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Thai nouns and noun phrases: A Lexicase analysis

Savetamalya, Saranya, Ph.D.

University of Hawaii, 1989
THAI NOUNS AND NOUN PHRASES: A LEXICASE ANALYSIS

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN

LINGUISTICS

DECEMBER 1989

By

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Lawrence A. Reid
David L. Stampe
ACKNOWLEDGEMENTS

The completion of my graduate studies at the Department of Linguistics, University of Hawaii, has been due to the support of a number of people and organizations to whom I would like to pay respect and express my deep gratitude.

This dissertation is dedicated to my parents, Somkuan and Pornsuk, who not only encouraged me to pursue my academic goals but also provided financial support and endless love and care.

A number of professors have inspired me and motivated me in my linguistic studies. In particular, I would like to thank my supervisor Prof. Stanley Starosta, who supervised the writing of this dissertation with rigorous criticisms, constructive comments, enormous effort and great patience. He was the person who first introduced me to Lexicase theory when I was a graduate student at Chulalongkorn University in Thailand ten years ago. While I take full responsibility for this dissertation, without Prof. Starosta's knowledge, generosity, sincere guidance and concern, the work could not have been satisfactorily completed.

I also would like to thank Prof. Lawrence Reid for the times he shared discussing his insightful views on the structure of Thai and for helping me develop computer and word-processing skills. The other members of my committee
also deserve my sincere gratitude. Prof. Greg Lee provided beneficial comments on both the dissertation proposal and the dissertation itself. My knowledge on Southeast Asian linguistics has greatly benefitted from discussions with Prof. David Stampe. Prof. Thomas Gething also shared his extensive knowledge and valuable comments about Thai for this dissertation.

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I would like also to thank my student friends in the department, who supported and encouraged me in the good times and the hard times. They include: Julie Toso, Akiko Yokoyama, Louise Pagotto, Francis Lindsey Jr., and Ken-Tsai Ching.

Finally, I would like to express my special thanks to my Thai friends, Panida Tong-On who helped me with the data-checking, Pornpilas Ruengchotwit who looked after my personal affairs in Thailand. And last, but not least, my thanks go to Yupadee Hiemer whose support was as great as the distance it travelled.
This dissertation provides an analysis of Thai nouns and noun phrases using the Lexicase theoretical framework. Syntactic subclasses of nouns are posited on the basis of their argument structure, such as their ability to cooccur with verbal dependent sisters and/or prepositional phrases.

In chapter two, a fundamental distinction is made between nouns that are deictic [+dctc] and those that are non-deictic [-dctc]. Non-deictic nouns consist of a number of subtypes, including relational nouns, non-relational nouns, possessed nouns, and informational nouns, all of which allow but do not require verbs and prepositional phrases as their dependent sisters. The class of deictic nouns consists of proper nouns, personal, and impersonal pronouns, none of which allow verbs, prepositional phrases, or non-relational nouns as their dependent sisters.

Constituents in the immediate domain of nouns can be divided into four subtypes according to their lexical heads: verb, noun, preposition, or determiner. A verbal attribute occurs immediately adjacent to the regent noun. A nominal attribute, i.e., a relative clause, a possessive noun phrase, a relator noun phrase, a classifier construction, or a prepositional attribute (which is also considered [+N] because one of its exocentric co-heads is a noun phrase),
occurs following the verbal attribute if any. A determiner which is not a dependent sister of a classifier or a possessive noun occurs last in the attributive string. The discussion of these types of attributes are presented in chapters three and four respectively.

Chapter five is a summary of the investigation. It also includes the discussion of substantial advantages of this study over other previous works on Thai nouns and noun phrases. It is presented first in the degree of the coverage, secondly in the level of explanatory adequacy, and thirdly in the universal applicability of the analysis. This section also points out several types of generalizations that can be characterized as being either specific to Thai, or as having language-universal significance.

The analysis of noun classes and noun phrase structures in this study demonstrates the ability of the Lexicase theoretical framework to formally and explicitly account for the syntactic facts of a language and to capture significant generalizations insightfully within a highly constrained system.
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### LIST OF ABBREVIATIONS

The feature abbreviations used in this study are listed below with their corresponding full forms:

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<th>Full Form</th>
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CHAPTER 1

INTRODUCTION

1.1. Scope and objectives

The investigation focuses on several aspects of the syntactic characteristics of nouns and noun phrases in Thai. In this study, Thai nouns are subcategorized primarily on the basis of the syntactic features which encode their argument structure, i.e., the syntactic categories with which they are allowed or required to cooccur. Besides, Thai nouns are also subcategorized by some of their semantic features, i.e., [+bstr] (abstract), [+anmt] (animate), etc. The full analysis of noun subcategories is presented in chapter 2.

The internal structure of a noun phrase in which each of the noun classes appears is presented in Chapters 3 and 4. The discussion in chapter 3 includes types of attributes of non-relational nouns such as verbs, determiners, prepositional phrases, etc.

Chapter 4 presents relational nouns as the heads of noun phrases in the following constructions: relative clauses, classifier constructions, possessive constructions, and relator noun phrases.
The last chapter discusses the advantages of this analysis over some analyses proposed within other theoretical frameworks. It also points out some generalizations that have been captured by the lexicase framework which have not been made by other previous works on Thai noun phrases. Some contributions of this study with reference to the lexicase framework will also be included.

1.2. Data collection

As the aim of a lexicase grammar is to describe the grammar of a specific language which is compatible with the description of single person's internalized knowledge of that language, this investigation is a description of my own idiolect of Thai. In other words, the data have been basically drawn from myself, as a native speaker of Thai, although all sentences have been double-checked with other Thai speakers to identify idiosyncratic properties that do not generalize across the Thai-speaking community as a whole. In addition, data from other sources, such as Thai printed matter and data provided in some previous analyses of Thai, e.g., Haas (1942), Uprakit Silapasan (1952), Anuman Rajadhon (1955), Noss (1964), Ekniyom (1971), Kullavanijaya (1974), Bandhumedha (1976), Sornhiran (1978), etc. have also been considered.
1.3. Previous analyses of Thai noun phrases

Several previous analyses of Thai noun phrases exist. They have been done within both non-transformational and transformational frameworks. In the following paragraphs I shall outline the approaches taken by some of these analyses and attempt to show how the analysis that will be made in this dissertation will differ from them.

Uprakit Silapasan (1952) and Anuman Rajadhon (1955) described Thai grammar using a traditional framework, but did not go much into detail about the structure of phrases and clauses. As a notional grammar, their works relied on semantics to establish word classes, e.g. nouns are names of persons, places, and things, etc. Lexicase, however, is a syntactic rather than a semantic theory. Thus it does not rely on semantics to establish word classes, but rather on distribution. Therefore the result of these two analyses will be different. For example, Anuman Rajadhon established the category of 'classifier' for Thai on the basis of the semantic function of words in this class. Following a distribution-based syntactic lexicase analysis, however, classifiers will be analyzed here as a special subclass of nouns.

Two structuralist analyses of Thai syntax have been made, Chantavibulya 1962 and Noss 1964. Since structural linguistics, like lexicase, places a heavy reliance on facts
of distribution, there are many similarities between these analyses and lexicase. However, as structuralist descriptions, these analyses attempted to describe Thai grammar purely in its own terms and did not make any attempt to discover cross-linguistic generalizations. These descriptions make no attempt to add to our knowledge of language as a human faculty, but were simply statements about patterns observed in one particular language. No language-internal or cross-linguistic predictions were made, and none could therefore be tested.

As Lexicase is a theory that does attempt to capture cross-linguistic generalizations, and therefore makes a claim about human language in general, if the facts of Thai noun phrases turn out to be incompatible with the claims made by the theory, then the theory will have to be modified until they are. Conversely, the claims that will be made in this dissertation about Thai noun phrases should provide insights into noun phrases in languages that are typologically and genetically different from Thai.

Several types of transformational analyses of Thai have been made. These included the works of Warotamasikkadit (1963) who provided some tentative phrase structure rules for noun phrases in Thai, Bandhumedha (1976) who discussed the structure of noun phrase deletion in Thai, and Ekniyom
(1971) and Sornhiran (1978) who analyzed the structure of relative clauses in Thai.

There are several problems with all of these analyses. The first is that although they claim to be generative, they fail to provide the set of formal and explicit rules and lexical entries which would be needed in order to allow the claims that are made in the grammars to be adequately tested.

In contrast, a lexicase analysis is generative in that it requires grammatical rules and representations to be expressed formally and explicitly.

Secondly, in transformational analyses of the kind used in these descriptions, there are two levels of representation: deep and surface structure. The power of such an analysis is so great that the theory allows almost any kinds of phrase structure rules to be constructed to generate the deep structure, and almost any kinds of transformations to derive surface structures from deep structures. It also allows the invention of an unlimited number of word classes, phrases, and abstract categories. The tree structures generated by phrase structure rules also are complex and have no limitation on tree depth.

Unlike transformational analyses, lexicase has limited its own power, to the point that ideally it allows only one
analysis for any given surface structure, with minimal complexity in tree structure. The syntactic information is directly read off from a relatively flat tree structure. This makes lexicase a less powerful theory than transformational theories. To the extent that lexicase is less powerful than transformational theories, its claim about the structure of Thai in particular, and its claims about language in general are narrower and more specific and consequently more easily tested.

As a highly constrained theory, lexicase achieves explanatory adequacy in accordance with Radford's characterization (1988:30):

A theory of language should attain the level of explanatory adequacy if it provides a descriptively adequate grammar for every natural language, and does so in terms of a maximally constrained set of universal principles which represent psychologically plausible natural principles of mental computation.

1.4. Phonemic inventory and orthography

Thai, on which this study is based, is the official dialect spoken in the central part of Thailand. Thai is an SVO, tonal, monosyllabic type of language (at least for native vocabulary). There is no inflectional system (unlike Japanese, English, or most Austronesian languages) to mark syntactic functions or to indicate syntactic relationships within a phrase, clause, or a sentence.
The following orthographic system will be used to represent Thai phonemic transcription throughout the study. It should be noted that these symbols are not meant to represent a definitive analysis of the phonemic system of the language but only to serve as a reference for the transcription of the data in this study. There are 21 consonants, 9 vowels, 3 diphthongs and 5 tones in the orthographic system in Thai.

Consonants:

**Bilabial Labio- Dental Palatal Velar Glottal**

dental

Stops:

vd. unasp. b d
vl. unasp. p t c k ?
vl. asp. ph th ch kh
Fricatives:

f s h

Nasals:

m n ng

Liquids:

r, l

Semi-vowels:

w j

Vowels:

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<td>Low</td>
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All vowels can occur either long or short. Long vowels are represented by the symbol for the short vowels written twice.

Diphthongs:

i@ y@ u@

Tones:

Mid unmarked
Low `
Falling ^
High /
Rising v

1.5. Linguistic framework

The theoretical framework to be used in the analysis is called Lexicase developed primarily by Stanley Starosta at the University of Hawaii. Lexicase is a non-transformational generative model. A lexicase analysis is generative in that it requires the presentation of the explicit machinery which allows it to be objectively tested against new data. Moreover, the elimination of transformations, the lack of an arbitrary, abstract, deep structure, and other constraints imposed by the theory on grammatical representation, on lexical representation, and on rules, sufficiently constrain the power of the theory to the point where it makes real and potentially falsifiable claims.
A lexicase grammar is a grammar of words. It is a set of generalizations about the internal compositions, external distributions, and lexical relationships of the words in the language (Starosta 1988:2). Each word in a lexicon is marked for the classes of words which can depend on it, and a sentence is any sequence of words such that every word is linked to one of the other words in accordance with the features specified on the two words. In that sense, the lexicon generates the sentences of a language: each lexical entry specifies well-formedness conditions on a tree node, and a sentence is defined as any sequence of words for which all these well-formedness conditions are satisfied.

Lexicase incorporates a number of constraints on the form of rules and on the representation of the structure in order to reduce the power of the grammar and thus strengthen its claim about the characteristics of human language. To limit the set of possible grammars compatible with the theory and to increase the probability of falsifying the theory, a number of constraints on grammatical representations, on lexical features, and on possible rules of grammar have been imposed on lexicase grammar. These are quoted as the following (Starosta 1988:9-37):

1. Distinct underlying representations and transformations are disallowed. In other words, there is no distinction between deep and surface structures, levels, strata, or other simultaneous levels of syntactic representation.
2. Phrase Structure Rules are eliminated as redundant. The syntactic information about sequential and hierarchical characteristics of words in phrases, clauses, and sentences is marked by contextual features marked on the lexical heads of constructions. Thus, the lexical entry of each word will include contextual features which specify the subordinate attributive word with which it may occur (Starosta 1988:56).

3. The one-bar constraint: every phrase X' must have a lexical head of type X^0. Each and every construction has at least one immediate lexical head, and every terminal node is the head of its own construction.

4. The domain of grammatical relatedness is limited to sisterheads, that is, to the heads of the Comps of X in X-bar terminology. This condition is developed into a Sisterhead constraint stating that lexical items are subcategorized only by their dependent sisters. Contextual features can only be marked on the lexical heads of constructions, and refer only to lexical heads of sister constructions (Starosta 1985:29; 1988:20, Pagotto 1987:28).

The Sisterhead constraint functions to place an empirically motivated limitation on possible grammatical representations. As a consequence, whether or not two words are grammatically related can be immediately read from a lexicase tree. For example, a noun cannot be subcategorized with respect to any constituent outside the noun phrase, and the verb cannot be subcategorized with respect to any constituent inside the noun phrase except for the lexical head noun. The following is an illustration of the application of this constraint:
The arrow indicates the dependent constituents to which
the noun and verb can refer. The noun pumpkin pie is
subcategorized with respect to the adjective big, and the
determiner a. The verb made is subcategorized with respect
to the lexical head nouns Micky and pumpkin pie, not with
other constituents. Both the noun and the verb are
subcategorized only by constituents that are in their
immediate domains.

5. The inventory of major lexical classes (parts of
speech) is limited to a small set of atomic categories
which are divided into syntactic subcategories based
on differences in distribution. The lexicon contains
only actually occurring words. Thus, all terminal
nodes are words and every word in a grammar is a
member of one and only one of a restricted set of the
following syntactic word classes: noun (N), verb (V),
adjective (Adj), adverb (Adv), determiner (Det),
preposition (P), conjunction (Cnjc), and sentence
particle (Sprt) (Starosta 1988:27). Each syntactic
class is defined in terms of a single positive atomic
feature from this set of categories, such as [+N],
+[V], etc.; and no lexical item is marked positively
for more than one of these features.

6. All non-contextual features which are marked only
on lexical items are binary. There can never be two
identical lexical entries differing only in that one
is specified by binary features and the other by
multi-valued features. This constraint, like the
others, can in principle be disproved by demonstrating
that such items do exist in some attested language (Starosta 1981b:27).

Contextual features are absolute or implicational (Starosta 1988:30). Absolute contextual features mark an item as requiring or excluding a particular kind of dependent sister category in order for the sentence to be well formed. For example, exocentric constructions must have two lexical co-heads, e.g. from [+P, [+N]] and and [+cnjc, [+N][+N]].

Implicational contextual features, which are indicated by the symbol [?[<Fi>]] rather than the old conventional horse-shoe [?[<Fi>]] type, mark an item as requiring the presence of a dependent sister of category [<Fi>]. For example, a transitive verb would bear the feature indicating that an accusative dependent is required as a dependent. This feature is satisfied if the '?' is replaced by an index of either (i) a dependent sister whose head is [<Fi>] (valence linking), (ii) a [<Fi>] constituent outside the domain of the verb (chaining), or a contextually determined antecedent (zero pronominalization). In Thai for example the object of a nominal relative clause can be missing, but some rule must still apply to replace the '?' by some index in order for the sentence to be well-formed.

Lexicase grammar also eliminates rule features and double contextual features, i.e., a feature in which a
contextual feature is included within another contextual feature. For example, the following contextual feature stating that the verb requires the verb of an embedded infinitival complement to have a preceding accusative NP is not allowed in a lexicase formulation.

\[
\text{seem}
\begin{array}{c}
+V \\
+[-\text{fint}]
\end{array}
\]

7. Non-terminal nodes in a tree do not bear features, and node labels may be omitted as redundant.

A lexicase tree diagram does not need node labels. The way in which words can combine together is strongly restricted by the Sisterhead constraint, which states that a word can contract a grammatical relationship only with the head of a dependent sister construction, and the One-bar constraint, which requires every construction to have at least one lexical head. The result is a syntactic tree representation which is flatter, contains only maximal projections, and is more universal (Starosta 1988:58).

A lexicase representation can be viewed as a network of dependencies obtaining between pairs of lexical items in a sentence. Each word is specified for the kinds of dependents it is allowed to take, including in the limiting case none at all. A word decides which classes or subclasses of words may, may not, or must occur as
dependents, whether the dependents appear to the right or left of it, how they are ordered among themselves, and how they are interpreted semantically. The positive and negative contextual features in each lexical matrix must be met by the lexical items which depend on it in that tree (Starosta 1988:105).

The following is an illustration of a lexicase tree with its contextual features:

```
played +V
   | 1(+N)
Shamu 3(+P)
   | +N
   1Index 1[-(+P)](+N)
   2Index 3(+P)
   3Index
with +P
   | +[+N]
   1[-(+P)](+N)
   2Index
   3Index
   5Index
mother +N
   | 4[+Det]
   1(+N)
   4Index
   5Index
   5Index

Played is a verb and functions as a head of the clause. Its contextual features allow a noun and a prepositional phrase as its dependent sisters. The verb looks to its left and it sees Shamu marked with the feature [+N]. When it looks to its right, it sees the virtual matrix containing the features of the [+P] and of the lexical head of the P's
phrasal sister [+N] with his mother. Therefore, all the contextual features marked on the verb are satisfied.

The syntactic relationship between a lexical head and the heads of its sister constituents is referred to in lexicase by the following notions (Pagotto 1987:16-8, Starosta 1988:108):

The tree diagram that follows is used to illustrate the syntactic concepts being defined:

```
A'
\  /   \
B'  A   C'
 \  |   |  \
  B  C  D'
   \  |   |
    D
```

A, B, C, and D are the lexical heads of their constructions, and A', B', C', and D' are their respective phrasal projections.

Cap-command: The syntactic relationship that holds between the head X of a phrase X' and the head(s) of its dependent sister constructions Y'. In other words, the phrasal node above X immediately dominates the phrasal node above Y. In the diagram above, A cap-commands B and C, while C cap-commands D.

Command: A relationship between the lexical heads of constructions which can be specified in terms of a chain of
cap-command relationships. In the diagram, A cap-commands C and C cap-commands D. The result is a chain of cap-commanding relationships. Therefore, A commands D (as well as commanding and cap-commanding B and C). In addition, C (cap-)commands D.

Domain: All constituents commanded by the lexical head of a phrase comprise the domain of that head. In the diagram, B, C, and D are in the domain of A, and D is in the domain of C.

In addition to the contextual features on each lexical entry stating which dependents are required, allowed, or excluded, lexicase has also formulated the Omega rule as a universal inflectional redundancy rule obligatorily included within every lexicase grammar so that subcategorization rules, redundancy rules and lexical representations can be most economically stated and fully formalized (Sayankena 1985:25).

The Omega rule functions as a default or elsewhere condition, stating that environments which are not specifically allowed are excluded, and it makes possible a number of rule simplifications. It is the last rule in the lexicase grammar of every language, and states quite simply that nothing can cooccur with anything. The Omega rule is formalized in the following format: the empty matrix to the
left of the arrow refers to all lexical categories, and the features to the right are non-directional, or equivalently, bi-directional, contextual features which have the effect of preventing any category from having any other category as a dependent sister (Starosta 1988:87).

\[
\text{IRR-OMEGA} \ [\ ] \rightarrow \ \\
\neg [+N] \ \\
\neg [+V] \\
\neg [+Adj] \\
\neg [+Adv] \\
\neg [+P] \\
\neg [+Det] \\
\neg [+CnjC] \\
\neg [+Sprt]
\]

In order for phrases or sequences of fully specified lexical entries to be further interpreted two types of phrase-level rules are needed: phrase-level phonological rules and phrase-level anaphoric rules. These two kinds of rules are the only non-lexical rules in the lexicase system. The phonological rules take care of all phonological representations of phrases which are characterized by specific phonological processes which cannot be accounted for at the word level, such as external sandhi and intonation.

Phrase level anaphoric rules (Linking Rules and Chaining Rules) account for the identification of the antecedents of certain pronouns and missing constituents when this is grammatically determined. They apply to constructions such as English infinitival complements and relative clauses (Starosta 1988:101). These rules apply to
the output of the lexical rules, called the simple syntactic representation. The output of these anaphoric rules is called the augmented syntactic representation.

The following are some examples of these anaphoric rules:

**Linking rule 1.** PAT > < actor, intransitive clauses (Starosta 1989:6):

\[
\begin{align*}
\text{PAT} > \text{PAT} & \rightarrow \text{n[+actr]} \\
\text{n[+PAT]} & \rightarrow \text{pat} \text{-trns} \\
\text{n[+actr]} & \rightarrow \text{n[+PAT]} \\
\text{-trns} &
\end{align*}
\]

This rule states that a Patient in an intransitive clause is also the actor of the clause, e.g.,

\[
\begin{align*}
\text{The rabbit} & \text{ slept quietly.} \\
\text{[+N]} & \text{[+actr]} \\
\text{[1[+PAT]} & \text{[index]} \\
\text{[N]} & \text{[+actr]} \\
\text{[+trns]} &
\end{align*}
\]

The *rabbit* is the Patient of the intransitive verb *slept*, therefore it is also the actor of the clause.

**Control rule 1.** Inner infinitival complements (Starosta 1989:8):

\[
\begin{align*}
\text{[+Nom]} & \rightarrow \text{n[+Nom]} \ \backslash \ \text{n[+PAT]} \\
\text{[-fint]} & \rightarrow \text{m[-fint]} \\
\text{mnindex} &
\end{align*}
\]
This rule states that the missing subject of an inner infinitival clause is coindexed to the Patient of the regent predicate, e.g.,

d. Tim persuaded Harry [ to go to the party ].

The missing subject of the verb go is coreferential with the patient of the regent predicate persuaded, that is Harry.

The application of both phonological rules and anaphoric rules results in fully specified phrases, which are important components of a production and parsing system.

There are case forms, case relations, and case markers in lexicase theory. Case forms are realized by means of a syntactic device, i.e., word order, as well as mechanisms including localistic features marked on prepositions, lexical and inflectional noun classes and verb classes. Case markers carry localistic information and combine to form case forms. Nouns are either predicates or marked for case relations. There are five case relations, i.e., Agent, Patient, Locus, Correspondent, and Means. The Patient is obligatory and the last three case relations have inner (subcategorizing) and outer (non-subcategorizing) versions.

Lexicase claims to be universally applicable to the description of all human languages. It has been applied
successfully to the description of a number of typologically and genetically dissimilar languages, e.g. Vietnamese (Clark:1978), Amis (Chen:1985), Swahili (Khamisi:1985), and Marshallese (Pagotto:1987), and to verb subcategorization in Thai (Kullavanijaya 1974). It can therefore be expected to provide insights into the structure of Thai noun phrases as well.
NOTES

CHAPTER 2

NOUN SUBCATEGORIZATION IN THAI

2.1. Introduction

This chapter begins with a discussion of the general principles of subcategorization within lexicase, which have been applied to various analyses of verbs among languages. The remainder of the chapter will present a comprehensive subcategorization of nouns in Thai, classified with respect to their syntactic and semantic properties.

A number of works on subcategorization have been done based on lexicase theory, e.g., Taylor 1971, Kullavanijaya 1972, Chen 1982, Kamisi 1984, Sayankena 1985, and Pagotto 1987. Most of these deal with the syntactic category of verbs. The verbs are subcategorized on the basis of their argument structure, i.e., the case relations which are implied in their case frame and/or the complements with which they must cooccur (Pagotto 1987:323).

2.2. Subcategorization in lexicase

Since most subcategorization analyses that have been done using lexicase have subcategorized verbs, the discussion of subcategorization in lexicase in this section will focus on verbs. In a lexicase grammar the features that are generally relevant in the subcategorization of
verbs include complement types, required case relations, inflectional and derivational features that affect subject choice and semantic features that characterize differences in syntactic behavior (Starosta 1978:527). The syntactic-semantic information that is relevant to subcategorization may be encoded in a variety of ways. Features that characterize syntactic-semantic properties of the verb itself appear in the matrix of the verb, e.g., the feature transitive [+trns]. Information relevant to subcategorization may also be encoded as contextual features, i.e., features that refer to sister constituents. For example, verbs that require verbal dependent sisters are marked with the feature [+[+V]] (verb) or [+[+prdc]] (predicate).

Even though syntactic features form the basis for subcategorization, semantic and morphological properties may also be used as subcategorization criteria, especially when these non-syntactic features have syntactic consequences. The subcategorization of verbs in Nataoran-Amis provides an example of using morphological features in classifying subtypes of verbs (Chen 1982:250).

The subcategorization presented in this study is the first application of syntactic-semantic criteria to a comprehensive analysis of nouns in Thai. The only other
comprehensive subcategorization of nouns using lexicase has been done for English (Starosta 1986).

2.3. The subcategorization of nouns in Thai

Nouns in Thai can be subcategorized in terms of their internal semantics and grammatical features such as [+prnn] (pronoun) and [+rltn] (relational), as well as external contextual properties such as their ability to cooccur with verbs or demonstratives, or the requirement that they cooccur with particular types of sentential attributes.

The range of meanings and the syntactic functions of Thai nouns generally correspond to the semantic range and grammatical functions of nouns across languages. That is to say, most nouns have referential meaning and function as arguments of verbs and prepositions.

Thai is syntactically a strongly right-branching language and nouns in Thai, except classifiers, do not allow any preceding dependent sisters. Thai nouns generally precede their dependent sisters. (See the section on classifier constructions (chapter 3) for an exception to this generalization.)

The redundancy rule accounting for the ordering of nouns is formulated as follows:
that is, a noun does not allow any dependent sister to its left.

Examples are as follows:

1. nāngsyy nāa
   book thick
   'The thick book'

2. *nāa nāngsyy
   thick book

3. nāngsyy sāam lēm
   book three clsf
   'three books'

4. *sāam lēm nāngsyy
   three clsf book

The structures assigned to noun phrases in (3 and 4) are illustrated in (A and B) respectively:

(A)

(B)

Nouns have two functions: they can be either predicates [+prdc] or non-predicates [-prdc], in which case they bear a case relation. The example in (5) shows that the first noun, which is the head of a noun phrase, functions as a non-predicate, whereas the second noun functions as a predicate, the head of a clause:
5. บ้านนี้ บ้าน ยี่
house this house I
'This house is mine.'

The noun บ้าน in บ้านนี้ is the head of a noun phrase. It is not a predicate, and bears the Patient case relation, as indicated by the appearance of its index on the [+PAT] feature of its regent. The noun บ้าน in บ้านยี่ is a nominal predicate of the clause. As a predicate, it implies a subject (indicated by the feature ?[+Nom]), an actor (indicated by the feature ?[+actr]), and a Patient (indicated by the feature ?[+PAT]). (The semantic interpretation of each implicational feature will be discussed in chapter 3 in the relative clause section.)

The inflectional redundancy rule accounting for the function of nouns is formulated as follows:

\[ \text{IRR-1} \quad [+N] \quad \rightarrow \quad [+prdc] \]

According to the Patient Centrality Hypothesis, a predicate always implies a Patient, and every predicate implies a subject ([+Nom]). The inflectional redundancy rules characterizing these properties are formulated as follows:
A non-predicate nominal can be in either the Nominative or the Accusative case form depending on the case assignment of the matrix verb. The inflectional redundancy rule is formulated as follows:

\[
\text{IRR-4 } [+N ] \rightarrow [+\text{Nom}] [-\text{prdc}]
\]

In a possessive construction, nouns do not allow non-pronouns, marked with \[?([-\text{Nom}]), ?([+\text{COR}])\] case forms to occur as their sisters, e.g.,

6. tó? chan
   'my table'

7. *dèk kâaw?ii
   'chair of the child'

The inflectional redundancy rules characterizing these properties are formulated as follows:
The subsections that follow present the details of the subcategorization of nouns in Thai. In section (2.3.1.), I discuss the basis for establishing the classes of deictic and non-deictic nouns in Thai. The remaining subsections are concerned with all types of relational and non-relational nouns. Pronouns and non-pronouns are described in section (2.3.2.1.).

Nouns are initially subcategorized by the following subcategorization tree:

```
+ N
  /   
- dctc   + dctc
  /     /     
- rlt n  + rlt n
  /     
- prnn  + prnn
```

Figure 1. Subcategorization of nouns

Nouns can be subcategorized according to the following lexical subcategorization rules:

SR-1  [+N]  -->  [+dctc]

Nouns can be subcategorized into two major subclasses: deictic and non-deictic. Non-deictic nouns are nouns that allow, but do not require, verbs and prepositional phrases as their sisters, as in (8-9); whereas deictic nouns do not
allow verbs and prepositions as their sisters, as in (10-
13):

8. ?an jàj
clsf big
'a big object'

N'

/an
[+N ] V'
[-dctc] 

jàj

[+V]

9. bān sāmprāp dēk
house for child

[+N | [+P]
[-dctc] 'a house for children'

10. *maalīi sāmprāp th@@
mali for her
[+dctc] [+P]
'Mali for her'

11. *khāw phy@ dēk
he for child

[+dctc] [+P]
'he for the children'

12. *khāw khajān
he diligent

[+dctc] [+V]
'a diligent he'

13. *maalīi kēng
Mali smart

[+N | [+V]
[+dctc] 'a smart Mali'

Sentence (12) and (13) would be grammatical if the
verbs were treated as predicates, and would mean 'He is
diligent.' and 'Mali is smart.' respectively.
A noun with a verbal sister must be indefinite, and this is the reason why deictic nouns, which are definite, do not allow verbal dependents. The inflectional redundancy accounting for this property is formulated as follows:

\[ \text{IRR-6 } [+N] \rightarrow [+\text{dfnt}] \]

The non-cooccurrence of deictic nouns with verbs and prepositional phrases will be stated as a part of the Omega rule (see section 1.4.), i.e.,

\[ \text{IRR-\text{OMEGA}}: \ ] \rightarrow [-[+N]] \]
\[ [-[+V]] \]
\[ [-.] ]

while the optional cooccurrence of non-deictic nouns with [+V] and [+P] attributes is formalized as:

\[ \text{RR-2 } [+\text{dctc}] \rightarrow [+([+V])] \]
\[ [+([+P])] ]

a rule which has the function of blocking the addition of the feature [-[+V]] and [-[+P]] by the Omega rule.

Most of the non-deictic nouns that allow verbs as their sisters are lexically marked with the feature [+([+V])] as an exception to the Omega rule.

Verbal dependents of nouns are always finite. The inflectional redundancy accounting for this is formulated as follows:
IRR-7 \([+[V]][-+][+-=][+-]+[[+V]][+]fint\] \(\rightarrow\) \([+([fint])]\)

where a linking filter takes care of the requirement that these two contextual features pick out the same dependent constituent (see section 3.2.).

The filter would be as follows:

\[
*\text{rm}([+V]) \text{, } m \text{ not equal to } n
\]

\[
\text{m}([+fint])
\]

Non-deictic nouns allow nouns as their dependent sisters, e.g.,

14. khōong₂ khruu
    possession teacher
    [-dctc] [+N]
    '(something) belonging to the teacher'

15. bon  bān
    on  house
    [-dctc] [+N]
    'on the house'

16. lēm  khōong₂ khruu
    clsf possession teacher
    [-dctc] [+N]
    'the one belonging to the teacher'

The inflectional redundancy rule accounting for this is formulated as follows:

IRR-8 \([+N] \rightarrow [?([N])]\)

Non-deictic nouns can be further subcategorized into two subclasses: \([+rltn]\) (relational).

SR-2 \([-dctc] \rightarrow [+rltn]\)

Deictic nouns are lexically definite:
They can be further subcategorized into two subclasses: [+prnn] (pronoun).

First we will look at the set of non-deictic nouns.

2.3.1. Non-deictic subclass

Nouns in the non-deictic subclass are subcategorized into two subclasses: [+rltn] (relational). Relational nouns are introduced first to facilitate the discussion of types of attributes of non-relational nouns since non-relational nouns allow all relational nouns as their dependent sisters.

2.3.1.1. Relational nouns

Relational nouns are nouns that have grammatical rather than referential functions. They typically signal relationships of location or possession between a noun and its regent. Non-relational nouns are nouns that have their own autonomous referential meaning.

Non-relational nouns allow both non-relational nouns and relational nouns as their sisters, e.g.,

17. kháα  chaαng
    leg   elephant
    'legs of the elephant'

\[ \begin{array}{c}
N' \xrightarrow{+N} N' \\
\mid \rightarrow \rltn \\
\mid \rightarrow \rltn \\
\end{array} \]

\[ \begin{array}{c}
khαα \xrightarrow{+N} N' \\
\mid \rightarrow \rltn \\
\mid \rightarrow \rltn \\
\end{array} \]

\[ \begin{array}{c}
chaαng \xrightarrow{+N} | \\
\mid \rightarrow \rltn \\
\mid \rightarrow \rltn \\
\end{array} \]
18. nāngsyy nhōngchan
book possession I
'my book'

19. nāngsyy nhōngkhruu
book possession teacher
[-rltn] [+rltn]
'the book belonging to the teacher'

20. nāngsyy bon tō?
book top table
[-rltn] [+rltn]
'A book on the table's top.'

21. nāngsyy thiī syy māj
book that buy new
[-rltn] [+rltn]
'a book which is newly bought'

Relational nouns sometimes allow relational and non-relational nouns as their sisters (22-23); but sometimes they do not (24-25):

22. bon tō?
ton table
[+rltn] [+rltn]
'(the one) on the table'

23. nhōngkhruu
possession teacher
[+rltn] [-rltn]
'(the one) belonging to the teacher'

24. *bon thiī syy māj
on that buy new
[+rltn] [+rltn]

25. *nhōngthī chūp
possession that like
[+rltn] [+rltn]
The rules accounting for this restriction will be stated in the relevant subsections that follow.

The subcategorization tree for relational nouns is as follows:

```
+N
| -dctc
| +rltn

| -nphr
| [?[(+N)])
| [-[+rltn]]
| [+nphr]
| [-[-rltn]]
| [-clsf]
| [+clsf]
| [+V]
| [?[(+N)])
| [+fint]
| [?[(+Det)])
| [+rltv]
| [?[(+Adj)])
| [+rltv]
| [?[(+V)])

khOonj1 bon thiI1 thiI3 leem
'possession' 'on' 'that' 'that', 'classifier'

Figure 2. Subcategorization of relational nouns
```

Relational nouns can be subcategorized into two subclasses: [+nphr] (anaphoric).

SR-4 [+rltn] --> [+nphr]

Non-anaphoric nouns do not allow relational nouns as their sisters, e.g.,
26. *khOong2 naj tó?
    possession in table

*N'
    khOong2
    [+N ] N'
    [-nphr]
    naj
    [+N ] N'
    [+rltn] tó?
    [+N ]
    [-rltn]

27. *khOong2 thii2 chOOP
    possession that like
    [-nphr] [+rltn]

28. *bon khOong2 chăn
    top possession I
    [-nphr] [+rltn]

29. *naj thii2 syy
    in that buy
    [-nphr] [+rltn]

30. *bon ?an
    top clsf
    [-nphr] [+rltn]

31. khOong2 khruu
    possession teacher
    [-nphr] [-rltn]
    '(the one) belonging to the teacher'

32. bon tó?
    top table
    [-nphr] [-rltn]
    '(the one) on the table'

Anaphoric nouns do not allow non-relational nouns as their sisters, e.g.,

33. *lêm nāngsyy
    clsf book
    [+nphr] [-rltn]
34. *thii\textsuperscript{2} n\textsuperscript{2}ngsy\textsuperscript{2} that book [+nphr] [-rltn]

The redundancy rule accounting for the non-occurrence of non-anaphoric noun with relational nouns and anaphoric noun with non-relational nouns is formulated as follows:

RR-3 \([-N] \rightarrow [-[-\text{rltn}]]\)

Non-anaphoric nouns do not allow verbs as their dependent sisters, as in (35), whereas anaphoric nouns do, as in (36):

IRR-10 \([+\text{nphr}] \rightarrow [+([+V])]\)

35. *bon su@j on beautiful

36. l\textsuperscript{\textperiodcentered}m lék clsf small 'a small one'

The non-cooccurrence of non-anaphoric nouns with verbs is accounted for by the Omega rule.

Anaphoric nouns can be subcategorized into two subclasses: [+clf] (classifier).
SR-5 [+nphr] --> [+clsf]

Non-classifier nouns do not allow any nouns, adjectives and determiners (37-39), but do allow verbs as their dependent sisters (40), whereas classifier nouns allow nouns, adjectives, determiners, and verbs as their dependent sisters, as in (41-44):

IRR-11 [+clsf] --> [?([+[N]]) ]
|?[([+Det])] |
|?[([+Adj])] |
|?[([+V])] |

37. *thii₂ nii₂
   that here
   thii₂ [+N] Det'
   [rltn] |
   [+nphr] nii₂
   [-clsf] [+Det]

38. *thii₂ khoong₂ baän
   that possession house
   [-clsf] [+N]

39. *thii₂ rxxk
   that first
   [-clsf] [+Adj]

40. thii₂ syy màj
   that buy new
   [-clsf] [+V]
   'the one that was newly bought'

41. lêm nii
   clsf this
   N'
   lêm [+N] Det'
   [+tn] |
   [+nphr] nii
   [+clsf] [+Det]

42. lêm bon tó?
   clsf top table
   [+clsf] [+N]
   'the one on the table'
The non-cooccurrence of the non-classifier noun with nouns, adjectives and determiners will be stated as a part of the Omega rule.

Non-classifier nouns are characterized by the requirement that they always take a verbal dependent according to the following rule:

\[ \text{IRR-12} \; [-\text{clsf}] \rightarrow [?(+V))] \]

and the Omega Rule prevents them from taking any other kind of dependent. They can be subcategorized into two subclasses: \([+\text{rltv}]\) (relative).

\[ \text{SR-6} \; [-\text{clsf}] \rightarrow [+\text{rltv}] \]

The relative noun \(\hat{\text{thi}}\_2\) 'that' functions as the head of a nominal relative clause (45); whereas the non-relative noun, complementizer \(\hat{\text{thi}}\_3\), functions as the regent of a complement clause (46). (See chapter (3) for more discussion of nominal relative clauses and noun complement clauses.)

45. nangsyy th\(\hat{i}\)_2 khi\(\hat{e}\)n dii
    book that write good
    'a book that was written well'
The structure assigned to (45) in which thii₂ is a relative noun is illustrated below:

```
N'       N'          N'
|         |            |
| nangsyy | thii₂       | V'          |
   [+N]    | [+N]        |            |
         | [+rltn]    |            |
         | [+nphr]    | khi@n      |
         | [-clsf]    | [+V]  Adv' |
         | [+rltv]    | dii        |
         | [+ [+V]]   | [+Adv]     |
```

46. kaan thii₃ khaw tyyn saaj thamhaj tok rotmee state that he get up late make fall bus 'The fact that he got up late made him miss the bus.'

The structure assigned to (46) in which thii₃ is a complementizer is illustrated below:

```
V'       V'       N'
|         |            |
| thamhaj | tok        | N'
   [+V]   | [+V]       |
         |            |
kaan    | rotmee     |
   [+N]   | [+N]       |
      N'   |            |
| thii₃   | V'          |
   [+N]   |            |
         | [+rltn]    |
         | [+nphr]    |
         | [-clsf]    |
         | [-rltv]    |
         | [+ [+V]]   |
```

In Thai, there are four different but related homophonous words pronounced thii. As discussed above, there is thii₂ as a relative noun and thii₃ as a
complementizer. There is also thi\(^1\) as a non-relational noun which means 'place or land' and thi\(^4\) as a relator noun. These different kinds of thi\(^i\) will be discussed individually in the relevant sections.

Non-anaphoric nouns can be subcategorized into two subclasses: [+rltr] (relator).

SR-7 [-nphr] --> [+rltr]

Non-relator nouns do not allow determiners as dependent sisters, as in (47), whereas relator nouns do (48):

IRR-13 [+rltr] --> [?(+[Det])]

47. *khOong\(^2\) nii
possession this
[-rltr] [+Det]

48. bon nii
on this
[+rltr] [+Det]
'on this'

The non-occurrence of non-relator nouns and determiners will be stated as a part of the Omega rule.

A non-relator noun is always marked with the feature [+pssd] (possessed) and it allows both pronouns and non-pronouns, marked with [?([-Nom]), ?([+COR])] case form, to occur as its sister, e.g.,
49. khOongg2 khun
    possession you
    'yours'

    N'
    khOongg2
    [+N ] N'
    [-rltr ] |
    [+pssd ] khun
    [?([-Nom]) ] [+N ]
    [?([+COR])] [+prnn]
    [-Nom ]
    [-COR ]

50. khOongg2 chaat
    possession nation
    [+N ] [+N ]
    [-rltr ] [-prnn]
    [+pssd ] [-Nom ]
    [?([-Nom]) ] [-COR ]
    [?([+COR])] [+prnn]
    '(possession) of the nation'

The fully specified feature matrix of the non-relator
noun khOongg2 is as follows:

    [+N ]
    [-rltr ]
    [+pssd ]
    [?([-Nom]) ]
    [?([+COR])] [+prnn]
    [-Nom ]
    [-COR ]

There is only one non-anaphoric, non-relator noun in
Thai, the possessive noun: khOongg2 'possession'. khOongg2 is
homophonous with a form khoOngg1 meaning 'thing'. They
differ syntactically in that khOongg2 can be a regent noun
which allows relational nouns as its dependent sisters, as
in (51), whereas khoOngg2 cannot, as in (52):

51. khoOngg1 bon to?
    thing   top table
    'the thing on the table'
A relator noun does not allow a pronoun as its sister (53), whereas a non-relator noun in a possessive construction does.

53. *naj chan
    in I
    [+N ] [+N ]
    [+rltr] [+prnn]

The redundancy rule accounting for the non-occurrence of relator nouns and pronouns is formulated as follows:

\[ RR-4 \quad [+rltr] \rightarrow [-[+prnn]] \]

Having discussed relational nouns, I shall now turn to non-relational nouns.
2.3.1.2. Non-relational nouns

The following is the subcategorization tree for non-relational nouns in Thai:

\[
\begin{array}{c}
+\text{N} \\
-\text{dctc} \\
-\text{rltn}
\end{array}
\]

\[
\begin{array}{c}
-\text{pssd} \\
[-\text{rltn}]
\end{array}
\]

\[
\begin{array}{c}
[-\text{nfmn}] \\
[-[-\text{rltv}]]
\end{array}
\]

\[
\begin{array}{c}
[-\text{grnd}] \\
\times\text{tns}
\end{array}
\]

\[
\begin{array}{c}
\text{mxxphim} \\
\text{kaan} \\
\text{kaanri@n} \\
\text{mxx}
\end{array}
\]

'teacher'  'matter'  'study'  'mother'

Figure 3. Subcategorization of non-relational nouns

As mentioned above, non-relational nouns are characterized by the syntactic property that they allow both relational nouns and non-relational nouns as their sisters. Non-relational nouns can be subcategorized into two subclasses: [+pssd] (possessed).
Non-possessed nouns do not allow non-relational nouns as their immediate dependent sisters (54-57), whereas possessed nouns do (58-61):

54. *'?ubàtheët kaanweela
    accident time
    [-pssd] [-rltn]
    'accident of time'

55. *khruu mxx
    teacher mother
    [-pssd] [-rltn]
    'teacher of the mother'

56. *kOt roongri@n
    rule school
    [-pssd] [-rltn]
    'rule of the school'

57. *kaan ruú
    state know
    [-pssd] [-rltn]
    'state of the knowledge'

58. lângkhaa bân
    roof house
    [+pssd] [-rltn]
    'roof of the house'

59. mxx khruu
    mother teacher
    [+pssd] [-rltn]
    'mother of the teacher'

60. ngën khruu
    money teacher
    [+pssd] [-rltn]
    'money of the teacher'

61. myy dek
    hand child
    [+pssd] [-rltn]
    'hands of the child'
The redundancy rule accounting for the non-occurrence of non-possessed nouns and non-relational nouns is formulated as follows:

\[ RR-5 \quad [-\text{pssd}] \rightarrow [-[\text{-rltn}]] \]

Possessed nouns allow pronouns or other non-relational nouns as their dependent sister. The possessor will be marked with \([-\text{Nom, COR})\] case forms.

\[ IRR-14 \quad [+\text{pssd}] \rightarrow [\text{?}(\text{[-Nom]})) \]
\[ [?([+\text{COR}])] \]
\[ [+([+\text{prnn}])] \]

Semantically, possessed nouns can be divided into three groups, the same as those in typical Austronesian languages (Pagotto 1987:99) and various other languages and language families: kinship terms, body parts, and part-of-the-whole nouns, e.g.,

62. mxx ch\=an
mother I
'my mother'

63. taa khruu
eye teacher
 [+pssd] [-rltn]
'eyes of the teacher'
64. plyèk tônmaáaj
bark tree
[+pssd] [-rltn]
'bark of the tree'

65. *mx̑xphim chān
teacher I
[-pssd] [+prnn]
'the teacher of mine'

In a possessive construction, non-possessed nouns are nouns that cannot be directly possessed. They require the non-relator (or possessive) noun as their dependent sister as in (66-69), but not (66'-69)):

66. mx̑xphim khoong2 chāat
teacher possession nation
[-pssd] [+rltn]
[-rltr]
'teacher of the nation'

67. lôk khoong2 sät
world possession animal
[-pssd] [+rltn]
[-rltr]
'world of the animal'

68. ryng khoong2 dèk
matter possession child
[-pssd] [+rltn]
[-rltr]
'matter of the children'

69. kaanriñ khoong2 nákriñ
study possession students
[-pssd] [+rltn]
[-rltr]
'study of the students'

66'. *mx̑xphim chāat
teacher nation
[-pssd] [-rltn]
'teacher of the nation'

67'. *lôk sät
world animal
[-pssd] [-rltn]
'world of the animal'
68'. *ryëng dëk
matter child
[-pssd] [-rltn]
'matter of the children'

69'. *kaanri@n nákri@n
study students
[-pssd] [-rltn]
'study of the students'

There is an exception for some nouns in this subclass. That is, *kaan and *khwaam never occur in an indirect possessive construction, e.g.,

70. *kaan khōong₂ dëk
matter possession child
[-pssd] [-rltr]

71. *khwaam khōong₂ khruu
matter possession teacher
[-pssd] [-rltr]

72. ryëng khōong₂ dëk
matter possession child
[-pssd] [-rltr]

This characteristic is marked as a negative contextual feature as the indiosyncratic property on the noun *kaan and *khwaam as follows:

kaan, khwaam
[+N
|-dctc
|-rltn
| -pssd
| -grnd
|-[-rltr]]

Non possessed nouns can be subcategorized into two subclasses: [+nfmn] (information).

SR-9 [-pssd] --> [+nfmn]
Non-information nouns do not allow a complementizer

thii₃ as their dependent sister (73-74); whereas information
nouns do (75):

IRR-15 [+nfmn] --> [+([-rltv)])

73. *khruu thii₃ f(on) t(òk) thamh₃aj khon klu@
teacher that rain fall make people afraid
[-nfmn] [-rltv]

74. *kûtmaaj thii₃ f(on) t(òk) thamh₃aj khon klu@
 law that rain fall make people afraid
[-nfmn] [-rltv]

75. kaan thii₃ f(on) t(òk) thamh₃aj ròt tît
 matter that rain fall make car get stuck
 [+nfmn] [-rltv]
'The matter that it rained caused the traffic jam.'

The redundancy rule accounting for the non-occurrence
of non-information nouns and the complementizer noun is
formulated as follows:

RR-6 [-nfmn] --> [-[-rltv]]

Information nouns can be subcategorized into two
subclasses: [+grnd] (gerund).

SR-10 [+nfmn] --> [+grnd]

Non-gerund nouns do not allow a complementizer
preposition wâ₂ [+P,+xtns] 'that' as their dependent sister
(76) (also see section 3.3.). There are only three nouns in
the subclass, i.e., kaan, khwaam, and ryëng 'state, matter'.

76. *kaan wâ₂ mâj mii ñing mii chiiwít bon
 matter that not have thing have life top
 [+N ] [+P ]
[-grnd] [+xtns]

du@ngchan pen phraw mâj mii ?aawkât
moon be because not have air
'The fact that there is no living thing on the moon is because there is no air.'

77. kaantângcaj wâ₂ câ? riŒn tŒø
intention that will study further
|+N | |+P |
|+grnd| |+cmpl|

thamhâj chăn khajân
make I work hard

'The intention to further my study makes me work hard.'

In lexicase notation, gerunds in English are analyzed as nouns, though their subcategorization frames are much more similar to those of their corresponding verbs than the frames of other nouns are (Starosta 1988:228). Nouns marked with the feature [+grnd] in Thai are a type of compound noun, formed by the juxtaposition of two independent morphemes. One of the two morphemes can be either kaan or khwaam 'matter, state', the other morpheme is a verb. Thus, gerund nouns are a type of nominalized verb.

The following redundancy rule accounts for the non-cooccurrence of non-gerund nouns and the complementizer preposition:

RR-7 [-grnd] --> [-[+P ] ]
       [+]xtns]

We have discussed the subclasses of non-deictic nouns in Thai. Now I will turn to the discussion of deictic nouns.
2.3.2. Deictic nouns

The subcategorization tree for deictic nouns is shown as follows:

```
[+N] /
 / 
[-dctc] [+dctc]  
     |       | 
     [+-rln] [+-dfnt]  
     /       /     
    [-prnn] [+prnn]  
```

Figure 4. Subcategorization of deictic nouns

Deictic nouns do not only allow verbs and prepositions as their dependent sisters (as stated above) but also do not allow non-relational nouns, e.g.,

78. *th@@ khruu  
    she  teacher  
    [+dctc] [-rln]

79. *maalii khruu  
    Mali  teacher  
    [+dctc] [-rln]

The following redundancy rule accounts for the non-occurrence of deictic nouns with non-relational nouns:

RR-8  [+dctc]  -->  [-rln]

Deictic nouns can be subcategorized into two subclasses: [+prnn] (pronoun).
SR-11 [+dctc] --> [+prnn]

Pronouns and non-pronouns, e.g., proper nouns and time words, are considered to be in the lexical category of noun [+N] because they occupy the same syntactic positions designated for nouns and function as the heads of noun phrases.

2.3.2.1. Pronouns

The subcategorization of pronouns will not include certain lexical items such as royal words, for example, kramOomchăn 'I', pra?ong 'you'; or religious pronouns, for example, ?àattamaa 'I' (used by monks), yoom 'you' (also used by monks), or impolite words, for example, kuu 'I', mung 'you', etc.

Pronouns can function as a type of attribute, and always imply direct possession.

IRR-16 [+prnn] --> [-Nom ]

They occur following non-relational nouns (allowed by IRR-5), as in (80), but not with nouns marked with the feature [-clsf], e.g., relative noun and complementizer, which do not take any nominal sister attributes (see section 2.3.1.1.):
The set of pronouns in Thai can be initially subcategorized into two subclasses, based on the semantic criterion [+prsn] (person).

2.3.2.1.1. Impersonal pronouns

The following is the subcategorization tree for impersonal pronouns in Thai:
Figure 5. Subcategorization of impersonal pronouns

Impersonal pronouns can be subcategorized into two classes: [+dmns] (demonstrative).

SR-13 [-prsn] --> [+dmns]

Locative pronouns in Thai are nouns that have homophonous forms with locative determiners, i.e., ni1 'this one', na1 'that one', and no1 'that one farther away'.

Locative pronouns do not allow anything as their sisters (81-82), whereas non-locative pronouns do (83-84):
The non-occurrence of locative pronouns with other attributes will be stated as a part of the Omega rule.

Non-locative pronouns can be subcategorized into two subclasses based on semantic criteria: [+ntrg]
(interrogative).

SR-14 [-lctv] --> [+ntrg]

Interrogative pronouns can be subcategorized into two subclasses: [+dfnt] (definite).
Indefinite non-interrogative pronouns do not allow
determiners as their dependent sisters, as in (85); whereas,
definite non-interrogative pronouns do, as in (86):

\[ \text{IRR-17} \quad [+\text{dfnt}] \rightarrow [?([+\text{Det}])] \]

85. *?araj nii
    whatever this

\[ *N' \]
\[ ?araj \]
\[ [+N] \]
\[ [+\text{prnn}] \]
\[ [+\text{dfnt}] \]
\[ [-\text{ntrg}] \]
\[ -\text{dfnt} \]

86. thangmôt nii
    all this

\[ [+N] \]
\[ [+\text{Det}] \]
\[ [+\text{prnn}] \]
\[ [+\text{dfnt}] \]

The non-occurrence of indefinite pronouns with
determiners will be stated as a part of the Omega rule.

In Thai, the set of indefinite pronouns is identical in
form to that of interrogative pronouns. They are different
in the feature marked [+ntrg] (interrogative).
Syntactically, indefinite pronouns which cooccur with the
relative noun thii2 never imply the meaning of question
(87), whereas interrogative pronouns do (88):
87. khrj thî {\_} chOOp dèk d@n maa lx\xw
who that like child walk come already
 [+prnn] [-ntrg] [-dfnt]
'Someone (who) likes children walked (to here) already.'

88. *khrj thî {\_} chOOp dèk d@n maa lx\xw
who that like child walk come already
 [+prnn] [-ntrg]
'Who who likes children walked (to here) already?'

The following sentences exemplify the difference between these two sets of pronouns.

Interrogative pronoun

89. kha\w pen khrj_1
he be who
'Who is he?'

Indefinite pronoun

89'. ch@n khrj_2 maa kOÔ dâj
invite who come also get
'Invite whomever you like.'

Interrogative pronoun

90. ?araj_1 y\uu bon tô?
what be on table
'What is on the table?'

Indefinite pronoun

90'. ?aw ?araj_2 paj kOÔ dâj
take what go also get
'Take whatever you like.'

Interrogative pronoun

91. k\waw cà? paj my@raj_1
he will go when
'When will he go?'
Indefinite pronoun

91'. raw cà? paj mû@raj₂ kÔO dâj
   we will go when also get
   'We can go any time.'

Interrogative pronoun

92. phÔO cà? paj nãj₁
    father will go where
    'Where is father going?'

Indefinite pronoun

92'. chan yaâk paj nãj₂ sàk hxnj nûng
    I want go where also clsf one
    'Sometime I would also like to go somewhere.'

Interrogative pronoun

93. khaw sy'y khaâw tháwrąż₁
    he buy rice how much
    'How much rice did he buy?' Or 'At what price did
    he buy rice?'

Indefinite pronoun

93'. hâj tháwrąż₂ chan kÔO rap
    give how much I also receive
    'No matter how much you give, I will take it.'

Interrogative pronoun

94. khaw cà? paj jângraj₁
    he will go how
    'How will he go?'

Indefinite pronoun

94'. paj jângraj₂ kÔO dâj
    go how also get
    'Any way is all right.'

Interrogative pronoun

95. thammaj₁ mâj maa roongriën
    why not come school
    'Why didn't (you) come to school?'
Indefinite pronoun

95'. คำาน่า ท่าน่า นี่ เขาค่า? ท่าน่า นี่เขาก่า? ท่าน่า
I will do pattern this who will why
'I will do like this, no matter what anybody
says.'

Interrogative pronouns can be subcategorized into two
subclasses: [+bstr] (abstract).

SR-16  [+ntrg] --> [+bstr]

Abstract pronouns do not allow anything as their
dependent sisters, (96); whereas, non-abstract pronouns do,
(97):

96. *ที่อะไร ตอนอาหาร
 how much top table

*ת

�名
[+bstr] [+N] N'

[Cat] [หน้า]
[+prnn] [หน้า]
[+ntrg] [หน้า]
[+bstr] [+N] N'

t่อ?
[+N]

97. เขาค่า ตอนบ้าน
 who top house
[-bstr] [+N]
'Who in the house?'

The non-occurrence of abstract pronouns with other
attributes is stated as a part of the Omega rule.

Non-abstract pronouns can be subcategorized into two
subclasses: [+anmt] (animate).
Animate nouns do not allow the possessive noun as their 
sister (98); whereas inanimate nouns does (99):

IRR-18 |+prnn| --> [?([+rltr])] 
|+anmt|

98. *khraj khOng2 th@@ 
who possession she
'who belonging to her'

*N'

khraj
+N
|+prnn| N'
|+ntrg| khOng2
|+rltr| [-anmt] [+N]

99. ?araj khOng2 th@@ 
what possession she
[N
|+prnn| [-rltr]
|+ntrg| [-bstr]
[-anmt]

'what belonging to her?'; 'what of hers?'

The following redundancy rule accounts for the non-
ocurrence of animate interrogative pronouns with the 
possessive noun:

RR-9 [+prnn] --> [-[-rltr]]
|+anmt|

Having discussed impersonal pronouns, I shall now turn 
to personal pronouns.
2.3.2.1.2. Personal pronouns

The following is a subcategorization tree for personal pronouns in Thai:

```
+N  |  +prnn  |  +dctc  |  +prsn  |
|    |          |          |          |

[-tnms]  [+tnms]
/    /    |
[-rflx]  [+rflx]  [-[-nphr]]
|    |          |          |
[+Nom]  [-Nom]  [-spkr]  [+spkr]
|    |    |    |    |
[+adrs]  [-adrs]  [-plrl]  [+plrl]

bâang, tu@eeeng, th@ chân, raw
'some', 'oneself', 'you', 'she', 'I', 'we'

?eeng
'self'

Figure 6. Subcategorization of personal pronouns

Personal pronouns can be subcategorized into two subclasses: [+tnms] (autonomous).
SR-18  [+prsn]  -->  [+tnms]

Non-autonomous pronouns do not cooccur with anything, they always appear alone without any dependent sisters. They are structurally bound by their antecedents in the same clause, e.g.,
100. mɔ̄x ʔeeng thii₂ paj talat
mother self that go market
[+N] [-tnms]
'Mother, herself, who went to the market'

The non-autonomous pronoun ʔeeng is bounded by the antecedent mɔ̄x.

The non-occurrence of non-autonomous pronouns with other attributes will be stated as a part of the Omega rule.

Autonomous pronouns allow anaphoric nouns, but not non-anaphoric nouns (e.g., the possessive noun and relator nouns) as their dependent sisters, e.g.,

101. *thàn bon kāw?ii
you top chair
'you on the chair'

The following redundancy rule accounts for the non-occurrence of autonomous pronouns with non-anaphoric nouns:

102. khun thii₂ tham ngaan nii
you that do work this
[+tmns] [+nphr]
'you who did this work'
Non-autonomous pronouns can be subcategorized into two subclasses: [+rflx] (reflexive).

There is only one reflexive pronoun tu@?eeng 'oneself'.

As in English and other accusative languages, reflexive pronouns are always marked with the feature [-Nom], e.g.,

103..choose {\(\text{ni\'i du\@j tu@?eeng} \quad I \text{ draw picture this by myself} \)}
\[
\begin{align*}
\text{[+N]} & \\
\text{[+prnn]} & \\
\text{[+prsn]} & \\
\text{[-ntms]} & \\
\text{[+rflx]} & \\
\text{[-Nom]} & \\
\end{align*}
\]
'I drew this picture by myself.'

104. *tu@?eeng wa\@t ru\@p d\@j oneself draw picture can
\[
\begin{align*}
\text{[+N]} & \\
\text{[+prnn]} & \\
\text{[+prsn]} & \\
\text{[-ntms]} & \\
\text{[+rflx]} & \\
\text{[-Nom]} & \\
\end{align*}
\]
'Myself can draw a picture'

Non-reflexive pronouns are marked with the feature Nominative [+Nom]. They are resumptive pronouns, i.e., ba\@ng 'some', ta\@ng 'each', man, 'it', and ?eeng 'self', e.g.,

105. choose {\(\text{th\@i\_2 wa\@t ru\@p ni\'i} \quad I \text{ self that draw picture this} \)}
\[
\begin{align*}
\text{[+N]} & \\
\text{[+prnn]} & \\
\text{[+prsn]} & \\
\text{[-ntms]} & \\
\text{[+Nom]} & \\
\end{align*}
\]
'I myself drew the picture'
106. นักเรียนบางท่านทำหนังสือบางท่าน
students some do homework some write book

[+N ]  
[+N ]
[+prnn]
[+prnn]
[+prsn]
[+prsn]
[-tnms]
[-tnms]
[+Nom ]
[+Nom ]

'Students, some are doing homework, some are writing.'

The case marking of these two sets is accounted for by the following rule:

RR-11 [rflx] --> [-Nom]

Autonomous pronouns in Thai can appear as subjects (107) or objects of transitive verbs (108), objects of prepositions (109), as well as dependents of possessive nouns (110):

107. ฉันชอบกับมื้อ
I like dessert

[+N ]
[+prnn]
[+tnms]
[+Nom ]

'I like dessert.'

108. ครูติ๊กท๊ะ
teacher hit he

[+N ]
[+prnn]
[+tnms]
[-Nom ]

'A teacher hit him.'

109. แม่ห่อมีผู้
mother give money to she

[+N ]
[+prnn]
[+tnms]
[-Nom ]

'Mother gave some money to her.'
Autonomous pronouns can be subcategorized into two subclasses: [+spkr] (speaker).

SR-20 [+tnms] --> [+spkr]

Non-speaker nouns [-spkr] can be subcategorized into two subclasses: [+adrs] (addressee).

SR-21 [-spkr] --> [+adrs]

Speaker pronouns can be further subcategorized into two subclasses: [+plrl] (plural).

SR-22 [+spkr] --> [+plrl]

The subcategorization system of autonomous pronouns in Thai is different from the English system. In English, the feature [+plrl] subcategorizes only the first and third person pronouns; whereas in Thai, the feature of plurality [+plrl] subcategorizes only the first person pronouns. There is no distinction in plurality for the second and third person pronouns.

2.4. Conclusion

Nouns in Thai are subcategorized in terms of their internal semantic and grammatical features. First, nouns are subcategorized into two subclasses [+dctc] (deictic). Non-deictic nouns are nouns that allow verbs and
prepositional phrase as their dependent sisters, whereas deictic nouns do not.

Non-deictic nouns are subcategorized into two subclasses: [+rltn] (relational). Non-relational nouns allow both non-relational and relational nouns as their sisters, whereas relational nouns sometimes do allow non-relational nouns, sometimes do not.

Relational nouns are introduced first to facilitate the discussion of types of attributes of non-relational nouns since non-relational nouns allow all relational nouns as their dependent sisters.

Relational nouns are subcategorized into two subclasses: [+nphr] (anaphoric). Non-anaphoric nouns do not allow any relational nouns as their dependent sisters; whereas anaphoric nouns do. Anaphoric nouns do not allow non-relational nouns as their sisters, whereas non-anaphoric nouns do.

Non-anaphoric nouns are subcategorized into two subclasses: [+rltr] (relator). The one non-relator noun, that is, the possessive noun khūng₂, does not allow a determiner as its sister, whereas relator nouns do. Relator nouns do not allow pronoun as their sisters, whereas the possessive noun does.
Anaphoric nouns are subcategorized into two subclasses: [+clsf] (classifier). Non-classifier nouns require finite verbal dependent sisters, whereas classifiers allow but do not require them.

Non-classifier nouns are subcategorized into two subclasses: [+rltv] (relative). The relative noun \(\text{thi}^3\) functions as the head of a nominal relative clause, whereas the non-relative noun or a complementizer \(\text{thi}^2\) functions as the head of a noun complement clause.

Non-relational nouns are subcategorized into two subclasses: [+pssd] (possessed). Non-possessed nouns do not allow non-relational nouns as their sisters, whereas possessed nouns do. Possessed nouns allow dependent nouns which are not possessors and are marked with the case form [-Nom, COR] to directly possess them; whereas non-possessed nouns do not.

Non-possessed nouns are subcategorized into two subclasses: [+nfmn] (information). Non-informational nouns do not allow the non-relative noun (the complementizer \(\text{thi}^2\)) as their sister, whereas informational nouns do.

Informational nouns are subcategorized into two subclasses: [+grnd] (gerund). Non-gerund nouns do not allow a complementizer preposition \(\text{w}^2\) as their sister, whereas gerund nouns do.
Besides not allowing verbs and prepositional phrases as their sisters, deictic nouns also do not allow non-relational nouns. The subclass of deictic nouns is subcategorized into two subclasses: [+prnn] (pronoun) based on semantic criteria. Pronouns are subcategorized into two subclasses: [+prsn] (person).

Impersonal pronouns are subcategorized into two subclasses: [+lctv] (locative). Locative pronouns do not allow anything as their sisters, whereas non-locative pronouns do allow some attributional sisters.

Non-locative pronouns are subcategorized into two subclasses: [+ntrg] (interrogative) based on semantic criteria.

Non-interrogative pronouns are subcategorized into two subclasses: [+dfnt] (definite). The non-definite pronouns do not allow determiners as their sisters, whereas definite ones do.

Interrogative pronouns are subcategorized into two subclasses: [+bstr] (abstract). Abstract nouns do not allow anything as their sisters, whereas concrete nouns do allow some type of relational nouns.

Concrete pronouns are subcategorized into two subclasses: [+anmt] (animate). Animate pronoun does not
allow the non-relator or possessive noun as it sister, whereas non-animate noun does.

Personal pronouns are subcategorized into two subclasses: [+tnms] (autonomous). Non-autonomous pronouns do not allow anything as their sisters, whereas autonomous pronouns do allow some attributional sisters.

Non-autonomous pronouns are subcategorized into two subclasses: [+rflx] (reflexive). Non-reflexive nouns are marked with the nominative [+Nom] case form, whereas the reflexive noun is marked with the accusative [-Nom] case form.

Autonomous pronouns are semantically subcategorized into two subclasses: [+spkr] (speaker).

Non-speaker pronouns are semantically subcategorized into two subclasses: [+adrs] (addressee). Speaker pronouns are semantically subcategorized into two subclasses: [+plrl] (plural).
NOTES

1 The [+tnms] distinction matches the Chomskyan pronoun/anaphor distinction (Chomsky 1981).
CHAPTER 3

ATTRIBUTES OF NON-RELATIONAL NOUNS

3.1. Introduction

This chapter is a discussion of attributes of non-relational nouns, which are marked by the feature [-rltn] (non-relational), i.e., common nouns. These attributes can be divided into three types. The first set of attributes has a verb [+V] as the head of a construction, it can be called a verbal relative clause. The second set of attributes has either a noun [+N] or a preposition [+P] as the heads of their constructions. They include nominal relative clauses, relator noun phrases, possessive nouns phrases, classifier constructions, and prepositional phrases. The third attribute is a determiner [+Det].

The restrictions on cooccurrence of more than one attribute and their respective ordering within a single noun phrase will also be presented.

3.2. Order of nominal attributes

In Thai, all the attributes of nouns, except cardinal numerals and quantifiers, are post-nominal modifiers. In this description cardinal numerals and quantifiers are treated as adjectives and adverbs respectively and discussion of them will be included in the section on
classifier constructions (chapter 4). Apart from these adjectives, nouns do not allow any pre-nominal modifiers, as in (111-115):

111. *suŋ j phuuy ū ng 
    pretty woman 
    [+V] [+N]

112. *nī bān 
    this house 
    [+Det] [+N]

113. *khOōng2 chān ngēn 
    possession I money 
    [-rltr] [+N] [+N]

114. *sāām lēm nāngsyy 
    three clsf book 
    [+Adj] [+clsf] [+N]

115. *bon tō? khan ō m 
    on table dessert 
    [+rltr] [+N] [+N]

The redundancy rule accounting for this syntactic property is already formulated in section 2.3.1., and is repeated below:

RR-13 [+N] --> [-[ ] __ ]

The inflectional redundancy rule accounting for the occurrence of adjectives and adverbs preceding the classifier, which will overrule the RR-1, is formulated as follows:

IRR-21 [+clsf] --> [+( [+Adj]) _ ] 
    [+( [+Adv]) _ ]
3.3. Verbal relative clauses

In Thai, verbal relative clauses occur immediately following the nouns. The structure of a noun phrase consisting of a regent noun followed by a verbal sister looks superficially like a compound noun, as in the following examples:

116. aahaan dii
    food good
    'high-class (luxurious) food'

117. khon khap rot
    person drive car
    'a chauffer'

118. s@phaa kaaw
    clothes old
    'used clothes'

119. raan ?aahaan
    shop food
    'restaurant'

120. phaa suej
    cloth beautiful
    'cloth which is beautiful'

121. khon syy nangsyy
    person buy book
    'a person who buys books'

The noun phrases in (116-119) are compound nouns, whereas the noun phrases in (120-121) are nouns which are modified by verbal constructions. Kuno and Wongkhomthong (1981:196) analyzed the verbal relative clause illustrated in (120-121) as a thii-less relative clause, not a compound noun.
There are both syntactic and semantic arguments for treating (120-121) as nouns followed by verbal relative clauses rather than as compound nouns. The syntactic arguments are as follows:

1. All the words that occur in this position can occur as predicates of free clauses.

   122. phâa chîn nî suêj maâk
cloth clsf this pretty much
   [+N]           [+V]
   'This piece of cloth is very pretty.'

   123. khon sîy nängsyî chalàat
person buy book clever
   [+N]           [+V]
   'The person who bought the book is clever.'

2. Elements of verbal relative clause can take the same kinds of modifiers, e.g., adverbs, as they can when acting as predicates of free clauses.

   124. [khon [tii hû khun rxxng thîisût]] pen khraj
person hit head you hard most be who
'Who is the person who hit you on the head hardest?'

3. Elements of a verbal relative clause can be conjoined, whereas compound noun cannot.

   125. phâa suêj lîx phxxng
cloth beautiful and expensive
'beautiful and expensive cloth'

   126. *raân ?aa[h]în lîx kaafxx
shop food and coffee

4. The meaning of a compound noun is not compositional. That is to say, its meaning is sometimes not
predictable from the original meaning. For example, *raá?n?aahaǎn* 'restaurant' is formed from two free morphemes *raá?n* 'shop' and *aahaǎn* 'food'. By looking at the original meanings of these two morphemes, there is no way to predict whether *raá?n?aahaǎn* is a place where people go to sit and eat (a restaurant) or a place to buy food only (a grocery store). On the contrary, the noun phrase formed by a noun and a verbal relative clause is semantically compositional, that is, its meaning is completely predictable from the meaning of its parts. For example *phaǎ suʔj* has only one meaning, i.e., 'cloth which is beautiful', nothing else.

In addition, compound nouns typically are formed from a particular type of bound morpheme. Compare the noun phrase in (127-128):

127. khon thiì2 sýy nãngsýy
   person that buy book
   'a person who buys books'

128. khon sýy nãngsýy
   person buy book
   'a person who buys books'

The noun phrase in (128) is not analyzed as a compound noun because if it were a compound, it would have to be introduced by a bound morpheme *phũu* 'person' rather than *khon*, as in *phũusýy* 'a buyer'.

All Thai constructions having these properties relativize only on subjects, and that in turn is a
confirmation of Comrie's universal hypothesis (Comrie 1981:15), e.g.,

129. phää suēj  
cloth beautiful  
'beautiful cloth'; lit. 'cloth which is beautiful'

130. *khanōm  chān chōop  
dessert I like

The verbal relative clause in (129) relativizes on a subject phaa, so the noun phrase is grammatical. On the contrary, the verbal relative clause in (130) relativizes on the object khanōm, the noun phrase is ungrammatical.

As for a nominal relative clause, it can relativize on more than one position (see section 4.2. on the discussion of nominal relative clauses).

3.3.1. Regent nouns of verbal relative clauses

Not every noun in Thai allows a verbal relative clause as its immediate dependent sister (135-136). Deictic nouns such as pronouns or proper nouns, and non-anaphoric nouns such as relator nouns or the possessive noun are types which do not (131-134):

131. *puuk nāārāk  
Puk lovable  
|+N | [+V]  
|+dctc|  

132. *th@@ suēj  
she pretty  
|+N | [+V]  
|+dctc|
133. *nii ʔuŋn
    this fat
    [+N ] [+V]
    [+dctc]

134. *naj jāj
    inside big
    [+N  ] [+V]
    [-nphr]

135. thii₂ dii
    that good
    [+N  ] [+V]
    [+nphr]
    'which is good'

136. phét ngaam
    diamond beautiful
    [+N  ] [+V]
    [-dctc]
    'beautiful diamond'

The non-occurrence of deictic and non-anaphoric nouns
with verbal relative clauses will be stated as a part of the
Omega rule (see section 2.3.).

Stative verbal relative clauses such as suŋj translate
as adjectives, or they function like adjectives in other
languages, but they are not adjectives in Thai. These
constructions are analyzed as verbal relative clauses
because they have exactly the same structure as non-stative
relative clauses: they have the form of free clauses with a
single NP missing, so setting up a separate Adj class is
unnecessary and would lose an important syntactic
generalization. The noun phrases that are omitted in both
stative and non-stative verbal relative clauses are always
subjects. The strategy of subject omission is the primary
relativization pattern in Thai, in accordance with Keenan and Comrie's relativization hierarchy (Keenan and Comrie 1977:8).

The internal structure of the noun phrase in (129) is as follows:

\[
\begin{array}{c}
\text{N'} \\
\text{phāa} \\
\text{[+N]} \\
| \\
\text{sū@j} \\
\text{[+V]}
\end{array}
\]

Types of verbs in verbal relative clauses can be divided into two subclasses. One is a stative [+sttv] subclass, the other is an action [-sttv] subclass. The subcategorization of verbs is formulated as follows:

\[
\text{SR-23} \quad [+V] \rightarrow [+sttv]
\]

In a noun phrase, multiple stative verb modifiers cannot cooccur after the head noun. Apparent examples of a sequence of two stative verbs, as in (137-140), are however actually instances of a single compound verb. We know that they are compounds because not all stative predicates can occur freely in this position. Rather, they follow strict rules of the sort they are typical of compound formation: such stative pairs must be semantically identical, are not permutable, as in (137'-140'); do not allow an intervening coordinating conjunction (137"-138"), and carry an intensive meaning. They are therefore idiomatic compounds, not
iterated relative clauses, and function like intensive reduplicative forms in other languages. Nacaskul (1970:873-89) has treated expressions such as these as "expressive elaboration", but she did not claim that they form a single unit.

137. naataa sa?aát mòtchòt
    face clean clean
    [+N] [+V] [+V]
    'a very clean face'

138. mùu ?uên phií
    pig fat fat
    'a very fat pig'

139. ?aayú kxx thàw
    age old old
    'very old age'

140. phaâpkhíèn wíchít bancong
    painting neat neat
    'a very neat painting'

137’. *naataa mòtchòt sa?aát
138’. *mùu phií ?uên
139’. *?aayú thàw kxx
140’. *phaâpkhíèn bancong wíchít
137”. *naataa mòtchòt lx sa?aát
138”. *mùu phií lx ?uên

Those stative verbs which do not signify the same meaning will not cooccur in a single dependency, as in (141-144):

141. màa dam wîng lën naj suên
dog black run play in garden
    [+V]
    'The black dog is running in the garden.'
142. *māa dam k̄x wing lện naj su̞n
dog black old run play in garden
[+V] [+V]
'An old black dog is running in the garden.'

143. *dēk nōoy naârăk nOOnlāp
child little cute sleep
[+V] [+V]
'A cute little child is sleeping.'

144. *dēk ?u̞n naârăk dii nOOnlāp
child fat lovable good sleep
[+V] [+V] [+V]
'A fat lovable child is sleeping.'

Multiple action verbs also do not cooccur as attributes
of a single regent, e.g.,

145. *khon phu̞t sĭng dang kin cȕu māj sabaaj
person speak sound loud eat a lot not feel well
'A person who speaks loudly (and) eats a lot does not feel well.'

146. *nākrĭn paj nōok rĭn kēng klāp māa
student go abroad study smart return come
l̄õwx already
'A student who went abroad (and) studied hard returned home already.'

A noun allows both a stative verb and an action verb as its sister. The stative verb always occurs preceding the action verb in such constructions, e.g.,

147. khon ?u̞n phu̞t sĭng dang d̄̄n māa l̄õwx
person fat speak sound loud walk come already
'A fat person who speaks loudly walks towards here.'

147'. *khon phu̞t sĭng dang ?u̞n d̄̄n māa l̄õwx
person speak sound loud fat walk come already
The following redundancy rule accounts for the ordering restriction of an action verb with a stative verb:

RR-14 \ [+N] \rightarrow [- [+V] [+V] ]
\ [-sttv] [+sttv]

that is, a verb may not cooccur with two [+V] attributes if the first is non-stative and the second is stative.

The following redundancy rule accounts for the limited number of stative and action verbal clauses that can cooccur in a noun phrase.

RR-15 \ [+N] \rightarrow [- [+V] [+V] ]
\ [- sttv] \ [ sttv]

that is, only two verbs can cooccur, and they cannot be the same type of verbs, i.e., two stative verbs or two action verbs may not cooccur.

A sequence of two stative verbs may occur but only if the second functions as the main verb of a clause, e.g.,

148. [naalíkaa thO0ng] su@j
[+N] [+V] [+V]
watch gold beautiful
'A gold watch is beautiful.'

This example cannot be interpreted as a noun phrase, with the second stative verb su@j functioning as a dependent sister of the regent noun naalíkaa. Such an analysis would be ungrammatical, as illustrated below:
This example is correctly analyzed as a clause, not as a noun phrase. สุ@จ is a main verb which governs the subject noun นาลิกา. The structure assigned to this analysis is as illustrated below:

```
N'
naalíkaa
| [+N ] | [+V ] | [+V ] |
| [ sttv ] [ sttv ] th00ng สุ@จ |
| [-+V ] [+V ] [-+V ] |
| [-sttv] [+sttv] [+sttv] [+sttv] |
```

A noun phrase which translates into English with a sequence of adjectives requires in Thai the use of a classifier construction. The second stative verb occurs as the modifier of a classifier which is the head of a classifier construction, e.g.,

149. บ้าน สุ@จ 啷 กحا อ 'a pretty white house'
The second stative verb *sũëj* functions as a dependent sister of the classifier *ryën*. Both the classifier *ryën* and the stative verb *th00ng* function as separate dependents of the regent noun *naalikaa*.

150. *naalikaa th00ng ryën sũëj*
    watch gold clsf beautiful
    'a beautiful gold watch'

The second stative verb *nærâk* functions as a dependent sister of the classifier *tuë*. Both the classifier *tuë* and the stative verb *dam* function as separate dependents of the regent noun *maa*.

151. *maa dam tuë nærâk*
    dog black clsf lovable
    [+N] [+V] [+N] [+V]
    [+clsf] [+ũëj]
    'a lovable black dog'
3.3.2. Order of the verbal relative clause in relation to other types of attributes

A verbal relative clause always occurs immediately following its head noun. It precedes any other attributes within the noun phrase. The following redundancy rule accounts for the order of a verbal relative clause when it cooccurs with other attributes within a noun phrase.

\[
\text{RR-16} \quad [+N] \quad \rightarrow \quad [-\wedge][+V]
\]

that is, a verbal dependent sister of noun never occurs following other attributes.

The following are some examples illustrating the occurrence of verbal relative clauses with other attributes.

A verbal relative clause can be followed by a nominal relative clause with its obligatory dependent verbal clause:

152. sy@ su@j thi\text{\`i}_2 phy\text{\`i}ng tat
blouse pretty that just cut
'pretty blouse that was just made'

A verbal relative clause can be followed by a possessive noun phrase:
A verbal relative clause can be followed by a relator noun phrase:

155. baan sug bon n@n
    house pretty top hill
    [+N] [+V] [+N ]
    [+rltr]
    'a pretty house on the hill'

A verbal relative clause can be followed by a prepositional phrase:

156. cxxkan thOong caak ?uroop
    vase gold from Europe
    [+N] [+V] [+P]
    'a gold vase from Europe'

A verbal relative clause can be followed by a determiner:

157. baan sug nii
    house beautiful this
    [+N] [+V] [+Det]
    'this beautiful house'

158. khon phut phasãa ciin nii
    person speak Chinese this
    [+N] [+V] [+Det]
    'this person who speaks Chinese'
If these attributes occur preceding the verbal relative clause, the verbal relative clause is predicative, it is then interpreted as the regent of the head noun instead of its attribute, e.g.,

159. syŋ thî th̃ phông tâte sṳ̃j
blouse that just cut pretty
'a newly made blouse is pretty'

160. baān bon ñn jàj
house top hill big
+[N] [+rltr]
'the house on the hill is big'

161. ròt càak nōk màj
car from abroad new
+[N] [+P]
'the car from abroad is new'

Having discussed verbal relative clauses, I shall now turn to the second types of attributes that can modify non-relational nouns.
3.4. Prepositional phrases

Prepositional phrases are exocentric constructions, i.e., constructions with more than one obligatory member. The first obligatory member of a prepositional phrase is a preposition, the lexical head of the construction. The second obligatory member, the phrasal co-head, is either a noun phrase or a sentence (if the preposition is a complementizer) (Starosta 1985:36, Pagotto 1987:754). In a nominal prepositional phrase, the preposition always requires the immediate presence of a following noun. In lexicase, prepositions are case markers that may carry localistic case features just like nouns may.

As is the case with all nominal modifiers, the prepositional phrase appears to the right of the noun it modifies, e.g.,

162.  cotmāaj càak myŋngthaj
      letter from Thailand
      [+N]   [+P]
      'letter from Thailand'

Most prepositions in Thai can also function as dependent sisters of verbs, e.g.,

163.  kàj wîng càak bâñ
      Kai run from home
      'Kai ran from his house.'

The prepositional phrase càak bâñ is a dependent sister of the verb wîng. The structure assigned to this sentence is as follows:
In the structure of a noun phrase, there are two sets of prepositions that are allowed to occur as dependent sisters of regent nouns. The first set includes a number of intrinsic prepositions, which are marked with the feature [-cmpl], such as càak 'from', sãmràp 'for', ki@wkàp 'about', phyâ 'for the sake of'. The second set is a complementizer preposition, which is marked with the feature [+cmpl], i.e., waâ, 'that'.

There is a difference in the cooccurrence restriction between the regent nouns and these two sets of prepositions in that only non-relational nouns allow the prepositions in the first set as their dependent sisters, as in (164-166), but not (167-172):

164. khaaw kì@wkàp kaanmy@ng news about politics [+N] [+P] [+N] [-rltn] [-cmpl] 'news about politics'

165. dontrii phyâ chiìwit music for the sake of life 'music for life'

166. kaanri@n sãmràp dèk study for children 'study for children'
167. *thi₂ særəp sàt
    that for animal
    [+N] [+P] [+N]
    [+rltn] [-cmpl]

168. *naj pʰy@ khon dii
    in for person good

169. *khOoŋ₂ kàp nOoy
    possession with nooy

170. *ʔan kʰkwàp chiivít
    clsf about life

171. *cötmaaj wàa₂ maa thỳng
    letter that come arrive
    [+N] [+P] [+V]
    [-rltn] [+cmpl]

172. *kʰaaw wàa₂ nám thuʔm
    news that water overflow

The structure assigned to the noun phrase (164) with a
prepositional phrase as its dependent sister is as follows:

N'
  
  kʰaaw
  [+N]

P'
  ki@wkâp N'
  [+P]
  kaanmy@ng
  [+N]

The noun kʰaaw is the head of the noun phrase and cap-
commands both the preposition kʰkwàp and the noun kaanmy@ng
within the prepositional phrase.

The redundancy rule accounting for the restricted
cocurrence of regent nouns and the complementizer
preposition is formulated as follows:

.
that is, relational nouns do not allow the complementizer preposition as their dependent sister.

A preposition also requires an immediately following noun or clause as its sister cohead. The sister nouns are limited to relator nouns (173) and non-relational nouns (174); neither anaphoric nouns nor the non-relator noun can occur as the co-heads of prepositions (175-176):

173. fon caak bon faa
rain from on sky
[+N] [+P] [+N]
[+rltn] [+rltr]
'rain from the sky'

174. baan samrap maa
house for dog
[+N] [+P] [+N]
[+rltn] [+rltn]
'house for a dog'

175. *cotmaaj caak ?an
letter from clsf
[+N] [+P] [+N]
[+rltn] [+nphr]

176. *baan samrap khooong2
house for possession
[+N] [+P] [+N]
[+rltn] [-rltr]

The following redundancy rule accounts for the cooccurrence restriction between a preposition and its dependent sister:

RR-18 [+P] --> [-] [+nphr] [+rltr]
that is, a preposition does not allow either an anaphoric noun or the possessive noun as its dependent sister.

A detailed analysis of prepositions in Thai will not be presented in this study.

3.5. **Relational attributes**

Besides a verbal relative clause and a prepositional phrase, nouns in Thai also allow the type of attribute which has a noun marked with the feature [+rltn] (relational) as its lexical head, i.e., a nominal relative clause, a possessive noun phrase, a relator noun phrase, and a classifier construction to occur as its dependent sister, e.g.,

177a. cxxkan thîi2 sy/th mâj khoOng2 chăn bon
   vase that buy new possession I top
   [+N] [+N ] [+N ] [+N ]
   [+rltv] [+rltr] [+rltr]

   tô? sâam baj
   table three clsf
   [+N ] [+clsf]

   'my three newly bought vases on the table';
   literally, 'vases that were newly bought of mine on the table which were three'

The order of relational attributes of the noun phrase in (177a) is variable. In (177b), the speaker focuses on the nominal relative clause, in (177c) on the possessive phrase, in (177d) on the relator noun phrase, and on the classifier construction in (177e):
Only sequences of two nominal relative clauses, or two classifier constructions can cooccur. Two nominal relative clauses directly modify a head noun (178); whereas the second attribute of the classifier construction modifies the first classifier, not the regent noun (see section 4.4).

178. sy@ thîi₂ tât mây thîi₂ sàj my@waan
     shirt that cut new that wear yesterday
     [+N] [+rltv] [+rltv]
     'a newly-made shirt that you wore yesterday'

179. sy@ tu@ mây sàam tu@
     shirt clsf new three clsf
     [+N] [+clsf] [+clsf]
     'new shirts which are three'
Only one occurrence of a relator noun phrase or a possessive noun phrase can directly modify a head noun, as shown in (180-181) versus (182-183):

180.  **bān  khoOng₂  khrÔpkhru@**  
    house possession family  
    [+N] [-rltr]  
    'a house of the family'

181.  **nôk  naj  rang**  
    bird inside nest  
    [+N] [+rltr]  
    'a bird in the nest'

182.  ***bān  [khoOng₂  khrÔpkhru@]  [khoOng₂  phOO]**  
    house possession family possession father  
    [+N] [-rltr] [-rltr]  
    'father's house that belongs to the family'

183.  ***nôk  [naj  rang]  [bon  tônmaáj]**  
    bird in nest top tree  
    [+N] [+rltr] [+rltr]  
    'a bird on the tree that is in the nest'

The noun phrase in (182) is grammatical if the second noun phrase is interpreted as a modifier of the noun khrÔpkhru@ 'family', not of the regent noun bān 'house'.

The noun phrase in (183) is grammatical if the second noun phrase is interpreted as a modifier of the noun rang 'nest', not of the regent noun nôk 'bird'. When we change the order of the attributes so that the third cannot pragmatically be interpreted as modifying the second, there is no way to get a reading:

183'.  ***nôk  [bon  tônmaáj]  [naj  rang]**  
    bird on tree in nest  
    [+N] [+rltr] [+rltr]  
    'a bird on the tree that is in the nest'
3.5.1. Potential semantic ambiguities of attributes of non-relational nouns

Attributes of non-relational nouns, except verbal relative clauses which have to occur immediately adjacent to the head noun, and classifier constructions (see chapter 4 for some restricted order when modifying their head nouns), are often ordered to avoid potential ambiguities, e.g., examples (184-186) are all semantically ambiguous.

184. nangsyy kî@wkâp khruu thîï₂ phûng maa thûng
book about teacher that just come arrive

\([+N]\) \([+P]\) \([+]\)
\([+rltv]\)

The noun phrase in (184) in which the relative clause follows the prepositional phrase is structurally ambiguous. It means either 'a book about a teacher who just arrived' or 'a book that just arrived about a teacher', reflecting the following two alternative bracketings respectively:

184'. nangsyy [kî@wkâp [khruu [thîï₂ phûng maa thûng]]]

184". nangsyy [kî@wkâp khruu] [thîï₂ phûng maa thûng]

185. nangsyy bon tó? khûûng₂ khûaw
book top table possession he

\([+N]\) \([+N]\) \([+N]\)
\([+rltr]\) \([-rltr]\)

The noun phrase in (185) in which the relator noun phrase follows the possessive phrase is ambiguous. It means either 'his book on the table' or 'a book on his table',
reflecting the following two alternative bracketings respectively:

185’. ṇãngṣyë [bon tó?] [khôong₂ khâw]
185”. ṇãngṣyë [bon tó? [khôong₂ khâw]]

186. cõtmaaj thî₂ khîn thûng phî khôong₂ chăn letter that write to sister possession I [+N] [+N ] [+N ] [+rlint] [-rltr]
' a letter that was written to my sister'

The noun phrase in (186) in which the order of the relative clause precedes the possessive phrase is ambiguous. It means either 'the letter that was written to my sister' or 'my letter that was written to sister (who may be my cousin rather than my real sister)'.

186’. cõtmaaj [thî₂ khîn thûng phî [khôong₂ chăn]]
186”. cõtmaaj [thî₂ khîn thûng phî] [khôong₂ chăn]

The alternative internal structures of (184'-196') are shown as follows:

\[
\begin{align*}
\text{N'} & \quad \text{N'} \\
\text{ñãngṣyë} & \quad \text{P'} \\
\text{[+N]} & \\
\text{kiòwkap} & \quad \text{thî₂} \\
\text{[+P]} & \quad \text{khruu} \\
\text{[+N]} & \quad \text{phûng} \\
\text{[+rlint]} & \quad \text{maa} \\
\text{[+N]} & \quad \text{thyng} \\
\text{[+N]} & \quad \text{[-trns]} \\
\text{[-trns]} & \quad \text{[-trns]}
\end{align*}
\]

'a book that just arrived about a teacher'
The tree structure shows that both the prepositional phrase and the nominal relative clause modify the head noun.

The alternative tree for the (184") is shown as follows:

' a book about a teacher who just arrived'

The tree structure shows that the nominal relative clause modifies the phrasal co-head of the prepositional phrase instead of modifying the regent noun.
'his book on the table'

The tree structure shows that both the relator noun phrase and the possessive noun phrase modify the regent noun.

The alternative tree for the (185") is shown as follows:

'a book on his table'

The tree structure shows that the possessive noun phrase modifies the relator noun instead of modifying the regent noun.
'my letter that was written to sister'

The tree structure shows that both the nominal relative clause and the possessive noun phrase modify the regent noun.

The alternative tree for the (186") is shown as follows:
'the letter that was written to my sister'

The tree structure shows that the possessive noun phrase modifies the last noun of the relative clause not the regent noun.

In order to avoid semantic ambiguity, the attributes of the head nouns in (184-186) have to occur in some other order, as in the following examples:

184-. นังสุ์ยนที่แล้ว พย่งมาที่ยังไม่กับ ครู
book that just come arrive about teacher
[+N] [+rltv] [+P]
'a book that just arrived about a teacher'

There would be no semantic ambiguity in (188) if the nominal relative clause preceded the prepositional phrase, as in (188-), since the prepositional phrase ครูกับ sách no longer immediately follows a noun.
There would be no semantic ambiguity in (185) if the possessive noun phrase preceded the relator noun phrase in (185-), since deictic nouns such as khāw 'he' do not allow following dependent relational attributes such as bon to? 'on the table' (see section 2.3.1.1.).

There would be no semantic ambiguity in (186) if the possessive noun phrase preceded the nominal relative clause in (186-).

3.6. **Determiners**

Determiners are the last type of attributes that modify nouns in Thai. Some determiners are identical in form to the locative pronouns discussed in section 2.3.2.1., except that the determiners have both high and falling tones, whereas the locative pronouns have only falling tones. They are also different in their syntactic distribution.

Locative pronouns do not function as attributes to any nouns, whereas determiners have a wider distribution, they can occur as attributes in other types of nominal construction.
Determiners always follow their regent nouns, as in (187) but not (188):

187. bàan nií
     house this
     'this house'

188. *nií bàan
     this house
     [+Det] [+N]

Baan is the head of the noun phrase, cap-commanding the determiner nií. The position of the determiner, which never precedes a head noun, is accounted for by the redundancy rule (RR-1).

Deictic nouns, except indefinite pronouns, the non-relator noun or the possessive noun, as well as non-classifier nouns (i.e., the relative noun and the complementizer noun), do not allow determiners as their dependent sisters, as in (189-191). Relator nouns, classifiers, and non-relational nouns do allow determiners as their dependent sisters, as in (192-195):

RR-19  [+prnn]  -->  [-[+Det]]
      [-dfnt]  |
      [+ntrg]  |
     < rltr >
      [-clsf]  

189. *narii nií
     Nari this
     [+N] [+Det]
     [+dctc]
The non-occurrence of pronouns and anaphoric nouns with determiners is stated as a part of the Omega rule. Nouns that allow determiners as their dependent sisters will be lexically marked by a rule that applies to a whole natural class with the feature \[\{+[+Det]\}\] (see also chapter 2).

\[
\text{IRR-22} \quad \left[ +\text{prnn} \right] \rightarrow \{+[+Det]\}
\]

\[
\left[ +\text{dfnt} \right] < \left[ +\text{rltr} \right] \left[ +\text{clsf} \right]
\]
Only one determiner may allow to modify a head noun in Thai. If there is more than one determiner, as in (196), the noun phrase is ungrammatical:

196. *kxxw níí níí
    glass this this

The redundancy rule accounting for this cooccurrence restriction is formulated as follows:

RR-20  [+N]  -->  [-[+Det] [+Det]]

3.6.1. Subcategorization of determiners

The subcategorization tree of determiners is shown as follows:
The lexical category referred to as [+Det] (determiner) in Thai falls into two major subclasses: [+dmns] (demonstrative).

SR-24 [+Det] --> [+dmns]

Indefinite or non-demonstrative determiners can be subcategorized into two subclasses: [+lctv] (locative).

SR-25 [-dmns] --> [+lctv]

Demonstratives and locational determiners can be subcategorized into two subclasses: [+prxt] (proximate).

SR-26 [+dmns] --> [+prxt]

Figure 7. Subcategorization of determiners

which other where there over- here that further- this only there away one
Non-locative determiner can be subcategorized into two subclasses: \([+\text{plce}]\) (place).

SR-27 \([-\text{lctv}] \rightarrow [+\text{plce}]\)

Non-proximate determiners can be further subcategorized into two subclasses: \([+\text{rmot}]\) (remote).

SR-28 \([+\text{prxt}] \rightarrow [+\text{rmot}]\)

Non-place can be further subcategorized into two subclasses: \([+\text{humn}]\) (human).

SR-29 \([-\text{plce}] \rightarrow [+\text{humn}]\)

Normally, non-relational nouns allow determiners as their sisters. There is an exception for non-relational nouns marked with the feature \([+\text{pssd}]\) (possessed). These are kinship terms and do not allow locative determiners (197), but do allow demonstratives as their dependent sisters (198):

197. *mx'x ni'\text{"ii}_2\nmother here
\([-N] [+\text{lctv}]\)
\([-\text{rltn}] [+\text{pssv}]\)

198. mx'x ni'\nmother this
\([-N] [+\text{dmns}]\)
\([-\text{rltn}] [+\text{pssv}]\)
\('this mother'\)

The redundancy rule accounting for the non-occurrence of possessed nouns with the locative determiner is formulated as follows:
3.6.2. Determiners in relation to other attributes

Determiners can cooccur with other attributes to modify nouns, but they obligatorily occur following such other attributes.

The set of determiners which can cooccur with other attributes is limited to the set of demonstrative determiners, i.e., níː 'this', nán 'that', noón 'farther away' or the set of locative determiners, i.e., níː_2 'here', nân_2 'there', noón_2 'over there'.

199. baːn jàːj nân_2
   house big that
   [+N] [+V] [+lctv]
   'a big house there'

200. túukataa thíː_2 sỳː màːj níː
doll that buy new this
   [+N] [+rltv] [+dmns]
   'this doll that was newly bought'

201. sỳː sàmrāp khonchon níː
   shirt for the poor this
   [+N] [+P] [+dmns]
   'these shirts for the poor'

202. *baːn jàːj nàːj
    house big where
    [+N] [+V] [-lctv]

203. *túukataa thíː_2 sỳː màːj daj
doll that buy new which
    [+N] [+rltv] [-lctv]
The following redundancy rule accounts for the non-occurrence of non-locative determiners with other attributes:

RR-23 \([+N]\) --> \([-[] \space [+\text{Det}] \space [-\text{lctv}]]\)

3.6.3. Determiner and classifier constructions

Determiners cannot cooccur with classifier constructions in modifying head nouns, e.g.,

204. *kxxw níi sāam baj
glass this three clsf
'these glasses which are three'

The structure which would be assigned to (204) is shown below:

\[
\begin{array}{c}
\ast N' \\
kxxw \\
\text{[+N]} \\
\text{Det'} \\
\text{N'} \\
\text{niī} \\
\text{[+Det]} \\
baj \\
\text{[+Adj']} \\
\text{[+clsf]} \\
\text{saām} \\
\text{[+Adj]}
\end{array}
\]

205. *kxxw níi sāam baj níi
glass this three clsf this
[+N] [+Det] [+clsf] [+Det]

The structure which would be assigned to (205) is shown as follows:
The regent noun allows only either a determiner or a classifier construction to occur as its dependent sister, but not both; e.g.,

206. kxxw níi
   glass this
   [+N] [+Det]
   'this glass'

207. kxxw saam baj
   glass three clsf
   [+N] [+clsf]
   'glasses which are three'

The following redundancy rule accounting for this restriction is formulated as follows:

$$\text{RR-24} \quad [+\text{N}] \rightarrow [\neg [+\text{clsf}] [+\text{Det}]]$$

Even though a determiner cannot cooccur with a classifier construction as co-attributes of a head noun, it can occur as a dependent sister of a classifier construction, e.g.,

208. syê saam tuê níi
   blouse three clsf this
   'these three blouses'

The RR-24 excludes the tree structure in diagram B but allows that in diagram A:
A:

N'  
     
     sy$a  N'  
          
          tu$a  Adj' [+clsf] Det'  
               
               sa$a  ni$I  
                          [+Adj]  [+Det]

B:

*N'  
     
     sy$a  N'  Det'  
          
          tu$a  ni$I  Adj' [+clsf] [+Det]  
               
               sa$a  [+Adj]

209.  sy$a  tu$a  jàj  sa$a  tu$a  ni$I  shirt  clsf  big  three  clsf  this  'these  three  big  shirts'

A:

N'  
     
     sy$a  N'  N'  
          
          tu$a  [+clsf] V'  Adj' [+clsf] Det'  
               
               jàj  sa$a  ni$I  
                          [+V]  [+Adj]  [+Det]
If two determiners occur in the same noun phrase, i.e., one determiner functioning as a sister of a classifier and the other determiner functioning as a sister of a regent noun, the noun phrase is always ungrammatical, e.g.,

210. *kxxw saâm baj níí níí
glass three clsf this this

The structure which would be assigned to (210) is shown below:

The redundancy rule accounting for this ungrammaticality cannot be formulated within the lexicase notation since the two determiners occur at different levels of modification. The regent noun can impose a sequential restriction only on its sisters which are at the same level
of modification. Thus, *kxxw* cannot restrict the occurrence of the first determiner, which modifies the classifier *baj*. This may be an indication that (210) is not ungrammatical but rather pragmatically unfelicitous: it is not said simply because it is redundant.

3.6.4. Potential semantic ambiguity of determiners in relation to other attributes

In some cases, a determiner that cooccurs with other attributes, except a classifier construction, will potentially create an embedded structure. That is, if another attribute that ends in a noun which can carry its own attribute happens to be followed by a determiner, that determiner can be regarded as modifying two kinds of head nouns: one head noun is its immediately preceding noun, the other is the regent of the whole noun phrase.

The following items exemplify noun phrases having determiners cooccurring with different types of attributes:

211. khon syý pháa níi
    person buy cloth this
    [+N] [+V] [+Det]

This noun phrase has two potential interpretations. It could mean either 'this person who bought some cloth' or 'a person who bought this cloth'. The structure assigned to each interpretation is different. The structure assigned to the first interpretation is shown below:
The structure assigned to the second interpretation is shown below:

```
N'
  └── khon
     └── V'
          └── sýy
               └── nií
                   └── N'
                        └── phàa
                             └── [+N]
```

212. cótmañj bon tó? nií
letter top table this
[+N] [+rltr] [+Det]

This noun phrase has two potential interpretations. It could mean either 'this letter on the table' or 'a letter on this table'. The structure assigned to each interpretation is different. The structure assigned to the first interpretation is shown below:
The structure assigned to the second interpretation is shown below:

```
N'  
côtmaaj  N'  Det'
    |    |
    |    | nií
[+N]  bon    N'  [+Det]
    |    |    |    | tó?
    |    |    |    | [+N]

213. côtmaaj thíi₂ khíén thýng khruu nán
letter that write to teacher that
    [+N]  [+rltv]  [+Det]
```

This noun phrase has two potential interpretations. It could mean either 'that letter which was written to the teacher' or 'a letter which was written to that teacher'. The structure assigned to each interpretation is different. The structure assigned to the first interpretation is shown below:
The structure assigned to the second interpretation is shown below:

```
N'
  /  \
[+N] cotmaaj  N'
      /  \
[+N] thi2    N'
          /  \
[+rltv] V'  N'
              /  \
[+trns] thyen     N'
                 /  \
[+P] thych      N'
                    /  \
[+N] khruu  Det' 
```

This noun phrase has two potential interpretations. It could mean either 'this teacher of the nation' or 'the teacher of this nation'. The structure assigned to each
interpretation is different. The structure assigned to the first interpretation is shown below:

```
N'
  |--- nǐi
  |      |--- [+Det]
  |      |       |--- [-rltr] N' [+Det]
  |      |       |       |--- chaát [+N]
  |--- 'họ̀n' [+N]
  |   |--- mx̂x̄phim [+N]
```

The structure assigned to the second interpretation is shown below:

```
N'
  |--- nǐi
  |      |--- [+Det]
  |      |       |--- chaát [+N]
  |      |       |       |--- mx̂x̄phim [+N]
  |      |       |       |       |--- 'họ̀n' [+N]
```

If a noun is possessed by a pronoun in a possessive construction, a determiner can only occur as the attribute of the head noun, not of the possessed pronoun, since personal pronouns do not allow a determiner as their sisters (as indicated in the Omega rule).

215. bánn 'họ̀n, chăn nǐi
    house possession I this
    [+N] [-rltr] [+Det]
The appropriate structure for this noun phrase is shown in diagram A, not diagram B:

A:

\[
\begin{array}{c}
\text{N'} \\
\text{baar} \\
\text{[+N]} \\
\text{N'} \\
\text{[+N]} \\
\text{khoOng} \\
\text{[-rltr]} \\
\text{N'} \\
\text{[+Det]} \\
\text{chi\`an} \\
\text{[+N]} \\
\text{Det'} \\
\end{array}
\]

B:

\[
\begin{array}{c}
\text{*N'} \\
\text{baar} \\
\text{[+N]} \\
\text{N'} \\
\text{khoOng} \\
\text{[-rltr]} \\
\text{N'} \\
\text{chi\`an} \\
\text{[+N]} \\
\text{Det'} \\
\text{[+Det]} \\
\text{ni'i} \\
\end{array}
\]

216. côtma\'aj c\`ak phû\'on nán
letter from friend that

This noun phrase has two potential interpretations. It could mean either 'that letter from a friend' or 'the letter from that friend'. The structure assigned to each interpretation is different. The structure assigned to the first interpretation is shown below:
The structure assigned to the second interpretation is shown below:

These constructions can be disambiguated by using a classifier appropriate to the regent noun or a classifier appropriate to the immediately preceding noun. Thus the determiner will modify the classifier instead of the regent noun.

The first interpretation of the noun phrases (211-214, 216) will be as follows:

211'. khon syy phaa khon nii
person buy cloth clsf this
[+N] [+V] [+clsf]

The structure assigned to (211') is as follows:
The second interpretation of the noun phrases (211-214, 216) will be as follows:

211". khon syỳ phàa phỳn níi
   person buy cloth clsf this
   [+N] [+V] [+clsf]

The structure assigned to (211") is as follows:
3.7. Conclusion

We have shown that all kinds of NP attribute can modify non-relational nouns. These attributes are divided into three types based on their relative sequential order after the regent noun. The first one is an attribute that has a verb [+V] as the head of its construction. The second one is an attribute which has either a preposition [+P] or a noun [+N] as the head of its construction. This attribute type includes prepositional phrases, relator noun phrases,
nominal relative clauses, possessive noun phrases, and classifier constructions. The third type of attribute is a determiner.

Each type of attribute has a unique position in the noun phrase. That is, a verbal attribute always occurs first, followed by a nominal or a prepositional attribute. A determiner always occurs last. Within the nominal or the prepositional attributes, the order is variable, resulting in ambiguous interpretations for some noun phrases. This ambiguity can be resolved by looking at the internal structure imposed by the regent noun on the noun phrase. When [+P] and [+N]-headed attributes cooccur with the same regent noun, speakers tend to choose an order which avoids ambiguity.

The determiner and classifier attributes are in complementary distribution—they never occur as the co-attributes of a head noun. When a classifier occurs as the attribute of a regent noun, a determiner can only occur as a dependent sister of a classifier, not of the regent noun itself. The interpretation of a noun phrase can be ambiguous if there is a determiner cooccurring with other types of attributes. This ambiguity can be resolved by the choice of a classifier which specifies the appropriate regent noun of the determiner.
4.1. Introduction

This chapter is a discussion of attributes of relational nouns. These are constructions that are immediate dependents of other nouns and which have a noun marked by the feature [+rltn] (relational) such as a relative noun, a complementizer noun, a classifier, a possessive noun, or a relator noun as the head of the construction.

4.2. Nominal relative clauses

Nominal relative clauses are headed by the relative noun thi12, marked by the feature [+rltv], as in (217–218). Unlike bare relative clauses, as in (219–220), they can relativize on non-subjects.

217. nāngsy thī2 khī@n sēt 1xīw
   book that write finish already
   [+N ]
   [+rltv]
   'the book that was already written'

218. phāáp thī2 chān khī@n
   picture that I write
   [+N ]
   [+rltv]
   'the picture that I drew'

219. phāá su@j
    cloth beautiful
    'the cloth which is beautiful'
220. *khanôm dèk khaâj
dessert child sell
'the dessert that the child sold'

The nominal relative clause in (217) and the verbal
relative clause in (219) relativize the subjects nãngsyý and
phaâ respectively. In (218), the nominal relative clause
relativizes the object phaâp, but in (220) the verbal
relative clause cannot relativize its object khanôm.

A nominal relative clause can be either an attribute
modifying a head noun (221), or the regent of a free noun
phrase (222):

221. tó? thii2 thasii lxxw
    table that paint already
    'the table that was already painted'

```
N'
  tó?     N'
    [+N]  
      thii2  V'
        [+rltv]  
          thasii  Adv'
            [-trns]  
              lxxw  [+Adv]
```

The nominal relative clause thii2 thasii lxxw is an
attribute, modifying the head noun tó?.

222. thii2 khun syý maa mâj su@j 1@@j
    that you buy come not pretty at all
    'What you bought was not pretty at all.'
4.2.1. Distribution of nominal relative clauses

Thei in the nominal relative clauses occur in two syntactic environments. They can be either free noun phrases or dependent sisters of another regent noun.

As a free noun phrase, thei can function as a subject (223), as an object of a clause (224), an object of a preposition in a prepositional phrase (225), or as a nominal predicate (226):

223. thei khun hën mâjchâj khûng cîng that you see not exactly thing real 'What you saw is not real.'

The structure assigned to (223) in which the noun phrase thei khun hën functions as a subject of the clause is illustrated below:
224. chăn mả́j chôop thíi₂ khun phứut
I not like that you say
'I did not like what you said.'

The structure assigned to (224) in which the noun phrase thíi₂ khun phứut functions as an object is illustrated below:

225. raw khiĕn kê̂wkàp thíi₂ khun phứut
we write about that you say
'We wrote about what you said.'
The structure assigned to (225) in which the noun phrase thìi₂ khun phùút functions as an object of the preposition ki@wkâp is illustrated below:

226. närngsýy níí pen thìi₂ tôngkaan khūng₂ book this be that want possession

talàät
market

'This book is the one that is in demand.'

The structure assigned to (226) in which the noun phrase thìi₂ tôngkaan khūng₂ talàät functions as a nominal predicate is illustrated below:
Pen is a copula verb that requires a nominal predicate as its sisters. Thǐ₂ in thǐ₂ tôngkaan khoɑng₂ talat occurs as a dependent sister of the main predicate pen. Thus it is a nominal predicate, which, as in English, is also non-finite.

By lexicase assumptions, if thǐ₂ and its verbal clause together have the distribution of a noun phrase, then they must constitute a noun phrase which must have a lexical head noun. The only possible candidate for the lexical head noun is thǐ₂, which is thus analyzed as a relative noun, a noun which functions as a regent noun for a dependent finite clause.
4.2.2. Nominal relative clauses as dependent sisters of regent nouns

Thii₂ and its verbal clause also functions as a dependent sister or an attribute to other nouns. It is analyzed as a descriptive nominal predicate that appears in the immediate domain of the first commanding noun, or a regent noun. The following is a fully specified feature matrix of thii₂ appearing in this function:

```
thii₂
[ +N ]
[ -clsf ]
[ +rltv ]
[ +prdc ]
[ -dfnt ]
[ +[V] ]
[ ?[+Nom] ]
[ ?[+actr] ]
[ ?[+PAT] ]
[ -Nom ]
```

Following Starosta, Pawley, and Reid (1982), I will refer to an indefinite predicate noun as a 'descriptive' nominal predicate. Such a predicate, as in an English sentence like Mary is a realtor, is characterized by the fact that it does not have its own independent reference, but rather states a property of its subject. Thii₂ is a descriptive nominal predicate which is lexically marked to require a verbal clause as its dependent sister. As an intransitive predicate, it implies a Nominative Patient which is also marked with an actor role. Thii₂ itself is a predicate rather than a subject, thus is marked with the accusative [-Nom] case form, since nominal predicates across
languages typically (though not always) are marked with a case form different from the case form of subjects.

Being an attribute, a nominal relative clause modifies its regent noun. Most nouns in Thai, except nouns marked with the feature [-nphr], i.e., possessive noun and relator nouns, allow thii₂ as their dependent sister, as in (227-228), but not (229-230).

227. nangsyy thii₂ khun tñxng khãaj dii book that you write sell good [+N ] [+N ] [+V]
[-rltn] [+rltv]
'The book that you wrote sold well.'

228. khraj thii₂ mâj sabaaj tõng phákphõOn who that not feel good must rest [+N ] [+N ] [+V]
[-rltn] [+rltv]
'Whoever does not feel well must take a rest.'

229. *naj thii₂ syỳ maa inside that buy come [+N ] [+N ] [+V]
[-nphr] [+rltv]
'The inside that (you) bought.'

230. *khûong2 thii₂ khãaj paj possession that sell go [+N ] [+N ] [+V]
[-nphr] [+rltv]
'The possession that sells well.'

The possessive noun and relator nouns, unlike thii₂, are unmarked for the feature [+ [+V]], and they are marked to exclude [+V] attributes, by the feature [- [+V]] assigned by the Omega rule. The rest of the nouns are marked by the feature [+([+V])] by the redundancy rule (see section 2.2.1. above), and this blocks the assignment of [- [+V]] by the
Omega rule. Thus some noun types allow relative clause attributes and some do not. However, relative clauses in Thai do not actually subcategorize nouns,\(^1\) since the environment before a relative clause does not constitute a grammatically significant environment (Starosta 1988:228); that is, the presence or absence of the relative noun does not constitute the sole basic for setting up a new subclass of noun.

In Thai, a nominal relative clause can be introduced by one of two other antecedents -sync or ?an (archaic form) 'that, which'. This construction can relativize both on subjects and object, e.g.,

\begin{align}
231. & \quad \text{kaan?O} \text{Okkamlang sync pen sing campen tO0} \\
& \quad \text{exercise that be thing necessary for} \\
& \quad \text{[+N \ ]} \\
& \quad \text{[+rltv]} \\
& \quad \text{râangkaaj cà? thamhâj khun khñngrxxng} \\
& \quad \text{body will make you healthy} \\
& \quad \text{'Exercise that is a necessary thing for the body will make you feel healthy.'}
\end{align}

\begin{align}
232. & \quad \text{nãngsyy sync chan rúucàk dii} \\
& \quad \text{book that I know well} \\
& \quad \text{[+N \ ]} \\
& \quad \text{[+rltv]} \\
& \quad \text{'the book that I know well'}
\end{align}

 Sync can also occur as the head of a noun phrase, functioning as a resumptive pronoun for a topic clause, e.g.,
The clause ʻtum rûÔt maa dâj syâng pen ryâng ly@chy@ 'Tum had survived, that (fact) was incredible.' is a topicalized verbal clause. Syâng is the head of a noun phrase which is coindexed with this clause and functions as a subject of the cap-commanding impersonal verb pen (see Pagotto's discussion on impersonal verbs and subject surrogates 1987: 5).

In this description, I will focus only on the relative noun thîi₂ since it is much more commonly used and has a wider distribution.

A nominal relative clause in Thai is defined here as having the following basic properties: (1) a nominal relative clauses can be a dependent sister of most of the nouns in Thai, except non-anaphoric nouns, i.e., relator nouns and the possessive noun, as well as demonstrative
pronouns, (see chapter 2 above). (2) a nominal relative clause is a non-finite nominal predicate with or without a missing subject or object; (3) the antecedent noun is the regent of the clause; (4) the antecedent noun is coreferential with a missing argument (if there is one) in the domain of the embedded verb; (5) the antecedent regent noun must be thii₂ if the missing argument is the direct object, but may be any noun (including thii₂) if the missing argument is the subject. (If the regent noun is not thii₂, it would be called a verbal rather than a nominal relative clause.)

A nominal relative clause in Thai sometimes lacks an argument, which can be either a subject or an object in the domain of the embedded verb, but no other NP². This is in accordance with the relativization strategy of Keenan and Comrie's classification (Keenan and Comrie 1977:27-9). Keenan and Comrie propose an accessibility hierarchy in relativizing noun phrases in different languages. Some languages have a relativization strategy which applies only to subjects; other languages have a strategy which applies only to subjects and direct objects; other have strategies which apply to subjects, direct objects, and indirect objects, etc.

The sentence below illustrates a missing subject and its coreferential element in the relative clause.
236. tó thiii thaaśii lxxw yók paj dâj
    table that paint already move go get
    'The table that was already painted can be moved.'

The structure assigned to (236) is as follows:

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The verb khāaj requires a nominative Agent ([+Nom], [+AGT]), a requirement which is satisfied by khun, and an accusative Patient ([−Nom], [+PAT]), which is missing.

4.2.3. Linking rules and chaining rules

In a lexicase grammar, required and optional dependents of a regent word are associated with their regent by linking rules, and missing arguments in a nominal relative clause are associated with an overt antecedent by linking and chaining rules. The difference between these two kinds of rules is that the linking rule applies to the arguments which are inside the clause, and the relationship is linked by a case form; whereas the chaining rule applies to the arguments which are outside the clause, and the relationship is chained by a case relation.
The missing argument in a relative clause in Thai can be interpreted by the following: one external linking rule, four internal linking rules, and one index-changing linking rule, along with two chaining rules:

1. Valence linking rule:

   \[ \text{LR-1 } \text{[?[+F_1]] } \rightarrow \text{[m[+F_1]] } / [F_1] \]

   Replace the implied feature [?] of [?[+F_1]] with the index of an immediate dependent which matches [+F_1].

2. Internal linking rules

   \[ \text{LR-2 } \text{[n[+Nom]] } \rightarrow \text{[n[+actr]] } \]

   Nominative always marks actor in accusative languages.

   \[ \text{LR-3 } \text{[n[+AGT]] } \rightarrow \text{[n[+actr]] } \]

   Agent (which can only appear in a transitive clause) is universally the actor.

   \[ \text{LR-4 } \text{[?[+PAT]] } \rightarrow \text{[n[+PAT]] } \]

   The Patient of a transitive verb is universally marked by the Accusative case form.

   \[ \text{LR-5 } \text{[?[+Nom]] } \rightarrow \text{[n[+Nom]] } \]

   The Nominative of an intransitive verb universally marks the Patient.
3. Index-changing linking rule

| LR-6 | [ +N    ] | --> | [mndex] |
|      | [ +prdc ] |     | [mndex] |
|      | [ -dfnt ] |     | [mndex] |
|      | [ m[+Nom] ] |   | [mndex] |

The index of a descriptive (non-definite) nominal predicate is changed to be the same as the index of its subject. This rule is useful for representing the fact that a descriptive predicate has no independent reference of its own, but rather indicates an internal property of its subject; and it is needed to formally link the missing argument of the verbal head of a relative clause with the regent of thii₂: (i) thii₂ is a descriptive predicate, so its index is the same as the index of its subject; (ii) thii₂ is a descriptive nominal relative clause on its regent noun; its missing subject is matched with the regent noun by the general relativization rule; and (iii) the missing argument of the verbal clause depending on thii₂ is matched with thii₂, also by the general relativization rule, thereby establishing the necessary coindexing relationship between the missing noun of the verbal relative clause and the regent of thii₂. This will be illustrated in the discussion below.

1. General relative clause chaining rule:

| CR-1 | [ +V    ] | --> | [n[<CR]>] \ [ +N    ] |
|      | [ <CR> ] | | [m([+V])] |
|      | [mndex] | | [nndex] |
The unspecified index of a dependent argument of a verb is chained to the index of its first commanding noun if the verb has been valence-linked to that noun. For example, the missing subject of a verbal relative clause is chained to its regent:

\[
\begin{array}{c}
\text{[+N]} \\
\text{\textit{m}([+V])}} \\
\text{[nndex]} \\
\end{array}
\]

2. \( \mathfrak{thi} \) chaining rule

\[
\text{CR-2 \quad [+rltv]} \quad \rightarrow \quad \text{[r[V]} \\
\text{\textit{m}( [+V] )]} \\
\text{\textit{m}( [+rltv] )]} \\
\text{[nndex]}
\]

The unspecified index of a case relation of the relative noun that requires a verbal clause as its dependent sister is chained to the index of a case relation of its first commanding noun, which allows a relative clause as its dependent sister. Thus, \( \mathfrak{thi} \) is always chained to its regent.

The linking and chaining relationship accounting for the anaphoric relations possible between the missing argument and its regent noun in (236) is shown below:
The Patient subject of thii₂ is chained with its cap-
commanding noun, tó?, by the CR-2. Thus it is marked with
the index (1). By the LR-5, the implied Nominative of thii₂
is linked with the same index as its Patient, and by the
LR-2 the implied actor is linked with the same index as the
Nominative subject. Thus, they are all marked with the
index (1).

By the Index-changing linking rule (LR-6), the index of
thii₂ is changed to be the same as the index of its cap-
commanding noun, thus thii₂ gets the index (1).

The verb thasasii implies a missing Nominative subject
marked with the feature [+Nom]. By CR-1, the missing
Patient is chained with the same case relation as its cap-
commanding noun, which is thii₂. Thus, it is marked with
the index (1). Therefore, the missing argument of thāsīī is equated to the regent noun tó?.

By LR-1, the implied Nominative subject of the intransitive verb yók is linked to the noun tó?, and it is marked with the index (1). By LR-5, the Nominative subject of an intransitive verb is always a Patient, so the Patient of yók is also marked with the index (1).

The linking and chaining relationship accounting for the anaphoric relations possible between the missing argument and its regent noun in (237) is shown below:

By CR-2, the implied Patient [+PAT] of thī₂ is chained to the first commanding noun, nāngsy̖, thus it is marked with the index (1). By LR-5, the Patient is linked to the
Nominative [+Nom]. By LR-2, the Nominative is linked to the actor [+actr]. All these three arguments are marked by the same index (1).

By the index-changing rule LR-6, the index of thii₂ is changed to have the same index as its regent noun, thus it is now marked with the index (1).

The verb khaaj requires a nominative subject [+Nom] and an accusative object [-Nom]. By LR-1, the implied [+Nom] is linked to khun, thus, it is marked with the index (3). By LR-2, the Nominative subject is linked to the actor [+actr]. By the LR-3, the actor is linked to the Agent [+AGT]. All these three arguments are marked by the same index (3).

The implied Patient [+PAT] of the verb khaaj, which is missing, is chained to thii₂ by the CR-2, thus it gets the index (1). By LR-4, the Patient is marked by the Accusative, thus the [-Nom] of khaaj also gets the index (1). Therefore, the interpretation of the missing element of the verb khaaj is equated to nangsyy.

By LR-1, the implied Nominative of the verb phxxng is linked to the immediate dependent, nangsyy, thus it is indexed by (1). By LR-5, the Nominative of an intransitive verb is always a Patient, thus the implied Patient gets the index (1).
The following example illustrates another chaining relationship accounting for the anaphoric relations possible between a missing argument and its regent noun in a verbal relative clause:

238. phâa su@j
    cloth beautiful
    'cloth which is beautiful'

By CR-1, the Patient of the verb su@j is chained to its cap-commanding noun, thus it gets the index (1). By LR-5, the Nominative subject is linked with the Patient. By LR-2, the actor is linked to the Nominative. Thus they are all marked with the index (1). Therefore, the interpretation of the Patient subject of su@j is phâa.

Having discussed nominal relative clauses, I shall now turn to the discussion of noun complement clauses.

4.3. Noun complement clauses

Noun complement clauses are inner sentential complements of nouns. They subcategorize nouns (that is, some nouns allow them and most nouns do not), and thus their
presence is required or allowed by some contextual feature marked on the head noun of a noun phrase (Starosta 1988:229). Noun complement clauses are similar to relative clauses in that neither requires a grammatical missing argument, but one may occur. They differ only in that noun complement clauses subcategorize nouns, whereas relative clauses do not.

Noun complement clauses in Thai are headed by the complementizer noun ที่, which is obligatorily followed by its immediate following verbal sister. They can be either the head of a free noun phrase (239), or an attribute modifying a regent noun (240):

239. ที่ฝนตกน้ำทมท่วม
That it rained heavily caused the flood.'

The structure assigned to (239) is as follows:
Thîi, is the head of the noun complement clause thîî, fon tok nàk.

240. kaan thîi, khàw maa chàa thàmhàj thûkkhon
    fact that he come late make everybody
    krôt
    angry

'The fact that he came late made everybody angry.'

The structure assigned to (240) is as follows:

```
V'
  |   thàmhàj
  | [-trns]
  | thîî,
  | PAT
  | ?([-rltv])
  | [+Nom]
  | [+rltv]
  | [+prdc]
  | [+V]
  | [-Nom]
  | maa
  | khàw
  | chàa
  | [+Nom]
  | [+Adv]
  | PAT

The noun complement clause thîî, khàw maa chàa is an attribute of the regent kaan.

4.3.1. Distribution of noun complement clauses

Noun complement clauses have two kinds of distribution: as the head of a free noun phrase or as a nominal predicate that modifies a regent noun. As a free noun phrase, they
can function as a subject (241), an object (242), or as the object of a prepositional phrase (243):

240. thîi₃ th@ su Jwt thamhaj khOn mOOnng that she pretty make people look at '(The fact) that she is pretty makes people like to look at her.'

V'

N' thamhaj [-trns ] V'

| thîi₃ [+Nom]

mOOnng [-trns ]

| thîi₃ [+actr]

thii₃ [4index ]

| th@ [+V]

thii₃ [3index ]

| th@ [+actr]

The noun complement clause thîi₃ th@ su Jwt is a free noun phrase functioning as the subject of a clause.

242. tûm sónchaj thîi₃ ry@ 100jna'am dâj Tum interest that boat float can 'Tum is interested in (the fact) that the boat can float.'
The noun complement clause thīi3 ry@ 100jnaām dāj is a noun phrase functioning as the object of a clause.

243. nākkhaaw raajngaan ki@wkāp thīi2 naām thu@m reporter report about that water flood phāaktâj South

'The reporter reported about (the fact) that there was a flood in the south.'
The noun complement clause thii₃, naam thuém phâaktâj is a noun phrase functioning as an object of a prepositional phrase.

Thii₃ and its verbal clause can function as a dependent sister of a regent noun. Only the nouns in the subclass marked with the feature [+nfmn] (information), (i.e., non-gerund nouns, e.g., kaan, khwaam, ryëng) and a gerund [+grnd] or a nominalized verb, allow noun complement clauses as their sisters. Thii₃ and its verbal sisters thus subcategorize nouns, and is therefore considered to be an inner complement.

The fully specified feature matrix of thii₃ as a descriptive nominal predicate that appears in the immediate domain of the first commanding noun, or regent noun is shown below:

```
thii₃
[ +N ]
[ -clsf ]
[ -rltv ]
[ +prdc ]
[ -dfnt ]
[ +[+V] ]
[ ?[+Nom] ]
[ ?[+actr] ]
[ ?[+PAT] ]
[ -Nom ]
```

The complementizer noun thii₃ requires a verbal clause as its dependent sister. As a predicate, it implies a Nominative subject bearing the macrorole 'actor', and as an
intransitive predicate, it specifies its subject as bearing the Patient case relation.

The implied argument of thî, is interpreted by the same linking and chaining rules which apply to a relative clause (see section 4.2. above). The linking and chaining relationship of a verbal clause which is the sister of a noun complement is self-contained if there is no missing argument. That is, the implicational features are satisfied within the domain of the cap-commanding verb.

The following examples show noun complement clauses functioning as dependent sisters of nouns marked with the feature [+nfmn]:

244. t`um s`oncaj kaan thî, taa s`yy ry@
Tum interest matter that Taa buy boat
'Tum is interested in the fact that Taa bought the boat.'
The linking relation in the noun complement clause

\[ \text{thii}_3 \text{ taa syy ry@ is self-contained. That is, by LR-1, the Nominative [+Nom] of syy is linked to the noun taa, it gets the index (5). And the Accusative [-Nom] is linked to the noun ry@, it gets the index (7). By LR-3, the Nominative of a transitive verb is an Agent, thus the Agent gets the index (5). And the Accusative is a Patient, thus the Patient gets the index (7).} \]

By CR-1, the Patient of thii, is chained with the cap-commanding noun kaan, thus it is marked by the index (3). By the index-changing rule, the index of thii, is changed to be the same as the index of kaan, thus it gets the index (3).

By LR-1, the Nominative [+Nom] of soncaj is linked to the noun tum, so it gets the index (1). And the Accusative [-Nom] is linked to the noun kaan, so it gets the index (3). By LR-3, the Nominative of a transitive verb is an Agent, thus the Agent gets the index (1). And the Accusative is a Patient, so the Patient gets the index (3).

245. khwaam [ thii3 khaw klu@ ] thamhâj mâj klâa tham fact that he afraid make not brave do 'The fact that he is afraid makes him fear to do it.'

246. ry@ng [ thii3 fôn tok ] thamhâj rôt tît fact that rain fall make car stuck 'The fact that it rained caused the traffic jam.'
247. khwaamcing thîi₃, fôn tòk nàk mŷ@waan fact that rain fall heavy yesterday

thamhâj thanôn lyyn
cause road slippery

'The fact that it rained heavily yesterday caused the road to be slippery'

248. kaantòklongcaj thîi₃ cà? riëen tòÓ thamhâj decision that will study further make

tàm khajàn
Tum diligent

'The decision to further her study makes Tum work hard.'

In (247-248), the regent noun of the thîi₃ phrase is a verb nominalized by compounding with khwaam or kaan.

Even though noun complement clauses do not grammatically require a missing argument, some do allow one (249). When an argument is missing, no Chaining rule is available to recover it, so it must be analyzed as a zero pronominalization which will be interpreted by reference to the context of situation or context of discourse, a process which cannot be formulated as a structurally conditioned universal rule.

249. th@ chOop thîi₃ /\ kèp dOOkmâaj dâj
she like that pick flower can

'She likes that someone she knows (or anyone non-specific) can pick flowers.' Or 'She likes it that she herself can pick the flowers.'

The structure of (249) is shown below:
The missing argument marked with the feature [? [+Nom]] and [? [+AGT]] can be interpreted as anybody, e.g., th@@ or other pronouns, depending on the context of situation.

4.3.2. Potential modification of nominalized verbs

Some nominalized verbs which are introduced by kaan and khwaam not only allow a complement clause introduced by thiî, (250-251) but also alternatively a prepositional phrase introduced by wâa2, a complementizer preposition, as their dependent sisters (252-253). The thiî-phrase is an appositional or coreferential NP attribute of the regent noun, while the wâa2-phrase is a clause expressing the content of the regent noun.

250. khwaamkhiít [ thiî, look klom ] mii khon
      idea that earth round have people
      ţëndu@j maa naan lxw
      agree come long already

      'The idea that the earth is round has been agreed to by many people for a long time already.'

251. khwaamch@ [ thiî, rab@t p@rämënuu thamlaaj
      belief that bomb nuclear destroy
      look dâj ]
      earth get

      'the belief that a nuclear bomb can destroy the earth'
The idea that (has the content that) the earth is round has been agreed to by many people long ago.

The belief that (has the content that) a nuclear bomb can destroy the earth.

The functional difference between nominalized verb constructions introduced by kaan and khwaam which are followed by either thii j or wâ a 2 as their dependent sisters is partly carried by a difference in dependency structure. That is to say, the noun complement clauses in (250-251) have the structure in diagram A, whereas diagram B indicates the structure of the noun phrases in (252-253):

Diagram A:

\[
\begin{array}{c}
N' \\
| \\
| \\
| \text{thii}_3 \\
| \text{wâa}_2 \\
\end{array}
\]

Diagram B:

\[
\begin{array}{c}
N' \\
| \\
| \\
| \text{thii}_3 \\
| \text{wâa}_2 \\
\end{array}
\]

Not all nominalized verbs allow both thii j-phrase and wâa 2 -phrase as their dependent sisters. The nominalized verbs
which belong to the natural semantic class of verbs conveying perception, e.g., kaanrúu 'knowing', kaanhën 'seeing', and action, e.g., kaanphûut 'saying', kaanthamngaan 'working', kaantxxngtu@ 'dressing', etc. allow only a complementizer preposition wââ2 as their dependent sister, as in (254-255), but not thiï3, as shown in (254'-255'):

254. kaanrúu wââ2 lôôk klom thamhâj khon state of knowing that earth round make people chalaât khûn clever up

'Knowing that the earth is round makes people cleverer'

255. kaanphûut wââ2 phaasãa ?angkrit riôn ngaaj nân saying that language English study easy that pen sîng ly@chû be thing beyond belief

'Saying that English is an easy language to study is unbelievable.'

254'. *kaanrûu thiï3 lôôk klom thamhâj state of knowing that earth round make people chalaât khûn khon clever up

255'. *kaanphûut thiï3 phaasãa ?angkrit riôn ngaaj speaking that language English study easy nân mâj mìi khraj chû that not have who believe

Logically, we can say that these perception nominalizations allow an attribute giving the content of what was perceived, but that the situation perceived cannot
be identified with the perception of it. Similarly, the content of what was spoken is not identical to the act of speaking, the thing created by work is not identical to the act of working, etc.

The redundancy rule accounting for the non-cooccurrence of this type of nominalized verb with a complement clause introduced by thii, is formulated as follows:

\[ RR-25 \ [+\text{grnd}] \rightarrow [-[-\text{rltv}]] \]

Noun complement clauses do not allow anything to occur as their sister. This restriction will be stated as a part of the Omega rule.

4.4. **Classifier constructions**

A classifier construction is a construction having a classifier as its head and having one or both of two types of dependent sisters. A classifier can function as the head of a free noun phrase (256), or as the attribute of a regent noun (257):

\[
\text{lêm níi phxxng maak} \\
\text{clsf this expensive very} \\
\text{'This (book) is very expensive.'}
\]

The structure assigned to (256) is as follows:
Lêm is the head of the noun phrase lêm nii.

257. nãngsyy sãam lêm
    book three clsf
    'books which are three volumes'

The structure of (257) is shown below:

Sãam lêm is the attribute of the regent noun nãngsyy.

A classifier construction that functions as the attribute of a regent noun, like the words thi'i₂ and thi'i₃, is analyzed as a descriptive nominal relative clause. A descriptive nominal predicate is one which does not have its own independent referent. Rather, it states some property or class member of the subject (Starosta, Pawley, and Reid 1981).
A fully specified feature matrix of a classifier functioning as a predicate of an equational nominal relative clause is characterized as follows:

```
枭+Nom  
+clsf  
+prdc  
?+[Nom]  
?+[actr]!  
?+[PAT]  
?+[PAT]  
?+[F_i]  
-L-Nom  
```

As a nominal predicate (which is universally intransitive), a classifier implies a subject marked Nominative [+Nom] and a Patient [+PAT] case relation. The implied Nominative implies a subject as an actor. As a predicate, it imposes some set of selectional restrictions [?+[PAT, $\neq F_i$]] on its implied Patient subject. The feature [?+[PAT, $\neq F_i$]] suggests that the implied Patient of the classifier has some semantic feature that agrees with the classifier.

The structure of a classifier construction functioning as a predicational modifier is analyzed in the same way as any other relative clause. Any missing argument is interpreted by the same linking rules and chaining rules which are applicable to relative clauses (see section (4.2.) above). A classifier, as a nominal predicate, implies a Patient or a subject. As a predicate, it imposes a selectional interpretation on its subject.
The fully specified structure of (257) is shown below:

```
N'
    nãngsýy [+N ]
    [index]
    lêm
    Adj' [+N     ]
    |  +clsf    |
    saâm  [+prdc  ]
    [+Adj  ] [1[+Nom] ]
    [2index] [1[+actr] ]
    [1[+PAT] ]
    [-Nom   ]
    [index ]
```

When a classifier nominal predicate functions as a relative clause modifying a regent noun, it imposes selectional expectations on its missing subject; thus assume that lêm as a predicate marked for taking a subject which is [+papr, +bund] ([paper] and [bound]). By CR-1, the Patient of lêm is chained to the cap-commanding noun nãngsýy. By LR-5, the Patient is also marked Nominative, and by LR-2, the Nominative is the actor. Thus all the implied features of the classifier are marked with the same index (1). By the index-changing linking rule, the index of lêm is changed to the same index as the regent noun, nãngsýy.

Therefore, the implied Patient of lêm is the regent noun nãngsýy, and lêm interprets its Patient, here nãngsýy, as something bound and made of paper. If the regent noun does not satisfy the interpretation imposed by the classifier, the result is a selectional violation. The
semantic agreement of nouns and their classifiers then is just a special case of verb-subject selection.

4.4.1. Distribution of classifier constructions

As just noted, a classifier construction may occur in two different environments: as a free noun phrase or as a dependent sister of a head noun.

As a free noun phrase, a classifier construction can function as a subject (258), as an object (259), as the object of a prepositional phrase (260), or as a nominal predicate of a clause (261-262):

258. lêm nîi sũ@j cang clsf this beautiful indeed 'This one is beautiful indeed.'

The classifier construction lêm nîi functions as a subject of the clause.

259. chăn chôôp lêm jàj
I like clsf big
'I like the big one.'
The classifier construction lem jà́j functions here as an object of the verb chOOp.

260. khǻw tåxng khloong phy@ ch@bàp nî́i he compose poem for clsf this 'He composed a poem for this (volume of the magazine).'

The classifier construction ch@bàp nî́i functions as object of the preposition phy@.

261. bäån nî́i làng jà́j house this clsf big 'This house is big.'
The classifier construction làng jàj functions as nominal predicate of the clause.

262. nãngsyy lèm níí lèm jàj mâa̱k
book clsf this clsf big very
'a book which is this is a very big one.

Lèm jàj mâa̱k is the predicate of the whole sentence; whereas lèm níí is an attribute of the regent noun nãngsyy.

The linking and chaining relationship of (262) works in the same way as that of (257), thus the fully specified structure of (262) is shown below:
As a predicate, a classifier imposes selectional expectations on its subject; for example, lêm as a predicate might be marked for taking a subject which is, say, [+papr, +bund] ('paper' and 'bound'). Thus lêm as the predicate imposes the interpretation on its subject that the subject be 'paper' and 'bound'. The subject of this clause, nãngsyy lêm nïi, is compatible with this interpretation, but a noun phrase such as bànn nïi 'this house' would not be, resulting in a selectional violation:

263. ?bànn nïi lêm jàj màak
house this clsf big very

A classifier construction as a dependent sister, always modifies the regent noun. Not all regent nouns allow a classifier construction to modify them. Non-anaphoric nouns, i.e., a possessive noun and a relator noun, as well as non-classifier nouns, i.e., a relative noun, a
complementizer noun, and demonstrative pronouns are of this type (264-267). Non-relational nouns, proper nouns, personal and impersonal pronouns do allow a classifier construction as their sister (268-272).

264. *nii saam chin
   this three clsf
   [+N ] [+N ]
   [+dmns] [+clsf]

265. *kh00ng2 haa lem
   possession five clsf
   [+N ] [+N ]
   [-nphr] [+clsf]

266. *klaang saam ?an
   middle three clsf
   [+N ] [+N ]
   [-nphr] [+clsf]

267. *thii2 saam ?an
   that three clsf
   [+N ] [+Adj] [+N ]
   [-clsf] [+clsf]

268. kxxw baj
   glass clsf
   [+N ] [+N ]
   [-rltn] [+clsf]
   'a glass'

269. nangsyy saam lem
   book three clsf
   [+N ] [+Adj] [+N ]
   [-rltn] [+clsf]
   'three books'

270. lem jaj saam lem
     clsf big three clsf
     [+N ] [+N ]
     [+clsf] [+clsf]
     'the ones which are big which are three'

271. maalii khon rxxk (majcha) khon lang
     Mali clsf first not exactly clsf last
     [+N ] [+N ]
     [+prpr] [+clsf]
     'the first Mali (not the last one)'
The redundancy rule accounting for the cooccurrence restriction of the classifier and other nouns is formulated as follows:

RR-26 \([-\text{nphr}] \rightarrow \text{[-[+clsf]]}\)
\(<\text{-clsf} \>\)
\([-\text{dmns}]\)

4.4.2. Dependent sisters of classifier constructions

There are two types of dependent sisters of a classifier. One is an adjectival sister, which includes adjectives and quantifier adverbs. The other is non-adjectival sisters, which include every kind of attribute that appears to the right of a noun in an ordinary NP, plus several attribute types specific to classifier constructions.

4.4.2.1. Adjectival dependent sisters

Adjectives can only occur as dependent sisters of a classifier. A classifier noun with its adjectival sisters is marked with the feature [+dfnt] (definite). The following examples indicate different types of adjectives occurring as dependent sisters of a classifier.
272. nangsûy lêm thînînﬂng
book clsf first
[+N] [+clsf] [+Adj] [+nmrî]
'the first book'

273. nangsûy saâm lêm
book three clsf
[+N] [+Adj] [+clsf] [+nmrî]
'the three books'

274. nangsûy iîk lêm
book additional clsf
[+N] [+Adj] [+clsf] [+nmrî]
'an additional book'

275. nangsûy lâaj₂ sip lêm
book many ten clsf
[+N] [+Adj] [+Adj] [+clsf] [+nmrî]
'many tens of the books'

276. nangsûy saâm lêm rûxk
book three clsf first
[+N] [+Adj] [+N] [+Adj] [+clsf] [+nmrî]
'the first three books'

277. nangsûy pramaan laaj₁ lêm
book approximately many clsf
[+N] [+Adv] [+Adj] [+clsf] [+nmrî]
'rather many books'

278. nangsûy kyôp thûk₁ lêm
book almost every clsf
[+N] [+Adv] [+Adj] [+clsf] [+nmrî]
'almost every book'

279. nangsûy pramaan kyôp rûbôj lêm
book approximately almost hundred clsf
[+N] [+Adv] [+Adv] [+Adj] [+clsf] [+nmrî]
'approximately almost a hundred books'
Several types of adjectives can cooccur as the sisters of classifiers. The adjectives can be further modified by several types of quantifier adverbs.

4.4.2.1.1. Subcategorization of adjectives

The subcategorization tree for Thai adjectives is illustrated below:

```
[+Adj] /
 /  /
[-fore] [-sqnl] [+sqnl] [+fore] [+addv] [+set] [+nmrl]
  /
 /   /
/   /   
/   /   /
/   /   /
rx̱k  thi̱ṉy̱ng  la̱j̱  1-9  sip  i̱ik
first  first  a lot  1-9  ten  addition
```

Figure 8. Subcategorization of adjectives

Adjectives can be subcategorized first according to their cooccurring position with the classifiers into two subclasses: [+fore] (before).

SR-30  [+Adj]  -->  [+fore]

The adjectives marked with the feature [-fore] can be subcategorized into two subclasses: [+sqnl] (sequential).

SR-31  [-fore]  -->  [+sqnl]
The adjectives marked with the feature [+fore] can be subcategorized into two subclasses: [+addv] (additive).

SR-32  [+fore] --> [+addv]

The adjectives marked with the feature [-addv] can be subcategorized into two subclasses: [+set] (set).

SR-33  [-addv] --> [+set]

The adjectives marked with the feature [-set] can be subcategorized into two subclasses: [+nmrl] (numeral).

SR-34  [-set] --> [+nmrl]

The redundancy rule accounting for the cooccurrence restriction of classifiers and their adjectival sisters is formulated as follows:

RR-27  [+clsf] --> ⊓+ ([+Adj]) ⊔ (A)
| - [-fore] | (B)
| - [+fore] | (C)
| - [+Adj]   | [+sqnl] | (D)
| - [-nmrl]  | [+Adj] | (E)

Classifiers take adjectival attributes. All other word classes exclude them by the Omega rule (rule A) (see section 4.3.2.2.).

Classifiers never occur after the adjectives marked [-fore] (rule B), or before the adjectives marked [+fore] (rule C). The adjectives marked with the feature [+fore] can occur preceding a classifier more than once.

No adjective will cooccur with an adjectives marked with the feature [+sqnl] (rule D). Classifiers never allow
adjectives marked with the feature [-nmrl] and other adjectives to cooccur as sisters (rule E).

The rules exclude the following ungrammatical noun phrases:

281. *kaaw?i tu@ sãam Excluded by
      chair clsf three
      [+N] [+clsf] [+Adj] [+fore]
      [+nmrl]

282. *kaaw?i rxxk tu@ Excluded by
      chair first clsf
      [+N] [+Adj] [+clsf] [+clsf]
      [-fore] [+sqnl]

283. *kaaw?i sãam tu@ thiinyng Excluded by
      chair three clsf first
      [+N] [+Adj] [+clsf] [+Adj]
      [+fore] [-fore]
      [+nmrl] [+sqnl]

284. *phaa thuk phyyn rxxk Excluded by
      cloth every clsf first
      [+Adj] [+clsf] [+Adj] [+Adj]
      [-nmrl] [-fore]

Non-numeral adjectives can be further subcategorized as follows:
Figure 9. Subcategorization of non-numeral adjectives

Subcategorization rules for the non-numeral adjectives are formulated as follows:

The adjectives marked with the feature [-nmrl] can be subcategorized into two subclasses: [+nclv] (inclusive).

SR-35 [-nmrl] --> [+nclv]

The adjectives marked with the feature [-nclv] can be subcategorized into two subclasses: [+ntrg] (interrogative).

SR-36 [-nclv] --> [+ntrg]

The adjectives marked with the feature [-ntrg] can be subcategorized into two subclasses: [+many] (many).

SR-37 [-ntrg] --> [+many]

Some roots occur in both the adjective and adverb sets, e.g., laaj and thûk. They are related by the following derivational rules:
4.4.2.1.2. Subcategorization of quantifier adverbs

The quantifier adverbs can be subcategorized based on their hierarchical ordering when modifying adjectives as follows:

Figure 10. Subcategorization of quantifier adverbs

Subcategorization rules for the quantifier adverbs are formulated as follows:
The adverbs can be subcategorized into two subclasses:

[+prim] (prime).

SR-38 [+Adv] --> [+prim]

The adverbs marked with the feature [+prim] can be subcategorized into two subclasses: [+pprx] (approximate).

SR-39 [+prim] --> [+pprx]

The adverbs marked with the feature [-prim] can be subcategorized into two subclasses: [+addv] (additive).

SR-40 [-prim] --> [+addv]

The adverbs marked with the feature [+addv] can be subcategorized into two subclasses: [+xcsv] (excessive).

SR-41 [+addv] --> [+xcsv]

The adverbs marked with the feature [-addv] can be subcategorized into two subclasses: [+tttv] (tentative).

SR-42 [-addv] --> [+tttv]

The adverbs marked with the feature [-tttv] can be subcategorized into two subclasses: [+estm] (estimate).

SR-43 [-tttv] --> [+estm]

4.4.2.1.3. Cooccurrence restrictions between adjectives and quantifier adverbs

Numeral adjectives are the head of numerative constructions, and allow certain quantifiers as their dependent sisters. The following is a discussion of the cooccurrence restrictions between adjectives and adverbs.
1. Adjectives marked with the feature [-set], such as the numerals one through nine (1-9), do not allow the adverb marked with the feature [-xcsv], i.e., laaj₁ as their sister, e.g.,

285. *phåa laaj₁ saam mét
cloth a lot three meter

The redundancy rules accounting for the cooccurrence of non-set adjectives and the adverb laaj₁ is formulated as follows:

RR-24  [-set]  -->  [-xcsv]

2. The adjective marked with the feature [+many], i.e., laaj₂ only allows the adverb marked with the feature [-pprx], i.e., tång as its sister, as in (287), but not (288):
287. phâa tâng la̖aj₂ meēt
   cloth as much as a lot meter
   [+N] [+Adv] [+Adj] [+clsf]
   [-pprx] [+many]
   'lots of meters of cloth'

288. *phâa thâng la̖aj₂ meēt
   cloth include a lot meter
   [+N] [+Adv] [+Adj] [+clsf]
   [-estm] [+many]

This idiosyncratic property of the adjective la̖aj₂ is shown as follows:

   [+many]
   [-Adv]
   [-[-prim]]
   [-[-pprx]]

3. The adjectives marked with the feature [+ncls], i.e., thúk₂ and that marked with the feature [-many], i.e., baang do not allow adverbs as their sisters, e.g.,

289. *ng@n ky̖p thúk₂ ba̕at
   money almost every baht
   [+Adv] [+Adj] [+clsf]
   [+ncls]
   'money for almost every baht'

290. *ng@n kh@x thúk₂ ba̕at
   money only every baht
   [+Adv] [+Adj] [+clsf]
   [+ncls]
   'money for only every baht'

291. *phâa tâng baang meēt
   cloth a lot some meter
   [+Adv] [+Adj] [+clsf]
   [-many]

The redundancy rules accounting for the non-occurrence of the adjective thúk₂ and baang with adverbs is formulated as a part of the Omega rule.
5. The adjective marked with the feature [+ntrg], i.e., kìi only allows the adverb marked with the feature [+estm], i.e., sàk and that marked with the feature [+pprx], i.e., pramaan as its sisters as in (292), but not (293):

\[
\text{292. phāa sàk kìi meēt} \\
\text{cloth about how many meter} \\
\text{[+Adv] [+Adj] [+clsf]} \\
\text{[+estm] [+ntrg]} \\
\text{'about how many meters of cloth'}
\]

\[
\text{293. *phāa thāng kìi meēt} \\
\text{cloth include how many meter} \\
\text{[+Adv] [+Adj] [+clsf]} \\
\text{[-estm] [+ntrg]} \\
\]

This idiosyncratic property of the adjective kìi is shown as follows:

\[
[[-ntrg] ] \\
\text{[+Adv]} \\
\text{[-[+pprx]]} \\
\text{[-[+tttv]]} \\
\text{[-[+estm]]} \\
\text{[-[+addv]]}
\]

4.4.2.1.4. Cooccurrence restrictions among quantifier adverbs

Quantifiers as adverbs can be divided into two subclasses with reference to their hierarchical order: class I and class II. The quantifiers in class I are marked with the feature [+prim], e.g., pramaan and thāng. The rest of the quantifiers are in class II and are marked with the feature [-prim], e.g., thūk₁, thāng, khxα, sàk, kyēp, lāaj₁, and kwāa.
The adjectival sisters of a classifier show left-branching modification, and the quantifier adverbs of these adjectives are also the adverbs in class I, which always precede those in class II.

The following are some cooccurrence restrictions between the quantifiers in class I and those in class II.

1. Quantifiers marked with the feature [-estm], i.e., thúk, thăng, and khhx do not allow the quantifiers in class II, which are marked with the feature [+prim], i.e., pramaan, tâng as their sisters, e.g.,

294. *phâa tâng thăng sip mét
cloth as many as every ten metre

295. *phâa pramaan khhx sip mét
cloth approximate only ten metre

"The cloth approximately only ten metres"
The redundancy rule accounting for this cooccurrence restriction is formulated as follows:

RR-28 \([-\text{estm}] \rightarrow [-[+\text{prim}]]\)

2. The quantifier marked with the feature \([+\text{estm}]\), i.e., \(\text{sàk}\) does not allow the quantifier marked with the feature \([-\text{pprx}]\) \(\text{tång}\) (296), but allows \(\text{pramaan}\) as its sister (297):

296. \(\text{phàa}\ \text{tång}\ \ \text{sàk}\ \ \text{sip}\ \ \text{meéet}\)

\(\text{cloth as much as about ten metre}\)

\([+\text{N}] \ [+\text{Adv}] \ [+\text{Adv}] \ [+\text{Adj}] \ [+\text{clsf}]

\([-\text{pprx}] \ [+\text{estm}] \ [+\text{set}]\)

297. \(\text{phàa}\ \text{pramaan}\ \ \text{sàk}\ \ \text{sip}\ \ \text{meéet}\)

\(\text{cloth approximate about ten metre}\)

\([+\text{N}] \ [+\text{Adv}] \ [+\text{Adv}] \ [+\text{Adj}] \ [+\text{clsf}]

\([+\text{pprx}] \ [+\text{estm}] \ [+\text{set}]\)

'about ten metres of cloth'

This idiosyncratic lexical property can be stated as follows:

\(\text{sàk}\)

\([+\text{estm}]\)

\([+\text{Adv}]\)

\([-[-\text{pprx}]]\)

3. The quantifier marked with the feature \([+\text{tttv}]\), i.e., \(\text{kyèp}\) allows the quantifier marked with the feature \([-\text{pprx}]\), i.e., \(\text{tång}\) (298) but not that quantifier marked with the feature \([+\text{pprx}]\), i.e., \(\text{pramaan}\) (299) as its sister.

298. \(\text{phàa}\ \text{tång}\ \ \text{kyèp}\ \ \text{hàa}\ \ \text{meéet}\)

\(\text{cloth as much as almost five metre}\)

\([+\text{N}] \ [+\text{Adv}] \ [+\text{Adv}] \ [+\text{Adj}] \ [+\text{clsf}]

\([-\text{pprx}] \ [+\text{tttv}] \ [+\text{nmrl}]\)

'as much as almost five meters of cloth'
This idiosyncratic lexical property can be stated as follows:

\[
\begin{align*}
kyêp & \quad [+tttv] \\
| +Adv & \\
| - [+pprx] &
\end{align*}
\]

The adjective marked with the feature [+addv], i.e., ?iik can occur with classifiers, as well as every adjective and adverb (300-302). It is considered to directly modify the classifier whenever it occurs.

\[
\begin{align*}
300. \quad phâa \quad ?iik \quad tâng \quad sip \quad meêt & \quad cloth \ addition \ as \ much \ as \ ten \ metre \\
[+N] & \quad [+Adj] \quad [+Adv] \quad [+Adj] \quad [+clsf] \quad [+addv] \quad [-pprx] \quad [+nmrl]
\end{align*}
\]

'as much as ten meters of additional cloth' or 'as much as ten additional meters of cloth'

\[
\begin{align*}
301. \quad phâa \quad ?iik \quad kwâa \quad sip \quad meêt & \quad cloth \ addition \ more \ ten \ metre \\
[+N] & \quad [+Adj] \quad [+Adv] \quad [+Adj] \quad [+clsf] \quad [+addv] \quad [+xcsv] \quad [+nmrl]
\end{align*}
\]

'the addition of more than ten meters of cloth'

\[
\begin{align*}
302. \quad nângsyû \quad ?iik \quad lâajj \quad lêm & \quad book \ addition \ many \ clsf \\
[+N] & \quad [+Adv] \quad [+Adv] \quad [+clsf] \quad [+addv] \quad [-xcsv]
\end{align*}
\]

'many more books'

The following exemplifies the left branching modification of the classifier construction in Thai:

\[
\begin{align*}
303. \quad phâa \quad ?iik \quad pramaan \quad lâajj \quad sip \ meêt & \quad cloth \ addition \ approximate \ many \ ten \ metre \\
[+N] & \quad [+Adj] \quad [+Adv] \quad [+Adj] \quad [+clsf] \quad [+addv] \quad [-pprx] \quad [+nmrl]
\end{align*}
\]

'the addition of some tens of meters of cloth'
4.4.2.2. Non-adjectival dependent sisters

Classifiers, since they are nouns, have all the potential modification possibilities that non-relational nouns do. In fact, as will be explained below, they have greater modification potential than non-relational nouns: they can be directly modified by a verbal stative clause, a prepositional phrase, a nominal relative clause, a relator noun phrase, a possessive phrase or a determiner, and in addition, they can be modified by an additional classifier construction.

The non-adjectival sisters of a classifier construction are occur in either of two classes depending on whether or not they can cooccur with adjectival modifiers. The first subclass includes prepositional phrases and noun phrases, both of which have nouns as heads of their construction,
i.e., a relator noun phrase, a possessive noun phrase, and a nominal relative clause. The second subclass is composed of verbal stative clauses and determiners. They cooccur with adjectival sisters with some restrictions, as will be discussed in the following section. First I will discuss the first subclass of non-adjectival dependents of classifiers.

A classifier allows non-adjectival sisters in the first subclass to cooccur with an adjectival sisters, e.g.,

304. kulāap saām dōok bon tō?
rose three clsf top table
 [+N] [+Adj] [+N] [+N]
[+nmrl] [+clsf] [+rltr]
'three roses on the table'

305. kulāap saām dōok khōong₂ chān
rose three clsf possession I
 [+N] [+Adj] [+N] [+N]
[+nmrl] [+clsf] [-rltr]
'three roses of mine'

306. kulāap saām dōok thīi₂ syy my@waan
rose three clsf that buy yesterday
 [+N] [+Adj] [+N] [+N]
[+nmrl] [+clsf] [+rltr]
'three roses that were bought yesterday'

307. kulāap saām dōok phy@ khun
rose three clsf for you
 [+N] [+Adj] [+N] [+P]
[+nmrl] [+clsf]
'three roses for you'

308. māa tu@ ?uën tu@ thīi₂ k@t màj
dog clsf fat clsf that born new
 [+N] [+N] [+N]
[+clsf] [+rltv]
'a new-born fat dog'
Every second attribute of a classifier construction is analyzed as a dependent sister of the classifier, not of the regent noun. The reason for this can be explained by considering the following example:

309. maka tu@ ?u@n saam tu@
dog clf fat three clf
'three fat dogs'

The different analyses of (309) are shown in the following diagrams:

Diagram A:

```
  N'
   `/--
   |
 mau [N]  N'  N'
   `/--
   |
 tu@ [+clf] V' Adj' [+clf]
   `/--
   |
 ?u@n saam [V] [+Adj]
```

Diagram B:

```
  N'
   `/--
   |
 mau [N]  N'
   `/--
   |
 tu@ [+clf] V' N'
   `/--
   |
 ?u@n [+V] Adj' tu@ [+clf]
   `/--
   |
 saam [+Adj]
```
We can determine which of these analyses is correct by omitting the regent noun māa and finding out if the remaining sequence, tu@ ?u@n såam tu@, is a grammatical free noun phrase, and in fact it is. This indicates that the structure in diagram B is preferable because in that analysis, tu@ ?u@n såam tu@ forms a constituent, as shown in B', but in diagram A, it does not, as shown in A'. In B', the second classifier construction, såam tu@ still has a regent, that is the classifier tu@. On the other hand, if māa in diagram A is left out, the second classifier will not have any regent to hang from, as in (A').

*A':

```
N'  
|   
| tu@ [+clsf]  
  V'  Adj' [+clsf]  
    |    |  
  ?u@n såam [+V] [+Adj]
```

*B':

```
N'  
|   
| tu@ [+clsf]  
  V'  N'  
    |    |  
  ?u@n Adj'  
    | [+clsf]  
  såam [+Adj]
```
As a result every attribute that follows a classifier will be treated as a dependent sister of the classifier, not of the regent noun.

That a classifier and its dependent sister forms one single unit can be further supported by the fact that this kind of construction can occur as a subject (310'), or as an object of a clause (311'):

310. A: maaS jUu thiiNaj
dog exist where
'Where are the dogs?'

310'. B: tu@ ?u@n saam tu@ nOOn jUu naj klOOn
clsf fat three clsf sleep exist in box
'The three fat ones are sleeping in a box.'

311. A: sy' khiiék hAj maaS r@'
buy cake give dog question marker
'Did you buy a piece of cake for the dogs?'

311'. B: chii hAj tu@ ?u@n saam tu@ thi'2 phii
yes give clsf fat three clsf that just
k@t mAj ngaj
born new final particle

'Yes, for the three fat dogs that were just born.'

A classifier allows a classifier construction as a sister under the condition that the classifier in the dependent construction is the same as the classifier which heads the construction, e.g,
312. khaâw naj thâng baj thiî₂ sîy cãak jiîpûn
trace in bag clsf that buy from Japan
sãam baj
three clsf

'rice in the three bags that were newly bought from Japan.'

The structure assigned to (312) is shown below:

The noun phrase in (312) has the same classifiers, baj. The second classifier is the sister and attaches to the first classifier, not the regent noun khaâw. The evidence for this is the fact that the regent noun khaâw does not allow baj as its sister because the semantic expectation of baj does not correspond to khaâw (313), but to thâng (314).
In addition, the first classifier allows the second classifier as its sister (315-316):

313. *khaaw saam baj
   rice three clsf
   'the rice which were three'

314. thang saam baj
   bag three clsf
   'the bags which were three'

315. thang baj thii2 syy caka jipun saam baj
    bag clsf that buy from Japan three clsf
    'the bags that were bought from Japan which were
    three'

316. baj thii2 syy caka jipun saam baj
    clsf that buy from Japan three clsf
    'the ones that were bought from Japan which were
    three'

If a sequence of two classifier constructions occurs in which the classifiers are different, the second classifier cannot be a sister of the first classifier. It must be a dependent sister of some preceding head noun with which its semantic features agree, e.g.,

317. khaaw naj thang baj thii2 syy caka jipun
    rice in bag clsf that buy from Japan
    saam krasOOp
    three clsf
    'three sacks of rice in the bags that were newly bought from Japan.'

The structure assigned to (317) is shown below:
In (317), there are two different classifiers, baj and krasØop. The classifier krasØop is a sister of the regent noun khåaw; whereas the classifier baj is a sister of the head noun thång. The semantic expectation of krasØop corresponds to khåaw (318), but not to thång (319):

318. khåaw sãam krasØop
    rice three clsf
    'rice which were three sacks'

319. *thång sãam krasØop
    bag three clsf

If two classifier constructions cooccur, one is indefinite, having a classifier and a verbal stative sister, the other is definite, having a numeral adjective and a
classifier. The regent noun cannot impose the order on the second classifier, rather it imposes constraints on the first classifier, and the first classifier in turn imposes requirements on the second classifier. Thus, the indefinite classifier always precedes the definite classifier, as in (320), but not (321):

320. cxxkan baj lék sa'äm baj jùù bon
vase clsf small three clsf exist top

\[ [+N] [+clsf] [+V] [+Adj] [+clsf] \\
\[ -dfnt] [+nmrl] [+dfnt] \]

tó?
table

'Small vases which are three are on the table.'

321. *cxxkan sa'äm baj baj lék jùù bon
vase three clsf clsf small exist top

\[ [+N] [+Adj] [+clsf] [+clsf] [+V] \\
\[ +nmrl] [+dfnt] [-dfnt] \]

tó?
table

The structure of the noun phrase (320) is as follows:
A noun phrase in which an indefinite classifier has a definite classifier as its sister is grammatical, but the reverse order is not.

The redundancy rule accounting for this is formulated as follows:

\[
\text{RR-29} \quad [+\text{clsf}] \rightarrow [-[+\text{clsf}]] \\
[-\text{dfnt}]
\]

Note the following ungrammatical structure in which an indefinite classifier is a dependent sister of a definite classifier:

\[
*N' \quad \text{cxxkan} \quad [+N] \\
\quad \text{baj} \\
\quad \text{ ADJ'} \quad [+N] \quad N' \\
\quad \text{ saam } \quad [+\text{clsf}] \\
\quad \text{ [+]Adj} \\
\quad \text{ baj} \quad [-\text{dfnt}] \quad N' \\
\quad \text{ [+N]} \quad V' \\
\quad \text{ [+clsf]} \\
\quad [-\text{dfnt}] \quad \text{ lék} \\
\quad \text{ [+V]}
\]

Having discussed classifiers having a noun phrase as its dependent sisters, I shall now turn to the second type of sister of a classifier construction.

**4.4.3. Classifiers and verbal clauses**

Classifiers allow verbal stative clauses as their dependent sisters (322). This type of classifier will be marked with the feature [-dfnt].
Since a classifier with a non-adjectival dependent is marked for the feature $[-\text{dfnt}]$, it does not cooccur with an adjective marked with the feature $[+\text{fore}]$, since $[+\text{fore}]$ adjectives only occur as dependents of definite regent nouns, e.g.,

323. *kulaap saam d00k jâj
    rose three clsf big
    'three roses which are big'

If the stative verb is in a reduplicated form, which is marked by the feature $[+\text{dfnt}]$, the noun phrase is grammatical, e.g.,
Thus, a derivation rule for reduplicative stative verbs needs to be formulated as follows:

\[ \text{DR-3} \quad [+V \rightarrow [+V \rightarrow [+sttv] \rightarrow [+sttv] \rightarrow [+F_1 \rightarrow [+F_1 \rightarrow [+ntns] \rightarrow [+ntns] \text{] \rightarrow [+dfnt] \text{]} \rightarrow [+dfnt] \text{]} } \]

The redundancy rule accounting for this cooccurrence restriction of a classifier and an adjectival sister with a verb is accounted for by the combination of the following rules:

\[ \text{IRR-23} \quad [+N \rightarrow [+dfnt] \text{]} \rightarrow [+dfnt] \text{] } \]

\[ \text{RR-30} \quad [+N \rightarrow [-[ntns] \text{]} \rightarrow [-[ntns] \text{]} \rightarrow [-[ntns] \text{]} \rightarrow [-[ntns] \text{]} \]

\[ \text{RR-31} \quad [+N \rightarrow [-[ntns] \text{]} \rightarrow [-[ntns] \text{]} \rightarrow [-[ntns] \text{]} \rightarrow [-[ntns] \text{]} \]

A definite noun allows only [+ntns] stative attributes, and indefinite nouns exclude [+ntns] stative attributes.

A classifier also allows both an adjective marked with the feature [-fore] and a reduplicative stative verb (325-326), not an ordinary stative verb (327), to occur as co-sisters.
325. บ้าน  LARGE  first  very big
house  clsf  first  very big
(+clsf)  [+Adj]  [+V]
[-fore]  [+sttv]  [+ntns]
'the first very big house'

326. ถนน  SMALL  third  big
street  clsf  third  big
(+clsf)  [+Adj]  [+V]
[-fore]  [+sttv]  [+ntns]
'the third very big street'

327. บ้าน  LARGE  first  big
house  clsf  first  big
(+clsf)  [+Adj]  [+V]
[-fore]  [+sttv]  [+ntns]

The redundancy rule accounting for this cooccurrence
restriction is formulated as follows:

RR-32  [+clsf]  -->  [-][-fore]  [+V]
        [+sttv]  [-ntns]

4.4.4. Classifiers and determiners

Classifiers do not cooccur with locative determiners,
as in (328-329), but do allow demonstrative determiners as
in (330-331):

328. *ต้น  nii2
clsf  here
(+N)  [+Det]
[-clsf]  [-dmns]

329. *นังสี  lem  năn2
book  clsf  there
(+N)  [+Det]
[-clsf]  [-dmns]
The redundancy rule accounting for this restriction is formulated as follows:

\[ RR-33 \quad [+\text{clsf}] \rightarrow [- [+\text{Det}]] \]

Normally a determiner can directly modify a head noun. However, if there is a classifier, a determiner cannot occur as a modifier of the regent noun, but can only appear as a modifier of the classifier, e.g.,

332. sy@ saam tu@ nìi
   blouse three clsf this
   'these three blouses'

The justification for the claim that the determiner is an attribute of the classifier rather than of the regent noun in such a construction is given in section (3.5.) above.
Having discussed the classifier construction, I shall now turn to the possessive constructions.

4.5. Possessive constructions

The possessive construction is treated as a descriptive nominal predicate modifier of regent nouns. Evidence for this claim is the fact that the possessive noun khoōng₂ can occur with the same meaning as the predicate of a free clause, e.g.,

333. bān níi khoōng₂ chān
house this possession I
'This house is mine.'

\[
S \rightarrow \text{nōng₂} \quad \text{N'}^N \quad \text{N'}^{+prdc} \quad \text{chān}
\]

\[
bān \quad \text{Det'} \quad \text{níi}
\]

Khōong₂, as a relational noun is syntactically different from khoōng₁ which is a non-relational noun. As a relational noun, khoōng₂ can be a dependent sister of a non-relational noun (334-335) (see section 2.3.1.1.), but a non-relational noun cannot be a sister of a noun which is marked by the same feature (336) (see section 2.3.1.2.):

334. khoōng₁ khoōng₂ chān
thing possession I
[-rltn] [+rltn]
'a thing that is a possession of mine'
335. ?aahkan khőong₂ thaj food possession Thai
[-rltn] [+rltn]
'a food that is a possession of Thai people'

336. *nákri@n chaat student nation
[-rltn] [-rltn]
'a student that is a possession of the nation'

Khőong₂ functioning as an attribute of a regent noun, like thii₂, thii₃, and classifiers as discussed earlier in this section, is treated as an equational nominal predicate. It has the following fully specified feature matrix:

```
khőong₂
| +N |
| +prdc |
| -dfnt |
| ?[+Nom] |
| ?[+actr] |
| ?[+PAT] |
| ?[-Nom] |
| ?[+COR] |
```

As a predicate, khőong₂ implies a Nominative subject which is also marked with the actor macro-role. By the Patient Centrality Hypothesis, every predicate expects a Patient. Khőong₂ also requires an immediate dependent sister marked with an accusative object, which implies a Correspondent case relation. Khőong₂ by itself cannot be a case-bearng attribute of any dependent.

The linking and chaining relationship of khőong₂ and its subject is accounted for by the same rules that accounts for the interpretation of a missing argument of relative
clauses, noun complement clauses, and classifier constructions.

Since khǒ̄̄ng₂ requires an accusative object marked with the Correspondent case relation, this linking rule needs to be formulated as follows:

LR-7 \( ?[-\text{Nom}] \rightarrow [n[-\text{Nom}]] / [-\text{Nom}] \)

This external valence linking rule states that an implied non-Nominative gets the same index as its immediate dependent.

LR-8 \( h[-\text{Nom}] \rightarrow [n[+\text{COR}]] \)

This internal valence linking rule states that an implied Correspondent gets the same index as the non-Nominative.

The following illustrates the full structure of khǒ̄̄ng₂ functioning as the predicational attribute of a regent noun:

337. bān khǒ̄̄ng₂ chǎn sǔ@j cang
    house possession I pretty indeed
    'the house which is mine is very pretty.'
The possessed noun *khōong₂ chan* is a nominal predicate, which is cap-commanded by *baan*, the head of the noun phrase. By CR-1, The Patient of *khōong₂* is chained with the cap-commanding noun *baan*. By LR-5, the Patient is a Nominative, and by LR-2, the Nominative is also an actor. Thus, all these implied features are marked with the same index (1).

By LR-7, the non-Nominative of *khōong₂* is linked with *chan*, it is marked with the index (3). By LR-8, the correspondent is linked with the non-Nominative, thus it gets the index (3).

This type of possessive construction in Thai can be divided in two ways--direct possession or indirect possession, depending on whether the possessor is introduced by *khōong₂* or not.
4.5.1. Direct possession

By SR-8, non-relational nouns in Thai are subcategorized into two subclasses: [+pssd]. Nouns marked with the feature [+pssd] occur in the direct possessive construction.

By IRR-14 repeated here below:

\[
\text{IRR-14} \quad [+pssd] \rightarrow [?-[-Nom] \uparrow \mid[?[-[+COR]] \downarrow \mid [+( [+prnn])] ]
\]

the dependent sisters of possessed nouns are marked with the feature [-Nom] (non-Nominative) and [+COR] (Correspondent). They allow, but do not require, pronouns as their sisters.

Besides pronouns, possessed nouns also allow non-relational nouns, or proper nouns as their sisters. Directly possessed nouns semantically include three subclasses of nouns: kinship terms, body parts, and part-of-the-whole nouns.

This subclass of nouns allows either pronouns (338-340), or proper nouns (341-342), or non-relational nouns (343), or concrete interrogative pronouns (344) but not relational nouns (345-346), or abstract interrogative pronouns (347) as their sisters:

338. m̄nx  chân
mother  I
[+N  ] [+prnn]
[+pssd]
'my mother'
339. bàän chan
  house I
  [+N] [+prnn]
  [+pssd] 'my house'

340. chaät chan
  nation I
  [+N] [+prnn]
  [+pssd] 'my nation'

341. mxxw pük
  cat Pük
  [+N] [-prnn]
  [+pssd] 'Pük's cat'

342. khaä nO0ng
  legs younger sibling
  [+N] [-prnn]
  [+pssd] 'younger sibling's legs'

343. plyäk tônmaäj
  bark tree
  [+N] [-rltn]
  [+pssd] 'bark of a tree'

344. bàän khraj
  house who
  [+N] [+prnn]
  [+pssd] [+ntrg] [-bstr]
  'a house belonging to who'; 'whose house?'

345. *bàän naj
  house in
  [+N] [+rltn]
  [+pssd]

346. *khaä ?an
  leg clsf
  [+N] [+rltn]
  [+pssd]

347. *nängsyë jangraj
  book how
  [+N] [+ntrg]
  [+pssd] [+bstr]
As mentioned above, possessive nouns only allow non-relational nouns, pronouns, or proper nouns as sisters in a possessive construction. The following redundancy rule accounts for the non-occurrence of other types of NP attributes:

RR-34 [+pssd] --> [- [+rltn] ]
                   [- [+ntrg] ]
                   [- [+bstr] ]

The structure assigned to (338) indicating direct possession is illustrated below:

```
N'
| | | | | |
| mx | | | N'
N | +N [+] rltn [+] bstr [+] pssv [+kinds] [+([+prnn])]
| [-Nom] [+] Nom | | COR |
| [-Cor] | | [2index] |
```

The noun mx is directly possessed by a pronoun chan.

By LR-7, the non-Nominative is marked with the same index of an immediate dependent which matches the same features, thus it is marked with the index (2). By LR-8, the implied Correspondent is linked with the non-Nominative, thus it is marked with the index (2).

4.5.2. Indirect possession

Nouns that are marked with the feature [-pssd] are indirectly possessed nouns. They do not allow non-
relational nouns as their immediate dependent sisters. Instead, they can only be possessed using khOong2 as a descriptive nominal predicate attribute.

By IRR-14 repeated here as follows:

IRR-14  [-rltr]  -->  ?([-Nom]) ?([+COR]) [+([-prnn])]

KhOong2 implies a non-Nominative, Correspondent dependent sister, it allows a non-pronoun as a sister. The subclasses of dependent sisters of KhOong2 is the same as those of possessed nouns, e.g., pronouns (348), proper nouns (349), or non-relational nouns (350). KhOong2 does not allow relational nouns, e.g., classifiers, the relative noun, or relator nouns, as its dependent sisters (351-353):

348. naali'kaa khOong2  khaw
  watch  possession he
  [+N ] [+N ] [+N ]
  [-pssv] [-rltr] [+prnn]
  [-bstr] [+prdc] [-Nom ]
  \[ COR \]

'his watch'

349. nangsyy khOong2  nok
  book  possession nok
  [+N ] [+N ] [+N ]
  [-pssv] [-rltr] [+prnn]
  [-bstr] [+prdc] [-Nom ]
  \[ COR \]

'Nok's book'

350. mxphim khOong2  chaat
  teacher  possession nation
  [+N ] [+N ] [+N ]
  [-pssv] [-rltr] [+prnn]
  [-bstr] [+prdc] [-Nom ]
  \[ COR \]

'a teacher of the nation'
The redundancy rule accounting for the non-occurrence of the possessive noun and a relational noun is formulated below:

\[
\text{RR-35 } [-\text{rltr}] \rightarrow [- [+\text{rltn}]]
\]

The full structure assigned to (348) is illustrated below:

\[
\begin{align*}
N' \mid \\
mx\xphim \mid \\
[+N] \mid \\
[+rltn] \mid \\
[\text{Index}] \mid \\
kh\Ongg \mid \\
[+N] \mid \\
[+rltn] \mid \\
[+\text{prdc}] \mid \\
\text{ch\at} \mid \\
[1[+\text{actr}]] \mid \\
[1[+\text{Nom}]] \mid \\
[1[+\text{PAT}]] \mid \\
[3[-\text{Nom}]] \mid \\
[3[+\text{COR}]] \mid \\
[2\text{index}]
\end{align*}
\]
By CR-1, the Patient of khOONG₂ is chained to the cap-commanding noun m̄ɔxphim. By LR-5 and LR-2, the Patient is a Nominative, and the Nominative is an actor, thus they are all marked with the index (1).

By LR-1, the Accusative Correspondent of khOONG₂ is linked with the noun chaāt, thus it is marked with the index (3).

The difference between direct possession and indirect possession can be explained in the following ways. A noun marked with the Correspondent case relation in a direct possessive construction is treated as the possessor of its regent noun. In an indirect possessive construction, that Correspondent noun is the possessor of khOONG₂. KhOONG₂ in turn is an equational predicate which signifies the relationship with its cap-commanding noun. It interprets its implied Nominative Patient as the cap-commanding noun. Thus a noun phrase such as nāṅɡsyy khOONG₂ nok could be paraphrased as 'the book which is a possession of Nok'.

4.6. Relator nouns

Relator nouns are nouns which are marked with the feature [+rltr] (relator). Relator nouns serve to carry the case-marking burden within the nominal phrases in which they occur. They occur as lexical heads of their noun phrases, functioning to exclusively carry the localistic feature of
such noun phrases (Kullavanijaya 1974:89, Starosta 1984:139).

Relator nouns, in other words, add semantic content to noun phrases, or provide localistic properties as well as semantic information needed by their cooccurring regents (Sayankena 1985:82), e.g.,

354. naam naj tum
   'water in the jar'

The regent noun naam cap-commands its attribute, the relator noun naj which is marked with the Locus case relation. Semantically, this phrase refers to tum 'jar' as the locus of naam 'water'. However, tum cannot be marked directly for the case relation LOC because the Thai case-marking system requires all LOC actants to have a [+lctn] case marker, and the lexical entry for tum does not carry this feature. Therefore, the relator noun naj is needed to add localistic content to its immediately following sister tum.
A relator noun also occurs in a clause to add localistic content required by a regent verb, e.g.,

\[ 355. \] *naǎm jùu tum
water exist jar
\[ [+N] [+V] [+N] \]
\[ ?[+LOC] ]
\[ ?[+lctn] ]

\[ 356. \] naǎm jùu naj tum
water exist in jar
\[ [+N ] [+V ] [+N ] [+N ] \]
\[ [1index] [3[+LOC] ] [+rltr ] [+Nom ] \]
\[ [3[+lctn] ] [+lctn ] [ COR ] \]
\[ [2index ] [ LOC ] [4index ] \]
\[ [4[-Nom] ] \]
\[ [4[+COR] ] \]
\[ [3index ] \]

'Water is in the jar.'

The noun tum 'jar' is not eligible to appear as the inner locus of the location verb jùu (355). The relator noun naj, which marks a localistic property, satisfies the Locus requirement of the verb jùu. Thus the noun tum becomes part of the Locus cooccurring with the main verb.

The structure of a relator noun phrase is different from that of a prepositional phrase. That is, a relator noun phrase is endocentric, the relator noun as the nominal head of a noun phrase carries all the localistic features for the whole noun phrase. A prepositional phrase on the other hand is exocentric, the preposition being a lexical head and a noun phrase (or a sentence) the phrasal co-head. Both the preposition and its following head noun contribute
case-marking features for the whole noun phrase (Starosta 1988:202).

The structure assigned to the noun phrase consisting of a regent noun and its relator noun sister is shown as follows:

357. nok bon faa
    bird top sky
    'a bird in the sky'; lit. 'bird at the sky's top'

                   N'
r
       nok           |  N'
[+N]                |   bon
|-rltn              |  N'
|2{[+lctn]}        |  [+N]   |  N'
|2{[+LOC]}         |  [+rltr] |
|index              |  [+lctn] | faa
|LOC                |  [+N]   |
|3[-Nom]            |  [-Nom] |
|3[+COR]            |  [COR]  |
|2ndex              |  [3ndex] |

The regent noun nok cap-commands its attributes, which consist of the relator noun bon marked with the Locus case relation. The relator noun bon requires the immediately following Correspondent sister faa.

Relator nouns in Thai are different from other Locative nouns in that they are bound, that is, they require as their dependent sisters either a following non-relational noun (358), a demonstrative determiner (359) or a classifier (360), but not a verb (361), locative determiner (362), non-classifier noun (363), or non-anaphoric noun (364):
358. bàin klaang naa
house middle field
[+N] [+N] [+N]
[+rltr] [-rltn]
[+lctn]
LOC 
'a house in the middle of the field'

359. naj nîi
in this
[+N] [+dms]
[+rltr]
[+lctn]
LOC 
'in this one'

360. naj lêm nîi
in clsf this
[+N] [+clsf]
[+rltr]
[+lctn]
LOC 
'in this volume'

361. *bon syý
on buy
[+N] [+V]
[+rltr]
[+lctn]
LOC 

362. *naj nîi
in here
[+N] [-dms]
[+rltr]
[+lctn]
LOC 
'in here'

363. *naj thi tham mà
in that do new
[+N] [-clsf]
[+rltr]
[+lctn]
LOC 

364. *naj khOong khâw
in possession he
[+N] [-nphr]
[+rltr]
[+lctn]
LOC 

The following redundancy rule accounts for the non-occurrence of relator nouns with locative determiners, non-classifier nouns, and non-anaphoric nouns:

\[
\text{RR-36} \quad [+\text{rltr}] \rightarrow \left\{ \begin{array}{l}
[-\text{dmns}] \\
[-\text{clsf}] \\
[-\text{nphr}] 
\end{array} \right.
\]

The non-cooccurrence of relator nouns and verbs will be stated as a part of the Omega rule.

### 4.6.1. Subcategorization of relator nouns

The following list of relator nouns in Thai was first proposed by Clark (1975:239) in connection with her lexicase analysis of the subcategory of nouns in Vietnamese.

Subcategorization tree for relator nouns is shown below:

```
|+N   |
|+rltn|
|+rltr|
\ /   \ /  
\[-rfrn]\ [+rfrn]
```

Figure 11. Subcategorization of relator nouns

First, relator nouns are subcategorized into two major subclasses: [+rfrn] (referential).

\[
\text{SR-44} \quad [+\text{rltr}] \rightarrow [+\text{rfrn}]
\]
Figure 12. Subcategorization of non-referential relator nouns

Relator nouns marked with the feature [-rfrn] can be subcategorized into two subclasses: [+term] (terminus):

SR-45 [-rfrn] --> [+term]

Relator nouns marked with the feature [-term] can be subcategorized into two subclasses: [+drcn] (direction):

SR-46 [-term] --> [+drcn]

Relator nouns marked with the feature [+term] and [-drcn] can be subcategorized into two subclasses: [+srce] (source):

SR-47 [+term] --> [+srce]

[-drcn]
Relator nouns marked with the feature [+srce] can be subcategorized into two subclasses: [+ncls] (enclosure):

SR-48 [+srce] --> [+ncls]

Relator nouns marked with the feature [-srce] can be subcategorized into two subclasses: [+pnct] (punctual):

SR-49 [-srce] --> [+pnct]

The subcategorization tree for referential relator nouns is shown below:

```
/     \
/      \ [+rltnl]
|       |
|       |
|       |
/+rfrn|   [+ncls]
\     /     \
[-nels]    [+ncls]
```

Figure 13. Subcategorization of referential relator nouns

Relator nouns marked with the feature [+rfrn] can be subcategorized into two subclasses: [+ncls] (enclosure):

SR-50 [+rfrn] --> [+ncls]

Subcategorization tree for non-enclosure relator nouns is shown below:
Figure 14. Subcategorization of non-enclosure relator nouns

Relator nouns marked with the feature [-ncls] can be subcategorized into two subclasses: [+vert] (vertical):

SR-51 [+ncls] --> [+vert]

Relator nouns marked with the feature [-vert] can be subcategorized into two subclasses: [+fore] (before):

SR-52 [-vert] --> [+fore]

Relator nouns marked with the feature [-fore] can be subcategorized into two subclasses: [+aftr] (after):

SR-53 [-fore] --> [+aftr]

Relator nouns marked with the feature [+vert] can be subcategorized into two subclasses: [+term] (term):

SR-54 [+vert] --> [+term]
Relator nouns marked with the feature [+term] and [+ntrr] (interior) can be subcategorized into two subclasses: [+sub] (sub):

SR-55 [+term] --> [+sub] [+ntrr]

The subcategorization tree for enclosure relator nouns is shown below:

```
+term       +ntrr
/ \           / \
[n-term]   [+term]  [-ntrr]  [+ntrr]
|     |     |       |
n00k    klaang   naj
outside middle inside
```

Figure 15. Subcategorization of enclosure relator nouns

Relator nouns marked with the feature [+ncls] can be further subcategorized into two subclasses: [+ntrr] (interior):

SR-56 [+ncls] --> [+ntrr]
4.6.2. Cooccurrence restrictions within the subclass of relator nouns

Generally relator nouns allow demonstrative determiners as their dependent sisters, but there are some relator nouns that do not. Relator nouns which are marked with the feature [-sub], i.e., nyọ 'above', or with the features [+ntrrr, -term] such as klaang 'middle' are of this type, as in (365-366).

365. *nyọ nii
    above this
    [+N ] [+dmns]
    [+rltr]
    [-sub ]

366. *klaang nii
    middle this
    [+N ] [+dmns]
    [+rltr]
    [+ntrrr]
    [-term]

The redundancy rule accounting for this restriction is formulated as follows:

RR-37 [ -sub ] [+ntrrr] --> [-[+dmns]]

There are also some locational nouns that are derivationally related to the relator nouns in the subclasses of [+rfrn] (referential) and [-nclr] (enclosure), such as naa, 'front', lang, 'back', bon, 'on', laang, 'below', nOOk, 'out', and naj, 'in'. They can occur alone as the heads of noun phrases (367):
367. náktè? yoon b0On khâw maa naj1
player throw ball enter come inside
'The player threw the ball into the inside.'

In this structure the noun naj1 has no dependent
sister, it is the head of its own noun phrase.

368. caak naâ1 thyng lâng1
from front to back
[+P] [+N] [+P] [+N]
'from the front to the back'

369. caàk bon1 10ng laâng1
from on down below
[+P] [+N] [+P] [+N]
'from the top to the bottom'

370. khâw n0Ok1 ?0Ok naj1
enter outside exit inside
[+V] [+N] [+V] [+N]
'enter from the outside, exit from the inside'

The derivation rule accounting for these homophonous
forms is formulated as follows:

DR-4 [+]N] --> [+]N]
[-rltn] | +rltn|
[+lctn] | +rltr|
[F_i] | +F_i|

The DR-4 allows the derivation of some relator nouns
for locational nouns.
4.7. Conclusion

In this chapter I have discussed types of attributes that modify relational nouns, i.e., those nouns which are marked with the feature [+rltn]. They include nominal relative clauses (thii$^2$), noun complements (thii$^3$), classifier constructions, possessive nouns (KhOong$^2$), directly possessed nouns, and relator nouns.

In the discussion of nominal relative clauses, it was noted that they are headed by the relative noun thii$^2$ and obligatorily require an immediate dependent verbal sister. Their position can be either the head of a noun phrase or the attribute of other nouns. They function either as free noun phrases or as dependent sisters of other nouns. As a dependent sister, the nominal relative clause is analyzed as a descriptive nominal predicate modifier.

A relative clause in Thai almost always contains a missing argument. The missing argument is interpreted by a set of Chaining rules and Linking rules.

Noun complement clauses are headed by the complementizer noun thii$^3$ and obligatorily require an immediate verbal sister. Their distribution is similar to that of the relative clauses—they can be either the head of a noun phrase or an attribute of nouns marked with the feature [+nfmn]. They function as either free noun phrases
or as dependent sisters. Since a noun complement clause occurs with a restricted subclass of nouns, it subcategorizes nouns. Therefore, it is an inner sentential attribute.

Noun complement clauses in Thai do not usually have a missing argument since all the features required by the embedded verb are self-contained. In some cases, however, they allow a missing argument, which is a case of zero pronominalization. Such arguments are interpreted from the context of the situation, not by any rule of the grammar as such.

The interpretation of the regent of thii, in a noun complement clause is accounted for by the same Chaining rules and Linking rules proposed in the relative clause section.

It has been noted that classifier constructions, headed by classifier nouns, are one type of relative clause. The position of the classifier construction can be either the head of a free noun phrase or the attribute of other nouns. As a dependent sister of another noun, the classifier construction is analyzed as a descriptive predicational modifier.

A classifier allows two types of dependent sisters: non-adjectival and adjectival sisters. The syntactic
categories that can occur as adjectival sisters are numerals, which are either cardinal and ordinal, or signify a numerative set. These adjectives can in turn be further modified by quantifier adverbs. Adjectives and adverb sisters of classifiers are left-branching modifiers of the noun phrase. The subcategorization tree for adjectives in Thai has been presented in this chapter. This subcategorization tree provides an explanation for the cooccurrence restriction of classifiers and their adjective sisters.

Non-adjectival sisters of classifier nouns include the full range of attributes that can modify non-relational nouns, e.g., verbal stative clauses, determiners, nominal relative clauses, possessive constructions, relator noun phrases, and prepositional phrases.

There are two types of possession in Thai: direct and indirect possession. Direct possession is the construction of a noun marked with the feature [+pssd] which is directly possessed by a non-relational noun, pronoun, or a proper noun.

Indirect possession is a construction of noun marked with the feature [-pssd] which cannot be directly possessed by other nouns. In order to signify possession, the [-pssd] noun requires the possessive noun khOOng to occur as its
dependent sister. Possessive constructions headed by the possessive noun *khōng*₂ take an immediate following noun in the Correspondent case relation. The construction composed of *khōng*₂ and its sister can only function as the attribute of a regent noun. It is analyzed as an equational nominal predicate modifier.

Finally, relator noun phrases have a relator noun as the head of the construction. A relator noun provides a localistic property and is lexically marked for the Locus case relation. It requires an immediately following possessor, which can be either a non-relational noun or a determiner.

The subcategorization tree for relator nouns in Thai has been presented in this chapter. This subcategorization tree provides an explanation for the fact that some relator nouns are limited in the specific type of determiners allowed as their dependent sisters.
NOTES

1 It is important to establish this point, since otherwise it would be necessary to set up two otherwise identical entries for every noun that could optionally occur with a thi[^2] relative clause.

2 There are some nominal relative clauses that do not have a missing argument, e.g.,

234. bet thi[^2] dek tok plaa rod that child catch fish [+rltv]

'the fishing rod with which the child fished'

No missing argument is possible in the clause dek tok plaa that corresponds to the noun bet. The clause without a missing argument is pragmatically interpreted as having an intrinsic connection with the preceding noun. Thus (235) is ungrammatical when there is no such intrinsic connection.


'the car with which the child fished'

Notice that we have a way to interpret the missing argument but there is no way to guarantee that there will be a missing argument. It seems that a missing argument is not grammatically required (Starosta: p.c.).

3 More generally, we can say that linking rules establish grammatical valence relationships stated in terms of morphological features such as [+Nom] or [+fint], while
chaining rules are concerned with establishing relationships between a regent and its dependents defined in terms of roles such as Agent, Patient, and Operator.

4 Note that CR-2 applies to [+prdc] items, so it automatically applies to verbs, since all verbs are predicates.

5 The term relator noun was first proposed by Laurence C. Thompson (1964). Starosta (1971b:195-200) originally referred to this category as Noun Auxiliaries. They are defined as bound nouns used to mark case to satisfy the selectional requirement of verbs. Kullavanijaya (1974:89) claims that the selectional requirement is for the Locus case relation when the following noun cannot itself be directly marked by the locus case.
The conclusions of this study can be divided into three main sections. The first section discusses the advantages of this study over studies written within other syntactic frameworks, limiting our attention to Thai language scholars' work based on structural or transformational analyses. The second section deals with some language-specific and cross linguistic generalizations that have been captured. The last section discusses some of the contributions that are made to the syntactic theory used in this investigation.

5.1. Advantages

There are three main areas in which this investigation claims to have substantial advantages over other analyses of Thai noun phrases. The first is in the degree of coverage of the subcategorization of nouns and of the structure of noun phrases. It is descriptively more adequate than other analyses. The second is in the level of explanatory adequacy. The third is in the universal applicability of the analysis. I shall briefly recapitulate the evidence for these claims.
5.1.1. General advantages

5.1.1.1. Descriptive adequacy

This study provides a more thorough coverage of the subcategorization of nouns and the structure of noun phrases in Thai than has previously appeared in the literature.

An examination of Thai noun classification and the internal structure of noun phrases reveals that a fundamental distinction is made in Thai between nouns that are deictic [+dctc] and those that are non-deictic [-dctc]. Non-deictic nouns consist of a number of subtypes, including relational nouns, non-relational nouns, possessed nouns, and informational nouns, all of which allow but do not require verbs and prepositional phrases as their dependent sisters. The class of deictic nouns consists of proper nouns and personal and impersonal pronouns, none of which allow verbs, prepositional phrases, or non-relational nouns as their dependent sisters.

 Constituents in the immediate domain of nouns can be divided into four subtypes according to their lexical heads: verb, noun, preposition, or determiner. A verbal attribute occurs immediately adjacent to the regent noun. A nominal attribute, i.e., a relative clause, a possessive noun phrase, a relator noun phrase, a classifier construction, or a prepositional attribute (which is also considered [+N]
because one of its exocentric co-heads is an NP), occurs following the verbal attribute if any. A determiner which is not a dependent sister of a classifier or a possessive noun occurs last in the attributive string.

Syntactic subclasses of nouns have been established according to the types of constructions that are allowed to occur as their dependent sisters. Non-relational nouns allow all kinds of attributes as their sisters. Relational nouns are more restricted in the types of attributes they allow. For example, relative nouns and complementizer nouns allow only verbal dependent sisters, a possessive noun allows only a non-relational noun or a pronoun dependent, and a relator noun allows only a non-relational noun or a determiner as a dependent. Classifiers are the only subclass of relational nouns that allow adjectives and certain other types of attributes as their dependent sisters, thereby explaining the appearance of classifiers in various kinds of constructions.

Twenty subclasses of regent nouns in Thai are posited on the basis of their syntactic argument structure, such as their ability to cooccur with dependent verbal sisters, and/or prepositional phrases. These categories are exemplified below:
Category

1. non-deictic
   1.1. relational
   classifier  tu@  'classifier for animals or objects with legs'
   relator     bon  'top'
   relative    thii₂ 'that'
   complementizer thii₃ 'that'
   possessive  khoong₂ 'possession'

   1.2. non-relational
   possessed    phoo  'father'
   non-informational mxmphim 'teacher'
   gerund       kaanri@n 'studying'
   non-gerund   kaan  'matter'

2. deictic
   2.1. proper          kàj  'Kay'
   2.2. pronoun
      2.2.1. personal
      non-reflexive  baang  'some'
      reflexive     tu@?eeng 'oneself'
      first person singular  chān  'I'
      first person plural    raw  'we'
      second person          khun  'you' (+plrl)
      third person            khāw  'he, she, they'

      2.2.2. impersonal
      demonstrative  nii₁  'this place'
      interrogative  khray₁ 'who'
The consequences of the syntactic features which distinguish each of these major categories are as follows:

1. Non-deictic [−dctc] nouns allow but do not require verbs and prepositional phrases as their dependent sisters, whereas deictic [+dctc] nouns do not allow them at all.

2. Relational [+rltn] nouns are nouns that have grammatical rather than referential functions. They typically signal relationships of location or possession between a noun and its regent. Non-relational [−rltn] nouns are nouns that have their own autonomous referential meaning.

3. Proper [+prpr] nouns are semantically distinguished from pronouns [+prnn] in that proper nouns are names of individual persons, institutions, and periods of time, whereas pronouns are nouns used in place of common nouns denoting persons or things.

4. Personal [+prsn] pronouns are semantically distinguished from impersonal [−prsn] pronouns in that personal pronouns are a paradigm of lexically definite pronouns whose members are distinguished by the category person, whereas impersonal pronouns do not form such a set.
(5) Non-demonstrative [-dmns] impersonal pronouns are distinguished from demonstrative [+dmns] pronouns, which do not allow anything as their dependent sisters.

(6) Non-autonomous [-ntms] pronouns do not allow any attributes as their sisters, whereas autonomous [+ntms] pronouns do allow anaphoric nouns as their sisters.

5.1.1.2. Explanatory adequacy

This study more closely approximates explanatory adequacy than other studies, because it uses a highly constrained theory. As Andrew Radford states, "a linguistic theory attains explanatory adequacy just in case it provides a descriptively adequate grammar for every natural language, and does so in terms of a maximally constrained set of universal principles which represent psychologically plausible natural principles of mental computation" (Radford 1988:30, emphasis mine; cf. Starosta 1987:100).

The constraints that are imposed on a lexicase analysis are such a maximally constrained set of universal principles. At the very least, this study has shown the way to analyze nouns and noun phrases in Thai using a highly constrained theory in a formal and explicit way, and a consequence of this procedure has been to capture important language-specific and cross-linguistic generalizations (see section 5.2. below).
5.1.1.3. Universality

Both structural and transformational analyses allowed the creation of ad hoc categories such as a classifier or a quantifier to be posited without adequate syntactic motivation. In contrast, all categories established in this study are strictly defined in terms of syntactic criteria, with the consequence that such ad hoc notional categories turn out to be unnecessary. For example, no separate 'classifier' word class is posited in this study. 'Classifiers' appear as the heads of a noun phrase, therefore they are nouns, and generalizations made about the distribution of Ns and NPs apply to classifiers as well, increasing the language-specific and cross-linguistic generality of the analysis.

5.1.2. Advantages over transformational analyses

Lexicase constraints ideally allow only one possible analysis for any given surface structure, with minimal complexity in tree structures. The syntactic information is directly read off from the tree structure. Lexicase theory is less powerful than transformational theory, since the set of possible lexicase grammars is a proper subset of the set of possible transformational grammars. This is true because all lexicase grammars are describable as limiting cases of transformational grammars, but the converse is not true.
For example, lexicase places stronger constraints on possible movement rules than transformational grammar does by simply not allowing movement rules to move anything at all, and stronger constraints on X-bar systems by limiting its phrasal categories to one-bar structures, a stronger constraint than the two-bar analysis assumed by Chomskyan grammars. It imposes equally strong constraints on binding relationships and the domain of subcategorization by limiting such relationships to sisterheads, whereas Chomskyan grammars must, for example, allow for 'external arguments' in order to assign theta-roles to subjects.

5.1.2.1. Generativity

The works on Thai noun phrases which have been done using transformational analyses include Warotamasikkadit (1963), Ekniyom (1971), and Bandhumedha (1976). Although these analyses are formulated within the generative tradition, all of them fail to provide the full set of formal and explicit rules and lexical entries that would be necessary to allow their claims to be meaningfully tested. Thus in the original sense of 'generative' (Chomsky 1965:22), they are not generative.

Bandhumedha (1976:9) proposed a phrase structure rule to account for the types of modifiers of a noun phrase. This rule is quoted below:
Specifier --> [ S ]
    | Quan |
    | Dem |
    < >
    | IND |
    | PP  |
    | Adj |

(S stands for embedded sentence, Quant for quantifier, Dem for demonstrative, IND for indefinite determiner, PP for prepositional phrase, and Adj for adjective.)

This analysis does not give any rules to expand Quan or one of the other categories, so the grammar is not generative.

Throughout the analysis in this study, grammatical rules and representations are formally and explicitly established and formulated along with the illustrated data. In this way, the grammar allows the claim for the specific data to be easily tested.

5.1.2.2. Power

A stronger theory makes a weaker claim, and transformational grammar is a very strong theory. The problem of the excessive power of transformational grammars has long been recognized within the transformational tradition, and some linguists have tried to find ways to limit its power. One example is Emonds's Structure-Preserving Constraint (Emonds 1976:3). The analyses used in transformational descriptions of Thai have not been particularly concerned with this problem of excessive power.
They all assume the usual two levels of syntactic representation: deep and surface structure, and they make use of a broad variety of phrase structure rules to generate the deep structures and transformations and of special conventions to derive surface structures from deep structures.

As an example of the excessive power of a transformational analysis of Thai, consider Warotamasikkadit (1963:5). He proposed seven phrase structure rules and three different types of transformational rules to account for the structure of noun phrases in Thai. Some of these rules are quoted below:

1. \[ Nm \rightarrow \begin{array}{c} \text{SUBJ} \\ < \\ \text{Nom} \end{array} \]

2. \[ \text{Nom} \rightarrow \begin{array}{c} \text{NP} \\ \text{PP} \\ \text{N}_{pr} \end{array} \]

3. \[ \begin{array}{c} \text{NP} \\ \text{PP} \\ \text{N}_{pr} \end{array} \rightarrow \begin{array}{c} \text{N} \\ \text{H} \\ \text{AN} \\ \text{IN} \\ \text{No} \\ \text{Det} \end{array} \]

(SUBJ stands for subject, Nm for noun marker, Nom for nominal, NP for noun phrase, PP for personal pronoun, N_{pr} for pronoun, H for human, AN for animate, IN for inanimate, M for mobile, No for non-mobile, and Det for determiner.)
The excessive power of this analysis is reflected in the fact that the number of the categories being used are multiplied. As a consequence, an important generalization is lost, since the various subtypes of nouns are not shown to be members of the same class of nouns [+N] in the lexicon.

To cite another example, Lehman (1989) proposes an analysis of the Thai classifier construction using Government and Binding theory, a framework which is more powerful than lexicase in several respects. First of all, the tree structures generated by phrase structure rules in this framework are complex and in practice have no limitation on tree depth. Thus the X-bar notation employed in Lehman's analysis is incompatible with the uniform One-bar constraint imposed on lexicase syntactic representations. The maximal projection of a lexical head in his analysis, following standard Chomskyan practice, has two bar levels; e.g. a V" (VP) is a two-bar projection of a verb.

The ad hoc transformations and conventions assumed by this framework also reflect excessive power. According to Lehman's analysis, a classifier is a Specifier when it cooccurs with another noun. The transformation which Lehman proposes to adjoin N' or N to the position corresponding to the surface occurrence of a classifier in Thai violates Emonds' structure-preserving constraint in allowing new
nodes to be created. In my analysis this is not allowed, since there is no feature percolation in a lexicase analysis, and it is unnecessary: a classifier is a noun; it is always the head of an NP, and needs no special transformations and conventions to reconcile the requirements of the theory with the facts of the language.

Lehman also claims that the classifier acts as if it were the head of the construction when no noun is present in the N slot. In this respect, however, his analysis is not generative, since he presents no formal rule or sample tree to explain how a classifier can be a specifier and a head at the same time. By contrast, one of the strong points of my analysis is the straightforward and explicit way in which it accounts for such constructions.

As in the case of structural grammar, conventional transformational grammar practice also allows the invention of an unlimited number of word classes, phrases, and abstract categories. For example, Ekniyom (1971) and Sornhiran (1978) both propose an abstract notionally motivated phrasal category of Quantifier (Quan) to represent a classifier construction. Such a category is not allowed in a lexicase X-bar analysis, since Quan0 is not included in the inventory of the eight universal categories. Instead, their 'Quan' category must be analyzed in a lexicase grammar as a type of NP, with a consequent gain in generality.
5.1.3. Advantages over structural analyses

The works on Thai noun phrases using a structural framework are Chantavibulya (1962) and Noss (1964). The advantages of this study over the structuralist analyses are explained in the following ways:

Structuralist analyses are limited to providing only statements about patterns observed in a particular language. They do not make any attempt to add to our knowledge of language as a human faculty, but are simply statements about patterns observed in one particular language. Only language-internal and not cross-linguistic generalizations are made, and therefore no cross-linguistic implications can be tested. In my analysis too, as in structuralist approaches, the characterizations of nouns and noun phrases in Thai are justified in language-internal terms, not by reference to the grammar of English. The difference, however, is that the categories and structures employed in a lexicase analysis are proposed as universals, and that the analysis of an individual language can be seen as a confirmation of the universal theory to the extent that the facts of Thai can be insightfully represented in terms of these universal categories.
5.2. Generalizations

This study is better able to capture linguistic generalizations than other previous analyses. These generalizations can be characterized as being either specific to Thai, or as having language-universal significance.

5.2.1. Thai language-specific generalizations

This analysis requires fewer lexical or phrasal categories than previous analyses, i.e., noun, verb, preposition, determiner, and adjective. It does not require setting up ad hoc language-specific or notionally-defined categories, i.e., classifier or quantifier. The subclasses of nouns are with very few exceptions defined in terms of syntactic criteria.

The study unifies the analysis of [+N] attributes with the analysis of [+N] predicates on the one hand and with relative clauses on the other. They all form a single interconnected system instead of three distinct and unrelated subsystems.

5.2.2. Cross-linguistic generalizations

1. The claim that 'adjectival' attributes of Thai nouns belong to the category of stative verbs, not adjectives, has not been made by other analyses. This
analysis has a close analog in French, for example, where 'adjectives' that precede nouns, such as presume in (371) below, and some of the 'adjectives' that follow nouns such as equestre in (373) are of the category [+Adj], but some 'adjectives' that follow nouns are actually stative verbs in reduced relative clauses: (examples (371, 373, 376-377) from Schwarze 1987; my analyses)

371. Ce présumé docteur était un escroc. [p.274]  
    [+Adj]  
    'This presumed doctor was a swindler.'

372. un grand; homme  
    [+Adj]  
    'a great man'

373. Cette statue équestre s'érige dans le parc. [p.274]  
    [+Adj]  
    'This equestrian statue stands in the park.'

374. un homme grand₂  
    [+V]  
    'a tall man'

Such words can appear as independent predicates, as shown by example (375), while the adjectives cannot, as shown by examples (376-377):

375. L'homme est grand₂  
    [+V]  
    'The man is tall.'

376. *Ce docteur est présumé. [p.267]  
    [+Adj]  
    'This doctor is presumed.'

377. *Cette statue est équestre. [p.267]  
    [+Adj]  
    'This statue is equestrian.'
When homophonous forms occur before and after the noun, it is the word that follows the noun which can also appear as a predicate; e.g., (Laurent Sagart, p.c.)

372. un grand₁ homme
    [+Adj]
    'a great man'

374. un homme grand₂
    [+V]
    'a tall man'

380. *L'homme est grand₁.
    [+Adj]
    'The man is great.'

This analysis in fact extends to English as well, where non-argument post-nominal complements have been analyzed as predicates (Starosta 1988:228).

2. Every syntactic category can be the attribute of a noun in Thai. Two types of attributes in this study, i.e., adjectives and determiners, can be compared with Greenberg's claim (1963:87) about universal modifiers of nouns. Greenberg claims that there are three kinds of such modifiers, descriptive adjectives (corresponding to stative verbs in this study), demonstratives (corresponding to determiners in this study), and numerals (analyzed as adjectives in this study). A cross-linguistic question raised by this study, then, is whether Greenberg's 'numerals' class might not be a notional category which can be syntactically reduced to a subclass of adjectives, as in this study, or perhaps to nouns, as in Philippine languages.
5.2.3. General metatheoretical considerations

5.2.3.1. Simplicity

This analysis does not require a non-lexical syntactic categories, e.g, 'specifier' (Spec), or 'complementizer' (Comp) and syntactically unmotivated constituents such as quantifier phrase, in the analysis of various languages.

5.2.3.2. The structure of relative clauses

This analysis provides a direct statement in a clear and straightforward manner about the head of a noun phrase in accordance with X-bar principles. For example, Thai relative clauses introduced by thii₂ may function as free noun phrases which occur as subjects, direct objects, or objects of prepositional phrase. This fact is accounted for by assuming simply that any construction which has the distribution of an NP is in fact an NP, and that thii₂ is to be analyzed as a noun which functions as the head of such a construction in accordance with strict X-bar conventions.

By contrast, Thai scholars who have analyzed these constructions within a more powerful transformational framework do not agree on the position of the relative noun thii₂. They proposed different kinds of label to name it. Sindhvananda (1970) for example gives it the label 'relativizer', and Sornhiran calls it a 'complementizer',

...
an arbitrary category which has no formal relation to the category of nouns, while Warotamasikkadit, Ekniyom, and Bandhumedha analyze thii in\_2 as an English-style relative pronoun, an internal constituent of the clause rather than the regent of the clause as in the present analysis. All five analyses thus fail to explain why an S should have the distribution of an NP.

5.2.3.3. The structure of classifier constructions, the lexical head hypothesis, and CL head assignment

The GB analysis of Southeast Asian classifiers proposed by Lehman (1989) treats the classifier as belonging to a category of quantifier (Q). It is not clear from his description where the quantifier comes from, however. It is introduced in the tree structure by the operation of internal adjunction to the N or N\' node. The feature correlation between the classifier and its head noun is handled by the mechanism called Head-feature percolation. This mechanism allows the feature of a classifier to be inherited by an adjunct sister from the matrix noun clause. In order to explain both the position and features of a classifier, he has to apply an adjunction operation as well as to postulate the Head-feature percolation mechanism.

The analysis in this study on the other hand is formulated under the lexical head hypothesis, which is a
general metatheoretical constraint on the form of X-bar grammar, a consequence of the lexicase one-bar constraint (the maximum number of bars is one). The lexical head hypothesis can be stated as follows: every phrase $X^n$ must be an $X^1$ with a lexical head of type $X^0$. Thus a noun is the immediate head of a noun phrase, a verb is the immediate head of a (verbal) clause ($V'$), etc. This entails that if a classifier is determined to be the head of a noun phrase, the classifier must be a lexical noun immediately dominated by the $N'$ node, and $N'$ must be a one bar projection of the classifier. This hypothesis helps to constrain the power of the lexicase analysis. As a consequence, the lexical head of any construction can be identified by inspection, without the necessity of stipulating additional ad hoc mechanisms such as Head-feature Percolation.

5.3. Contributions to lexicase

1. Testing against new data.

The syntactic rules proposed in this study can be easily tested against new data. What has been proposed here has a potential to strengthen the lexicase theory, since the claims resulting from the analysis may provide insights into the structure of noun phrases in other languages that are typologically and genetically different from Thai.
2. The analysis of noun classes and noun phrase structure proposed in this study demonstrates the ability of the theoretical framework to formally and explicitly account for the syntactic facts of a language and to capture significant generalizations insightfully within a highly constrained system.

3. Chaining Rules have been shown to be a viable alternative to more powerful transformational approaches to relative clauses and complementation, and the implementation of Linking Rules and Chaining Rules, combined with the representation of case relations as implied rather than positive contextual features to account for the relationship between antecedents and anaphoric elements, especially in relative clauses, demonstrates the practicability of recent modifications of the theory.

In summary, the investigation of Thai nouns and noun phrases reaffirms the ability of the theory to account for the syntactic facts of a language in a formal and explicit way and to capture significant generalizations insightfully.
NOTES

1 Unfortunately, with the recent upsurge in the use of empty categories in Chomsky's Government and Binding theory, such constraints have become circumventable, and the problem of excessive transformational power is perhaps as bad now as it ever was.

2 This is true because although the theory assumes a strict two-bar system of phrasal categories, intermediate categories such as N' and V' and empty-headed categories such as I', C', and C'' can be created at will and piled up to any desired degree of depth.
APPENDIX

The specified feature matrix of the nine subclasses of non-deictic nouns in Thai is shown as follows:

1. Relative noun thii₂

```
[+N]  
[-dctc]  
[+rltn]  
[+nphr]  
[-clsf]  
[+rltv]  
[+V]  
[+(fint)]
```

2. Complementizer noun thii₃

```
[+N]  
[-dctc]  
[+rltn]  
[+nphr]  
[-clsf]  
[-rltv]  
[+V]  
[+(fint)]
```

3. Classifiers

```
[+N]  
[-dctc]  
[+rltn]  
[+nphr]  
[-clsf]  
[+clsf]  
[+V]  
[+(fint)]  
[+([fint])]  
[+([N])]  
[+([Det])]  
[+([Adj])]  
[-([-rltn])]
```
4. Non-relator or possessive noun $khōng_2$

\[
\begin{array}{c}
[+N] \\
[-dctc] \\
[+rltn] \\
[-nphr] \\
[-rltr] \\
[-[+rltn]] \\
[?([+N])] \\
[?([-Nom])] \\
[?([+COR])] \\
[+([-prnn])] \\
\end{array}
\]

5. Relator nouns

\[
\begin{array}{c}
[+N] \\
[-dctc] \\
[+rltn] \\
[-nphr] \\
[+rltr] \\
[-[+rltn]] \\
[?([+N])] \\
[[-prnn]] \\
\end{array}
\]

6. Possessed nouns

\[
\begin{array}{c}
[+N] \\
[-dctc] \\
[-rltn] \\
[+pssd] \\
[?([-Nom])] \\
[?([-Nom])] \\
[?([+COR])] \\
[[-prnn]] \\
\end{array}
\]

7. Non-informational nouns

\[
\begin{array}{c}
[+N] \\
[-dctc] \\
[-rltn] \\
[-pssd] \\
[-nfmn] \\
[-[-rltv]] \\
[?([-Nom])] \\
[?([-Nom])] \\
[?([+COR])] \\
[-[-prnn]] \\
\end{array}
\]
8. Non-gerund nouns

| +N |
| -dctc |
| -rltn |
| -pssd |
| +nfmn |
| -grnd |
| - [+P ] |
| [+xtns] |

9. Gerund or nominalized nouns

| +N |
| -dctc |
| -rltn |
| -pssd |
| +bstr |
| +nfmn |
| - [+P ] |
| [+xtns] |

The specified feature matrix of thirteen subclasses of deictic nouns in Thai is shown as follows:

1. Non-pronouns or proper nouns

| +N |
| +dctc |
| +dfnt |
| -prnn |
| [-rltn]|  

2. Indefinite, non-interrogative pronouns

| +N |
| +dctc |
| +prnn |
| -prsn |
| -htrg |
| -dmsn |
| -dfnt |
| [-rltn]|
3. Definite, non-interrogative pronouns

[\[ +N \] ]

\[ +dctc \] | +prnn \n\[ -prsn \] | -ntrg \n\[ -dmns \] | +dfnt \n\[ -[-rltn]\] 

4. Inanimate, interrogative pronouns

[\[ +N \] ]

\[ +dctc \] | +prnn \n\[ -prsn \] | -ntrg \n\[ -dmns \] | -bstr \n\[ -anmt \] | -[-rltr]\] 

5. Animate, interrogative pronouns

[\[ +N \] ]

\[ +dctc \] | +prnn \n\[ -prsn \] | -ntrg \n\[ -dmns \] | -bstr \n\[ +anmt \] | -[-rltn]\] | -[-rltn]\] 

6. Abstract, interrogative pronouns

[\[ +N \] ]

\[ +dctc \] | +prnn \n\[ -prsn \] | -ntrg \n\[ -dmns \] | +bstr \n\[ -[-rltn]\] | -[-rltn]\]
7. Demonstrative pronouns

```
[ +N ]
| +dctc |
| +prnn |
| -prsn |
| +dmns |
```

8. Non-reflexive pronouns

```
[ +N ]
| +dctc |
| +prnn |
| +prsn |
| -tnms |
| -rflx |
| +Nom |
```

9. the reflexive pronoun tuðeeng

```
[ +N ]
| +dctc |
| +prnn |
| +prsn |
| -tnms |
| +rflx |
| -Nom |
```

10. Second person pronouns

```
[ +N ]
| +dctc |
| +prnn |
| +prsn |
| +tnms |
| -spkr |
| +adrs |
| -[-rltn] |
```

11. Third person pronouns

```
[ +N ]
| +dctc |
| +prnn |
| +prsn |
| +tnms |
| -spkr |
| -adrs |
| -[-rltn] |
```
12. First person singular pronouns

\[
\begin{array}{c}
\text{[+N]} \\
\text{[+dctc]} \\
\text{[+prnn]} \\
\text{[+prsn]} \\
\text{[+tnms]} \\
\text{[+spkr]} \\
\text{[+-plrl]} \\
\text{[-[-rltn]]}
\end{array}
\]

13. First person plural pronouns

\[
\begin{array}{c}
\text{[+N]} \\
\text{[+dctc]} \\
\text{[+prnn]} \\
\text{[+prsn]} \\
\text{[+tnms]} \\
\text{[+spkr]} \\
\text{[+plrl]} \\
\text{[-[-rltn]]}
\end{array}
\]

**Redundancy Rules:**

- **RR-1**  \([+N]\)  \(\rightarrow\)  \([-[]\)]
- **RR-2**  \([+dctc]\)  \(\rightarrow\)  \([+\{[+V]\}]\)  \([+\{[+P]\}]\)
- **RR-3**  \([+N]\)  \(\rightarrow\)  \([-[-\text{rltn}]]\)  
  \([?([N)])\]  \([\text{~nphr}]\)
- **RR-4**  \([+\text{rltr}]\)  \(\rightarrow\)  \([-[+\text{prnn}]]\)
- **RR-5**  \([-\text{pssd}]\)  \(\rightarrow\)  \([-[-\text{rltn}]]\)
- **RR-6**  \([-\text{nfmn}]\)  \(\rightarrow\)  \([-[-\text{rltv}]]\)
- **RR-7**  \([-\text{grnd}]\)  \(\rightarrow\)  \([-[+]P\]  \([+]\text{xtns}]\)
- **RR-8**  \([+\text{dctc}]\)  \(\rightarrow\)  \([-[-\text{rltn}]]\)
- **RR-9**  \([+\text{prnn}]\)  \(\rightarrow\)  \([-[-\text{rltr}]]\)
- **RR-10**  \([+\text{tmns}]\)  \(\rightarrow\)  \([-[-\text{nphr}]]\)
- **RR-11**  \([\text{~rflx}]\)  \(\rightarrow\)  \([-\text{Nom}]\)
RR-12 [+N] --> [-[ ] ___ ]
RR-13 [+N] --> [- [+V ] [+V ] ]
     [-sttv] [+sttv]
RR-14 [+N] --> [- [+V ] [+V ] ]
     [-sttv] [ sttv]
RR-15 [+N] --> [-__][+V]]
RR-16 [-+N ] --> [- __ [+P ]] [+cmpl]
     [+rltn]
RR-17 [+P] --> [- [[+nphr]]]
     < >
     [[-rltr]]
RR-18 [- [+prnn]] --> [-[+Det]]
     [-dfnt] |
     [+ntrg] |
     < >
     [[-rltr]]
     [-clsf] ]
RR-19 [+N] --> [-[+Det] [+Det]]
RR-20 [+pssv] --> [-[
     [-pler] [-lctv]]
RR-21 [+N] --> [-__][+Det] []]
RR-22 [+N] --> [-[] [+Det ]] [-lctv]
RR-23 [+N] --> [- [+clsf] [+Det] ]
RR-24 [+grnd] --> [-[-rltv]]
RR-25 [-nphr ] --> [-[+clsf]]
     <clsf >
     [+dmns ]
RR-26 [+clsf] --> [- [+Adj]]  
     [-[-fore]__ ] (A)
     [- [+fore] ] (B)
     [- [+Adj] ] [+sqnl] (C)
     [-[-nmrl]___ [+Adj]] (D)
RR-27 [-estm] --> [-[+prim]]
<table>
<thead>
<tr>
<th>Rule</th>
<th>Transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR-29</td>
<td>[+N] --&gt; [-[-ntns] [+dfnt]</td>
</tr>
<tr>
<td>RR-30</td>
<td>[+N] --&gt; [-[+ntns] [-dfnt]</td>
</tr>
<tr>
<td>RR-31</td>
<td>[+clsf] --&gt; [-[-fore] [+V] ] [+sttv] [-ntns]</td>
</tr>
<tr>
<td>RR-33</td>
<td>[+pssd] --&gt; [- [+rltn] ] [+ntns] [+ntrgl] [+bstr]</td>
</tr>
<tr>
<td>RR-34</td>
<td>[-rltr] --&gt; [- [+rltn] ]</td>
</tr>
<tr>
<td>RR-36</td>
<td>[-sub] --&gt; [-[+dmns]] &lt; [+ntrr] &gt; [-term]</td>
</tr>
</tbody>
</table>

Subcategorization Rules:
<table>
<thead>
<tr>
<th>Rule</th>
<th>Transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR-1</td>
<td>[+N] --&gt; [+dctc]</td>
</tr>
<tr>
<td>SR-2</td>
<td>[-dctc] --&gt; [+rltn]</td>
</tr>
<tr>
<td>SR-3</td>
<td>[+dctc] --&gt; [+prnn]</td>
</tr>
<tr>
<td>SR-4</td>
<td>[+rltn] --&gt; [+nphr]</td>
</tr>
<tr>
<td>SR-5</td>
<td>[+nphr] --&gt; [+clsf]</td>
</tr>
<tr>
<td>SR-6</td>
<td>[-clsf] --&gt; [+rltv]</td>
</tr>
<tr>
<td>SR-7</td>
<td>[-nphr] --&gt; [+rltr]</td>
</tr>
<tr>
<td>SR-8</td>
<td>[-rltn] --&gt; [+pssd]</td>
</tr>
<tr>
<td>SR-9</td>
<td>[-pssd] --&gt; [+nfmn]</td>
</tr>
<tr>
<td>SR-10</td>
<td>[-nfmn] --&gt; [+grnd]</td>
</tr>
</tbody>
</table>
SR-36 \([-nclv]\) --> \([+ntrg]\)
SR-37 \([-ntrg]\) --> \([+many]\)
SR-38 \([+Adv]\) --> \([+prim]\)
SR-39 \([+prim]\) --> \([+pprx]\)
SR-40 \([-prim]\) --> \([+addv]\)
SR-41 \([+addv]\) --> \([+xcsv]\)
SR-42 \([-addv]\) --> \([+tttv]\)
SR-43 \([-tttv]\) --> \([+estm]\)
SR-44 \([+rltr]\) --> \([+rfrn]\)
SR-45 \([-rfrn]\) --> \([+term]\)
SR-46 \([-term]\) --> \([+drcn]\)
SR-47 \([+term]\), \([-drcn]\) --> \([+srce]\)
SR-48 \([+srce]\) --> \([+ncls]\)
SR-49 \([-srce]\) --> \([+pnct]\)
SR-50 \([+rfrn]\) --> \([+ncls]\)
SR-51 \([+ncls]\) --> \([+vert]\)
SR-52 \([-vert]\) --> \([+fore]\)
SR-53 \([-fore]\) --> \([+aftr]\)
SR-54 \([+vert]\) --> \([+term]\)
SR-55 \([+term]\), \([+ntrr]\) --> \([+sub]\)
SR-56 \([+ncls]\) --> \([+ntrr]\)

**Inflectional Redundancy Rules:**

IRR-1 \([+N]\) --> \([+prdc]\)
IRR-2 \([+prdc]\) --> \([?([+PAT])]\)
IRR-3 
[+prdc] --> [?+[Nom]]
IRR-4 
[+N] --> [+Nom]
IRR-5 
[+N] --> [?[-prnn]]
IRR-6 
[+N] --> [+dfnt]
IRR-7 
[+([+V]]) --> [+([+fint])]  
IRR-8 
[+N] --> [?([+N])]
IRR-9 
[+dctc] --> [+dfnt]
IRR-10 
[+nphr] --> [+([+V])]
IRR-11 
[+cslf] --> [?([+N])]  
IRR-12 
[-cslf] --> [?([+V])]
IRR-13 
[+rltr] --> [?([+Det])]
IRR-14 
[+pssd] --> [?([-Nom])] 
IRR-15 
[+nfmn] --> [+([-rltv])]  
IRR-16 
[+prnn] --> [-Nom]
IRR-17 
[+dfnt] --> [?([+Det])]
IRR-18 
[+prnn] --> [?([+rltr])]
IRR-19 
[-spkr] --> [?([+cslf])]
IRR-20 
[+plrl] --> [?([+cslf])]
IRR-21  [+clsf]  -->  [+([+Adj])]  
   [+([+Adv])]  

IRR-22  [+[prnn]]  
         [+dfnt]  
         <  
         >  
         [+rltr]  
         [+clsf]  

IRR-23  [+N]  -->  [+dfnt]  

IRR-OMEGA:  [ ]  -->  [+N]  
               [-[+V]]  
               [-[+P]]  
               [-[+Adj]]  
               [-[+Adv]]  
               [-[+Det]]  
               [-[+Cnlnc]]  
               [-[+Sprt]]  

Derivation Rules:

DR-1  [+Adj]  -->  [+Adv]  
       [+many]  
       [+F₁]  
       [+Fᵣ]  

DR-2  [+Adj]  -->  [+Adv]  
       [+nclns]  
       [+F₁]  
       [+Fᵣ]  

DR-3  [+V]  -->  [+V]  
       [+sttvs]  
       [+F₁]  
       [+Fᵣ]  
       [+Fₙ]  
       [+dfnt]  

DR-4  [+N]  -->  [+N]  
       [-rltn]  
       [+F₁]  
       [+Fᵣ]  

Linking Rules:

LR-1  [?[F₁]]  -->  [m[F₁]]  
       /  
       [mndex]  
       [mndex]
LR-2  \[ n[+Nom] \] \[? [+actr] \] --> \[ n[+actr] \]
LR-3  \[ n[+AGT] \] \[? [+actr] \] --> \[ n[+actr] \]
LR-4  \[? [+PAT] \] --> \[ n[+PAT] \]
LR-5  \[ n[-Nom] \] +trns --> \[ n[+Nom] \]
LR-6  \[ +N \] --> \[ mndex \]
LR-7  \[? [-Nom] \] --> \[ n[-Nom] \] / \[ -Nom \]
LR-8  \[ n[-Nom] \] \[? [+COR] \] --> \[ n[+COR] \]

Chaining Rules:

CR-1  \[ +V \] \[? [+CR] \] mndex --> \[ n[+CR] \] \[ +N \] \[ m([-V]) \] \[ nndex \]

CR-2  \[ +rltv \] \[? [+CR] \] mndex --> \[ n[+CR] \] \[ +N \] \[ +([+rltv]) \] \[ nndex \]
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