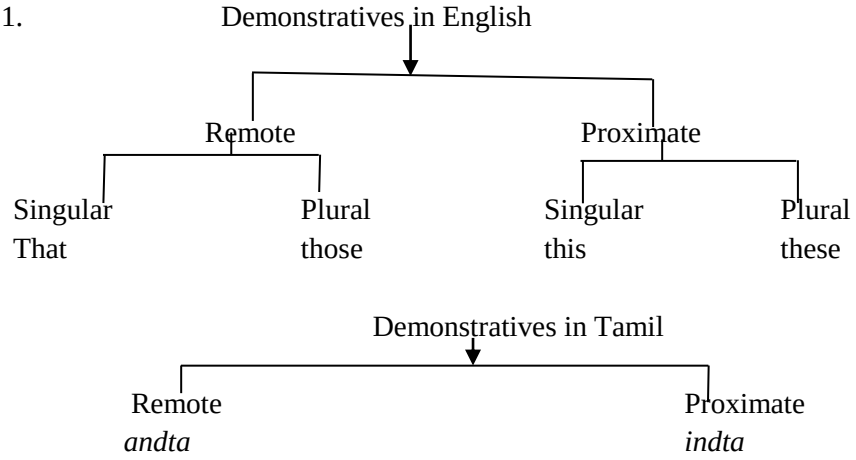
English: NP << Pre-det + Det + Ord + Quant + Adj P + Class + N
Tamil: NP << Class + Gen P + Qrd /Quant + Dem + Adj + N

The word order of the constituents in NP in Tamil is not fixed as in the case of English.

6.2.1.1. Transfer of demonstrative

Demonstratives in English and Tamil can be distinguished into two types in terms of proximity and remoteness. In English they can be further distinguished in terms of number. The following tree diagrams will illustrate the point:

Figure.1.



The following table gives the correlative features of English and Tamil demonstratives

English	Tamil
this	*indta*, itu
that	*andta*, atu
these	*indta*, ivai
those	*andta*, avai

The following correlative features of determiners in English and Tamil have to be noted down while transferring NP in English into Tamil.

1. English have articles, which can be differentiated into definite and indefinite articles whereas Tamil has no article, which can be distinguished into definite or indefinite.
2. It is sometimes possible in Tamil to make use of demonstratives for the definite article.

3. English recognizes singular versus plural distinction under remote and proximate demonstratives whereas Tamil does not make such distinction.
4. English makes use of demonstratives as pronominals in certain places whereas Tamil does not make use of demonstratives as pronominals.

6.2.1.2. Transfer of quantifiers

The following points have to be noted down while transferring the quantifier system of English into Tamil.

1. The aggregates (*all, both,* etc.), fractionals (*half, one-third, two-third* etc.) and multiples (*Twice, three times, four times,* etc.) occur before determiners in English and so they are called pre determiners. But in Tamil, the aggregates (*ellaa* 'all', etc), fractionals (*paati* 'half' *muunRil onRu* 'one third', *muunRil iraNTu* 'two third', etc) and multiplicatives (*iraNTu maTangku* 'two times', *muunRu maTangku* 'three times', etc) do not precede the demonstratives (except in certain cases where it may be due to stylistic variation).
2. In English the prepositions either optionally or obligatorily links the head noun with certain set of quantifiers. Because of this reason fractionals and multiples in English occur before determiners, whereas in Tamil fractionals and multiples follow the determiners. The following examples will illustrate this point.

English	Tamil
all those girls	*andta ellaa ciRumikaLum*
all those things	*andta ella poruTkaLum*
two thirds of this portion	*ltil muunRil iraNTu pangku*
double the amount	*iraNTu maTangku tokai*
half of the crowd	*andta paati kuuTTam*
three fourths (of the) share	*andta mukkaal pakuti*

In Tamil the clitic *um* has to be added after the noun to bring in the aggregate meaning.

6.2.1.3. Transfer of genitive

Genitive observes the arrangement of relative clause with regard to their head; a considerable number of genitive constructions in contemporary English do, follow their head.

The lap of her sister.
Her sister's lap.

If genitive, however, are proper nouns, particularly single names, they often precede.

John's house.

Yet even single names are often postposed.

House of John.

The current status of the genitive in English reflects a change form OV order to VO order. While the favoured order for genitives has been shifted, adjectives still predominantly precede the modified noun.

Large blue eyes.

Only when they are in turn modified do descriptive adjectives regularly follow their head.

They rested on a rock conveniently low.

Limiting adjectives–articles and demonstratives – also stand before nouns, as do numerals; they usually precede descriptive adjectives.

I could not hear him at that distance.
I haven't sent the two persons.
I jumped over the first of the six benches.

Parallel to the order of limiting adjectives is that of multiplying numeral combination with nouns representing higher entities millions, thousands, hundreds, tens in the order of higher to lower (preceded by the simple numerals).

Four thousand two hundred and seven.

As with proposed descriptive adjectives, genitives and relative clauses, proposed limiting adjectives and the cited numerals combinations reflect OV structure. This is the most conservative of the English modifying patterns. In maintaining it as a relic pattern, English provides evidence for the OV structure, which posited for its ancestor language.

Yet English nominal phrases for the most part observe the canonical order of SVO languages, maintaining form early stages OV order only with adjectives and numeral constructions other than the teens.

6.2.2. Transfer of verb phrase

In SVO languages, like English, expressions of verbal modification should be placed before verbs, in accordance with their VO structure. Like nominal modification, verbal modification avoids disruption of the VO constituent. The presence of separate verb like

elements called auxiliaries constitutes one of the characteristics of SVO languages and of English. The expressions for declarative utterances simply observe the normal word order.

This speech caused a remarkable sensation among the party.

It is generally believed that Tamil lacks of VP constituency. So generally Tamil sentences are given a flat structure without VP being at a different hierarchical level. Tamil is an SOV language in which 'S' and 'O' can be shuffled. Tamil is not strictly a configurational language. The direct and indirect objects can be identified by case suffixes.

Many interesting points will be revealed for the purpose of transferring English language structure into Tamil, if we look at the correlating features of the two languages from the point of view of their typological characteristics as SVO and SOV languages respectively. Syntactically, English and Tamil are perhaps most saliently different in the basic word order of verb, subject, and object in simple declarative clauses. Tamil is an SOV language, meaning that the verb tends to come at the end of basic clauses. Tamil being SOV language has postpositions. Tamil is a typical (S) OV language in which the verb occurs at the final position of a sentence. Word order in the sentence is relatively free, as long as the sentence ends with a main verb.

6.2.2.1. Transfer of complex verbal forms denoting tense, mood and aspect.

Both English and Tamil employ the complex process of combining both inflection and compounding in denoting tense, aspect, and mood. We can find correspondences between English and Tamil for the purpose of translating one from the other, though the correspondences are not always perfect; there are proper equivalents and improper and defective equivalents. The tense, aspect, and mood systems of English and Tamil operate differently and finding equivalents is a tough task. But for the purpose of MT, we compromise with certain peripheral differences between them and try to capture the core of the systems with the view in mind that what is conveyed in English can be transferred to Tamil without much distortions as our idea is to translate linguistic text in English into Tamil. The emotive and attitudinal senses conveyed by the auxiliary system will not play a vital part in expressing linguistic concepts. So we ignore the emotive and attitudinal sense and try to capture a core aspectual and model system. That is why we have ignored certain auxiliaries, which are used in Tamil to denote certain attitudinal and non-attitudinal senses. With this aim in mind, the aspectual and modals systems in both languages have been correlated for the purpose of preparing MTA. The following table correlates TAM system of English with that of Tamil.

TAM forms in English with examples	**Meaning**	**Equivalent TAM forms in Tamil with examples**
V1 + past tense He wrote	Past tense	V + past tense + PNG a*van ezhutinaan*

V + present tense He writes	Present Tense	V+present tense+PNG *avan ezhutukiraan*
has + have + V3 He has written. I have written	Present perfect aspect	V + past participle + *iru* + present+ PNG *avan ezhutiyirukki Raan.* ndaan ezhutiyirukkiReen
had + V3 He had written	Past perfect aspect	V + past participle + *iru* +past +PNG *avan ezhutiyirundtaan* V + past participle + ~~*koNTiru* + present – PNG~~
Be' verb + Present tense + V – in He is writing.	Present progressive aspect	*avan ezhutik koNTiukiRaan*
'Be' verb + past tense + V- ing He was writing	Past progressive aspect	V + past participle + *koNTiru* – past – PNG *avan ezhutik KoNTirundtaan*
Will/shall be verb future tense + V – ing He will be writing a letter.	Future progressive aspect	V + past participle + *KONTiru* + future + PNG *avan ka Titam ezhutik koNTiruppaan*

1.can + V1 He can speak English but he can't write it very well.	Ability = be able to = be capable of = know how to	V + infinitive + *mu Tiyum-iyalum* *avanaal aangkilam peeca muTiyum, aanaal ezhuta muTiyaatu.*
1. Can + V1 Can I smoke in here ('Am I allowed to smoke here?)	1. Permission = be allowed to = be permitted to ('Can' is less formal than 'may' in this sense)	1. V-*al* + *aam* + *aa* ndaan pukai piTikkalaamaa?
1.can + V1 Anybody can make mistakes. 2.can + be + V3 The road can be blocked.	1. Possibility = it is possible but / to theoretical possibility may = factual possibility	1. V-*al* + *aam* *yaarum tavaRu Ceyyalam* 2. V + infinitive + *paTal* + *aam* *caalai aTaikkppa Talaam.*
Could + V1 I never could play the chess.	Ability	V + infinitive + *muTiyum / iyalum* *enaal caturangkam aaTa muTiyavillai.*

Could + V1 Could I smoke in here?	II. Permission	V-*al* + *aam* + *aa* ndaan pukai PiTikkalaamaa?
1. Could be + C That could be my train. 2. Could be + V3 The road could be blocked.	II. Possibility (theoretical or factual, cf: might)	1.irukkal + *aam* Atu ennaTaiya to TarvaNTiyaay irukkalaam 2a. V + infinitive + *PaTTu* + irukkal + aam (aalai aTaikkap PaTTu irukkalaam 2b. V + infinitive + *PaTTu* + irukka + kuuTum (aalai aTaikka PaTTirukkak kuuTum
may + V1 He might leave tomorrow	Future time with modal auxiliaries. In many contexts, modal auxiliaries have in-herent further reference, both in their present tense and past form.	V-*al* + *aam* avan ndaalai Pookalam
1.may + V1 You may borrow Car if you like. 2. may not + V1 ex. You may not borrow my car (=You are not allowed to borrow my car.)	III. Permission =be allowed to = be permitted to in this sense may is more formal than can. Instead of may not or mayn't mustn't is often used in the negative to express Prohibition	1.V-al + aam ndii ennuTaiya kaarai KaTanaakap peRalaam 2.V+infinitive + maaTTu +PNG .ndii ennuTaiya kaarai KaTanaakap PeRamaaTTaay
1.may +V1 He may never Succeed ('It is Possible that he will never succeed') 2. may + be + V_3	III. Possibility = be it is possible that /to May – factual possibility (cf: can = theoretical possibility)	1a. V-*al* +*aam* (for positive meaning) 1.b. V+ infinitive + *maaTTu* + PNG avan veRRi peRamaaTTaan 2. V+ infinitive +paTal +aam Caalai aTaikkappaTalaam.
might + V1 He might leave tomorrow.	Future time with modal auxiliaries. In many contexts, modal auxiliaries have inherent	V-*al*+*amm* avan ndaalai pookalaam

	future reference, both in their present tense and past for.	
Might…? Might I smoke here?	IV. Permission	V-*al* + *aam* + *aa* Ndaan pukai PiTikkalaamaa?
Might + V1 He might succeed.	Possibility	V-*al* + *aam* Avan veRRi peRalaam.
Shall + V1 He shall get the money. You shall do exactly as you wish.	II. Willingness on the part of the speaker in 2nd person and 3rd person ('weak volition') Restricted use.	V-al + aam Avan paNam peRalaam. Ndii virumpuvatu pool Ceyyalaam.
Shall + V1 We shall let you know our decision. We shall, overcome. 1b. Shan't + V1 It shan't be long for me to meet the minister.	1. Intention on the part of the speaker only in 1st person ('intermediate volition')	1a.V+future tense +PNG ndaagkaL ungkaLiTam engkaL tiirmaanattait terivippoom. 1b. aakaatu enakku mandtiriyai paarkka ndiiNTa ndeeram aakaatu
Shall + V1 You shall do as I say. He shall be punished. The vendor shall Maintain the equipment in good repair.	1.a. Insistence ('Strong volition'). Restricted use. b. Legal and quasi-legal.	V-al+aam Ndaan collukiRa paTi Ceyyalaam. Avan taNTikkappa Talaam. Teru viyaapaaari tannuTaiya Karuviyai ceppam ceytu Vaittirukkalaam.
Should + V1 You should do as he says. They should be home by now.	1.Obligation and logical necessity (=ought to)	V+infinitive + veeNTum ndii avan colvatu pool Ceyya veeNTum avarkaL ippootu viiTTil irukka veeNTum.
Will/shall + v1 He will write. I shall write.	Future tense	V + future + PNG avan ezhutuvaan Ndaan ezhutuveen
Will + V1 I'll write as soon as I can. Will you have another cup of tea?	I. Willingness ('weak volition') unstressed, especially 2nd person. "Down toners' like please may be used to soften the	V+future tense + PNG Epootu muTikiRatoo apootu Ndaan ezhutuveen. Innoru kooppai teenier kuTikkiRaayaa?

	tone in requests.	
Will + V1 I'll write as soon as I can. We won't stay longer than two hours.	II. Intention (intermediate volition). Usually contracted 'II', mainly 1st person.	V+future tense +PNG muTiyumpootu uTanee ezhutuveen. ndaangkaL iraNTu maNi ndeerattiRku meel tangka maaTToom.
Will + V1 He 'will do it, whatever you say ('He insists on doing it…') (cf He 'shall do it, whatever you say = 'I insist on his doing it')	II. Insistence ('strong volition'= insist on). Stress = ed, hence on 'll contra-diction. An un-common meaning.	V+future tense + PN G ndiingkaL colvatai avan ceyvaan.
would….? Would you excuse me?	III. Willingness ('Weak volition')	V+future tense + PNG + aa ndii ennai Mannippaayaa?
Would + V1 It's you own fault: you 'would take the baby with you.	III. Insistence ('Strong volition')	V+ past participle form + Iru + infinitive + veeNTum atu un tavaRu. Ndii Kuzhandtaiyai unnuTan eTuttuc cenRirukka veeNTum
1.must You must be back by 10 o'clock. 2.had to Yesterday you had to be back by 10 o'clock. Yesterday you said you had to / must be back by 10 o'clock.	II. Obligation or compulsion in the present tense = (=be obliged to, have to); except in reported speech. Only had to (not must) is used in the past.n the negative sentence needn't, don't have to, not be obliged to are used (but not must not, mustn't which = 'not be allowed to')	1.V+infinitive +veeNTum ndii pattu maNikku tirumpa veeNTum. 2.V + past participle +iru+infinitive+veeNTum ndeeRRu ndii condaay pattu maNikku ndaan tirumpiyirukka veeNTum enRu.
Will, must, Should + V1 The game will/must/should be finished by now.	[Prediction of the similar meanings of other expressions for logical necessity and habitual present. The contracted form 'll is common]. Specific prediction.	V+infinitive + veeNTum viLaiyaaTTu inndeeram muTindtirukka veeNTum.
Will + V1, V1	Timeless Prediction	V + future + PNG

Oil will float/floats on water.		eNNai taNNiiril mitakkum.
Will, 'll He'll (always) talk for hours if you give him the chance.	Habitual prediction	V+future +PNG Avanukkuc candtarppam koTuttaal avan (eppozhutum) maNiokkaNakkaakap peecuvaan.
1.must, has to There must / has to be a mistake. (must is not used in sentences with negative or interrogative meanings, can being used instead.	Logical necessity.	1. irundirukka + veeNTum 2. tavaRu irundtirukka 3. veeNTum
2.cannot There cannot be a mistake. 3. mustn't (Must can occur superficially interrogative but answer-assuming sentence) Mustn't there be another reason for his behaviour.		2. irudndirukka + muTiyaatu tavaRu irundtirukka muTiyaatu. 3. irundirukka + veeNTaam avanuTaiya parimaaRRattiRku veeRu kaaraNam irundirukka veeNTaam.
ought to + V1 You ought to start at once. They ought to be here by now.	Obligation and logical necessity.	V+infinitive +veeNTum Ndii uTanee puRappaTa veeNTum. avarkaL ipootu ingkee irukka veeNTum.
Used to + V1 He used to fish for hours. He used to be an excellent cricketer.	A state of habit that existed in the past but has ceased. (cf: would, and formerly or once + past)	V-atu+vazhakkam +aay + iru + past + PNG maNikkaNakkil miin piTippatu avan vazhakkamaay irundtatu. Avan oru arumaiyaana Kirikket aaTTakaaranaaka Irundtaan.

The following points have to be noted while transferring TAM system of English into Tamil.

1. Both English and Tamil make use of inflection as well as compounding (i.e. combining main verbs with the auxiliary verbs) to express TAM.
2. The important point to be noted from the point of view of word order is that auxiliary verbs in English precede the main verb in English, whereas in Tamil they follow the main verb.
3. In English auxiliary verbs are inflected for tense, person and number; whereas in Tamil they are inflected for tense, person, number and gender.
4. Both English and Tamil undergo auxiliary reduction.
5. Identical auxiliary verbs in complex constructions get deleted both in English and Tamil.
6. Auxiliary verb occurs in a sequence to denote tense, mood, aspect, voice etc. In both English and Tamil. The modal auxiliary verb in English never occurs after a primary auxiliary verb in English, whereas; in Tamil primary auxiliary verb never occur after a modal auxiliary verb (with the exception of few modal auxiliary verbs).
7. Both Tamil and English express perceptive and progressive sense by auxiliary verbs. But Tamil makes use of this device to express the completive and reflexive sense too.
8. In English, interrogative sentences are derived from their respective affirmative sentences by shifting the relevant auxiliary verbs to the initial position.

The following table shows the correlative features of auxiliary system in English and Tamil for the sake of transfer.

Auxiliary system in English	**Auxiliary system in Tamil**
The auxiliary verbs are used to add auxiliary meaning to the main verb.	In Tamil too, a lot of auxiliary verbs are used to add auxiliary meaning to the main verb.
The auxiliary verb precedes the main verb.	The auxiliary verb follows the main verb.
Primary auxiliary verbs are inflected for tense, person and number.	Primary auxiliary verbs are inflected for tense, person, and gender.
The modal auxiliary verbs are inflected for negation.	Tamil too, the modal auxiliary verbs are inflected for negation.
-.	The main verbs in the auxiliary verb constructions occur in the form of verbal participles infinitives or verbal nouns.
-	Any one of the identical auxiliary verbs is deleted in the formation of compound sentences.
Auxiliary verb reduction is possible.	Auxiliary verb reduction is possible in Tamil too.
Lexical insertion between the main verb and auxiliary verb (with the exception of	Lexical insertion mentioned in the case of English is not possible in Tamil.

a few modal auxiliary verbs) is possible.	
Auxiliary verb occurs in a sequence to denote a different grammatical meaning.	This is the case with Tamil too.
A modal auxiliary verb never occurs after a primary verb	A primary auxiliary verb never occurs after a modal auxiliary verb.
A statement can be converted into a yes – or – no question by shifting the auxiliary verb to the sentence initial position.	-
Auxiliary verbs occur in tag questions, but the main verbs do not occur in tag questions.	This is the case with Tamil too.
The *n't* that is the contracted form of *not* is cliticized onto the preceding auxiliary verbs but never onto a preceding main verb.	-
The supportive *do* appears before a main verb in certain environments, but never before an auxiliary verb.	-
The *all* (quantifier), which follows the auxiliary verb, is semantically associated with the subject of the sentence.	-

6.2.2.2. Transfer of verb patterns

The following table illustrates the transfer of verb pattern forms in English into Tamil.

Verb patterns in English	**Parallel patterns in Tamil**
VERB PATTERN 1 NP + BE + NP This is a book	NP + NP atu our puttakam
NP + BE + PN It's me	NP + NP atu ndaan / atu ennu Taiyatu
NP + BE + Possessive P That's mine	NP + Possessive Pronoun – uTaiyatu atu ennuTaiyatu
Interrogative + BE + NP Who is that?	NP + interrogative pronoun atu yaar?
NP + BE + Adj.	NP + Adj – pronominalizer

She is clever	aval azhakaanaval
NP + BE + Adj.P The statue will be life size	NP + Adj – pronominalizer Andta cilia mikapp periyathu
NP + BE + PP She is in good health	NP + NP-ooTu + iru avaL ndalla aarookkiyattooTu irukkiRaalL
NP + BE + Adv She is here	NP + Adv + iru avaL ingke irukkiRaaL
There + BE + NP There was a large crowd	Angkee + NP + iru angkee perum kuuTTamaaka irundtatu
There + BE + NP + PP There are three windows in this room	PP + NP + iru Indta aRaiyil muunRu jannalkaL irukkiRana
It + mBE + Adj. / NP + to – infinitive It is so nice to sit here with you.	atu-clause + Adj. + iru unnuTan uTkaarndtu iruppatu rompa ndanRaaka irukkiRatu
How + Adj./NP + (it+BE) to – infinitive phrase How nice it is to sit here with you	atu-clause + evvaLavu + Adj + iru unnuTan uTkaarndtu iruppatu evvaLavu ndanRaaka irukkiRatu
What + Adj. / NP + (it + BE) to infinitive clause What a pity it is to waste time.	atu-clause + ervvaLavu + Adj + iru ndeerattai viiNaakkuvatru evvaLavu moocamaaka irukkiRatu
It BE + Adj. / NP + gerundial clause It is so nice sitting here with you	atu-clause + Adj. + iru UnnuTan UTkaarndtu iruppatu ndanRaaka irukkiRatu
NP + BE + that-clause The trouble is (that) all the shops are shut.	enpatu- clause + Adj + iru ellaa kaTaikaLum muuTappaTTirukkinRana enpatu cikkalaaka irukkiRatu
It + BE + NP / Adj. + that – clause It was a pity (that) you couldn't come	enpatu-clause + Adj + iru unnaal vara iyalavillai enpatu varattattiRkuriyataaka irundatu
NP + BE + to-infinitive clause This house is to let It + BE + Adj. / NP + for + N/ Pronoun + to-infinitive (phrase) It was hard for him to live in this small cell.	NP + infinite-clause + iru Indta viiTu vaaTakaikku vita irukkiRatu atu-clause + Adj + iru indta cinna ciRaiyil vaazhvatu kaTinamaaka irundtatu

VERB PATTERN 2 NP + Vi The sun is shining	Cuuriyan pirakaacikkiRatu NP + Vi
There + vi + NP There followed a long period of peace and prosperity.	NP + vi Amaitiyaana vaLamaana Kaalam toTarndtau
It + Vi + whether –clause It does not matter whether we start now or latter.	Enpatu-clause + Vi ippozhutaa allatu pinnaraa ndaam toTangakvirukkiRoom enpatu viSayam alla .
It + Vi + to-infinitive clause It only remains to wish you both be happiness.	Infinitive clause + Vi ndiingkaL iruvarum makizhcciyaaka irukka vaazhtta irukkiRatu
It + Vi + that-clause It seemed that the day would never end.	enRu – clause + Vi ndaaL muTivuRaatu enRu toonRukiRatu
NP + Vi + for + PP (adv. Adjunct) We walked for five miles	NP + NP (Adv adjunct) + Vi Ndaam aindtu maikaL ndaTandoom
NP + Vi + Adj. Adjunct My hat blew off	NP + Vi ennuTaiya toppi PaRandtu viTTatu
NP + Vi + Adj. The leaves are turning brown.	NP + Adj + Vi ilaikaL pazhuppu ndiRattil maaRukinRana
NP + Vi + Adjectival past participle You look tired	NP + Adj + Vi Ndii kalaippaakat toonRukiRaay
NP + Vi + NP He died a millionaire	NP + Adj + Vi Avan oru laTcaatipatiyaaka iRandtoan
NP + Vi + Reflexive pronoun You are not looking yourself today	NP + Pronoun – aaka + Vi Ndii inRu ndiiyaakat toonRavillai
NP + Vi + V-ing + infinitive-clause The children came running to meet us.	NP + infinitive-clause + V-past participle + Vi kuzhandaikaL ndammaic can dtikka ooTivandtana
VERB PATTERN 3 NP + Vi + preposition + NP (NP= noun, pronoun) You can rely on me	NP + NP + postposition + vi NP = noun, pronoun ndii en militu ndammpikkai vaikkalaam
NP + Vi + preposition + NP + to-	NP + infinitive-clause + NP + postposition + Vi

Infinitive Clause They advertised for a young girl to look after the children.	avarkaL kuzhandtaikaLai kavanikka veeNTi oru iLamaiyaana peNNiRku viLamparam ceytaarkaL
NP + Vi + (preposition + (it) + that-clause We will see (to it) that she gets home early. They decided (on) who should act as Sita.	Infinitive-clause + NP + Vi avaL kaalam taazhttaamal viiTTiRku vara ndaam eeRpaaTu ceyvoom. Infinitive-clause + NP + Vi avarkaL muTivueTuttu viTTaarkaL, yaar ciittaavaaka ndaTippatu enRu.
VERB PATTERN 4 NP + Vi + to-infinitive clause (of purpose, outcome, or result) He ran to chase the thief.	NP + infinitive clause + Vi avan tiruTanait turatta ooTinaan.
NP + Vi + to-infinitive clause (may be equivalent to a coordinated or subordinated clause) He turned to see the sun setting.	NP + infinitive-clause + Vi avan cuuriyan maRaivataip paarkkat tirumpinaan
NP + Vi + to-infinitive clause (Infinitive adjunct is used after some verbs) She agreed to sing a song	NP + infinitive-clause + Vi avaL oru paaTTupaaTa cammatittaaL
NP + seem/appear + (to be) + Adj./NP This seems (to be) light thing NP + seem / appear + (to be) + Adj. /NP She seemed (to be) unable to enjoy it.	NP + Adj/NP-aaka + toonRu/teri atu ileecaana poruLaakat toonRukiRatu enRu-clause + toonRu/teri avaL atai iracikka iyalaatu enRu toonRukiRatu.
NP + be + to-infinitive clause You are to break the news	NP + infinitive clause + veeNTum ndii anda ceytiyai veLippaTutta veeNTum
VERB PATTERN 5 NP + Anomalous finites + bare infinitives You may leave now.	NP + infinitive clause + aam Ndii ippootu pookalaam
VERB PATTERN 6 NP + Vt + NP (passivisation is possible) Nobody answered my question.	NP + NP-kku + Vt Yaarum ennuTaiya keeLvikku viTai aLikkavillai
NP + Vt + NP (passivisation is not possible) She laughed a merry laugh.	NP + NP + Vt avaL inimaiyaana cirippu cirittaaL

NP +Vt+Gerundial clause (not replaceable by to infinitive She enjoys playing tennis	NP + infinitive- Clause + Vt avaL Tenni ViLaiyaaTa VirumpukiRaaL
NP + Vt + Gerundial clause (Replaceable by to-infinitive clause) The childrem love playing on the sand.	NP + atu-clause-ai+Vt kuzhandtaikaL maNalil viLaiyaaTuvatai virumpukinRana
NP+ need/want/bare + Gerund (With passive meaning) The garden needs watering	Atu-clause + NP tooTTAttil taNNiir viTuvatu avaciyam.
VERB PATTERN 7 NP+Vt + (not) + to-infinitive clause I prefer not to start early	Atu-clause-ai + Vt Munnaree toTangkuvatai ndaan virumpavillai
NP + have/ought + (not) + to-infinitive clause You ought not to complain	NP + infinitive-clause + kuuTaatu ndii kuRaikuuRak kuuTaatu
VERB PATTERN 8 NP + Vt + interrogative Pronoun + to-infinitive clause I don't know who to go for advice	NP + interrogative pronoun-iTam + atu-clause + enRu + Vt Ndaan yaariTam aRivuraikkaaka Poovatu enRu teriyavillai
She cound not decide what to do next	NP + interrogative pronoun-iTam + atu-clause + enRu + Vt avaLukku aTuttu enna ceyvatu enRu muTivu ceya iyalavillai
NP + Vt + interrogative Adv. + to-infinitive Clause Have you settled where to go for your holidays?	Interrogative Adv+V-atu+enRu+NP+ Vt Un ViTumuRai ndaaTkaLil en… PooVatu enRu ndii tiiirmaanittu ViTTaayaa?
NP + Vt + whether + to- Infinitive Clause She didn't know whether to cry or to laugh	atu-clause-aa enRu + NP-ukku + Vt taan cirippataa azhuvataa enRu avaLukkut teriyavillai
VERB PATTERN 9 NP + Vt + that-clause He doesn't believe that my intentions are serious.	atu-clause + enRu + NP + Vt ennuTaiya viruppangkaL mukkiyattuvam vaayndtatu enRu avan ndampavillai
VERB PATTERN 10 NP + Vt + wh-clause I don't know who she is. I don't know who is she.	[NP + interrogative word + (V)]S + enRu + NP-ukku + Vt yaar avaL enRu enakkut teriyaatu avaL yaar enRu enakkut teriyaatu
NP + Vt + whether-clause She asked whether I put sugar in my tea.	S-aa + enRu + NP +Vt Ndaan teendiiril carkarai pooTeenaa enRu avaL keeTTa

VERB PATTERN 11 NP + Vt + NP + that-clause He warned us that the roads were covered with snow.	S + enRi + NP + NP-ai + Vt caalaikaL panikkaTTikaLaal muuTappaTTuLLana enRu avan engkaLai eccarittaan.
VERB PATTERN 12 NP + Vt + NP [IO] +NP [O] The indirect object can be coverted into *to* + NP He handed her the letter (= He handed the letter to her)	NP + NP-iTam + NP + Vt avan avaLiTam kaTitaittai oppaTaittaan
NP + Vt + NP [IO] + NP [O] The indirect object can be converted into for + NP Are you going to buy me Some? (=Are you going to buy some for me?)	NP + NP-aaka + NP + Vt ndii enakku-aakak konjcam vaangkap pookiRaayaa?
NP + Vt + NP + NP He struck the door a heavy blow..	NP + NP-aaka + NP + Vt avan katavukk oru veeka maanatattu koTuttaan
VERB PATTERN 13 NP + Vt +NP [O] + to + NP She read the letter to all her friends	NP + NP-iTam + NP-al + Vt avaL tannuTaiya …… cineekitikaLiTamum andta KaTitattaip PaTittuk'kaaTTinaL
NP + V + NP [O]+ for + NP I have bought some Cholocate for her	NP + NP-aaka + NP + V + Ndaan avaLukkaaka Konjam caakleeTT VaankigirukkiReen
VERB PATTERN - 14 NP + Vt + NP [O] + for + NP We congratulated him on his success. Thank you for your kind help.	NP + NP-aaka + NP-ai + Vt. ndaangkaL avan veRRikkaaka avanaip paaraaTTincom. ungkaLuTaiya anpaana utavikku ndanRi
NP + Vt + PP + NP [O] I explained to him the impossibility of granting his request.	NP + NP-ai + NP-iTam + Vt avanuTaiya veeNTukooLukku utavipuriya iyalaamaiyai ndaan avaniTam viLakkineen
NP + Vt + PP + to-infinitive + that clause I must leave it to your own judgment to decide whether you should offer your resignation.	enRu clause +atu-clause-ai + NP + NP-ukku + Vt. ndii unnuTaiya iraajinaamaavai koTukkaveeNTumaa enRu muTivu ceyvatai ndaan unnuTaiya tiirmaanattiRkee viTTuviTaveeNTum.

VERB PATTERN 15 NP + Vt + NP [O] + Adv. P/PP Please put the milk in the refrigerator.	NP + NP-ai + NP-iL/Adv + Vt tayavu ceytu paalai kuLircaatanap peTTiyil vai.
NP + Vt + NP [O] + Adverbial Particle Put your shoes on	NP + NP-ai + VtT unnuTaiya kaalaNikaLai aNi
VERB PATTERN 16 NP + Vt + NP [O] + to-infinitive clause He brought his brother to see me.	NP+ NP-ai + infinitive-clause + Vt. avan tannuTaiya cakootaranai ennaip paarkka koNTu vandtaan
NP + Vt +NP [O] + as/like/for + NP They have hired a fool as our football coach.	NP + NP-ai + NP-aaka + Vt avarkaL oru muTTaaLai engkaLuTaiya kaal pandtaaTTA payiRciyaaLaraaka vaaTakaikku eTuttirundtaarkaL.
VERB PATTERN 17 NP + Vt + NP [O] + (not) + to-infi itive clause. (Can be passivized) I warn you not to believe a word he says.	[…. V-infinitive + veeNTaam]S + enRu +NP +NP-ai +Vt avan kuuRuvatil oru collaikkuuTa ndampa veeNTaam enRu ndaan unnai eccarikkiReen.
NP + Vt + NP + (not) + to-infinitive clause. (Cannot be passivized) He doesn't want anyone to know that she is going away.	atu-clause-ai + NP +Vt avaL veLiyeeRikkoNTirukkiRaaL enRu yaarum aRivatai avan virumpavillai.
VERB PATTERN 18 NP + Vt + NP + infinitive clause (Verbs indicate physical perception) Did any one hear John leave the house? Did you see anyone go out?	Atu-clause-ai + NP + Vt jaaN viiTTai viTTu veLiyeeRiyatai yaaraavatu paarttiirkaLaa? Ndii yaaraavatu veliyee poonataip paarttaayaa?
NP + Vt + NP + infinitive clause (Verbs do not indicate physical perception) What makes you think so?	NP + NP-ai + infinitive-clause + Vt etu unnai avvaaRu eNNat tuuNTiyatu?
NP + have + NP + infinitive clause We have computers to do our work.	Atu-clause + ukku + …+Vt ndaangkal engkaL veelaiyai ceyvataRku kaNini vaittuirukkiroom

VERB PATTERN 19 NP + Vt + NP + ing-clause (Verbs indicate physical perception) He felt his heart throbbing.	NP + atu-clause-ai + Vt avan tan itayam aTippatai uNarndtaan.
NP + Vt + NP + ing-clause (Verbs do not indicate the Physical Perception) I can't have you doing that…	NP + NP-ai verbal participle Clause +….. + Vt Ndaan atai Unnai Vaittu Ceyya iyalaaku.
NP + Vt + NP + ing-clause (NP = noun, pronoun, possessive) I can't understand him/his Leaving so suddenly.	NP + atu-clause-ai + NP/NP-aal + Vt avan tiTiir enRu veLiyeeRuvatai purindtukoLLa iyalavillai
Verb pattern 20 NP + Vt + NP + interrogative on noun or adverb + to-infinitive clause I showed them how to do it.	[interrogative pronoun/Adv + V- atu] + enRu + NP + NP-ukku + Vt. evvaaRu ceyvatu enRu ndaan avarkaLukku kaaTTineen
NP + Vt + NP + whether + to- infinitive clause Ask her whether to trust him or not.	atu-clause-aa + enRu + NP + NP-iTam + Vt avanai ndampuvataa veeNTaamaa enRu avaLiTam keeL
VERB PATTERN 21 NP + Vt + NP + wh-clause Tell me what your name is? He told me why he had come.	[…. Wh-word …] enRu + NP + NP-iTam + Vt un peyar enna enRu enniTam kuuRu avan een vandtaan enRu enniTam connaan.
VERB PATTERN 22 NP + Vt + NP [O] + Adj. (NP = noun, pronoun, gerund) We painted the ceiling green. The blister on my heal made walking painful.	NP + NP-kku + Noun of quality equivalent to adjective + Vt ndaangkaL uTkuuraikku paccai varNan aTittoom NP + NP-ai + Adj + Vt en paatattil irunda puNdaTappatai veetanaikkuriyataay ceykinRatu.
VERB PATTERN 23 NP + Vt + NP [O] + NP [Object complement] The team has voted me their new captain.	NP + NP-ai + NP-aaka + Vt andta kuzhu ennai avarkaLin putiya talaivanaaka teerndteTuttirukkinRatu
NP + Vt + NP + NP (Subject complement) Jill has made jack an excellent wife.	NP + NP-ai + NP-aaka + Vt Jill jaakkiRku oru ndalla Manaiviyaaka uruvaakiyirukkiRaaL

VERB PATTERN 24 NP + Vt + NP [O] + Past Participle Phrase NP [O] = noun, pronoun You must get this door painted You must make yourself respected	NP + [NP-ai+Infinitive] infinitive-clause + Vt Ndii indta katavai varnam Puucac Ceyya VeeNTum NP + [NP-uuku+V-infinitive] infinitive – clause + Vt. Ndii unaker mariyaatai tarac ceyya VeeNTum
NP + Vt + NP [O] + Past participle phrase NP [O] = noun, pronoun She's had her handbag stolen. The pilot had his plane hijacked.	NP + NP-ai + V-infinitive + Vt avaL tannuTaiya kaipaiyai tiruTa viTTaaL vimaanam ooTTiyee tan vimaanattai kaTattac ceytaar.
NP + have/get + NP [O] + Past participle NP [O] = noun, pronoun Please get the machine Repaired.	NP + NP-ai + V-infinitive + Vt tayavuceytu poRiyai pazhutu Paarkkac cey.
VERB PATTERN 25 NP+Vt + NP [O] + (to be) + Adj./NP Most people considered him (to be) innocent. I have always found Jonathan a good friend.	NP + NP-ai + NP-aaka + Vt palar avanai ndiraparaatiyaakak karutinaar. ndaan joonaatanai oru ndalla ndaNpanaakak KaNTeen.

6.2.3. Transfer of adjectival phrases

The following points of typological correlation have to be noted while attempting to transfer adjective phrase in English into Tamil.

1. Adjectives precede the nouns, which they qualify in Tamil, which reflect the characteristic of SOV language. Adjectives precede the nouns they qualify even though English is an SOV. However, a few numeral adjectives and all predicative adjectives follow the nouns, which they qualify. This tendency reflects the transition of sentence structure form SOV to SVO.

2. In English a few simple adjectives are inflected for degrees of comparison. Whereas in Tamil the adjectives are not inflected for degrees of comparison.
3. Adjectives occur in succession as qualifiers of head in both languages.

The following table illustrates the transfer of adjectival patterns in English into Tamil.

Adjectival Patterns of English	Parallel Patterns in Tamil
[…. + Adj. + N] NP + V A good boy came	[…. Adj + N] NP + V oru ndalla paiyan vandtaan
NP + BE + […. +Adj. + N] NP He is a good boy	NP + […. Adj. + N] NP avan oru ndalla paiyam
NP + BE + Adj. She is beautiful	NP + Adj + BE avaL azhakaay irukkiRaaL
NP + BE + Intensifier [Adv] + Adj. She is very beautiful.	NP + intensifier + Adj + Adj + BE avaL mika azhakaay irukkiRaaL
It + BE + Adj. + to-infinitive clause It's easy to please Jim	NP + atu-clause + Adj + BE Jimmai tirupptipaTuttuvatu eLitaaka irukkiRatu.
NP + BE + Adj. + to-infinitive clause Jim is eager to please every one	NP + infinitive clause + Adj + BE Jim ovvoruvaraiyum tiruptipaTutta Viruppamaaka irukkiRaan
It + BE + Adj. + to-infinitive clause It is wrong of Jim to leave	NP + atu-clause + Adj + BE jim veLiyeeRuvatu tavaRaaka irukkum
It + BE + Adj. + that-clause It is certain that Jim will win.	enpatu-clause + Adj. BE jim jeyippaan enpatu ndiccayamaaka irukkiRatu
It + BE + Adj. + to-infinitive clause John was first to arrive	Adv + V-atu + NP Mutalil vandtu cerndtatu jaaN
NP + BE + Adj. + (Preposition + NP] PP John is anxious for news NP + Adj. + (+preposition) + Clause John is glad that you succeeded. John is anxious about how they got on.	NP + [NP-ai + postposition] PP + Adj + iru jaaN ceytiyaip paRRi kavalaiyaaka irukkiRaan. NP + enRu-clause + NP + Adj + iru ndii veRRi peRRaay enRu jaaNukku mazhcciyaaka irukkiRatu. avarkaL eppaTi camaaLikkiRaarkaL enRu jaaNukku kavalaiyaaka irukkiRatu.

6.2.4. Transfer of adverbial phrases

The following points of typological comparison have to be noted while attempting to transfer adverbial phrases in English into Tamil.

1. An adverb occurs in attributive construction with a verb, an adjective, an adverb or a main clause in both English and Tamil.

2. Adverbs in English are inflected for degree of comparison whereas adverbs in Tamil are not inflected for degrees of comparison.

3. Adverbs in English follow the forms, which they modify as in other SVO languages whereas in Tamil they generally precede the forms, which they modify.

4. More than one adverb can occur in a sequence in both English and Tamil.

5. In Tamil adverbial stems are used in repetition to give more emphasis to the meaning expressed.
umaa miiNTum miiNTum vandtaaL
'Uma came again and again'

The following table illustrates the transfer of adverbial patterns in English into Tamil.

Adjectival Patterns of English	Parallel Patterns in Tamil
Adverbs of Manner NP + Vi + Adv.1 Usha ran fast.	NP + Adv + Vi avaL veekamaaka ooTinaaL
NP + Vt + NP [O] + Adv 1 I ate banana hurriedly. Usha welcomed Uma warmly	NP + NP-ai + Adv. + Vt avaL vaazhaippazhattai viraivaaka caappiTTaaL. uSaa umaavai anpooTu varaveeRRaaL
NP + Adv1 + Vt +NP [O] Usha warmly welcomed the minister from Chennai.	NP + NP-ai + Adv + Vt uSaa cennaiyilurundtu vandta mandtiriyai anpooTu varaveeRRaaL
1. NP + Adv1 + V + to-infinitive clause. They secretly decided to go to Chennai. 2. NP + V + to-infinitive clause + Adv1 They decided to go to Chennai secretly.	NP + Adv + infinitive-clause + V avarkaL irakaciyamaaka cennai cella muTivu ceytanar. NP + infinitive-clause + Adv + V *avarkaL cennai cella* *irakaciyamaaka muTivu* *ceytanar.*
1. NP + V + NP [O] + Adv.11 (ex. Foolishly, generously, etc.,) Usha answered the question foolishly	NP + Adv. + NP-ukku + vt uSaa muTTaaLtanamaaka keeLvikku viTaiyaLittaaL NP + NP-ukku + Adv.+ Vt
2. NP + Adv1a + V + NP [O] Usha foolishly answered the question.	uSaa keeLvikku muTTaaLtanamaaka

	viTaiyaLittaaL
1. NP + V (AV) + NP [O] + Adv 12 (ex. Badly and well) Kannan paid her well. Uma treated him badly 2. NP + BE + adv12 + V (PV) She was well paid. He was badly treated	NP + NP-ukku + Adv. + V kaNNan avaLukku ndanRaaka campaLam koTuttaan umaa avanai moocamaaka ndaTattinaaL NP + NP-ukku + Adv. V avaLukku ndanRaaka campaLam koTukkappaTTatu avan moocamaaka ndaTattappaTTaan
Adv (somehow) + …V…. Somehow they did it. … V. Adv (somehow) They did it somehow.	NP + Adv + NP-ai + Vt NP + NP-ai + Adv + Vt avarkaL atai eppaTiyoo ceytaarkaL
Adverbs of place 1. NP + V + Adv2 (away, everywhere, here, nowhere, somewhere, there etc.,) Usha waits outside Raja sent her aboard Write it there. NP + V + PP + Adv2 Kannan looked for it evrerywhere NP + Vt + NP + Adv2 Keep the book somewhere	NP + Adv + V uSaa veLiyee kaattirundtaaL raajaa avaLai veLindaaTRiRku anuppinaan itai angkee ezhutu NP + NP-ai + Adv + V kaNNan atai ellaa iTangkaLilum] teeTinaan NP + NP-ai + Adv + V *puttakattai engkeeyuaavatu vai.*
NP + Vt + (NP) + Adv21 (ex. Somewhere and anywhere) Usha has seen it somewhere Uma hasn't gone anywhere Kannan has gone somewhere Kannan hasn't gone anywhere	NP + (NP-ai) + Adv + V uSaa atai engkoo paarttirukkiRaaL umaa atai engkum paarttirukkavillai kaNNan engkoo pooyirukkiRaan kaNNan engkum pooyirukkavillai
Here / there + BE/COME/GO + NP [S] Here's Usha's friend There goes my wife. Here comes Raja There comes the elephant	itoo/atoo + NP itoo uSaavin ndaNpar atooatto + NP + V itoo en manaivi pookiRRaaL itoo raajaa varukiRaan atoo yaanai varukiRatu.
There/here + NP [=Personal pronoun] + V There he goes Here he comes	atoo + NP + V atoo avan pookiRaan atoo avan varukiRaan

Adverbs of time Adv 31 (Afterwards, eventually, lately, now, recently, soon, etc.,) +NP + V + NP [IO] + NP [O]	Adv + NP + NP-iTam + NP-ai + V
Eventually Usha told Uma the secret NP + V + NP [IO] + NP [O] + Adv.31 (afterwards, eventually, lately, now, recently, soon, etc.,) Usha told Uma the secret eventually	muTivaaka uSaa umaaviTam irakaciyattaic connaaL uSaa umaaviTam irakaciyattaic connaaL muTivaaka. (marked style)
NP + V + Adv.32 (before, early, immediately, and late) Kala came early.	NP + Adv + V Kalaa munnareettil vandtaaL
NP + V + Adv 32 Uma has gone there before Let's start late Come immediately	NP + Adv. + V Umaa munnareetil angku pooyviTTaaL ndaam taamatamaaka puRappaTalaamaa viraivaaka vaa.
NP + V-Perf + Adv33 (since and ever since) Uma left Mysore in 1998 I haven't seen her since	Adv. + NP + NP-ai + V Umaa 1998-il maicuurukkuc cenRaaL atanPiRatu ndaan avaLai Paarkkavilleii
1. NP + V + (NP [O]) + Adv.34 (Yet and still) Usha hasn't come yet. Uma hasn't seen him yet 2. NP + Adv34 + Vt + NP [O] Kalaa hasn't yet finished the work I gave her a week ago.	NP +(NP-ai) + Adv + V uSaa ituvarai varavillai. umaa avanai ituvaraip paarkkavillai NP + Adv + (NP-ai) + V kalaa ituvarai ndaan oruvaarattiRku munnar koTutta vellaiyai muTikkavillai

Adverbs of frequency 1.NP + V + Adv4 (Always, continually, frequently, occasionally, often, usually, once, etc.,) + Adj/NP NP + Adv + V Uma always comes late 2. NP + Adv4 + V Jaya often comes late. Kala is often late Kannan seldom visits Uma	NP + Adv + V uSaa vazhakkamaaka usha is usually happy. makizhcciyuTan irukkiRaaL NP + Adv + V Umaa epootum taamatamaaka varukiRaaL jayaa epootum taamatamaakka varukiRaaL kalaa aTikkaTi taamatamaaka varukiRaaL kaNNan eppootaavatu umaavai paarkka vuruvaan
1. NP + Aux1 + Adv 4 + Aux 2 + V Uma has often been warned Has Uma ever been warned? 2. Aux 1 + NP + Adv1 + V	NP + Adv + V umaa epootum eccarikkap paTukiRRaaL NP + Adv + V umaa epootaavatu eccarikkap paTTaaLaa?
Adv 1 + Adv 41 + NP + V Secretly ever did Uma try to meet Usha? Adv 42 + NP + V Seldom have Usha beard such a speech	Adv + Adv + NP + NP –ai V irakaciyamaaka epootaavatu umaa uSaavai candtikka muyanRaaLaa? Adv + NP + NP-ai + V aritaakat taan uSaa appaTippaTTa peecai keeTTirukkiRaaL
There + BE + Adv4 (hardly, scarcely, and barely) + NP There is hardly any money left. NP + Adv 4 + V	NP + Adv + V paNam konjam kuuTa miitamillai NP + Adv + V
Usha hardly ever visit her friends	uSaa aritaakattaan taan ndaNparkaLai candtippaaL
Sentence adverbs: These modify the whole sentence / clause and normally express the speaker opinion. NP + BE + Adv 5 (actually, apparently, certainly, definitely, perhaps, surely, etc.,) +Adj. Usha is certainly right Uma is apparently happy	NP + Adv + Adj + BE uSaa ndiccayamaaka cari umaa veLippaTaiyaaka makizhcciyaaka irukmkiRaaL
NP + Adv5 + V …	NP + Adv + ….V

Kannan definitely looks happy	kaNNan ndiccayamaaka makizhcciyaakat terikiRaan
NP + Aux 1 + Adv5 + Aux2 + V Uma would obviously have gone NP + Aux + Adv5 + V Usha will surely come	NP + Adv + Aux1 + V umaa ndiccayamaakp Pooy iruppaaL NP + Adv + V uSaa kaTTaayamaaka varuvaaL
Adv 5 + NP + V…. Apparently Uma looks happy. NP + V … + Adv5 Uma looks happy apparently….	Adv + NP + V veLippaTaiyaaka umaa makizhcciyaakat terikiRaaL umaa makizhicciyaakat terikiRaal veLippa Taiyaaka
NP + V…. + Adv 51 (definitely) Uma will like Usha definitely NP + V…. + Adv52 (perhaps and possibly) Perhaps Uma will like Usha	NP + Adv + NP-ai + V umaa ndiccayamaaka uSaavai virumpuvaaL Adv + NP + (NP-ai + V oruveeLai umaa uSaavai virumpuvaaL
Adv 53 (admittedly, frankly, honestly, etc), NP + V…. Honestly, Usha has won the first prize.	Adv + NP + (NP) + V unmaiyaaka uSaa mutal paricu peRRirukkiRaaL
Adverbs of degree NP + BE Adv6 (quite, almost, barely, completely, enough, quite, rather, etc.,) + Adj Usha is quite happy. Uma is extremely beautiful.	NP + Adv + Adj + iru usaa mikavum makizheciyaaka irukkiRaaL uSaa mikavum azhakaaka irukkiRaaL NP + Adv + … + V
NP + BE + Adv 6 (quite, almost, barely, completely, enough, quite, rather, etc.) +V … Kalaa was completely covered with mud NP + HAVE + Adv6 + V….	uSaa makizhcciyaaka irukkiRaal umaa mika mika azhakaaka iRukkiRaaL kalaa muzhuvatum tozhiyaal muuTappaTTaL
Bava had almost reached Chennai. NP + BE + Adj + Adv61 (enough) The knife isn't sharp enough That food is not good enough	NP + Adv + …. + V Bavaa kiTTattaTTa cennaiyai aTaindtu viTTaaL NP + NP + BE Kattikku kuurmai pootaatu NP + Adj + BE caappaaTu ndanRaaka illai
NP + Adv 62 + V	NP + Adv + V

Uma almost fell down	umaa kiTTattaTTa vizhundtuviTTaaL
NP + V + Adv 63 (only) Usha ate only banana Kala only gave me her pen. NP + V + NP + PP + Adv 63 (only) Kala gave her pen to me only.	NP + …. + Adv + V uSaa vaazhaippazham maTTum caappiTTaaL kalaa maTTum Taan peenaa koTuttaal NP + … + Adv + V Kala Peena koTuttaal enaakku maTTumTaan
NP + Aux + Adb 64 (Just) + V… Uma has just gone home Usha has just finished her work	NP + Adv + …V + Aux umaa ippootu taan viTTukkup pooyirukkiRaaL uSaa ippootutaan veelaiyai muTittaal.

6.2.5. Transfer of prepositional phrases

Adposition is cover term used to incorporate preposition, postposition and cases markers. For the sake of correlation we have to take into account the case suffixes of Tamil also under adposition. The difference, as we are well aware of, is that the case suffixes are inflectional elements of nouns and pronouns, whereas postpositions are loosely added after the oblique forms or case inflected forms of nouns and pronouns. As both of them are used to express different case relations, they are not distinguished from one another for the sake of computation.

The following points are the out come of typological correlation of adpositional phrases in English and Tamil.

1. English generally makes use of prepositions to denote the case relation existing between Vern and noun phrase. But Tamil mostly makes use of case suffixes to denote various case relations. Of course, Tamil too makes use of postpositions at par with English prepositions.

2. Fairly obviously word order is an alternative to case marking in distinguishing subject from object in languages like English. In English the word order also distinguishes the patient object from the recipient or beneficiary object in double object constructions where the patient object always follows the other object:

She gave me good marks.
She cut me a bunch of dahlias.

3. It has frequently been observed that there is a correlation between the presence of case marking on noun phrases for the subject-object distinction and flexible word order and this would appear hold true for Tamil.

4. Typologically it appears that there is a tendency for languages that mark the subject-object distinction on noun phrases to have the basic order of subject-object-verb (SOV), and conversely a tendency for languages lacking such a distinction to have order subject-verb-object (SVO). This statement appears to hold true for English and Tamil.

The following table illustrates the transfer of prepositional phrases in English into Tamil.

Preposition + NP in English	**Prepositional Relations / meaning**	**NP + Postposition in Tamil**
At + NP He is standing at the bus stop.	Dimension type o position	NP-oblique+ - *il* Avan peerundtu ndilaiyattil ndiRkiRaan
To + NP He went to Chennai Give it to me.	Dimension type 0 Destination	NP-oblique +*ku/itam* Avan cennaikkuc cenRaan NP-oblique + *iTam* enniTam koTu
On + NP The book is on the table	Dimension type ½ position (line or surface)	NP-oblique +*il/meel* meecai il/meel puttakam irukkiRatu
On (to) + NP He fell on (to) the floor.	Dimension type ½ destination (line or surface)	NP-oblique+*il* avan taraiyil vizhundtaan
In He is in the village. In (to).	Dimension type 2/3 position (area or volume)	NP-oblique+*il* Avan kiraammattil irukkiRaan.
Kannan dived in (to) the water.	Dimension type 2/3 destination (area or volume)	NP-oblique + *il* kaNNan taNNiiril kutittaan
Away from (=not at) + NP He is away from Chennai	Dimension type o position	NP – oblique + *il* + *illai* avan cennaiyil illai
Away form + NP He went away form Chennai	Dimenstion type 0 destination	NP-oblique +accusative + *viTTu* svan cennaiayai viTTup poonaan
Off + NP The books were off (=not on) the shelves.	Dimension type ½ position (line or surface)	NP-oblique +-*il* + *illai* puttakangkaL SelpukaLil illai

Off + NP He took the book off the shelves Out of (=not in)+NP He is out of the office.	Dimension type ½ destination (line or surface) Dimension type 2/3 position (area or volume)	NP-oblique + - *il* + *irundtu* avan SelpukaLilirundtu Puttakattai eTuttaan Avan aluvalakattil illai NP-oblique +-*il* + *illai*
Out of + NP He went out of the office	Dimension type 2/3 destination (area or volume)	NP-oblique+-*il* + *irundtu* + *veLiyee* Avan aluvalakattilirundtu veLiyee poonaan
Above / over/ On top of + NP The lamp is hanging over the head.	SUPERIOR	NP-oblique + (dative) + *meel/meelee* talaikku meelee viLakkut tongkukiRatu
Below / under/ underneath/ beneath+ NP The dog is lying under the table. INTERIOR in front of +{ NP The house is in front of the temple. Behind + NP The house behind the temple Into / inside +NP He is inside the house Out of / outside + NP He went out of the house.	INFERIOR ANTERIOR POSTERIOR INTERIOR EXTERIOR	1. Inferior location ‘under’ NP-oblique+*in*+ *kiizh/kiizhee/aTiyil* 2. Inferior location ‘below’ NP-oblique + dative + *kiizh/kiizhee* meejaiyin aTiyil ndaay kiTakkiRatu NP-oblique + dative + *munnaal, munp/mun/munnar/mundti* Koovilukku munnaal viiTu irukkiRatu NP-oblique + dative + pinnaal, pin, pinup, pinnar, pindti Koovilukkup pinnaal viiTu irukkiRatu. NP-oblique+dative + *uL, uLLee* Avan viiTTukkuL irukkiRaan NP-oblique + dative + *veLiyee* Avan viiTTuku veLiyee cenRaan.
Near / by / beside / by the side of / at the side of + NP He went near her	NEAR	NP -oblique+ dative + *arukil* Pakkattil/KiTTee Avan avaL pakkattil cenRaan.
With + NP The onion is lying with potato.	In the same place as position	NP-oblique + *ooTul uTan* venkaayam uruLaikkizhankuTan kiTakkiRatu

With + NP He wants with her.	In the same place as Accompainment	NP-oblique + *ooTu / uTan / kuuTee* avan avaLooTu cenRaan
Betweenm, amid, amidst, among, Among + NP The Minister stood among the People.	BETWEEN	NP + dative + *iTaiyil/ ndaTuvil* mandtiri makkaLukku ndaTuvil ndiRkiRaar
Beyond + NP The school is beyond the temple.	ULTERIOR	NP-oblique + accusative + *taaNTi* NP-oblique + dative + appaal koovilukku appaal paLLikkuuTam irukkiRatu
Opposite to + NP The house is opposite to the temple	CITERIOR	NP + dative + etiree / etiril / etirkku/etirttaaR poola Koovilukku etiree viiTu irukkiRatu
Around +NP The trees are around the house.	CITERIOR CIRCUMFE–RENTIAL	NP-oblique + accusative + cuRRi ViiTTaic cuRRi marangkaL irukkinRana.
Across + NP They went across the river.	ACROSS	NP-oblique + accusative + *taaNTi* avarkaL aaRRait taaNTi cenRaarkaL. NP-oblique-in + *kuRukee* avarkaL aaRRin kuRukkee cenRaarkaL
Through + NP He went through The forest.	THROUGH	NP + *vazhiyaaka* avan kaaTTu vazhiyaakaP poonaan.
Along + NP He went along the road.	ALONG	NP + *vazhiyaaka* avan caalai vazhiyaakap poonaan.
Towards + NP He went towards The park	TOWARDS	NP-oblique + accusative + *ndookki*. *paarttu* avan puungkaavai ndookkic cenRaan.
From + NP He went from house.	SOURCE	NP-oblique + locative *il* + *irundtu*, NP + accusative + *viTTu* avan viiTTai viTTuc cenRaan.
To + NP He gave her money.	GOAL	NP-oblique + *ku/ iTam* avan avaLiTam paNam koTuttaan.
Because of + NP He came there because of her.	CAUSE	NP-oblique + *aal* avan avaLLal angku vandaan NP + kaaraNamaaka avan avaL kaaraNamaaka vandtaan.
For + NP	PURPOSE	NP-oblique + dative + *aaka*

He came there for seeing her.		avan avaLaip paarpatarkaaka angku vandaan
With + NP He treated her with respect.	MANNER	NP – oblique + *ooTu /uTan* NP + *aaka* avan avaLai mariyaataiyooTu ndaTattinaan.
By means of/ by + NP..I came by bus	MEANS	NP + oblique + aal ndaan pusil / pusaal vandteen
By + NP He beat the animal by a cane.	INSTRUMENT	NP-oblique + *aal* avan andta vilangkai pirampaal aTittaan. NP + accusative + vaittu / koNTu avan andta vilangkai pirampaal koNTu aTitaan.
About + NP He talked about her.	ABOUT	NP-oblique + accusative + paRRi/ kuRittu avan avaLaip paRRi peecinaan
In connection with + NP He went to Chennai in connection with his busniness	CONNECTION	NP-oblique + accusative + oTTi avan tan viyaapaarattai oTTi cennai cenRaan
For + NP He struggled for her.	SUPPORT	NP-oblique + dative + aaka, veeNTi avan avaLukku veeNTi pooraa Tinnaan.
Against + NP He fought against them.	OPPOSITION	NP-oblique + dative + *etiraaka* avan avarkaLukku etiraaka caNTaiyiTTaan
Except for / with the exception of / excepting / except / but for/barring + NP All except Usha came to office.	EXCEPTION	NP + accusative + tavira tavittuozhiya usaavait tavira elloorum aluvalakattiRku vandaarkaL
Istead of + NP He drank coffee Instead of tea.	SUBSTITUTION	NP + dative + *patilaaka* avan teendiirukkup patilaaka kaappi arundinaan
But for + NP But for him I have not bought the gift.	NEGATIVE CONDITION	NP + *illaaviTTaal/allaamal*__avan illaaviTTaal ndaan inda paricai vaangki irukka maaTTeen.
With / out of - NP He walks with walking stick	INCREDIENT	NP-oblique + *aal* NP-oblique + (ai) + *koNTu/vaittu* avan ndaTakool koNTu ndaTandtaan

6.2.6. Transfer of Phrasal Co-Ordination

There are different types of phrasal co-ordination

Type of coordination	In English	In Tamil
Coordination of noun phrases	1. NP and NP Noun phrases are commonly conjoined Ram and Prem are brothers. 2. NP or NP Ram or Prem will come 3. Either NP or NP Either Ram or Prem did it. 4. Neither NP nor NP Neither Ram nor Prem did it.	1. NP – *um* NP - *um* cakootarakaL raamum pireemum raamoo pireemooi varuvaarkaL 2. NP – *oo* NP – *oo* 3. NP – *oo* NP – *oo* V – negative ramoo pireemoo atai ceyyavillai. (Note in Tamil the clitic oo can be replaced by negative element *allatu*.) 4.raam allatu pireem iruvarumee ceyyavillai
Coordination of more than two noun phrases	NP, NP… and / or NP *And* and *or* can link more than two NPs, and all but the final instance of the conjunctions can be omitted. We congratulated Ram, Prem, and Beem, Det and / or Det	1. Conjunction NP – um, NP– *um*,NP-um ndaangkaL raamaiyum, preemaiyum, piimaiyum paaraaTTinoom. 2. Disjunction NP – oo, NP – *oo* ndaangkaL raamaiyoo, preemaiyoo pimaiyoo paraaTTinoom.
Coordination of determiners	Demonstrative can be linked to each other or to other determiners in the NP. Take this and that Take this (pen) and that pen.	1. Det-*um* Det-*um* itaiyum ataiyum eTu 2. Det + N + um + Det + N + um Indta peenaavai – um andta peenaavai – um eTu. Indta peenavaiy – oo andta peenavai – *oo* eTu.
Coordination of adjectival phrases	Adj P and / or Adj P Adjectives both predicative and attributive can be conjoined. She is beautiful and smart.	AdjP + um / *oo* + AdjP+ um/*oo* avaL azhakaakavum keTTikaarattanamaakavum iRukkiRaaL
Coordination of adverbial phrases	Adv Pnd/or Adv P Adverbials and dependent clause can be conjoined. I can announce it loudly or by using a speaker.	Adv+*um/oo* + Adv + *um/oo* ennall itai captamaakavoo allatu olipperukki koNToo aRivikka iyalum

Coordination of prepositional phrases	PP and / or PP Prepositional phrases can also be conjoined. He looks for his pen inside and outside the box The test in April and in May is postponed.	PP + um/oo + PP + um/oo avan tan peenaavai peTTikku uLLeeyum veLiyeeyum teeTinaan NP+maRRum+NP eeppiral maRRum meey teervukaL ottivaikkap paTTirukkinRana.

6.3. Transfer of Clauses

Three important types of subordinate clauses and the four nonfinite sub classes that can be structurally identified for English are correlated with that that of Tamil.

Type	English	Tamil
Finite clause	As + S+S As she is ill, she cannot attend her class.	*atu* – clause – *aal* + S uTalndalam illatataal avaLaal vakuppiRkucc cella iyalaatu
Non-finite clause	1. Infinitive clause with *to* It is better for you to do that work. 2. Infinitive clause without *to* All he did was open the door. 3. ing – partcipal clause Having arrived late, he was disappointed. 4. ed-participal clause They hurried home, the work is completed.	1. *atu-clause* + S ndii anda veelaiyaic ceyvatu ndallatu. 2. atu – clause + S avan ceytatu ellaam katavaitt tiRandtatu taan. 3. Verbal participle clause + S taamatamaaka vandtu avan eemaandtaan. 4. S […. V-finite + S […. V- finite] S avarkaL viraivaakac cenRaarkaL. Veelai muTindtu viTTatu.
Verbless clause	[Although + ….]Verbless clause + S Although very cheerful, mary has many problems.	aalum-clause + S mika makizhcciyaaka irundtaalum, meerikku pala cikkalkaL uNTu.

Dependent clause may function as subject, object, complement or adverbial.

Dependent clause and they in English	Equivalent clauses and their functions in Tamil
[That …] NP + VP Subject That he is lazy is a fact.	S + *enpatu* + NP Subject avan coompeeRi enpatu uNmai

NP V [that ….] NP Direct object I know that he likes you.	S + *enRu* + S Direct object avan unnai virumpukiRaan enRu enakkut teriyum.
NP BE [that …] NP Subject complement The point is that he is your friend.	S + *enpatu* + NP avan unnuTaiya ndaNpan enpatu kuRippu.
NP + V interrogative clause {Io} + NP {o} Indirect object I gave whoever it was a cup of tea.	… V – aalum clause + S yaaraaka irundtaalum ndaan oru koopai teendiir koTutteen.
S + participle clause He found her excited with joy.	avaL makizhcciyaaka irukka avan kaNTaan
Adverbial clause + S Adverbial When we meet, I shall explain it.	V-um + pootu clause + S ndaam candtikkum pootu ndaan atai paRRi viLakkuveen

Subordinate clauses in English and Tamil can be correlated according to semantic criteria – whether their perspective on the content of the superordinate clause, as indicated by their subordinator, is one of time, location, manner, reason, etc.

Subordinate clauses in English	**Perspectives**	**Subordinate Clause in Tamil**
S + After + S ex. I questioned them after Usha met them.	TIME	… V + Past + adjectival participle + *pinnar/ piRaku* + S uSaa avarkaLai candtitta pimmar/piRaku ndaan avarkaLiTam keeLvi keeTeen
S + before + S I saw Ramu before he died	TIME	V + *um* + *mun* Raamu caakum mun ndaan avanaip paartteen
S + since + S I am in contact with them since I last met them.	TIME	… V-*atu* clause +*il*+*irundtu* + S ndaan avarkaLaik kaTaiciyaakac candittatilirundtu avarkaLiTam toTarpu vaittirukkiReen
S + until + S I will be staying in Chennai until we meet again	TIME	… V-*atu* clause + varai + S ndaam miNTum candtippatu varai ndaan cennaiyil iruppeen
S + when + S I hated you when you were in love with him.	TIME	Adjectival clause + pootu + S Ndii avaLiTam kaatal koNTirukkum pootu ndaan unnai veRutteen
S + while + S	TIME	Adjectival clause + pootu + S

I was watching them while they were eating.		avarkaL caappitukiRa *pootu* ndaan avarkaLaip paarttuk koNTirundteen.
S + where + S I don't know where Sujatha went.	LOCATION	…*engku* + V-finite + *enRu* + S cujaataa engku cenRaaL *enRu* enakkat teriyaatu
Since + S Since you didn't pay Money, we will not Give you books	REASON	*aal*-clause of ndii paNam kaTTaatataal ndaangkaL unakkup puttakam tara maaTTom
S + as if + S HC acted as if usha was Sick	MANNER	*atu* – clause + Pool + S Usaa uTal ndalamillaatatie Pool avan ndaTittaan
S + as though + S He acted as though Kannan hadn't seen him	MANNER	Atu-clause + *pool* + S kaNNan tannaip paarkkaatatu pool avan nda Tittaan.
S+need + S I need a bag so that I can take it safely.	PURPOSE	*ataRkaaka*-clause + S *atai* paatukaappaaka eTuttuc celvataRkaaka enakku oru pai veeNTum
S + in order that + S I encouraged Rajan in order that he would confer.	PURPOSE	…*um*-clause + *paTi*+ S raajanaik kalandtaaloocikkum ndaan uRcaakap paTuttineen
S + so as to + V1… He went through a small lane so as to avoid the police	PURPOSE	*ataRkaaka* clause + S avan kaavalarait tavirppataRkaaka oru kuRukiya paatai vazhiyaakac cenRaan
S +in order to+V1… He went through a small lane in order to avoid the police	PURPOSE	*ataRkaaka* clause + S avan kaavalarait tavirppataRkaaka oru kuRukiya paatai vazhiyaakac cenRaan
S + as (many) as + S I had eaten as (many) apples as Uma had eaten.	COMPARISON	NP…ettanai + NP + V- finite-oo + attanai + NP +… + V-finite umaa ettanai appiL caappiTTaaLoo attanai aappiL ndaanum caappiTTeen.
S + more than + S I had eaten apples more than Uma had eaten.	COMPARISON	*atu-ai* clause + *viTa kuuTutal*+ S umaa cappiTTatai viTa kuuTutal ndaan caappiTTeen
NP + BE + Adj (comparative degree) + than + NP I am taller than Usha.	COMPARISON	NP + NP-ai + viTa + Adj + pronominalizer + {-aay+iru} ndaan uSaavai viTa uyaramaanavan

S + although + S She thanked them although they refused her suggestion.	CONTRAST	adjectival clause + pootilum + S avarkaL avaL karuttai maRutta pootilum avaL avarkaLukku ndanRi kuuRindaaL.
S+ even though + S She behaved politely even though she was rich.	CONTRAST	adjectival clause + *pootilum* + S avaL paNakkaariyaay irundta pootilum avaL mariyaataiyaay ndaTandtu koNTaaL.
S + despite + S I ate two eggs despite (my) hating eggs.	CONTRAST	adjectival clause + *pootilum* + S Ndaan muTTaiyai veRutta pootilum iraNTu muTTaikaL caappiTTeen.
S + so (that) +S He had spent a lot of money on the project so (that) it was a success.	RESULT	V-infinitive + veeNTum + enpataRkaaka + S tiTTam veRRi peRaveeNTum enpataRkaaka paNam calavazhittaan.
Please get the letter from Raju if he had read it.	CONDITION	All-clause + S Raaju andta kaTitattaip paTittuviTTaal atai avaniTemirundtu vaangkit taravum.

The following are the different dependent clauses whose transfer is dealt here.

1. The nominal clauses
2. Adverbial clauses
3. Adjectival clauses
4. Comparative clauses
5. Comment clauses.

6.3.1. Transfer of Nominal / Complement Clauses

Clauses in English	Clauses in Tamil
1.1. That – clause functioning as subject That she is beautiful is true.	1.1. S + *enpatu* + NP avaL azhakaanavaL enpatu uNmai
1.2. that – clause Functioing as direct object I told him that she was beautiful	1.2. S + *enRu* + S ex. avaL azhakaanavaL enRu avaniTam kuuRineen.
1.3. That – clause functioning as oppositive Your assumption, that things will improve, is understood.	S + *enRa* + S kaariyangKaL meenmaiyaTaiyum enRa unnuTaiya karuttu terikiRatu.
1.4. That – clause functioning as adjectival complement I am sure that things will improve.	S + *enRu* + S kaariyangkaL meenmaiyuRum enRu ndaan uRutiyaaka ndampukiReen.
2.1. Wh-clause functioning as subject What he is searching for is a house.	*atu* – clause + S avanm teeTikkoNTirukkiRatu oru viiTu

2.2. Wh – clause functioning as direct object He wants to eat whatever is ready.	Interrogative *oo*-clause + S etu tayaaraaka irakkiRatoo atai avan caappiTa virumpukiRaan
2.3. Wh – clause functioning as indirect object She gave whoever came a cup of tea.	Interrogative oo-clause + S yaar vandtaarkaLoo avarkaLukku avaL teendiir koTuttaaL
2.4. Wh – clause functioning as subject complement The truth is what I guessed correct.	Interrogative *oo*-clause + S etu cariyenRy ndaan ndinaitteenoo atu taan uNmai
3. If / whether – clause functioning as direct object I don't care if/whether he is available.	*aalum*-clause + S avan irundtaalum ndaan ataippaRRi kavalaip paTavillai
4. Nominal relative clause introduced by wh – element. What he is looking for is a wife.	*atu* -clause + S avan teeTikkoNTiruppatu oru manaiviyai
5.1. To – infinitive nominal clause functioning as subject For a boy to do that is strange.	*atu*-clause + NP oru paiyan itaic ceyvatu aticayamaanatu
5.2. To-infinitive nominal clause as subject complement Her intention is to become a doctor.	*atu* -clause + NP oru maruttuvaraavatu avaLatu viruppam.
6. Nominal ing – clause as subject complement. His hobby is collecting stamps.	*atu* -clause + S anjcal villaikaL ceekarippatu avanuTaiya pozhutu pookku
7. Bare infinitive All he did was press the button	atu – clause + S pottaanai amukkiyatu taan avan ceytatu
8. Verbless clauses Mosaic flooring in every room is expensive	*atu* -clause + S ovvoru aRaiyaiyum mucaik tarai pooTuvatu perunjcelavaakum.

6.3.2. Transfer of Adverbial Clauses

The following tables show the correlative features of adverbial clauses in English and Tamil.

Clause structures in English	**Type of clause**	**Equivalent clause structures in Tamil**
1.1. S + after + S I went to Madurai after she left Chennai.	1. Clause of time	Adjectival clause + *piRaku, pinnaal, pinup, pinnar, pin* avaL cennaiyai viTTu Poona pinnar ndaan maturai cenReen.

1.2. S + before + S She left the college before she finished her ecucation.	"	*ataRku*–clause + *munnaal, munpu, munner, mun* + S avaL tan paTippai muTippataRku munnaal kalluuruyai viTTup pooyviTTaaL.
1.3. S + Since + S I am working as teacher since we last met.	"	*atu* clause + *il* irundtu Poona taTavai ndaam candittatilirundtu ndaan aaciriyaraakap paNiyaaRRukiReen.
1.4. S + until + S I will be at Chennai until we meet again	"	Adjectival *um* – clause + *varai* + S ndaam miiNTum candtikkum varai ndaan cennaiyil iruppeen.
1.5. S + When + S I met you when you were in Chennai.	"	Adjectival clause + *pootu* ndii cennaiyil irundta pootu ndaan unnaic canditteen.
1.6. While… V-ing He watched them while they were eating	"	Adjectival clause (i.e.RC) + pootu avarkaL caappiTTukoNTirundta pootu avan avarkaLai kavanittaan.
2.1. S+ where + S I met her where she was working	2. Clause of place	… *engku* … V-finite – *oo angku* …. V-finite avaL engku veelai ceykiRaaloo angku avan avaLaic candtittaan. Or Adjectival clause + iTam avan avaL veelai ceykiRa iTattçk avaLaic candtittaan.
2.2. S +wherever + S He accompanied her wherever she went.	"	…*engkellaam*.. V-finite oo + *angkellam*. V- finite. avaL engkellam cenRaaLoo angkellam avanum kuuTac cenRaan. Adjectival clause + iTanttiRkellaam avaL cenRa iTattiRkellam avanum kuuTac CenRaan.
3.1. If + S + S If he performs well, He will win the prize. If you wait, (then) You can meet him. 1. Real condition if she comes, I'll talk to her.	3. Clause of condition	*aal*-clause + S avan ndanRaaka ceyalpaTTaal, paricu peRuvaan. ndii kaattirundtaal avanaic candtikkalaam 1. Real condition avaL vandtaal ndaan avaLiTam peecuveen.
If it rains, the picnic will be cancelled.	"	mazhai vandtaal piknik rattu ceyyappaTum.

2. Unreal condition if she came, I'd talk to her.		2. Unreal condition avaL vandtirundtaal, ndaan peeciyiruppeen.
3.2. Unless + S S Unless it rains, the crops will die.	"	V + *aa* + viTTaal – clause + S Mazhai peyyaaviTTaal, payirkaL iRanduviTum.
3.3. Had + S + S Had I been there, I'd have congratulated you.	"	*aal* – clause + S ndaan angku irundtaal, unnai paaraaTTiyiruppeens
4.1. although + S + S Although he tried hard, he failed.	4. Clause of concession	Adjectial + *pootilum* – clause + S avan mikundta ciramappaTTa pootilum tooRRuviTTaan
4.2. if + S + S if he's poor, at least he's happy	"	Adjectival + *pootilum* – clause + S Avan ezhaiyaaka irundta pootilum makizhcci yaaka irukkiRaan
5.1. because + S I could not meet Uma, because she was ill.	5. Clause of reason or cause	Adjectival clause + kaaraNattaal + S umaa uTal ndalamillamal irundta kaaranataal ndaan avaLaic candtikka muTiyavillai.
5.2. S + since + S I did not work hard since you didn't give me salary.	"	Adjectival clause + *kaaraNattaal* ndii enakkuc campaLam taraata kaaraNattal ndaan kaTinamaaka uzhaikkavillai.
6.1. Since + S + S Since the rain has stopped, we shall go out.	6. Clause of circumstances	*aal*-clause + S Mazhai ndinRuviTTataal, ndaanm veLiyee poovoom.
6.2. As + S + S As it was dark, she hesitated to go out.	"	*aal*-clause + S iruTTaaka irundtaTaal, avaL veLiyee pooka tayangkinaaL
7.1. S + so that + S He worked hard, so that he could succeed.	7. Clause of purpose	U-clause enpataRkaaka + S veRRi peRaveeNTum enpataRkaaka avan kaTinamaaka uzhaittaan.
7.2. S + in order that +S We eat well, in order that we may be healthy.	"	*Um*-clause + enpataRkaaka raaju kuRRattai oppukkoLLaTTum enpataRakaaka kattirunteen
7.3. S + to-infinitive clause He walked fast, to catch the train	"	Infinitive clause + S avan rayilaip piTikka viraivaay ndaTandtaan
7.4. S + so as + infinitive – clause She studied hard. So as to get the scholarship	"	*veeNTum*-clause + *enpataRkaaka* + S avaL uukkattokai kiTaikka veeNtum enpataRkaaka ndanRaakap paTittaaL

7.5. S + in order + infinitive – clause He went through the narrow lane in order to avoid the police.	"	*VeeNTum* – clause + *enpataRkaaka* + S Ex. kavalariTamirundtu Tappa veeNTum enpataRkaaka paatai kuRukiya paatai vazhiyaakac cenRaan.
7.6. S + in order that +S We eat well, in order that we may be healthy	"	*veeNTum* – clause + *enpataRkaaka* aarookiyamaaka irukkaveeNTum enpataRkaaka ndaam ndanRaakac caappiTukiRoom
8. S + so that + S He practiced well, so that he could perform well. The dog barked so loudly that the thief fled	Clause of result	*um*-clause+*paTikku*+S avan taan ndanRaaka ceyalpaTum paTikku ndanRaaka payiRci ceytaan tiruTan ooTum paTikku ndaay kuraittatu
S + as if + S Raja acted as if he was sick	Similarity	*atu*-clause + *poola/pool* raajaa uTalndalamillaamal irundtatu poola ndaTittaan
S + as though + S He acted as though Usha has not seen him	Similarity	*atu*-clause + poola/pool uSaa avanaip paarkkaatatu poola avan ndaTittaan.
… as … as Ramesh came as frequently as Raja.	Similarity	NP ai + *viTa kuuTutal* raajaa umaavaivtha kuuTutai celavazhitt aaL
… more than + S Raja spent more than Uma had spent.	Difference	NP – ai + ViTa Raajaa rameeSai viTa viraivaaka ndaTandtaan
(al) though + S He gave them money although they refused to accept it.	"	Adjectival clause + *irundta pootilum* avaL paNakkaariyaaka irundta pootilum ndanRaaka ndaTandtukoNTaaL.
So (that) + S He spent lavishly so (that) he became pauper soon.	Reason	*ataRkaaka* – clause avan vaRiyavanaavataRkaaka taaraaLamaaka celavazhittaan

6.3.3. Tansfer of Adjectival Clauses

Adjectival clause or relative clauses are clauses linked to a noun in their container clause, frequently with a WH form like the relative pronoun *which* and *whom.* As relative clauses qualify an NP, it performs the function of an adjective.

The girl who is clever

The following points have to be remembered while transferring a relative clause construction in English into Tamil.

1. In English the relative construction occurs in the finite from whereas in Tamil the verb in relative construction occurs in the non-finite form.
2. In English the verb follows the head noun whereas in Tamil, it precedes the head noun.
3. In both the languages, the verbal form in the relative constriction has time relation.
4. In English the relative pronoun has always a co referential noun whereas in Tamil, there is no co referential noun to the head noun.
5. In English, the relative construction occurs in conjunction to qualify the co referential noun whereas in Tamil, the relative participle occurs in succession to qualify the head noun.
6. In Tamil, an adjective may intervene between the non – finite verb and the head noun.

The following table gives the three types of relative clauses in English and their parallel clauses in Tamil.

Types of relative clauses in English	**Their equivalents in Tamil**
1. Restrictive relative clause as post modifiers: 1.1. [NP + [relative word +S]] NP The boy that is eating is her friend. 1.2. [NP + S] NP The table we bougt was strong.	[[…. V+ Tense /negative+relative participle]+ NP] NP caappiTTukkoNTiruppatu avaLuTaiya ndaNpan. Ndaam vaangkina meecai valimaivaayndtatu.
2. Non restrictive relative claise as post modifiers [[NP + [relative word +S]] NP The boy drawing the picture is my son.	[[… V+ Tense/negative + relative participle] + NP]] NP vaazhttu terivitta kaNNanai avaL candtittaaL
3. Non finite relative clause as post medifiers 3.1. (NP + [V-ing….]] NP The boy drawing the picture is my son 3.2. [[NP + [V3…]] NP The man rejected by you is my uncle. 3.3. [[NP [infinitive clause]] NP The next girl to sing is my daughter.	[[V+Tense/Negative + Relative Participle] + NP] NP paTattai varaindtu kiNTirukkiRatu ennuTaiya makan unnaaL taLLappaTTa manitar enmaamaa. aTuttu paaTairukkum ciRumi enmakaL.

6.3.4. Transfer of comparative clauses

The following table correlates the comparative elements used in English and Tamil.

Meaning	Comparative elements in English	Comparative elements in Tamil	Comment
Similarity	as… as so … as She is as clever as her brother.	*pool, poola* avaL tan cakootaranaip poola aRivuLLavaL avaL tan cakootariyaip poola aRivuLLavalaay irukkiRaaL	Tamil makes use of pronominalized forms of adjectives instead of adjectives while denoting the present state/ quality. The formation can be captured by the following rule : [[Adj + [pronominalizer] NP + {aay]Adj+iru}]]
Dissimilarity	Than She is cleverer that her brother.	*vita, kaaTTilum* avaL tan cakootaranai viTa/ kaaTTilum aRivullavaL. avaL tan cakootariyai viTa/ kaaTTilum aRivuLLavaLLay irukkiRaaL	“

6.3.4.1 Comparative clause of quality

The following table illustrates the transfer comparative clauses of quality.

Adjectival form in English	Degree	Parallel form in Tamil
NP + BE + as + positive form of adjective + as + NP Uma is as beautiful as Usha.	Similarity positive degree	NP + NP–*ai* + *poola* + Adjective + *iru* umaa uSaavaip poola azhakaay irukki RaaL.
NP + BE + more + adjective + than + NP Uma is more beautiful than Usha.	Dissimilarity comparative degree	NP + NP – *ai* + *viTa* + Adjective + *iru* umaa uSaavai viTa azhakaay irukkiRaaL

NP + BE + Comparative form of adjective + than + all Raja is the tallest among all.	Dissimilarty comparative degree	NP + NP + *ai* + *viTa* + Adjective + iru ex.rajaa rameesai viTa uyaramaaka irukkiRaan.
NP + BE + the + Suforltive form of adjective + among all Raja is the tallest among all	Dissimilarity Super lative degree	NP + NP + elloorilum / ellaavaRRidam + Adjective + tiru raja avarkaL elloorilum uyaramaay irukkiRaan.

6.3.4.2. Comparative clause of quantity

The following table illustrates the transfer of comparative clauses of quantity.

Adjectival form in English	Degree	Parallel form in Tamil
… NP + HAS + as + many + NP + as … Ram has as many shirts as Sam has.	Positive degree clause of similarity	NP – iTam + ettanai + NP iru + Tense + PNG-oo + attanai + NP + NP – iTam iru + Tense + PNG RaamiTam ettanai caTTaikaL irukkinRanavoo attanai caTTaikaL caamiTamum irukkiRana.
NP… + HAVE + more + NP + than + NP + HAVE Ram has more shirts than san has.	Comparative degree Clause of difference	NP –iTam + ettanai + NP iru + Tense + PNG-oo + atai viTa kuuTutal+NP+NP- iTam + iru + Tense + PNG RaamiTam ettanai caTTaikaL irukkinRanavoo atai viTa kuTutal caTTaikaL caamiTam irukkiRana

6.3.4.3 Comparative clause of adverbs

Adverbial comparative construction varies based on the three degrees of comparison. The three forms of adverbs, positive, comparative and superlative forms, can be referred from the DEWA.

English	Tamil
POSITIVE DEGREE With the positive form *as … as* in the affirmative and *as/so…* as in the negative are used Uma shouted as loudly as she could. It didn't cost her so much, as she feared.	umaa avaLaal muTindta aLavukku urakka captamilTTaaL avaL kavalaippaTTatu pool atu avaLukku KuuTutalaana vilai alla.
COMPARATIVE DEGREE With comparative form than is used. Uma walks faster than Usha. Kannan screamed louder than I expacted.	NP + NP – ai + ViTa + Adv + V Umaa uSaavai viTa veekamaaka ndaTandtaaL Ndaan etirpaarttatai viTa kaNNan kuukuraliTTaan
SUPERLATIVE DEGREE With superlative it is possible to use *of* + noun Usha worked hardest of the labourers.	NP + NP –il Adv + V uSaa veelaiyaaTkaLil kuuTutalaaka veelai ceytaaL.

6.3.5. Transfer of clausal co-ordination

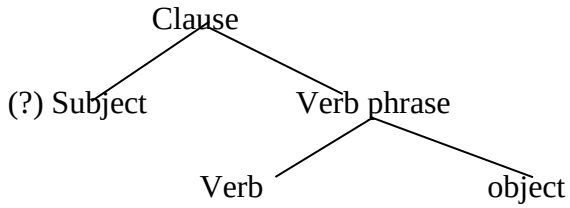
The following table depicts the points to noted while transferring coordination in English to Tamil.

English	Tamil
In expressing coordination. English being an SVO language, place particles before the coordinated element, typically the last. Mathematics, physics, chemistry and zoology.	Tamil as a SOV language, by contrast, place such particles after the coordinated elements. kaNitamum, iyeRpiyalum, veetiyalum vilangkiyalum
Coordination is often accompanied by ellipses when two clauses are coordinated. Usha sat still and said nothing.	In this type of coordination, Tamil does not make use of the coordinator um. Intead it makes use sunordination by verbal participle form. uSaa acaiyaamal uTkaarndtukoNTu onRum peecavillai

6.4. Transfer of sentences

English relies on word order as a means of expressing grammatical relationships within constructions. In Tamil, word order is more flexible, as grammatical relations are

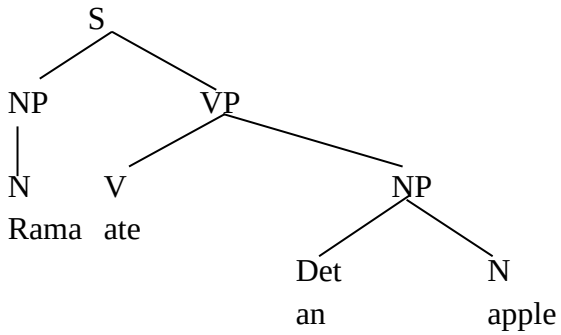
signaled by inflections. In generative linguistics, English with fixed word order is called configurational language and Tamil with fairly free word order is called non-configurational language. The core of the configurationality issue is about the question of special grammatical relation of subject and a different one of object, whatever these relations correspond to different positions in the hierarchy of the sentence. In Tamil, there is little or no evidence for a hierarchy as given below, but very often Tamil differentiates subjects and objects in crucial ways.



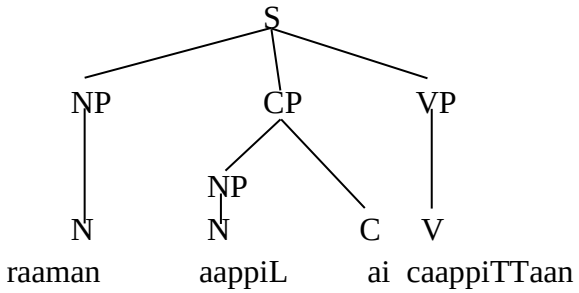
It has been taken for granted that in English there is a syntactic VP node. It is generally believed that Tamil lacks VP constituency. So, generally Tamil sentences are given a flat structure without VP being at a different hierarchical level.

Subathra Ramachandran (1975) strongly argues that Tamil is a configurational language possessing a VP node. Even if it is true, we cannot compromise on the fact that Tamil is different from English as English is an SVO language where as Tamil is an SOV language in which 'S' and 'O' can be shuffled. Tamil is not strictly a configurational language. The object is decided by position in English whereas in Tamil by case markers.

English: Rama ate an apple



Tamil: *raaman aappiLaic caappiTTaan*.



Many interesting points will be revealed for the purpose of transferring English language structure into Tamil, if we look at the correlating features of the two languages from the point of view of their typological characteristics as SOV and SVO languages respectively**.**

1. Syntactically, English and Tamil are perhaps most saliently different in the basic word order of verb, subject and object in simple declarative clauses. English is an SVO language, meaning that the verb tends to come between the subject and object and Tamil is an SOV language, meaning that the verb tends to come at the end of basic clauses. So the two languages differ in their ordering of certain functional units. For example, English being an SVO language has prepositions, whereas Tamil being SOV language has postpositions.

2. The affirmative sentence in English which are in SVO order becomes aux + SVO to form interrogative sentences which is a discontinuous order. In Tamil, the interrogation does not change the word order.

3. English is a highly consistent SVO language. The government constructions observe SVO patterns, as do the nominal modifying constructions – with the exception of descriptive and limiting adjectives in an archaic order. As a consistent language, English exemplifies characteristic features of SVO languages, such as the many patterns that have been developed in the verbal modifying constructions, the wide use of substitutes, and the grammatical processes used to highlight elements of sentences. The verbal patterns make heavy use of auxiliaries, which are also involved as substitutes and in interrogative and negative constructions, differentiating English in this way from (S)OV languages like Tamil. The grammatical process involves function words, again in distinctive constructions like clefting.

Tamil is a typical (S)OV language in which the verb occurs at the final position of a sentence. Word order in the sentence is relatively free, as long as the sentence ends with a main verb. For example, the sentence *Kannan introduced Uma to Raja* in Tamil can have the following word- order- variants.

1. kaNNan umaavai raajavukku aRimukappa Tuttinaan.
   1 2 3
2. kaNNan raajaavukku umaavai aRimukappa Tuttinaan.
   1 3 2
3. umaavai raajaavukku kaNNan aRimukappa Tuttinaan.
   2 3 1
4. raajaavukku umaavai kaNNan aRimukappa Tuttinaan.
   3 2 1
5. raajaavukku kaNNan umaavai aRimkappa Tuttinaan.
   3 1 2
6. umaavai kaNNan raajavukku aRimukappa Tuttinaan.
   2 1 3

ai and *kku* are accusative and dative case markers and nominative is unmarked in Tamil. The above sentences are identical in logical content, but are different in discourse presupposition in a very subtle way. Ordinarily, constituents that represent older information precede those that represent newer information. The subject – initial sentence pattern is the most common among the various word order patterns. In declarative sentence with nominal subject and object, the dominant order is almost always one in which the subject precedes the object.

4. Simple, unmarked clauses in English agree with the SVO pattern, and require representations for the three constituents: subject, verb, and object. Neither the subject nor the verb nor the object of a transitive verb may be omitted.

Uma folded her hands.
*Her hands Uma folded.

5. English does not permit any order other than the above in unmarked sentences occurring as single utterances. This constraints applies also in subordination, as in the following sentences:

Kannan shouted while Uma folded her hands.

6. In English the verbal qualifiers must precede verbs. This position conflicts with the optimum position for subjects. To express negation, for example, the negative element might be prefixed to the verb.

Uma does not fold her hand
*Uma folded not her hand
In Tamil the negative element follows the verb
*Umaa tan kaikaLai maTikkavillai Uma did not folded her hands'
*Umaa tankaikaLai illaimaTittaaL

7. Government operates strongly in English, both in predicates and in other government constructions.

Her hands are folded.
Two of her hands are folded.
This is case with Tamil too.
avaL kaikaL maTikkappaTTana 'Her hands are folded'
avaL iru kaikaLum maTikkappaTTana 'Two of her hands are folded'

8. In comparison of inequality the adjective precedes the standard.

Uma is more beautiful than Usha.

9. In titles, the name follows, functioning like a standard for the 'variable' title.

Queen Uma.
Tamil allows both the possibilities.
raaNi umaa 'Queen Uma'
umaa raaNi 'Queen Uma'

In personal names the surname follows as standard to the given name.

John, F Kennedy.

10. In numerals in the teens, the form of ten follows, as ten follows, as in the other constructions of this kind furnishing a sturdier for the simple numerals from three to mine ex in Tamil pattern is tent numeral.

Thirteen, fourteen, fifteen, sixteen, seventeen, eighteen, nineteen.

patinonRu 'eleven', panniraNTu 'twelve', patimuunRu 'thirteen', patinaanku 'fourteen', patinaindtu 'fifteen', patinaaRu 'sixteen', patindeezhu 'seventeen', patineTTu 'eighteen', pattonpatu 'nineteen'

11. English has been characterized by functional syntacticians as a language in which the initial segment, or theme, often using old material, sets the scene for the new material, or rhyme.

Uma folded her hands.

The subject Uma is one of the important elements of the preceding discourse, while the predicate folded her hands introduces a new action. SVO order provides a convenient basis for such organization of sentences. The same can be said for Tamil too.

umaa tan kaikaLai maTittaaL 'Uma folded her hands'

12. For the basic sentential structures identified for English, the corresponding Tamil structures are given.

English	**Tamil**
SVA Arul is in the reception hall	S AV aruL varaveeRpaRaiyil irukkiRaan
SVC Arul is clever	SCV aruL puticaali aavaan
SVO	SOV

Arul threw the ball	aruL Pandtai eRindtaan
SVOA Arul kept the ball on the table	S O A V aruL pandtai meecai meel vaittan
S V O C Arul has proved her wrong	S enRu-clause V aruL avaL tavaRu enRu ndiruupittaan 'Arul has proved that is wrong'
S V O I O Arul taugh her music	S I O O V aruL avaLukku icai kaRpitaan
SV The baby cried.	SV Kuzhandtai azhutatu

(Here in this context A = Adjunct, C = Complement, I O = indirect Object, O = Object S = Subject, V=Verb)

In both English and Tamil simple, compound and complex sentences have been identified traditionally

Sentence	English	Tamil
1.Simple sentence	He goes to market	avan *maarkeTTukkup* *pookiRaan*
2. Compound sentence	He went to market and bought some vegetables	avan *maarke TTukkup* *poonaan* *kaaykaRikaLai* *vaangkinaan*
3. Complex sentence	He is going to market to buy vegetable	Avan kaaykaRivaangka candtaikkup pookiRaan

Though the distinction of sentences into simple, compound, complex is traditional, it is crucial from the point of view of translation. We can expect a simple sentence in the source language having an equivalent simple sentence in the target language. For example, for a simple sentence in English, we can expect a simple sentence as its translation equivalent in Tamil. Similarly for a compound sentence in English we can expect a compound sentence as its translation equivalent in Tamil. Also we can expect a complex sentence as a translation equivalent in Tamil for a complex sentence in English.

English	Tamil
He went to market NP V to-NP	avan candtaikkup poonaan NP NP-ukku V
He went to market and bought vegetable	avan candtaikkup poonaam

NP V to – NP V NP	maRRum kaaykaRikaL vaangkinaan. NP Np-ukku V maRRum NP V
He went to market to buy vegetable. NP V to-NP V NP	avan kaaykaRikaL vaangkad Candtaikkup poonaan NP V-INF NP-ukku V

But this idealization of getting translation equivalent as mentioned above may not be true always. One can expect a complex sentence for a simple sentence or vice versa.

English	Tamil
Arul has proved her wrong NP V NP Adj	arul avaL tavaRu enRu Ndiruupittaan 'AruL has proved that she wrong' NP [NP NP] S enRu V

This complexity should be kept in mind while looking for translation equivalents of English sentences in Tamil.

Traditionally in both English and Tamil the following types of sentences are identified.

Sentence type	English Sentence	Corresponding Tamil sentence
Affirmative or assertive sentences	He went to market	*avan candtaikkup poonaan*
Question or interrogative sentences	Is he going to market?	*avan candtaikkup pookiRaana?*
Negative sentences	He is not going to market	*avan candtaikkup pookavillai*
Imperative or command Sentences	Go to Market	*candtaikkup poo*
Exclamatory sentences	How beautiful the building is!	*aa!evvaLavu azhakaana kaTTiTam itu1*

This functional distinction of sentences is also crucial to our venture in finding translation equivalents in Tamil for English sentences. It should also be noted that the word order plays a crucial part in converting affirmative sentences into interrogative sentences in English. In Tamil word order does not play a crucial role while transforming an affirmative into an interrogative sentences, it makes use of clitics.

6.4.1. Transfer of affirmative sentences

English has an explicit link verb ('be' verb) to equate the subject NP with the complement, NP, Adj, and Adv. Explicit link verb is lacking in Tamil. But there are contexts in which we make use of 'be' verb, which can be equated with English 'be' verb. The 'be' verb *iru* can complement an NP through an adverbial particle *aaka*.

avaL oru maruttuvaraaka irukkiRaaL
'She is a doctor'
avaL azhakaaka irukkiRaaL
'She is beautiful'
avaL cennaiyil irukkiRaaL
'She is in Chennai'

Adjective in Tamil cannot occupy the predicate position as in English. (In English adjective is supported by the 'be verb). In Tamil *aaka* helps in the formation of an adjective when followed by the verb *iru*. The following table will depict the mechanism of transfer of equative sentences in English into Tamil.

Structure of English equative sentences	**The corresponding structure of Tamil equative sentences**
NP + 'Be' verb + NP Kala is a girl	NP + NP Kalaa oru ciRumi
NP + 'Be' verb + NP Kamala is a doctor	NP + NP-aaka + iru-T-PNG Kamalaa maruttuvaraaka irukkiRaaL
NP + Be verb + Adj. Kamala is beautiful	NP + NP-aaka + iru-T-PNG Kamala azhakaaka irukkiRaaL NP + NP-aana-PN Kamala azhakaanavaL
NP + Be verb + Adv. Kamala is there	NP + Adv. + iru-T-PNG kamala angkee irukkiRaaL
NP + Become + NP Kamala became a teacher	NP + NP + aaku-T-PNG Kamala aaciriyar aanaaL

In Tamil, the equative sentences of NP + NP type are used in the present context. If the equation is made in the future and past contexts, Tamil needs the help of the 'be' verb *iru*, which can be inflected for past and future.

Kamalaa oru maruttuvar
"Kamala is a doctor'
Kamalaa *oru maruttuvaraaka irundtaaL*
'Kamala was a doctor'
Kamalaa *oru maruttuvaraaka iruppaaL*

Kamalaa will be/may be a doctor.

6.4.2. Transfer of interrogative sentences

An auxiliary is proposed before the subject to express interrogation in English.

Did he come yesterday?
Do cats eat bats?

Such questions require an answer of either yes or no, and as a result they are often labeled yes-or-no- questions.

In accordance with the general principle, the interrogative marker should stand close to the sentence boundary, whether initially in VO languages or finally in OV languages. English makes use of a special set of words, which may combine with the interrogative with a substitute for the subject, the so-called wh-words. For yes-or-no questions it has lead to the introduction of auxiliaries. Among the auxiliaries *do* is the most remarkable in having today only a grammatical function, whether as interrogative marker or as a device for the indication of negation or emphasis. Other auxiliaries combine uses as grammatical markers with expression of modality, aspect and tense.

The second set of questions in languages is characterized by a question word. These often referred as wh-question words after wh-segment in many English interrogative words, because they include an 'unknown quantity'. Initial position of the interrogative element accords with the expectation of this order for the theme as well as with the general ordering principle.

What's the French word for cuckoo?
What right has you to call me uncle?
How is bread made?

English, as an SVO language, permits only one wh-word before finite verb, whether this is a noun, an adjective, or an adverb.

Besides wh-questions and yes-or-no questions, English includes devices indicating presupposition in yes-or-no question. One such device is tag question, consisting of a positive auxiliary when a negative answer is presupposed, and a negative auxiliary for a presupposed positive answer. The auxiliary corresponds in form to that of the principal verb, as in the following idiosyncratic statement.

I speak English, don't I?

Interrogative expressions are then closely related to expressions for sentence negation, though negation may be used for syntactic rather than pragmatic purpose.

The three types of interrogation found in English have to be correlated with that of Tamil for the purpose of developing MTA.

6.4.2.1. Transfer of yes-no questions

Contrasting characters pertinent to the transfer of yes-no questions in English into Tamil needs close scrutiny. As we have already noted, the yes-no questions can be sub divided into three types in English:

1. Those with 'be' verb
2. Those with 'modal' auxiliary
3. Those with 'do' verb

The table below correlates the question with 'be' verb in English with Tamil.

English pattern	**The corresponding Tamil pattern**	**Comments**
1.Question with be verb 1.1.Be + NP + NP Is she a teacher? 1.2.Be n't + NP + NP Isn't she a teacher? 1.3.Be + NP + ADj Is she beautiful?	1.1.NP + NP-aa avaL oru aaciriyaraa? 1.2.NP + NP + allav/illaiy-aa? avaL aaciriyar allav/ ilaiy-aa1 .3.NP + NP-aana- PNG-aa avaL azhakaanavaLaa	In the case of negative sentence with *not*, the short form n't will be placed after the '*be'* verb. The movement of English 'be' verb to the initial position, is matched by adding of clitic *aa* in Tamil.
2.Question with modal auxiliary 2.1.Modal + NP + Main verb + (NP) Can he be a doctor? 2.2. Modal + NP+V Can I sing? Should I write?	*NP-aal + NP-aaka +* *iru + Modal-aa* *avanaal* *maruttuvaraaka* *irukka muTiyumaa?* *NP-aal + V-INF +* *Modal-aa* *ennaal paaTa* *muTiyumaa?* *ndaan ezhuta* *veeNTumaa?*	
3.Question with do verb 3.1.Do + Tense + NP + V + (NP) Did write the story? 3.2. Don't + Tense + NP + V + (NP)	3.1.NP + (NP) + V-T- PNG-aa raaNi katai ezhutinaaLaa? 3.2.NP + (NP) + V-INF iilaiy-aa	The movement of English *do* to the initial position (or do insertion) is matched by adding of clitic *aa* in Tamil

Didn't Rani write the story?	raaNi katai ezhutavillaiyaa?	

Interestingly to trigger all the three types of interrogation in English, Tamil makes use of the clitic *aa* with the relevant units. It can be summarized that for the question type in English where the 'be' verbs such as *is, am, was, are, were, will be, shall* be are proposed to the subject to frame questions, we can expect two types of equivalents in Tamil.

The interrogative structure of type 'be' verb + NP+NP in English will be matched by 'NP + NP-aa' in Tamil.

Is she a girl?
avaL oru ciRumiyaa?

For the interrogative structure of the type "be' verb + NP + Adj' in English, Tamil makes use of NP + [NP-aana] Adj-PN-aa. Note that in Tamil adjective is pronominalized when it is used as a predicate.

Is she beautiful?
avaL azakaanavaLaa?
Is he poor?
avan eezhaiyaa?

The yes-no question of the type "be' verb + NP + adv' in English is matched by 'NP + Adv + iru-T-PNG-aa' in Tamil.

Is he here?
avan inkee irukkiRaanaa?

6.4.2.2. Transfer of wh-questions

The 'wh' questions of Tamil are similar to 'wh' questions in English. As in English, interrogative pronouns, adverbs, etc in Tamil introduce them. Since the word order is flexible the question word can be introduced anywhere in the sentence. As we have noticed already, English question sentences are formed by the movement of the operator verb followed by the movement of interrogative words (noun, adverb, adjective). Tamil does not have operators to be fronted although it has counterparts for 'wh' words in English. These counterparts do not move to the front of the clauses. As we noted already 'yes/no' questions in Tamil differ from their declarative counterparts by suffixing a clitic to the concerned elements to be questioned.

The following table shows the correspondence between interrogative words in English and Tamil.

Interrogative words in English	Interrogative words in Tamil
Who	yaar, evan, evaL, evar
Which, What	etu, evai, enna
How much	evvaLavu
How many	ettanai
How	eppaTi, evvaaRu
Where	engku
When	eppootu, eppozhutu
At what (time)	endndeeram, eppootu
On which (day)	e(endaaL), enRu
At what (place)	engkee
In which (town)	e(endakaril)
To which (country)	e(endaaTTil)
By whom	yaaraal
With whom	yaaruTan
With which (friends)	enta (ndaNparkaLuTan)
Whose (house)	yaaruTaiya (viiTu)
Why	een, etaRku

The following table shows the correspondence between interrogation in English and Tamil.

Interrogation in English	Interrogation in Tamil
In English interrogation is framed by shifting the auxiliary verbs to the initial position of the construction or by introducing the interrogative words or by adding super segmental morphemes to any statement. Interrogation framed by auxiliary for yes-or-no type. In English the auxiliary verbs and the interrogative words occur in the initial position. Tag questions are framed by auxiliary movement. In interrogative sentences, interrogative words occur in isolation.	Interrogation is framed by the addition of interrogative particles or by the introduction of interrogative words or by adding super segmental morphemes to any statement. Interrogation is framed by interrogative particles for yes-or-no type In Tamil the interrogative particles occur in the final position of any word in the construction, the interrogative words occur in the initial, medial or final position of the construction. Tag questions are framed by suffixing the interrogative clitic the concerned units. In Tamil too, the interrogative words occur in isolation in interrogative sentences.

6.4.3. Transfer of negative sentences

Under this title the transfer of negation in equvative sentences and non-equvative sentences and transfer of negative pronouns and determiners are dealt here.

6.4.3.1. Transfer of negation in equvative sentences

In the following table, negation in equvative sentences in English is correlated with that of Tamil.

English	Tamil
NP + BE-V +not + NP She is not a school teacher	NP + NP + *illai* avaL oru paLLi aaciriyar illai
There + BE-V + no + NP There is no God	NP + *illai* kaTavuL illai
NP + BE-V + not + PP	NP-LOC + *illai* avan cennaiyil illai
He is not in Chennai There + BE-V + no + NP There are no girls	*angkee + NP + illai* angkee maaNavikaL yaarum illai
It + is + not + ADJ-to-clause It is not easy to go there.	S-atu + adjectival noun + *alla / illai* angkee poovatu eLitallal/eLitu illai

6.4.3.2.Transfer of negation in non-equative sentence types

In the following table, negation in non-equvative sentences in English is correlated with that of Tamil.

English Negative forms	Corresponding Tamil forms
Did not +MV1 He did not go	MV-INF + *illai* avan pookavillai
Does not + MV1 He does not go	MV-atu + *illai* Avan poovatillai
Cannot + MV1 I cannot go	MV-INF + *iyalaatu/muTiyaatu* ennaal pooka iyalaatu / muTiyaatu
Could + MV1 I could not go	MV-INF + *iyalavillai/muTiyavillai* *ennaal pooka iyalavillai / muTiyavillai*
Shall not + MV1 I shall not go	MV-INF + *maaTTu* + PNG/muTiyaatu ndaan pooka maaTTeen
Should not + MV I should not go	MV-INF + kuuTaatu ndaan pooka kuuTaatu
Will not + MV 1 I will rot go	MV INF + *maaTTu* + PNG ndaa Pooka maaTTeen

Would not + MV_1 I would not go	MV INF + *maaTTu* + PNG ndaan Pooka maaTTeen
Will not + MV1 It will not go.	MV-*atu* atu pookaatu
Must not + MV I must not go	MV-INF + kuuTaatu ndaan pooka kuuTaatu

6.4.3.3. Transfer of negative pronouns and determiners

English makes use of negative pronouns such as *none, nothing, neither, nobody, none* and negative determiner *no.* Tamil does not have negative pronouns; instead it makes use of *um*-suffixed interrogative pronouns such as *yaarum, etuvum, evarum* that do not posses any negative feature; the negation is expressed by adding *illai* to the verb.

Negative pronouns in English	**Corresponding pronouns in Tamil**
Person = no one, nobody No one come Nobody come	*yaarum* *yaarum varavillai.*
Non-personm = nothing I ate nothing	*onRum* *ndaan onRum caappiTavillai*
None None of the students is good. None of the students here arrived	Oruvarum/yaarum *maaNavarkaLil oruvarum nallavarillai* *maaNavarkaLil yaarum varavillai*.

Tamil does not have a negative word equivalent to addition adverbial negative form *neither… nor*. Tamil makes use of negative verb form such as *illai, muTi, kuuTaatu,* V-aatu. The noun phrases or pronouns will be added with the disjunctive clitic *oo.* Similarly Tamil does not have the equivalent of *never* which is a negative adverb. Tamil makes use of Gerundive form of the type V-T/N-atu.

English	**Tamil**
Neither … nor Neither Usha nor Uma came today	NP-*oo* NP-oo MV-INF _ *illai* uSaavoo umaavoo inRu varavillai
Never Never I met him	V-T-RP-*atu+illai* ndaan avanai candtittatillai Note : The adverb *orupootum* which can be equated with English *never* also need the support of the negative verb *illai. orupootum* can be compensated by the emphatic clitic *ee*

	added to the VN. ndaan avanai orupootum candittatillai. ndaan avanai cantittatee illai.

The following table sums up the corlative features of English and Tamil for the sake of computation.

Negation in English	**Negation in Tamil**
Negation is effected by the addition of segmental word or suprasegmental morphemes to the affirmative construction.	Negation in Tamil. In Tamil too, negation is effected by the same method.
Forms like *no, not, nothing, nobody, none, not only, rarely, scarcely, seldom, few, little,* etc. are the negative words which are used to bring in negation.	The negative roots *al, il, maaTTu* are the negative words which bring out negation in Tamil.
The negative words do not show concord with the subject of the negative construction.	Except the negative verbs *alla and illai,* all other inflected negative words (ex. *maaTTu*) show concord with the subject of the negative construction.
Monomorphemic negative words in pure negative constructions occur with auxiliary verbs and others occur without any auxiliary verbs.	The negative words follow the nouns, a few adverbs or the infinitives.
The negative words in pure negative constructions occur in the initial position of the construction	The negative words in near negative constructions occur in the medial position.
A construction with a main verb can be negated only after introducing an auxiliary verb.	
The monomorphemic negative word in pure negative constructions is moved with the auxiliaries to form negative interrogative constructions whereas the negative words in near negative constructions are not moved with the auxiliaries.	

6.4.4.Transfer of imperative sentence

Imperative sentences are associated mostly with the second person commands, instructions and requisitions. Both Tamil and English make use of verb root to express

impetration. As English does not have overtly marked separate terms for singular and plural second persons and the verbs do not inflect for subject, it does not have separate verbal form for singular imperative and Plural imperative. As Tamil has two or three distinct second person pronouns, one expressing singular *(ndii)*, another expressing plural *(ndiir)* and honorific *(ndingkaL)*, it reflects this distinction in the imperative forms of verbs too. So, for English *you*, depending upon the context, Tamil may have at least two forms, one is verbal root and another is 'verb root + ungkaL'. The following table correlates different ways of bringing imperative sense in English and Tamil:

Imperative type	**English pattern**	**Corresponding Tamil pattern**
Imperative positive	Non honorific: V1 (i.e. verb root) Go Emphasis: Do + V1 Do go Honorific Please + V1 Please go Be + adjectival Compliment Be quiet Be serious Be seated	Imperative singular: Verb root Poo V-Past participle + *viTu /koL* pooyviTu, pooykkoL Imperative plural / Honorific Verb root + ungkaL poongkaL N-aaka + iru Amaitiyaay iru Kavanamaaka iru uTkaarungkaL
Imperative negative	Don't + V1 Don't go Don't sit	Verb root –aat- ee pookaatee uTkaaraatee
Let command	Let + object pronoun (1st & 3rd)/ Proper Noun + V1 Let him go Let me go Let Rama go	Sub (1st & 3rd person) /Proper noun _ V-INF – *aTTum* avan pookaTTum ndaan pookaTTum raaman pookaTTum
Positive *should* command	2nd person + should + V1 You should go	Sub (all three persons) + V-INF + veeNTum ndii pooka veeNTum
Negative *should* command	Sub (all three persons) + should not + V1 I should not go	Sub (all three persons) + V-INF + *kuuTaatu* ndaan pookak kuuTaatu
Positive must command	2nd person All person +	Sub (all person) + V-INF

	must + V1 You must go	
Negative must command	Sub (all three persons) + must not + V1 You must not go	Sub (all three persons) + V-INF + kuuTaatu ndii/ndiingkaL Pookakkuu taatu
Positive has to/ have to command	Sub (all three persons) + has to/ have to + V1 + You have to go He has to go	Sub (all three persons) + V-INF ndaan pooka veeNTi irukkum avan pooka veeNTi *irukkum*
Negative have to command	Sub (all three persons) + don't/doesn't have to + V1 I don't have to go He doesn't have to go	Sub (all three persons) + V-INF + veeNTiyirukkaaatu ndaan pookaveeNTirukkaatu avan pooka veeNTirukkaatu
Positive need command	Sub (all three perons) + need + infinitive He need to go	Sub (all three persons) + V-INF + veeNTum ndii pooka veeNTum
Negative need command	Sub (all three persons) + need not + V1 He need not go	Sub (all three persons) + V-INF + veeNTaam ndii pooka veeNTaam

6.5. Conclusion

The mechanism of transferring English sentences in to Tamil has been explored by correlating the syntactic structures of the two languages. The correlative study tried to explore the commonalities and differences in the structure of English and Tamil from the point of view of computation to build a machine translation aid to translate English into Tamil. It has been noticed that the two language deviate from one another from the point of view of English as language of SVO and Tamil as language of SOV, i.e., verb final language. While English makes use of preposition to link nominal arguments with verbs, Tamil makes use of postposition and case markers to serve the same purpose. The absence of regular case inflection in the case of English makes it rigid in its word order and the presence of case inflection in Tamil makes it more flexible in its word order. English distinguishes subject form object by means of the position, i.e., word order, where as Tamil does it by case inflection. Relative clause in English is after the head noun, which is attributed and in Tamil it comes before the head noun. The infinitive clause in English comes after the main clause, whereas in Tamil it is comes before the main clause. That-clause complement occurs at the right side of the main clause in English, whereas it occurs at the left side of the main clause in

Tamil. Interrogation is effected by changing the order of the words, i.e., by moving an auxiliary verb to the initial position before subject. In Tamil interrogation is effected by suffixing interrogative clitic or by making use of interrogative pronouns. In English, the auxiliary verbs and the interrogative words occur in the initial position of the construction. In Tamil, the interrogative particles occur in the final position of any word in the construction. All these correlative features have to taken into account while marking transfer module to restructure English as per Tamil sentential structure.

CHAPTER 7
CONCLUSION

The preceding chapters fulfill the aim of the research work by correlating the syntactic Structure of English with that of Tamil from the point of view preparing a transfer grammar for developing English-Tamil Machine Translation. Preparation of a transfer grammar to facilitate machine translation among English and Tamil is the main motive behind this research work that has been accomplished now. It has been found out that English being predominantly an SVO language and Tamil being predominantly an SOV patterned language show unique characteristics, which differentiate them drastically from one another. So it is possible to manipulate these differences to form transfer rules that can be exploited to map English structure into Tamil and vice versa.

The first chapter is 'introduction' in which the aim of the thesis, the hypotheses to be tested, methodology, plan of the thesis, and the uses of the thesis are discussed.

The second chapter deals with the syntactic structure of English, which is nothing but a computational analysis of syntactic structure of English. English is a configurational language in which the structures of words, phrases, and clauses are more or less fixed, that is, they occur in certain predictable positions in sentences. Compared to Tamil, English is a fixed word order language. The functional interpretations of constituent elements of English depend more on the positions rather than inflections. English shows the characteristics features of SVO language. It is a prepositional language in which the elements marking the relation between noun and verb come before the noun. Here in this chapter the constituent structures of sentences in English are elaborated upon to make it available for creating a transfer rules. The rules involved in the analysis of English sentences are identified so as to compare them with the rules involved in analyzing Tamil sentences and thereby to understand the intricacies involved in the transfer of the source language structure into the target language structure.

The constitutional structure of English has been worked out and the ways by which parsing can be performed on the English text to get the needed parsed tree structures for lexical and structural transfer has been framed. The analyses at the level of word, phrase, clause and sentence have been organized. The constituent structures of NP, VP, Adj. P, Adv. P and PP have been worked out. All the sentential patterns of English have identified. With the help of these patterns, English sentence have been parsed into words, phrases, and clauses. As a result the parsed trees have been prepared for different types of sentences in English.

The third chapter deals with the over all syntactic structure of Tamil language, which is noting but the computational analysis Tamil structure. Tamil is a verb final language and it shows the characteristic features of SOV language. Tamil nouns are inflected for case markers. So the noun phrases can be shuffled before the predicate verb. Unlike English,

which is a prepositional language, Tamil is a postpositional language. When compared with English, Tamil is a free word order language. The constitutional structures of Tamil have been worked out so as to compare them with the constituent structures of English. The syntactic structure of Tamil is dealt under the following headings: 1. Noun Phrase, 2. Post Positional Phrase, and 3.Verb Phrase, 4. Adjectival Phrase, 5. Adverbial Phrase, and 6. Sentence Types (based on the structure and function). The word analysis has been outlined to facilitate lexical transfer. Analyses of major phrases such as noun phrase, verb phrase, adjectival phrase, adverbial phrase and postpositional phrase have been studied with an eye on transfer mechanism. The clause construction by subordination has been thoroughly explored. Different types of dependent and independent clauses have been identified and their structural patterns have been designed to facilitate transfer mechanism. The coordination of phrases and clauses has been dealt under the relevant heads. The formation of different types of Tamil sentences and their word order has been studied with the aim of transferring the English sentences into Tamil.

The fourth chapter gives an outline of the formal grammars commonly used for syntactic parsing in Machine Translation Systems. The fundamental idea of machine translation is to transfer source language text into target language text. For that, the source language structure at the level of morphology, syntax and semantics have to be analyzed and the information gathered from the analysis to be transferred into target language by a generator. The analysis and generation are based on certain grammatical formalisms. The predominantly used formalisms are the following: phrase structure grammar, context free grammar, context sensitive grammar, government and binding theory, lexical functional grammar, Paninian grammar, case grammar, generalized phrase structure grammar, head driven phrase structure grammar, and finite state grammar. A few of these formalisms have been outlined and their merits and demerits have been pointed out. Each of the grammatical formalism has its own merits and drawbacks. We have to choose one of the formalisms for our purpose. The choice of the formalism decides upon the parsing technique to be used. For transferring English texts into Tamil, syntax plays a central role. English being an SVO language and Tamil being an SOV language differs crucially from each other in their syntactic make up. For example, English has postpositions, where as Tamil has prepositions. So syntactic parsing is a must to transfer English into Tamil and vice versa. For this various types of grammatical formalisms are used. The CFG (context free Grammar) formalism is the most exploited one. The fundamental idea of machine translation is to transfer source language text into target language text. For that the source language structure at the levels of morphology, syntax and semantics have to be analysed and the information gathered from the analysis have to be transferred into target language by a generator.

"Translating Languages with Computer" – Machine Translation (MT) has been one of the greatest dreams in computer applications. The fifth chapter deals with the MT System development in and outside India. The steps to be followed in the developing of a deployable MT system have been discussed elaborately. The development of MT systems outside India, especially in European and America is remarkable. Machine Translation systems acts as a

bridge to access cross lingual information by making the documents available in one language to another language. Such systems are inexpensive, instantaneous and multiplicative when compared to human translation. Building such a system across a pair of languages is nontrivial. Fully automatic high-quality translation of an arbitrary text from one language to another is far too hard to automate completely. The level of complexity in building such a system depends on the similarities and difference among the pairs of languages.

But the dream of building a deployable MT system is gradually becoming a reality. Research on MT is an intellectual challenge with worthy motive and practical objective. The challenge is to produce translations as good as those made by human translators. The motive is the removal of language barriers. The practical objective is the development of economically viable systems to satisfy growing demands for translations. Contrary to general belief, there is a considerable shortage of human translators even for technical translations. To fill this vacuum there is an increasing demand, worldwide, for MT systems.

India is also making attempts to develop MT system for Indian Language to Indian Language transfer as well as English to Indian languages transfer. Ministry of Communication and Information Technology and Ministry of Human resources give financial support to these programs. Of course we have to travel a lot to achieve this goal. Though such attempts are expensive, at least for the development of Research and Development and from the experimental point of view we have try to build such systems. The present thesis explores one such possibility.

The sixth chapter aims to explicate the transfer grammar behind rendering English text into Tamil while preparing a machine translation aid. Of course, the theory of contrastive study is very relevant in this context. Contrastive study is an analysis, which tries to unearth the typological commonalties found between the languages being compared or contrasted. There is minute difference between comparative study and contrastive study. Comparative study is made between two genetically related (cognitive) languages of a particular linguistics family in order to bring out their family affiliation. But contrastive study is undertaken between any two languages in order to bring out the corresponding features between them without bothering about their family affiliation, if there is any. It is a common notion that there is logic behind it. When two languages are compared expecting the commonalties, it is quite natural that the two sister languages will share common properties as they have originated from a common source (proto language). But in one sense, it is illogical and unwise to expect similar linguistic traits between two languages that are believed to have been originated from different sources. Chomsky's assumption that there are linguistic universals exists among languages, leads us to expect shared features between two unrelated languages. Contrastive analysis indirectly helps to frame the theory of linguistic universals, although the contrastive study has basically been made for language teaching purpose. However the contrastive study yields many a fruit in the domain of translation too.

The mechanism of transferring English sentences in to Tamil has been explored by correlating the syntactic structures of the two languages. The correlative study tried to explore the commonalities and differences in the structure of English and Tamil from the point of view of computation to build a machine translation aid to translate English into Tamil. It has been noticed that the two language deviate from one another from the point of view of English as language of SVO and Tamil as language of SOV, i.e., verb final language. While English makes use of preposition to link nominal arguments with verbs, Tamil makes use of postposition and case markers to serve the same purpose. The absence of regular case inflection in the case of English makes it rigid in its word order and the presence of case inflection in Tamil makes it more flexible in its word order. English distinguishes subject form object by means of the position, i.e., word order, where as Tamil does it by case inflection. Relative clause in English is after the head noun, which is attributed and in Tamil it comes before the head noun. The infinitive clause in English comes after the main clause, whereas in Tamil it is comes before the main clause. That-clause complement occurs at the right side of the main clause in English, whereas it occurs at the left side of the main clause in Tamil. Interrogation is effected by changing the order of the words, i.e., by moving an auxiliary verb to the initial position before subject. In Tamil interrogation is effected by suffixing interrogative clitic or by making use of interrogative pronouns. In English, the auxiliary verbs and the interrogative words occur in the initial position of the construction. In Tamil, the interrogative particles occur in the final position of any word in the construction. All these correlative features have to taken into account while marking transfer module to restructure English as per Tamil sentential structure.

The application and use of the present research is many fold. First a strong base is made by identifying transfer rule to facilitate rendering English into Tamil and vice versa. This help in furthering research in this line of thinking. The present state of affair in the development of MT system points to us that parallel corpus are prepared for the source and target language to build such system using statistical methods. For that the computer needs to be trained. The transfer grammar comes handy to serve this purpose. A hybrid approach, which partly makes use of rule governed methods and partly statistical methods, appears to do well in machine translation. For this purpose transfer grammar is the only answer. As a byproduct, computational analyses of English and Tamil structures have been achieved. Such analyses are crucial for building MT systems.

Bibliography

1. Agesthialingam, S. 1967. A Generative Grammar of Tamil (A Fragment of Tamil Syntax). Annamalai Nagar: Annnamalai University.
2. Akhsar Bharati, Vineet Chaitanya and Rajeev Sangal. 2004. Natural Languge Processing. Pentice-Hall of India Private Limited.
3. ALPAC. 1966. Language and Machines: Computers in Translation and Linguistics. Washington D.C.: National Academy of Sciences.
4. Andronov. M.S. 1969. A Standard Grammar of Modern and Classical Tamil. Madras: NCBH.
5. Annamalai, E.
6. Arden, A.H. 1954. A Progressive Grammar of Common Tamil. Madras: CLS.
7. Asher, R.E. 1982. Tamil. Lingua Descriptive Studies. Amsterdam: North Holland Publishing Company.
8. Bakiyavathi T.. 2010. "Syntactic Structure Transfer in a Tamil to Hindi MT System - A Hybrid Approach". In A. Gelbukh (ed), Computational Linguistics and Intelligent Text Processing, Springer LNCS Vol. 6008. 2010a. pp 438 – 450.
9. Barathi, Akshar, Chaitanya, V. & Sangal, R. 1994. Natural Language Processing: A Paninian Perspective. New Delhi: Prentice-Hall of India.
10. Barton, G. Edward, Robert C. Berwick and Eric S. Ristad. 1987. Computational Complexity and Natural Language. MIT Press, Cambridge, MA.
11. Berwick, Robert C., S.P. Abney and C. Tenny (Eds.) 1991. Principle Based Parsing: Computation and psycholinguistics. Kluwer Academic, Boston.
12. Becker, C.L. Introduction to Generative Transformational Grammar. New Jersy: Prentice Hall.
13. Blake, B.J. 1994. Case. Cambridge: Cambridge University Press.
14. Bresnan, Joan (Ed.) 1982. The Mental Representation of Grammatical Relations. MIT Press, Cambridge, MA.
15. Brown, G. & Yule, G. 1993. Discourse Analysis. Cambridge: Cambridge University Press.
16. Buchmann, B. 1987. Early History of Machine Translation. In: King, M. (ed.) 1987. Machine Translation: The State of the Art. Edinburgh: Edinburgh University Press.
17. Catford, J.C. A Linguistic Theory of Translation. London: Oxford University Press.
18. Chomsky, N. 1965. Aspects of the Theory of Syntax. Cambridge: The MIT Press.
19. Chomsky, N. 1981. Lectures on Government and Binding. Foris, Dordrecht.
20. Chomsky, N. 1986. Knowledge of Language: Its nature, origin and use. Praeger Publishers, New York.
21. Cort, W. 1993. Typology and Universals. Cambridge: Cambridge University Press.
22. Crystal, D. 1971. Prosodic Systems and Intonation in English. Cambridge: Cambridge University Press.

23. Crystal, D. 1971. Linguistics. 2nd Edition 1985. Harmoundsworth: Penguin.
24. Crystal, D. and Davy, D. 1969. Investigating English Style. London: Longman.
25. Darbyshire, A.E. 1971. A Grammar of Style. London: Andre Deutsch.
26. Deshpande, W.R. 1994. Machine Translation: State of the Art (manuscript). Department of Electronics, Government of India.
27. Dakshinamurthy, R. 1983. A Contrastive Analysis of Complementation in English and Tamil. Ph.D. Thesis. Annamalainagar: Annamalai University.
28. "Dependency Grammar". Down loaded from Wikipedia.
29. Di Pietro, R. J. 1971. Language Structures in Contrast. Rowlery, Mass.: Newburry House Publications.
30. Edward, W.T. 1973. A Contrastive Analysis of Tamil and English. Ph.D. Thesis. Annamalainagar: Annamalai Universtiy.
31. Enkvist, N.E. et al. 1964. Linguistics and Style, London: Oxford University Press.
32. Fillmore, C.J. 1968. "The Case for case." In E. Bach and R.T. Harms (Eds.). Universals of Linguistics Theory. Holt, Rinehart and Winston, New York, 1968, pp. 1-88.
33. Frisiak, J. (ed.) 1981. Contrastive Linguistics and the Language Teacher. Oxford: Pergamon Press.
34. Ganesan, S.N. 1975. A Contrastive Grammar of Hindi and Tamil. Madras: University of Madras.
35. Geetha, K. 1985. Subsystems of Principles: A Study in Universal Based on Tamil Syntax. Ph.D. Thesis. Kanpur: IIT.
36. Gilman, W. 1961. The Language of Science. London: The English University Press.
37. Gleason, H. Allan. 1955. An introduction to descriptive linguistics. New York: Henry Holt and Company..
38. Greenberg, et al. (eds.) 1978. Universals of Human Language. Vols. 1-4. Stanford: Stanford University Press.
39. Gopal, A. 1981. Adjectives in Tamil. Ph.D. thesis. Annamalainagar: Annamalai University.
40. Halliday, M. A. K. (2005 [1995]) Computing meanings: Some reflections on past experience and present prospects. In J. J. Webster (ed.) Computational and Quantitative Studies. Volume 6 in the Collected Works of M. A. K. Halliday, 239–267. London and New York: Continuum.
41. Halliday, M. A. K. Introduction to functional grammar. Routledge.
42. Harris, Z. 1954. Transfer Grammar. In: International Journal of American Linguistics vol. 20, pp 259-270.
43. Haugen. Einar 1966.Language Conflict and Language Planning: The Case of Modern Norwegian. Cambridge, Massachusetts: Harvard University Press.
44. Hawkins. J.A. (ed.).1992. Explaining Language Universals. Oxford & Cambridge: Blackwell.

45. Hervey, S. & Higgins, I. 1994. Thinking Translation: A Course in Translation method: French to English. London & New York: Routledge.
46. Hendricks, W.O. 1976. Grammar of Style and Style of Grammar. New York: North-Holland Publishing Company.
47. Hornby, A.S. 1975. Guide to Patterns and Usage in English. London: Oxford University Press.
48. Hough, G. 1969. Style and Stylistics. Amsterdam/New York/Oxford: Routledge & Kegan Paul.
49. Hudson, R. 1995. Word Meaning. London & New York: Routledge.
50. Hutchins, W.G. 1986. Machine Translation: Past Present and Future. Ellis Horwood.
51. Hutchins, W.J. 2003. "ALPAC: the (in)famous report." In: Nirenburg et al (2003), 131-135.
52. Hutchins, W.J. Machine translation: a concise history. Journal of Translation Studies, vol.13, nos.1-2 (2010). Special issue: The teaching of computer-aided translation, ed. Chan Sin Wai. (Chinese University of Hong Kong, 2010); pp.29-70. [PDF, 216KB]
    [Website: http://ourworld.compuserve.com/homepages/WJHutchins]
53. Hwee-Boon, L. 1993. Some Lessons Learnt by a New Comer (manuscript). Japan: MT Smmit IV.
54. Isabelle, P. 1993. Machine-Aided Human Translation and the Paradigm Shift (manuscript). Japan: MT Smmit IV.
55. Jakson, H. 1988. Words and Their Meaning. London: Longman.
56. Jensen, K, Heidron, G.E.& Richardson (ed.). 1993. Natural Language Processing: The PLNLP Approach. Boston/Dordrecht/London: Kluwer Academic Publishers.
57. Jurafsky, D. & Martin, J. H. 2000. Speech and Language Processing New Jersy: Prentice Hall.
58. Kaplan, R.M. and Joan Bresnan. 1982. "Lexical Functional Grammar: A formal system for grammatical representation." In Joan Bresnan (Ed.). The Mental Representation of Grammatical Relations, MIT Press, Cambridge, MA.
59. Kamakshi, S. and Rajendran, S. 2008. Preliminaries to the Preparation of a Machine Aid to Translate Linguistic Texts in English into Tamil. Dravidian Linguistics Association publication.
60. Kay, Martin. 1979. Functional grammar. Proc. 5th Annual Meeting of the Berkeley Linguistics Society, 1979, pp 142-158.
61. King, M. 1987. A Tutorial on Machine Translation. ISSCO Working papers No. 53. Geneva: ISSCO.
62. King, M. (ed.) 1987. Machine Translation: The State of the Art. Edinburgh: Edinburgh University Press.
63. Kothandaraman, Pon. 1997. A Grammar of Contemporary Literary Tamil. Chennai: International Institute of Tamil Studies.

64. Kothandaraman, R. 1990. Tamil Syntax. Pondicherry: Podicherry Institute of Linguistics and Culture.
65. Leech, G.N. 1989. An A-Z of English grammar and usage. London: Edward Arnold.
66. Leech, G.N. et al. 1975. A Communicative grammar of English. London: Longman.
67. Lehmann, T. 1993. A grammar of modern Tamil. Pondicherry: Pondicherry Institute of Linguistics and Culture.
68. Lehmann, W.P. (ed.) Syntactic Typology: Studies in the Phenomenology of Language. Austin: University of Texas Press.
69. Levine, J.R. Mason, T. and Brown, D. 1999. Lex and Yaac. Mumbai, Calcutta: Shroff Publishers & Distributors Pvt. Ltd.
70. Lado, R. 1957. Linguistics across Cultures. University of Michigan Press, Ann Arbor, Mich.
71. Lado, R. 1968. Contrastive Linguistics in a Mentalistic Theory of Language Learning James E. Alatis (ed.) Report of the Nineteenth Annual Round Table Meeting on Linguistics and Language Studies. Georgetown University Press Washington, D.C. 20007
72. Matthews, P.H. 1991. Morphology. Cambridge: Cambridge University Press.
73. Newmark, P. 1988. A Text Book of Translation. New York: Prentice Hall.
74. Nida, E.A. 1974. Theory and Practice of Translation. Leiden: United Bible Societies.
75. Nida, E.A. 1975. Language Structure and Translation. Stanford, California: Stanford University Press.
76. Nirenberg, S. (ed.) 1987. Machine Trasnlsation. Cambridge: Cambridge University Press.
77. Osborne, Timothy. 2019. A Dependency Grammar of English. Publishing status: Available © John Benjamins. https://doi.org/10.1075/z.22
78. Palmer, F.R. 1986. Mood and Modality. Cambridge: Cambridge University Press.
79. Palmer, F.R. Grammatical Roles and Relations. Cambridge: Cambridge University Press.
80. Quirk, R., Greenbaum, S. 1988. A University Grammar of English, London: ELBS, Longman.
81. Quirk, R., Greenbaum, S, Leech, G.N. and Svartvik, J. 1972. A Grammar of Contemporary English. London: Longman.
82. Quirk, R., Greenbaum, S., Leech, G.N. and Svartvik, J. 1985. A Comprehensive Grammar of the English Language. London: Longman.
83. Quirk, R., Greenbaum, S. Leech, G.N. and Svartvik, J. 19 .Comprehensive Grammar of English.
84. Radford, Andrew. 1988. Transformational Grammar. Cambridge University Press, London.

85. Radhakrishnan. S. 1983. Noun Phrase in Tamil. Ph.D. Thesis. Annamalainagar: Annalmalainagar.
86. Rajendran S. & N. Gejeswari. 2019. Word Order Typology and Its Implication in Translation.Language in India www.languageinindia.com ISSN 1930-2940 Vol. 19:4 April 2019
87. Rajendran S. & G. Vasuki. 2019. English to Tamil Machine Translation System Using Parallel Corpus. Language in India www.languageinindia.com ISSN 1930-2940 Vol. 19:5 May 2019
88. Ramasamy, K. 1981. "Correlative Relative Clauses in Tamil." In: Agesthialingom, S. and N. Rajasekharan Nair (eds.).
89. Ramasamy, K. 1988. A Contrastive Analysis of the Relative clauses in Tamil and English. Phd Thesis, Annamalai University.
90. Rangan, K. 1972. A Contrastive Analysis of the Grammatical Structures of Tamil and English. Unpublished Ph.D. Dissertation. Delhi: University of Delhi.
91. Rangan, K. & Chandrasekaran, G. 1994. A Glossary of standardized technical terms in Linguistics English-Tamil. Thanjavur: Tamil University.
92. Rangan, K., Suseela, M. & Rajendran, S. 1999. Some issues on the Relative Clause Constructions in Tamil (manuscript). Trivandrum: 27th All India Conference of Dravidian Linguistics.
93. Renuga Devi, V. 1997. Grammatical comparison of Tamil and English: A Typological Study. Madirai: Devi Publications.
94. Rohrer, C. 1993. The Future of MT Technology (manuscript). Japan: MT Summit IV.
95. Rosenbaum P.S. 1967. The Grammar of English Predicate Complement Constructions. Cambridge: MIT Press.
96. Savory, T.H. 1967. Language of Science. London: Andre Deutsh.
97. Schiffmann, H. 1976. A Grammar of Spoken Tamil. Madras: CLS.
98. Schank, R.C. 1975. Conceptual Information Processing. New York: Elsevier.
99. Shanmugam Pillai, M. 1965. Interrogatives in Modern Tamil. IL vol. 26, 139-145.
100. Simmons, Robert F., Sheldon Klein and Keren McConlogue. 1994. "Indexing and dependency logic for answering English questions." https://doi.org/10.1002/asi.5090150306
101. Sobha Lalitha Devi, V. Kavitha, Pravin Pralayankar, S. Menaka, T. Bakiyavathi and R. Vijay Sundar Ram. "Nominal Transfer from Tamil to Hindi". In International Conference on Asian Language Processing (IALP), Harbin, China. 2010b. pp. 270 – 273.
102. Sobha Lalitha Devi, Pravin Pralayankar, S. Menaka, T. Bakiyavathi, R. Vijay Sundar Ram and V. Kavitha. "Verb Transfer in a Tamil to Hindi Machine Translation System". In International Conference on Asian Language Processing (IALP), Harbin, China. 2010c. pp. 261 – 264.
103. Shopen, T. (Ed.). 1985. Language Typology and Syntactic description. vol i-iii. Cambridge: Cambridge University Press.

104. Sinha, B.K. 1986. Contrastive Analysis of English and Hindi Nominal Phrase. New Delhi: Bahri Publications.
105. Sivakumar, S. 1980. Complementation in Tamil. Ph.D. Thesis. Annamalainagar: Annamalai University.
106. Sobha Lalitha Devi, Sindhuja Gopalan and Vijay Sundar Ram. "Transfer Grammar in Tamil Hindi MT System." 2013. International Conference on Asian Languge Processing.
107. Spencer, J. (ed.). 1965. Linguistics and Style. London: Oxford.
108. Sreedevi, B. 1991. Syntactic Patterns of Malayalam and Telugu. Thiruvananthapuram: Vivek Publications.
109. Stockwell, R.P. Schachter, P. & Paree, R. 1973. The Major Syntactic Structure of English. New York: Rinehart ans Winston , Holt.
110. Subbaiah Pillai, K. 1983. A Contrastive Analysis of Interjections in Tamil and English. Ph.D. Thesis. Annamalainagar: Annamalai University.
111. Suseela, M. 1981. A Contrastive Analysis of Relative Clauses in Tamil and Hindi. Ph.D. Thesis. Annamalainagar: Annamalai Universtiy.
112. Syamala, V. 1992. A text book of English Phonetics and Structure for Indian Students. Trivandrum: Sharath Ganga Publication.
113. Syamala, V. 1994. A Textbook of English Phonetics and Contemporary Grammar. Trivandrum: Sharath Ganga Publication.
114. Theivanatham Pillai, K. 1970. A Comparative Study of the English and Tamil Auxiliary Verb Systems and Prediction of Learning Problems for Tamil Students of English. International Review of Applied Linguistics, vol 8, pp. 21-47.
115. Theivanatham Pillai, K.. 1974. Contrastive Linguistics and Language Teaching. Annamalainagar: Annamalai University.
116. Thiyagarajan, K. 1881. Modal System of English and Tamil. Ph.D. Thesis. Madras: University of Madras.
117. Turner, G.W. 1973. Stylistics. Harmondsworth: Penguin.
118. Thirumalai, M.S. 1979. Language in Science. Mysore: Geetha Book House.
119. Ullmann, S. 1966. Language and Style. Oxford: Basil Blackwell
120. Verma, M.K. 1971. The Structure of the Noun Phrases in English and Hindi. Delhi: Motilal Banarsidas.
121. Wasdow, T. 1979. Anoaphora in Generative Grammar. E. Story-Scientica P.V.B.A. Scientific Publishers, Brussels.
122. Wilks, Y. 1973. "The Standord Machine Translation and Understanding Project." In R. Rustin (ed.) Natural Language Processing, pp 243-290, Algorithmic Press, New York.
123. Wilks, Y. 1975a. "An Intelligent Analyser and Understanding of English." Communication ACM 18(5)264-274.
124. Wilks, Y. 1975b. "A Preferential Pattern Seeking Semantics for Natural Language Inferene." Artificial Intelligene 6:53-74.

125. Zribi-Herz, Anne,. 1989. Anaphora, Binding and narrative point of view: English reflexive pronouns in setences and discourse. Languge 65, 695-727.