

THAI NOUN CLASSIFIERS:
SYNTAX OR SEMANTICS?

by

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ABSTRACT

The grammatical category "noun classifier" has been established, under various rubrics, for many of the world's languages. In Thai it occurs in a definable class of noun phrase. Thai noun classifiers are related to nouns through a complex set of agreement rules. Are these rules best analyzed syntactically or semantically, or must both approaches be utilized?

In what follows, syntactic and semantic structures are discussed, and the concept of the "terminology set" is developed. Those terminology sets which are grammatical categories are open to the method of tagmemic analysis, and those terminology sets which are contrast sets are open to the method of componential analysis. The hypothesis to be tested is that those terminology sets which are both grammatical categories and contrast sets should be open to both tagmemic and componential analyses, and the hypothesis is disproved.

The inadequacy of our hypothesis leads us to conclude that syntactic and semantic structures are variably related in specific languages. The range of variation may be measured along a continuum of structural intersection from non-intersection to congruence. It is also argued that syntactic structure dominates semantic structure to a degree directly related to the degree of structural intersection.

Data from several languages are presented to test the new hypothesis, and it is concluded that only those terminology sets

whose syntactic and semantic structures approach non-intersection are open to both tagmemic and componential analyses.

CHAPTER 1

INTRODUCTION

The present study deals with two hypotheses concerning the syntactic and semantic structure of linguistic categories. The first hypothesis (Chapter 4) will be tested against data from the Thai language, while the second hypothesis (Chapter 5), being broader in scope, will draw upon data from a number of languages. This introductory chapter includes a discussion of procedural matters, a definition of "noun classifiers," a statement of the problem to be treated, and comments on analytical approaches.

Procedural Notes

Thai is one of the Tai-Shan languages of the Kam-Thai family, which in turn is a member of the large Sino-Tibetan phylum of languages widely distributed throughout Asia (Voegelin and Voegelin 1964: 8, cf. pages 9-13 for a summary of the controversy surrounding this classification). A thorough review of Thai would encumber the present paper unnecessarily, and the interested reader is referred to the comprehensive bibliography of Shorto, Jacob and Simmonds (1963) for such material. In this study, we will restrict ourselves to those aspects of Thai which relate directly to noun classifiers.

Data Elicitation

The informant who supplied the data on Thai was a young foreign exchange student at The University of Arizona, Adasai Vongsevaisayavan. Adasai was born in Bangkok, the capitol of Thailand, where he has spent most of his life. Data was collected during 17 one-hour sessions spread over a two-month period. Work was facilitated by the author's prior acquaintance with Thai and the informant's good command of English.

Since the informant was bilingual, we worked primarily with the following sequence of English frames in gathering data pertaining to noun classifiers:

1. "What is (the object) 'A'?"
2. "Can 'A' be counted?"
3. "How do you count 'A'?"

Responses to each frame were given in Thai and any subsequent discussion was carried out in English.

The major problem in elicitation was a lack of materials to which the informant could respond. The pages of National Geographic are a poor substitute for the bustling streets of Bangkok. Every effort was made to present items which would stimulate the informant to volunteer data from his own memory and experience. A measure of success was gained by asking him to add nouns to the list of a given noun classifier, but it appears that Thai speakers do not customarily think in these terms (see Chapter 4 for a discussion of implications for learning Thai classifiers). Problems inherent in the complexity of Thai noun classifiers are treated toward the end of Chapter 4.

Phonemic Transcription

The phonemic notation employed in this study is taken from Mary Haas' excellent Thai-English Students Dictionary (1964: xi) as shown in Table 1, with a few accommodations to the typewriter. Thai data is presented in the form /maa3/, 'dog' (but note that most noun classifiers cannot be glossed). Phonemic interpretations (especially those concerning tone) are the author's and have not been checked against Haas' more authoritative transcription, but this will not be a hindrance to the problem at hand.

The Definition of Noun Classifiers

The grammatical category "noun classifier" has been established, under various rubrics, for many of the world's languages. Specific studies have been done on Tzeltal (Berlin and Romney 1964), Chontal (Mayan) (Keller 1955), Gilbertese (Silverman 1962), Chinese (Schafer 1948), Vietnamese (Nguyen-Dinh-Hoa 1957), Khmer (Jacob 1965), Burmese (Haas 1951, Burling 1965, Pe 1965), and Thai (Haas 1942), to cite a few which will be of interest to us in the present thesis.

Generally speaking, noun classifiers comprise an obligatory category of morphemes which are manifested in the presence of nouns, when these are being counted. They serve to classify these nouns in much the same way as other gender and case systems place restraints of selection and agreement on morpheme classes. As Berlin and Romney (1964: 79) put it: "In many languages, counting 'something' is associated with 'classifying' or 'modifying' indicators about the thing being counted."

Table 1. The Phonemes of Thai

<u>Consonants</u>	<u>Labial</u>	<u>Dental</u>	<u>Palatal</u>	<u>Velar</u>	<u>Glottal</u>
<u>Stops</u>					
vd. unasp.	b	d			
vl. unasp.	p	t	c	k	q
vl. asp.	ph	th	ch	kh	
<u>Spirants</u>					
vl. unasp.	f	s			h
<u>Sonorants</u>					
vd. semi-vowel	w		j		
vd. nasal	m	n		ng	
vd. lateral		l			
vd. trill		r			
<u>Vowels</u>	<u>Front</u>		<u>Central</u>		<u>Back</u>
High	i,ii,ia		y,yy,ya		u,uu,ua
Mid	e,ee		ɔ,ɔɔ		o,oo
Low	ɛ,ɛɛ		a,aa		ō,ōō
<u>Tones</u>					
Low	1				
Mid	no symbol				
High	2				
Rising	3				
Falling	4				

Other authors discuss classifiers in more specific terms. Noting their occurrence in many Southeast Asian languages, Burling observes that in these languages "a number is never used without being accompanied by one of the special class of morphemes, known as numeral classifiers. The choice of classifier depends upon the type of object which is being counted" (1965: 244). Keller (1955: 259-60) describes the Chontal situation in structural terms: "Classifiers are defined as the obligatory morphemes which occur after the quantifiers in the numeral complex."

Terminology Note

A note on terminology is pertinent at this point. Although Burling (1965), Haas (1942, 1951), Berlin and Romney (1964), and a number of other authors have employed the term "numeral classifier" to designate the forms under discussion here, it can be shown that the focus of the construction is almost entirely on the classification of nouns and that the presence of an obligatory numerative is of secondary importance. Referring again to the article by Berlin and Romney on Tzeltal classifiers, we may note that

semantically, these forms function very much as adjectivals in English, specifying certain qualitative features of the referents of nouns. If it were not for the long precedent in linguistic circles to refer to such forms as "numeral classifiers," a more functionally and descriptively appropriate term would be "nominal qualifier." Their occurrence in numeral phrases is relatively unimportant in considering their broad semantic features (1964: 79).

The title of Berlin's forthcoming monograph, Tzeltal Numeral Classifiers: A Study in Ethnographic Semantics (1969), indicates

that he does not see fit to act on his own evaluation. We would argue that in spite of the "long precedent in linguistic circles" there is good reason to call at least for an adjustment in terminology from "numeral" to "noun" classifier. While the presence of a numerative is usually requisite to the structure of the classifier phrase, it in no way enters into the semantic relationship between a noun and its classifier. In fact, we may go so far as to maintain that the only "numeral classifiers" involved are the numeratives themselves. They answer the question, "How many classified nouns is the speaker designating?" Even in the case of "quantitative" phrases, where nouns are classified in terms of such units as "dozen," "pair," or "group," there must be one, two, or more classified nouns referred to.

By way of summary, noun (or numeral) classifiers are characterized as being obligatory, associated with nouns (especially when they are counted) in specific phrases, and "adjectival" in the sense that they modify or clarify the concepts referred to by nouns.

The Problem

Robbins Burling has challenged the effectiveness of componential analysis and other formal methods in dealing with the problems of semantic structure:

...The techniques of semantic analysis which anthropologists have applied with considerable elegance seem to fall down here. If there is such a thing as "semantic structure" in a language, then this list /of Burmese numeral classifiers/ ought to be reducible to some more orderly arrangement, but it seems doubtful that componential analysis is up to the task (Burling 1965: 264).

Burling's "problem," and ours by implication, centers on a research strategy which requires him to decide whether noun classifiers are to be analyzed as lexical or syntactic sets:

An interesting feature of numeral classifiers is the difficulty of deciding whether they constitute a lexical or a syntactical set. That is, in some ways the choice of which numeral classifier to use in a sentence seems similar to the choice among nouns: one picks the term which corresponds to the extralinguistic situation.... In other ways, however, the choice of numeral classifier more closely resembles the choice among grammatical markers...where the speaker is constrained by the internal syntactical rules of the language.... This rather ambiguous position makes numeral classifiers somewhat difficult to cope with, but strategic to investigate if one hopes to clarify that most slippery of linguistic problems, the relation of structure to meaning (Burling 1965: 244).

Burling goes on to argue that Burmese "numeral" classifiers must be treated as a lexical set:

For the most part...the Burmese speaker's choice of classifier is governed by extralinguistic requirements - the avoidance of nonsense - rather than the intralinguistic requirements of avoiding nongrammaticality (1965: 248).

This leads him to the following conclusion:

The problem resolves itself into whether it is simpler to specify the criteria of choice by the linguistic or by the non-linguistic environment. I feel that there is no doubt that the latter is more promising (1965: 249).

Thus, Burling gives us two alternatives: (1) either noun classifiers are a syntactic set, or (2) they are a lexical set, and our approach to the problem depends upon our choice between these two conceptualizations. However, the evidence to be presented here (and that presented by Burling himself) suggests that still a third alternative must be considered; namely that systems of noun classifiers are neither exclusively syntactic nor exclusively semantic but the result of these two systems viewed as intersecting.

In fact, for Burling the larger question is "How much do we want to build into the syntactical rules of grammar, and how much do we want to leave to meaning" (1965: 248)? The notion of a clear dichotomy between grammar and syntax is evident in this query. For purposes of analysis, for the testing of hypotheses, and for the construction of models, it has proven useful, even necessary, to treat given sets of phenomena as if they had an independent existence. Thus, we can appreciate Burling's call for an "either-or" decision with regard to noun classifiers. However, it may be the case (as we hope to demonstrate) that certain phenomena are best analyzed as manifestations of independent systems which are nevertheless operating conjointly in a non-arbitrary fashion. If we proceed along these lines, the problem of the nature of these systems becomes secondary to the problem of the nature of relationships existing between them.

Analytical Approaches

We begin with a conceptualization of language as consisting of three possible dimensions of study: the syntactic, the semantic, and the pragmatic. Although he finds the basic elements of this approach in a tradition going back to the Greeks, Charles Morris is generally credited with its first systematic treatment in his Foundations of the Theory of Signs (1955, originally published in 1938).

Semiosis, "the process in which something functions as a sign" (Morris 1955: 81), involves three correlates: the sign vehicle (symbol), the designatum (referent), and the interpreter (user of the symbol) (Morris 1955: 81-4). The symbol is the cornerstone of the

semiotic process. Syntactics comprises the study of the relationships among symbols of a given communication system; semantics is concerned with symbols as they are related to referents; and the relationships between symbols and their users are treated in pragmatics (Morris 1955: 84-5).

Nida, following Lounsbury (1955), outlines three types of meaning which correspond to Morris' semiotic correlates. These are linguistic, referential, and emotive meanings (Nida 1964: 41-3). The typology is based upon three pairs of contrasting dimensions of meaning whose detailed description we must leave to Nida and Lounsbury. A passage from Nida sums up his discussion.

In general we regard referential meanings as situational, extraorganismic, and extralinguistic. Emotive meanings are primarily behavioral, somatic, and intraorganismic. Linguistic meanings constitute a special class. To this extent, referential, linguistic, and emotive meanings parallel the distinction of semantic, syntactic, and pragmatic. However, the use of three sets of descriptive dimensions: situational vs. behavioral, linguistic vs. extralinguistic, and extraorganismic vs. intraorganismic, has the advantage of providing a much more detailed and precise manner of describing the relationship of the communicative event to the total cultural context in which it occurs (Nida 1964: 43).

The hypotheses to be tested in Chapters 4 and 5 will require that we analyze noun classifiers and other obligatory categories as syntactic and semantic structures involving linguistic and referential meanings, respectively. Descriptions of these two kinds of structure and an introduction to specific methods for their analysis are presented in Chapters 2 and 3.

CHAPTER 2

SYNTACTIC STRUCTURE

Following Morris, we have defined syntactics as the study of the relationships of symbols to one another. The concept is further restricted by directing our attention only toward linguistic symbols as against all others, e.g., paralinguistic, mathematical.

A number of theoretical approaches to syntactic structure are available to the linguist, such as the taxonomic, the transformational, and the stratificational. Another of these, tagmemic theory, has been developed by Pike (1967), Longacre (1964), and a number of other scholars associated with the Summer Institute of Linguistics. Although primarily a taxonomic or structural approach, tagmemics has much in common with transformational and stratificational theories as they are presented by Chomsky (1964, 1965) and Lamb (1966), respectively (Longacre 1964, 1965; Gleason 1964; Merrifield 1967). Because of its focus on classes of linguistic symbols and the relationships of these classes within and among levels of grammatical organization, tagmemic theory is ideally suited to the present study.

Linguistic Meaning

In a syntactic sense, the meaning of a linguistic symbol is the relationship it bears to other linguistic symbols. It is

important not to confuse linguistic meaning with other types of meaning. As Nida puts it (1964: 57):

Linguistic meaning must be carefully distinguished from other types of meaning, for the linguistic signification of a form does not refer to anything outside of language itself, as does referential or emotive meaning, but rather to the meaningful relationships which exist within language.

Syntactic relationships are extremely complex. They involve much more than the relation of symbol-to-symbol. From a tagmemic perspective, syntactic structures are systems of grammatical units, made up of categories of symbols and organized in a hierarchical manner characterized by increasing inclusiveness (Longacre 1964: 16-17, Longacre n.d.).

The basic construction of tagmemic theory is the "function-set correlation," or tagmeme:

The tagmeme is a functional point $\sqrt{\text{slot}}$...at which a set $\sqrt{\text{class}}$ of items and/or sequences occur. So intimate is the correlativity of function and set that each is mutually dependent on the other; the function cannot exist apart from the set nor has the set significance apart from the function (Longacre 1964: 15-16).

The meaning of a particular tagmeme, and hence our notion of linguistic meaning, is trimodally structured and represented in the formula:

$$U = F, M, D$$

where F is the feature mode, M the manifestation mode, and D the distribution mode of U, the linguistic unit (tagmeme) (Pike 1967: 92).

These modes are "simultaneously" structured:

Modes are not parts, nor pieces of the whole. They each comprise the entire substance in a different simultaneous structure. The same 'stuff,' the activity $\sqrt{\text{e.g., verbal behavior}}$, is STRUCTURED THREE WAYS AT ONCE (Pike 1967: 93).

The feature mode of a linguistic unit consists of a set of "identificational-contrastive" features which distinguish it from all other linguistic units (Pike 1967: 89-91). Thus, the feature mode of a phoneme /p/ would be its definition as a voiceless bilabial stop. This would contrast with the feature mode of a phoneme /b/, which is defined as a voiced bilabial stop.

The manifestation mode of a linguistic unit is essentially a list of its possible representations in behavior, i.e., a set of fillers of the slot occupied by the unit within the total linguistic structure (Pike 1967: 87-89). The potential manifestations of many tagmemes, e.g., obligatory grammatical categories, are constrained by manifestations of other tagmemes. That is, a series of "agreement" rules may exist between the manifestations of two or more tagmemes within a given syntactic construction such that the particular manifestation of one tagmeme is dependent upon the particular manifestation of some other tagmeme. This is precisely the situation with regard to noun classifiers and the nouns with which they are associated.

The distribution mode of a linguistic unit is a statement of the position or positions in which the unit may occur within the structured hierarchy. In analytic terms, the distribution mode of a linguistic unit is a description of the "function points" with which it is associated in a "function-set" or "slot-class" correlation (Pike 1967: 86-87). It is in this mode that the linguistic meaning of a grammatical category is primarily determined, especially in the sense of syntactic relations.

However, we have already noted that the feature, manifestation, and distribution modes of a linguistic unit are simultaneously structured. The linguistic meaning of such a unit is the relationship it bears to other linguistic units. This relationship is the product of relationships established by "identificational-contrastive" features, intra-structural constraints on manifestation, and distribution vis à vis other units.

We have also noted that syntactic structure involves more than the relationship of symbols to one another. Linguistic symbols are manifestations of linguistic units, whether these units be phonemic, morphemic, or lexemic. Discovery of the structure and meaning of linguistic units requires detailed analysis. The method of analysis associated with tagmemic theory is outlined below.

Tagmemic Analysis

Tagmemic analysis is a search for pattern in a linguistic corpus. It is avowedly inductive. In his Grammar Discovery Procedures, the most thorough treatment of this method to date, Longacre asserts that "the procedures here outlined are guess-and-check procedures (1964: 11, cf. Elson and Pickett 1962, an excellent introductory manual). The discussion below is a brief summary of Longacre's introductory chapter (1964: 7-34).

If the tagmeme is the basic construct of tagmemic theory, then the syntagmeme is the basic construct of tagmemic analysis. Recalling the tagmemic view of language as a structured hierarchy, we may say that the tagmeme is related to the syntagmeme as part is to whole.

The tagmeme is the basic analytical unit of a syntactic structure at a given level, e.g., the "phrase" level, of the grammatical hierarchy. This structure (syntagmeme) is in turn a tagmeme of a syntactic structure at the next more inclusive level, e.g., the "clause" level, of the grammatical hierarchy. This oversimplifies a situation wherein "words" may be tagmemes at the "clause" level, and "phrase" level syntagmemes may nest as tagmemes of other "phrases," but it will suffice in the present summary.

Analysis proceeds from level to level in an order best suited to each particular language. At each level, syntagmemes are typed according to their distinguishing structural characteristics, e.g., number, type, and ordering of constituent tagmemes. Each syntagmeme type is described in a tagmemic "apparatus" which consists of a formula and prose statement showing the tagmemic structure and a list of rules governing intra-structural restraints (primarily of the "agreement" type discussed above). This apparatus is illustrated in Figure 1.

A tagmemic analysis is adequate to the extent that it allows us to reconstruct all the grammatical utterances of the original corpus and to generate an infinite series of additional grammatical utterances. Of two competing analyses, we prefer the one which is most adequate while having the least number of apparatuses presented in the simplest form. Utterances at each level are generated by performing three ordered operations on each tagmemic apparatus: reading, permutation, and exponence.

Syn X = +Slot 1:Class A ±Slot 2:Class B
±Slot 3:Class C +Slot 4:Class D²

Read: The syntagmeme X consists of an obligatory slot 1 filled by class A, followed by an optional slot 2 filled by class B, followed by an optional slot 3 filled by class C, followed by an obligatory slot 4 filled by class D which may be read twice.

- Rules:
1. Slot 2 may be read (+) only if slot 3 is read (+).
 2. Slot 3 may follow slot 4.
 3. If class D is read twice, the manifestation of the second reading must reduplicate the manifestation of the first.

Figure 1. The tagmemic apparatus.

The possible readings of a syntagmeme are accounted for in the tagmemic formula by way of obligatory and optional markers and superscripts denoting potentially repeating tagmemes (see Figure 1). A given reading may be disallowed by an appropriate rule, e.g., rule No. 1 in Figure 1.

The possible permutations of a given reading of a syntagmeme are accounted for in the rules of the apparatus, e.g., rule No. 2 in Figure 1. Permutations involve reorderings of the tagmemes of a syntagmeme which do not affect the typological status of that syntagmeme. Each permuted reading becomes a new reading on which the operation of exponence may be performed.

Exponence is the process of representing each tagmeme in a given reading of a syntagmeme by one of its possible manifestations. The number of exponents of a reading is equal to the number of possible combinations of tagmemic manifestations of its syntagmeme. Tagmemic manifestations may be heavily restricted by the rules of the apparatus, e.g., rule No. 3 in Figure 1, and by the structure of the tagmemes as syntagmemes at lower levels. It is at this point, too, that semantic structure may interfere with, or otherwise affect, the structure so carefully developed by tagmemic analysis.

Tagmemics is one of several approaches to syntactic structure. Although its emphasis is taxonomic, it is fully equipped to generate the grammatical utterances of a language and to show transformational relationships among structural types, albeit in different ways than the generative approach of Chomsky. As a performance model, the

tagmemic conceptualization of interlocking phonological, grammatical, and lexical hierarchies is in many ways similar to the stratificational model of the sound-to-meaning process.

The method of tagmemic analysis is inductive and highly operationalized. It provides explicit procedures for analyzing the structure of a linguistic corpus and testing the adequacy of that analysis. In Chapter 4 the method will be applied to Thai noun classifiers in an effort to account for the complex nature of this obligatory grammatical category.

CHAPTER 3

SEMANTIC STRUCTURE

In Chapter 1, semantics was defined as the study of symbols "as they are related to referents." As in the case of syntactic structure, these relationships are complex. Unlike the situation in syntactics, however, semantics has not been dominated by systematic, structurally oriented treatments. As late as 1963 Katz and Fodor stated that:

...facts about the semantics of natural languages have been contributed in abundance by many diverse fields including philosophy, linguistics, philology, psychology, and so on. Indeed, a compendium of such facts is readily available in any good dictionary. At present, however, the superabundance of facts obscures a clear view of their interrelations and of the principles providing their underlying structure (reprinted in Fodor and Katz 1964: 480).

Whether or not we can fully endorse this strong statement, and our reliance on Morris rightly implied that we cannot, it is certainly true that the study of semantics has not been characterized by the clear definition of problem and delineation of subject matter which has been a hallmark of syntactics.

The problem of "the meaning of meaning," to paraphrase the classic work by Ogden and Richards (1923), has had a long and fascinating history. Excellent overviews are to be found in Bruner, Goodnow and Austin (1962), Morris (1964), and Nida (1964). For our purposes, however, the "problem" may be restricted to that of referential

meaning and its relevance to an analysis of semantic structures. In the present chapter, an approach to referential meaning is developed which stresses the paradigmatic nature of semantic structures. The method of componential analysis is also outlined, and the notion of the terminology set is introduced as a common framework in which syntactic and semantic structures may be discussed.

Referential Meaning

As pointed out in Chapter 1, Nida regards referential meaning as "situational, extraorganismic, and extralinguistic" (1964: 43). In this context, referential meaning is a cognitive response to the stimuli of some external situation. In contrast, emotive meaning is essentially a somatic response to behavioral factors associated with those stimuli. From this perspective, both "responses" are internal or "intraorganismic," and both may generate additional behavioral responses.

A simple example given by Nida (1964: 41-42) may clarify the distinction between referential and emotive meaning. The linguistic symbols "fire" and "a large destructive conflagration" may be taken as referentially identical. However, in the context (situation) of a crowded theatre, screaming the first or stating the second will produce vastly different behavioral responses which will be due almost entirely to emotive interpretations.

Regardless of the difficult and often tenuous distinction between emotive and referential meanings, the basic issue continues to be the analysis of the meaningful structured relations between

symbols and their referents. What is the nature of these relationships? What units are involved? How are they systematically described? For syntactics, we have introduced tagmemes, interrelated in syntagmatic structures. For semantics, we propose to introduce "categories," interrelated in paradigmatic structures.

We begin with what seems a paradox. The world of experience of any normal man is composed of a tremendous array of discriminably different objects, events, people, impressions.... But were we to utilize fully our capacity for registering the differences in things and to respond to each event encountered as unique, we would soon be overwhelmed by the complexity of our environment.... The resolution of this seeming paradox - the existence of discrimination capacities which, if fully used, would make us slaves to the particular - is achieved by man's capacity to categorize. To categorize is to render discriminably different things equivalent, to group the objects and events and people around us into classes, and to respond to them in terms of their class membership rather than their uniqueness (Bruner et al 1962:1).

It is not enough to say that linguistic symbols refer to "things" in the extralinguistic world. Rather, they refer to categories, in the sense of the above quotation. In other words, referential meaning and semantic structure involve the classification of phenomena in such a way that some things are "the same," while other things are "different." Furthermore, in order for communication to be possible within some interacting group, knowledge of the phenomenal world must be based upon shared principles, or rules, of classification.

Looking again to Morris (1946, 1955) we see that categories are known or arrived at through processes of denotation, designation, and signification. Goodenough has put it succinctly by saying that:

...a linguistic expression designates a class of concepts; it denotes a specific image or subclass of images within

the class on any one occasion of its use; and it signifies the criteria by which specific images or concepts are to be included or excluded from the class of images or concepts that the expression designates. What are signified, then, are the definitive attributes of the class, the ideational components out of which the class is formed (Goodenough 1968: 317).

It is clear from this discussion that "the main evidence for the existence of a category is the fact that it is named" (Sturtevant 1964: 106). It should also be evident that these named categories, or segregates, may be further organized into contrast sets, wherein the segregates are mutually exclusive and mutually substitutable "in the same culturally relevant environment" (Sturtevant 1964: 106).

The structure of a contrast set is paradigmatic. A paradigm is "a set of segregates which can be partitioned by features of meaning, i.e., a set some members of which share features not shared by other segregates in the same set" (Sturtevant 1964: 108). Sturtevant (1964: 108) correctly points out that while all contrast sets are paradigms, not all paradigms are contrast sets. As we shall see, this is the situation in the case of Thai noun classifiers. However, the fact of sub-sets within contrast sets is a major analytical problem only when it is not explicitly recognized. Once sub-sets are isolated and defined, analysis can proceed accordingly.

The partitioning of paradigmatic space is often extremely complex (Wallace 1962). We will only note here that segregates may be organized hierarchically or along continua, as well as within a single level of contrast. All such structurings, however, may be dealt with by the method of componential analysis, as it is described below.

Componential Analysis

The impetus for the application of componential analysis to anthropological problems is usually attributed to articles by Goodenough (1956) and Lounsbury (1956), both published in Language. Briefly, a componential analysis is "an analysis of a paradigm in terms of the defining features, the 'dimensions of contrast' or 'critical attributes' of the segregates in the set" (Sturtevant 1964: 109). The following outline is taken primarily from Wallace and Atkins (1960).

The first step of analysis is to collect and record a complete set (or defined sub-set) of the segregates which are mutually substitutable in the same frame. The frame is typically a question or statement in the native language, although we have worked in English to collect Thai data. These segregates are the designations of the contrast set in question. They are the terms of the set.

Each segregate, as a category, has one or more specific denotations, or manifestations. In American kinship terminology, the segregate 'uncle' denotes father's brother, mother's brother, father's sister's husband, and mother's sister's husband. Note that in this instance that the manifestations of the segregate are not commonly verbalized by the native speaker of the language. In the case of Thai, however, the denotations of classifiers are nouns, which are always expressed as members of their segregate classes. An exhaustive list of each segregate's denotations is required as the second step of the analysis.

Analysis continues with the identification of two or more conceptual dimensions of the segregates. Each of these dimensions must be "signified" by one or more of the segregates. That is to say that a dimension, or signification, is irrelevant unless it is shared by at least two of the named categories in question. Kroeber's 1909 list of kinship terminology principles is a good example of what the analyst searches for in the way of defining attributes.

With a full set of defining or criterial attributes at hand, each segregate is formally defined in terms of one or more of these components. Often, the components may be organized along dimensions showing internal contrast, e.g., a dimension of sex displaying a contrast of male and female. It is evident that along with the stipulation that each component be shared by at least two segregates, no two segregates may share the same set of components. They may not have the same signification, the same definition.

The final step of a componential analysis involves a statement of the semantic relationships among the segregates of the contrast set and of the structural principles which order the paradigm. This is usually accomplished by means of a chart with significant dimensions and their components arrayed along both axes.

The similarities between componential and tagmemic analyses are clear. Both proceed inductively through an explicit set of operations in an effort to reduce a corpus of data to an ordered structure of related categories. It is also apparent that both approaches are often useful for analyzing the same corpus.

It is just this possibility that we wish to explore in the final two chapters of this paper. In order to do so, we must first describe a unit which will accommodate both syntactic and semantic data. This unit, the terminology set, is discussed below.

The Terminology Set

So far, we have dealt with two major categories of phenomena; (1) in syntactics, the grammatical category; (2) in semantics, the contrast set. By its very nature, the grammatical category is made up of and manifested by linguistic symbols, or "terms." This is also at least partly true for contrast sets.

The analysis of a culture's terminological system will not, of course, exhaustively reveal the cognitive world of its members, but it will certainly tap a central portion of it. Culturally significant cognitive features must be communicable between persons in one of the standard symbolic systems of the culture. A major share of these features will undoubtedly be codable in a society's most flexible and productive communication device, its language (Frake 1962: 75).

On the other hand, segregates and contrast sets are, by definition, named sets. This characteristic is not shared generally by grammatical categories, except as metalanguages are developed to talk about them. Nevertheless, syntactic and semantic categories both share the characteristics of mutually exclusive and mutually substitutable distributions.

Let us also note that the linguistic symbol is at the core of both syntactic and semantic relationships. Thus, it is permissible to refer to both grammatical categories and contrast sets as terminology sets, i.e., sets of linguistic units which are named and

thereby distinguishable from all other such sets. Looked at in another way, a terminology set may have both a syntactic and a semantic structure. It stands to reason, then, that a terminology set, when isolated, may be analyzed by both tagmemic and componential methods.

It should be clear from this discussion that for a set of items to be a terminology set all that is required is that those items be linguistic symbols and that the set itself be named. Furthermore, although most grammatical categories and contrast sets are terminology sets by these requirements, a given terminology set is not necessarily both a grammatical category and a contrast set. In other words, a given grammatical category need not also be a contrast set and vice versa, even though it is a terminology set.

To reiterate, some terminology sets are characterized by this double or "simultaneous" structuring, and a failure to recognize this fact may lead to serious difficulties in the analysis of the set. In Chapters 4 and 5 we will examine these propositions and a number of other notions which have been introduced in the first three chapters.

CHAPTER 4

THE HYPOTHESIS OF SIMULTANEOUS STRUCTURING

In Chapter 1, noun classifiers were defined and mention was made of their wide distribution in the languages of the world. In Chapters 2 and 3 the nature of syntactic and semantic structures was reviewed, together with possible methods for their analysis. In Chapters 4 and 5 two hypotheses will be tested which attempt to demonstrate how noun classifiers are structured, both as grammatical categories and as contrast sets, i.e., as syntactic and semantic systems.

The first of the hypotheses, that of "simultaneous structuring," is presented below. To test the hypothesis tagmemic and componential analyses are performed on a corpus of Thai noun classifiers. The data was collected by the author, as discussed in Chapter 1, and is shown in Table 2. Finally, a number of problems bearing on the hypothesis are examined.

The Hypothesis

As syntactic structures, grammatical categories may be analyzed tagmemically. As semantic structures, contrast sets may be analyzed componentially. Both grammatical categories and contrast sets may be referred to as terminology sets, and, as we noted in Chapter 3, it follows from this that some terminology sets may have both a syntactic and a semantic structure. Any terminology set which

Table 2. Thai Noun Classifiers

<u>Number</u>	<u>Noun Classifier</u>	<u>Noun Class Members</u>
1.	/khon/	man, woman, boy, girl, nun, all kin terms.
2.	/ong/	all royalty, acolyte (Buddhist), Buddha, male and female fairies.
3.	/tua ⁴ /	all animals (except the elephant), table, chair, stool, pants, shirt, sewing needle, pin, nail, guitar.
4.	/cya ⁴ /	elephant (the only member).
5.	/on/	eraser, feather, knife, lock, coin, whistle, ruler, compass, bamboo needle, toothpick, comb.
6.	/sen/	rope, chain, belt, thread, hair, electric cord, rubber hose, rubber band, auto tire, cigarette carton, sugar cane stalk.
7.	/phyan ⁴ /	blanket, towel, washcloth, flag, hanky, carpet, sarong, robe.
8.	/baj ³ /	leaf, saw blade, box, bowl, tray, paper and burlap bags, purse (coin), bottle, glass, balloon, breast, basket, plate, watermelon, drum (musical).
9.	/phen/	paper, map, phonograph record.
10.	/x̄bɔp/	newspaper and other documents.
11.	/luk/	small ball, grape, tomato, coconut, bullet.
12.	/hua ⁴ /	head, sweet potato, onion.
13.	/duang ⁴ /	neon light, light bulb, star, sun, moon, postage stamp.

Table 2. Thai Noun Classifiers--Continued

<u>Number</u>	<u>Noun Classifier</u>	<u>Noun Class Members</u>
14.	/saj ³ /	necklace, bracelet, road, river, stream.
15.	/klööng/	canal.
16.	/wong/	ring (jewelry), washer (hardware), circle (geometric), band (music).
17.	/löt/	radio tube, toothpaste tube, wind-pipe, drinking straw.
18.	/lup/	triangle, rectangle, monk, photo.
19.	/kön/	bar of soap, ice cube, brick, rock.
20.	/lem/	book, ox-cart.
21.	/khon/	auto, bicycle, carrying pole, bow (archery), umbrella, saw.
22.	/lom/	bamboo pole, skiff, boat, airplane.
23.	/klyan ⁴ /	radio, "TV", typewriter, adding machine.
24.	/tu/	cabinet, mailbox
25.	/dam/	fountain and ball-point pens, candle, toothbrush.
26.	/thang/	pencil, stick of chalk.
27.	/dök/	arrow (archery), key, stick of incense.
28.	/ton/	tree, scallion, fence post, column (architecture).
29.	/si/	tooth, rib.
30.	/phon ³ /	banana, apple
31.	/fööng ⁴ /	hen's egg.

Table 2. Thai Noun Classifiers--Continued

<u>Number</u>	<u>Noun Classifier</u>	<u>Noun Class Members</u>
32.	/muan ⁴ /	cigarette.
33.	/söng/	cigarette pack, envelope.
34.	/löng/	all buildings.

is, in fact, both a grammatical category and a contrast set will be said to exhibit "simultaneous structuring."

The hypothesis to be tested is straightforward: if a terminology set is simultaneously structured, that is, if it is both a grammatical category and a contrast set, then the terms of the set are amenable to both tagmemic and componential analyses. The test of the hypothesis is equally straightforward: take some terminology set which is shown to be simultaneously structured, and perform the two analyses on its terms. The hypothesis is proved if both analyses successfully render a structural description of the terms of the terminology set. "Success" refers to the adequacy of the analyses as established in Chapters 2 and 3.

Thai noun classifiers comprise a terminology set in that they are a series of linguistic symbols in mutually exclusive and mutually substitutable distribution. We are able to isolate these symbols from other Thai symbols and refer to them collectively as noun classifiers. In Thai they are known as /laksanaknam/.

Clearly, the isolation of Thai noun classifiers is made on syntactic and/or semantic grounds since the terminology set must be one or the other or both. However, we should stress the fact that this "separating-out" of the category from a mass of language data is entirely pre-analytical. At this point we are merely entertaining the possibility that such a set exists which meets the criteria for being a terminology set.

The terminology set of Thai noun classifiers comprises a grammatical category, a linguistic unit. The feature mode of the

unit is its definition as a set of morphemes which classify the countable nouns of Thai. The manifestation mode of this unit is the list of classifier morphemes which systematically represent the grammatical category. The distribution mode of this unit is the description of its position within the Thai classificatory noun phrase (to be presented below).

The terminology set of Thai noun classifiers also comprises a contrast set. The set is recognized and named by Thai speakers. The terms of the set are mutually substitutable in a "culturally relevant environment" -- the classificatory noun phrase, wherein a choice among classifiers must be made in terms of the referent of the head noun of the phrase. The environment is particularly "relevant" because of the obligatory nature of the set: some classifier must be selected if a noun is counted.

If, as we maintain, Thai noun classifiers comprise a terminology set which exhibits simultaneous structuring, then the double analysis which follows should adequately describe both its syntactic and semantic structure. If these analyses are inadequate, then we must carefully consider alternative hypotheses.

Analysis of the Grammatical Category

Longacre has defined a phrase as:

...a class of syntagmemes of a hierarchical order ranking above such syntagmemes as the word and/or stem and below such syntagmemes as the clause and sentence. It may be single-centered, double-centered, or relator-axis; and expresses such relationships as head-modifier, linkage of elements, or relation of an element to the clause by means of an overt relator (e.g., English prepositional phrases) (Longacre 1964: 74).

An examination of Thai utterances reveals that certain nouns may be counted and that, when they are counted, an additional morpheme, the noun classifier, is invariably present. As such, these elements display an internal complexity characteristic of single-centered phrases: "In single-centered phrases some sort of HEAD or MAIN element occurs along with one or more MODIFYING, ATTRIBUTIVE, or QUALIFYING elements" (Longacre 1964: 74-75).

For convenience, we may label this phrase a "classificatory noun phrase." A few other optional adjectival slots are part of the phrase structure, but we will consider only the obligatory, nuclear elements of the construction, as shown in Figure 2. In this tagmemic framework, it is the lengthy and absolute rules of agreement between the fillers of the noun and noun classifier slots that demand our attention. As stated in the rule of the tagmemic apparatus, a given noun classifier may be manifested only if the appropriate class of noun slot filler is manifested. Thus, classifier no. 1 /khon/, can only occur if noun class no. 1 occurs, i.e., man, woman, boy, girl, nun, or any kin term.

Some of the difficulties of data elicitation were discussed in Chapter 1. Additional problems are treated in the discussion section of the present chapter. The result of 17 elicitation sessions is a corpus which is deficient on at least two counts: first, the set of 34 classifiers of count nouns is probably not exhaustive. Secondly, the denotata (noun referents) of each classifier are, in all likelihood, not complete. These deficiencies reflect, among

CNP = +N:ni-3₄ +Q:num +NC:ncl-3₄

Read: The classificatory noun phrase consists of an obligatory noun slot filled by noun classes 1 through 3₄, followed by an obligatory quantifier slot filled by numeratives, followed by an obligatory noun classifier slot filled by noun classifiers 1 through 3₄.

Rule: Noun classifiers co-vary with noun classes, such that ncl occurs with any member of n1, nc2 occurs with any member of n2, ... nc3₄ occurs with any member of n3₄.

Figure 2. Tagmemic apparatus for the Thai classificatory noun phrase.

other problems, the limitations of working with only one informant in the relatively sterile environment of a seminar room. Nevertheless we believe that the data in Table 2 are an adequate sample of both the sub-set of count noun classifiers and the count nouns with which they are so intimately associated.

The analysis presented in Figure 2 speaks for itself. It demonstrates that the terminology set of Thai noun classifiers is a grammatical category and adequately describes the structure of that category with but one qualification: although only one rule is necessary to express the constraints of agreement placed upon count nouns and their classifiers, the analysis is still unsatisfactory. The required co-variation of nouns and classifiers cannot be explained in linguistic terms, and the rules of agreement summarized by the rule in Figure 2 must remain an unanalyzed list. For the moment, however, we may pass on to a componential analysis of Thai noun classifiers.

Analysis of the Contrast Set

For reasons to be discussed below, we can only state that the classifiers of Thai count nouns form a paradigmatic sub-set of segregates within the total contrast set, or semantic domain, of Thai noun classifiers. Again, we confront the problem of incomplete data and, in addition, the likelihood that more than one type of classifier may be involved in the domain. These, too, will be discussed in the final section of the present chapter.

With regard to the semantic structure of Thai noun classifiers we ask the following kinds of questions:

1. Why is noun "A" a member of segregate (classifier) "X" while noun "B" is a member of segregate "Y"?

2. Why does the Thai speaker designate the new noun "C" a member of segregate "X" rather than segregate "Y"?

One discovery procedure for answering these sorts of questions is componential analysis.

The steps involved in a componential analysis were outlined in Chapter 3. The first two of these steps have been completed, as shown in Table 2: (1) the recording of a complete set (or a defined sub-set) of the noun classifiers -- those fillers of the NC slot of the CNP syntagmeme, and (2) the recording, for each classifier, of all nouns which may be manifestations of the N tagmeme when a given classifier is manifested in the NC tagmeme.

Proceeding to the third step of the componential analysis, we seek a series of dimensions with which to construct a 34-cell paradigm. The dimensions should be contrastive at any given level and may be hierarchically organized as well. Referring to Table 2, the broadest contrastive level seems to be "animate-inanimate." The "animate" dimension shows a "human-nonhuman" contrast, and "human" is apparently divided into two ranked status classes, no. 1, /khon/ and no. 2, /ong/. Principles organizing the "inanimate" dimension are not immediately clear but seem to consist of a number of geometrical and functional attributes in complex relationships. However,

even this cursory search for semantic components reveals a number of inconsistencies which must be dealt with if our analysis is to continue.

One of the goals of a componential analysis is to develop conjunctive definitions for every segregate such that the defining attributes of each are both sufficient and necessary for the determination of any noun's class membership. Disjunctive definitions, on the other hand, "exhibit defining attributes such that one or another of these attributes can be used in identifying or categorizing... /class membership/" (Bruner et al 1962: 156). While admittedly clumsy, disjunctive definitions do not invalidate the notion of semantic structure and do not argue against the usefulness of componential analysis (Bruner et al 1962: 156-181; Basso 1968: 259).

Examining Table 2 in search of componential definitions for the several noun classifiers, we find that almost every Thai noun classifier in the table must be defined as a disjunctive category. We have said that the fact of disjunction does not necessarily do harm to our analysis, but compounding this "inelegant" complexity is a pervasive ambiguity and indeterminacy of noun class membership.

A few noun classifiers are conjunctively defined. No. 7, /phyan⁴/, for example, is defined by the combination of attributes "inanimate," "rectangular," "flexible," "fabric," and "non-container" in contrast to all other classifiers. Most of the others, however, require at least two sets of attributes to account for them as categories. No. 3, /tua⁴/, straddles the high level contrast of

"animate-inanimate," and no. 5, /ɔn/, would seem to have nearly as many componential definitions as it has noun referents.

Indeterminacy exists when a given noun, as a denotatum, clearly satisfies the componential definitions of more than one segregate. No. 6, /sen/, is defined largely by the attributes "inanimate," "linear," and "flexible." A rubber band shares all of these attributes with most of the other members of the class, except that it exhibits the attribute "circular," rather than "linear." Why, then, is it not a member of no. 14, /saj³/, along with bracelets and necklaces? Similarly, auto tires, also members of no. 6, would seem to be more appropriately found in no. 16, /wong/, sharing with rings and washers the additional attributes of "circular" and "rigid." The distribution of vehicles in no. 21, /kɔn/, and no. 22, /lɔm/, is not clear, and the same holds true for the objects in no. 25, /dam/, and no. 26, /thang/, as well as many others.

No. 4, /cya⁴/, classifies but one noun -- elephant. The only explanation for this isolated case seems to be that the elephant has a traditional association with royalty, thus giving it a special status relative to all other animals.

Finally, there is the noun classifier no. 5, /ɔn/, which can fill the NC slot in any instance where the speaker is unsure of the appropriate filler. Foreigners are advised to use /ɔn/ to avoid any possible embarrassment when first learning Thai. It is the author's guess, and there is informal confirmation from the informant, that the Thai child uses /ɔn/ as a "basic" classifier and gradually

replaces it with proper classifiers as he becomes more sophisticated in the use of his language.

A componential analysis of a semantic domain, or some defined sub-set of that domain, should provide us with a structural description which accounts for all the data in our corpus. More importantly, it must account for all additional denotata of that domain. In view of the inconsistencies and ambiguities discussed above, we can hardly make claim to such a structural description for this sub-set of Thai noun classifiers. On the contrary, we are forced to conclude, with Burling, that componential analysis is "not up to the task" (Burling 1964: 20-28).

We are unable to construct a componential paradigm for Thai noun classifiers. Nevertheless, we cannot escape the fact that some segregates are conjunctively defined; nor can we ignore the fact that while many segregates are disjunctively defined, some are still contrastive with other segregates. We conclude, then, that a semantic structure exists, albeit inadequately described.

Discussion

Since we have not been able to perform both a tagmemic and a componential analysis on the terminology set of Thai noun classifiers, our hypothesis of simultaneous structuring is disproved. Before presenting an alternative hypothesis about the structure of the set, some possible factors influencing our initial failure will be examined. If Thai noun classifiers are both a grammatical category

and a contrast set, why have the analyses -- especially the componential one -- proven inadequate?

Metaphorical Extension

A major factor leading to ambiguous semantic structures is the process of metaphorical extension. In this process, terms come to be disjunctively defined. The English kin term "father," for instance, is extended as a label for Roman Catholic priests. In many societies, kin terms are extended to such items as "moon," "corn-mother," or totem figures. We are familiar with the use of metaphor as a means of enriching our discourse by selecting concrete or well-known concepts and postulating significant similarities between them and other more abstract categories. "Life" is a "game" or "a bowl of cherries."

With regard to referential meaning and the description of semantic structures, Nida has described the problem of metaphorical extension as follows:

In attempting to deal with referential meanings we are constantly troubled by problems of figurative extensions of meaning, for many words possess domains with marginal protuberances which do not seem to fit into the regular patterns... Figurative extensions of meaning arise primarily from the process of selecting one or more components of the meaning of a particular term...and extending them to cover some object which has not been within the domain of such a word. If an object comes to be included permanently within the domain of a particular word, there is no longer an active figurative extension (i.e., a metaphor), but simply an increase in the area of meaning of the term in question (Nida 1964: 93-94).

A great many metaphorical relationships exist among the denotata of Thai noun classifiers. In no. 3, /tua³/, furniture and

certain articles of clothing are presumably denotata of the category because they share with most animals the feature of "legs" or "appendages." But, because they are in the category, /tua⁴/ must be disjunctively defined as "animate" or "inanimate," as well as "non-human." The matter of selectivity is clear since not all animals have legs, e.g., fish and snakes. The problem in a structural analysis is that the components "animate" and "inanimate" are necessary contrasts between the first four segregates in Table 2 and all other segregates.

Furthermore, while we may account for the inclusion of furniture and clothing in /tua⁴/ by metaphorical extension, we cannot easily do the same for other of its denotata such as sewing needle, pin, and nail. They are clearly associated with one another, but the criteria for this association is hardly correlated with any criteria for membership in /tua⁴/. It is far more satisfying to discuss disjunctive definitions in terms of metaphorical extensions than in terms of arbitrary inclusion.

Some disjunctive categories may be dealt with entirely in terms of figurative extensions. No. 13, /duang⁴/ may be divided into three sub-sets: (1) star, sun, and moon; (2) neon light and light bulb; and (3) postage stamps. These sub-sets are related by a simple series of extensions: from (1) natural light source, to (2) man-made light source, to (3) representational light source (assuming that Thai stamps are either brightly colored or display images of celestial objects).

The presence of all these disjunctively defined segregates, whether the disjunction is metaphorical or arbitrary, reflects a

situation of some flexibility in the semantic structure of Thai noun classifiers. This is not the case in the syntactic structure of the set.

Quantity and Variety of Classifiers

An obvious problem which increases the complexity of analysis is the very size of the corpus. A grammatical category this large, which is constrained by highly specific agreement rules, is not open to a simple structural description. At the same time, the construction of a 34-cell paradigm is no mean task -- even if all the segregates could be conjunctively defined.

Another complexity, only potentially troublesome, is the fact that there are actually three types of Thai noun classifiers. Pe has assessed the situation for Burmese, and his typology is quite relevant to Thai.

A classifier is a word for an attribute of a specific object, some of which may have more than one; a repeater is the specific object itself or part of it...; whilst a quantifier concerns itself with the estimating of things by some sort of measure - size, extension, weight, amount or number especially for Burmese of ten or multiples of ten (Pe 1965: 166).

Our analysis has been restricted to that type of Thai noun classifier which Pe would refer to as a "classifier." This raises no special problem as long as the sub-set is isolated from the other types. The inclusion of "repeaters" and "quantifiers" would not alter the structure of the CNP syntagme, although the rules of the apparatus would become correspondingly more complex. However, to consider all three types of classifier in an analysis of the entire

contrast set of Thai noun classifiers would simply compound the complexity of an already difficult problem.

No. 15, /klööng/, has been included in the data of Table 2 as an example of the type of complexity involved in Pe's category of "repeaters." /klööng nyng klööng/ is the CNP 'canal one canal.' What componential definition can we give which will segregate no. 15, /klööng/, from no. 14, /saj³/, which includes the denotata road, river, and stream? A great many Thai CNPs are formed in this fashion, involving many nouns that clearly qualify as denotata of the noun classifiers in Table 2. /tiang/, 'bed' is both noun and noun classifier in the CNP /tiang nyng tiang/. We cannot see any semantic criteria for not classifying a bed along with other pieces of furniture in no. 3, /tua⁴/ -- and Thai beds in Bangkok do have four legs.

Learning and Using Thai Noun Classifiers

This is neither the time nor the place to engage in a lengthy discussion of learning theory, but statements of various authors about how one learns classifiers have direct implications for the analysis of the terminology set. Concerning Thai, Haas states that:

...in most cases it is impossible to devise rules which will serve as an infallible guide in choosing the proper classifier to be employed with any given noun. For this reason it is desirable to memorize the classifier to be used with a noun at the same time that one learns the noun, just as in French or German one must memorize the gender of each noun (Haas 1942: 201).

In her Thai dictionary (1964), Mary Haas lists the appropriate classifier within the definition of each noun.

According to Burling, in spite of the kinds of difficulties described above for Thai,

Burmese do learn to speak to each other and even foreigners can learn to use classifiers without difficulty. Seeing the problems which arise in the attempt to bring order into the set of classifiers, one may feel that the best available "analysis" so far is simply the list of classifiers with their definitions (Burling 1965: 264).

Finally, Nguyen-Dinh-Hoa, describing the noun classifiers in Vietnamese, points out that:

...there exist some two hundred special classifiers which students of the language just have to memorize in connection with different nouns (Nguyen-Dinh-Hoa 1957: 127).

In simplest terms, we might say that learning is basically a process of memorization. We should note, however, that children do not memorize individual events or phenomena. Rather, they memorize concepts and the clusters of defining attributes which distinguish single concepts from all others. Thus, it is not sufficient to say that Thai speakers simply memorize lists of noun classifiers together with the nouns they classify.

It would be more accurate to say that Thai speakers learn noun classifier concepts and the morphemes that label them. Because the relationship between a symbol and its referent is arbitrary, it is possible that the classifier morphemes and the complex system of concepts they label may become confused. This would be as true for the Thai child as for an adult foreigner. If, in addition, the relevance of correctly classifying nouns was decreasing over time, then the apparent contradictions and inconsistencies of Thai noun

classifiers would be more acceptable and less baffling. There is evidence to suggest that this may be the case.

Earlier, we mentioned the classifier / α n/. It may substitute for any other classifier when there is uncertainty and was used frequently by the informant during elicitation sessions. This option clearly works to reduce the significance of decisions as to the proper classifier of any given noun.

Repeaters, a classifier type described just above, are yet another method of avoiding indeterminacy in specific situations. In several instances, the informant first used a repeater, that is, he employed the noun in question as its own classifier. Then, after some thought, he would decide upon an established classifier he judged to be appropriate.

A third suggestion of the reduced significance of "proper" classifiers is found in the area of sociolinguistics. In many instances, the non-linguistic context may override errors made in the choice of noun classifiers. In the market place, for instance, if one were looking for a quantity of /man/, 'sweet potatoes,' and accidentally asked for /man sööng³ luk/ (no. 11) instead of /man sööng³ hua⁴/ (no. 12), no confusion would arise. As the informant put it, "Anyone would know that you were asking for two sweet potatoes." You would get a funny look, however, if you simply asked for /man sööng³/.

We have said that we might consider learning as a process of concept formation and memorization and that arbitrary labelling is

a possible source of confusion in verbal behavior. What is more important, though, is the fact that even with an internalized set of concepts, one must confront each new stimulus or event and decide how to categorize it. What we have presented in the above paragraphs are some indications that the Thai speaker, when he must make such a decision concerning counted nouns, has open to him a number of choices which are grammatically equivalent but semantically dissimilar. In Chapter 5 we will develop this proposition in the form of an hypothesis of "structural intersection."

CHAPTER 5

THE HYPOTHESIS OF STRUCTURAL INTERSECTION

We have established that the terminology set of Thai noun classifiers is both a grammatical category and a contrast set, although we have subjected only a portion of that set to formal analysis. An effort was made in Chapter 4 to describe the structure of noun classifiers by testing an hypothesis of simultaneous structuring. The hypothesis proved to be unproductive, and several relevant problems were discussed which will be of value in developing an alternative formulation.

One premise of our initial hypothesis was that the simultaneous structuring of a terminology set involved two independent systems. Based on this assumption we argued that a syntactic analysis of the set could proceed without regard to the set's semantic structure, and, in turn, a semantic analysis of the set could proceed without regard to the set's syntactic structure. The analyses and post-analytic discussion make it clear that we must now re-examine this premise.

The Hypothesis

In the initial hypothesis of simultaneous structuring, we adopted Burling's position (1965) that syntactic and semantic systems may be viewed as operating independently of one another. The

hypothesis proved untenable, and it is our contention that this assumption was the primary source of inadequacy.

In the outline of the problem orientation of this thesis (Chapter 1) we offered an alternate working assumption, namely that "certain phenomena are best analyzed as manifestations of independent systems which are nevertheless operating conjointly in a non-arbitrary fashion." From this premise, we would suggest a second hypothesis -- one of "structural intersection."

The hypothesis consists of two arguments and a statement of the relationship between them.

1. If a terminology set is simultaneously structured, then the relationship between its syntactic and semantic structure is expressed as a degree of intersection ranging from non-intersection to congruence.

2. In simultaneously structured terminology sets, the syntactic structure tends to dominate the semantic structure.

3. The degree of syntactic dominance is directly related to the degree of intersection.

The minimal degree of syntactic dominance will be co-dominance in the case of structural non-intersection. The maximal degree of syntactic dominance will occur in the case of structural congruence. In the latter case, there will be essentially no semantic structuring of the terminology set. Technically, the set will not exhibit simultaneously structuring.

We have already defined simultaneous structuring as the condition wherein a terminology set is both a grammatical category and

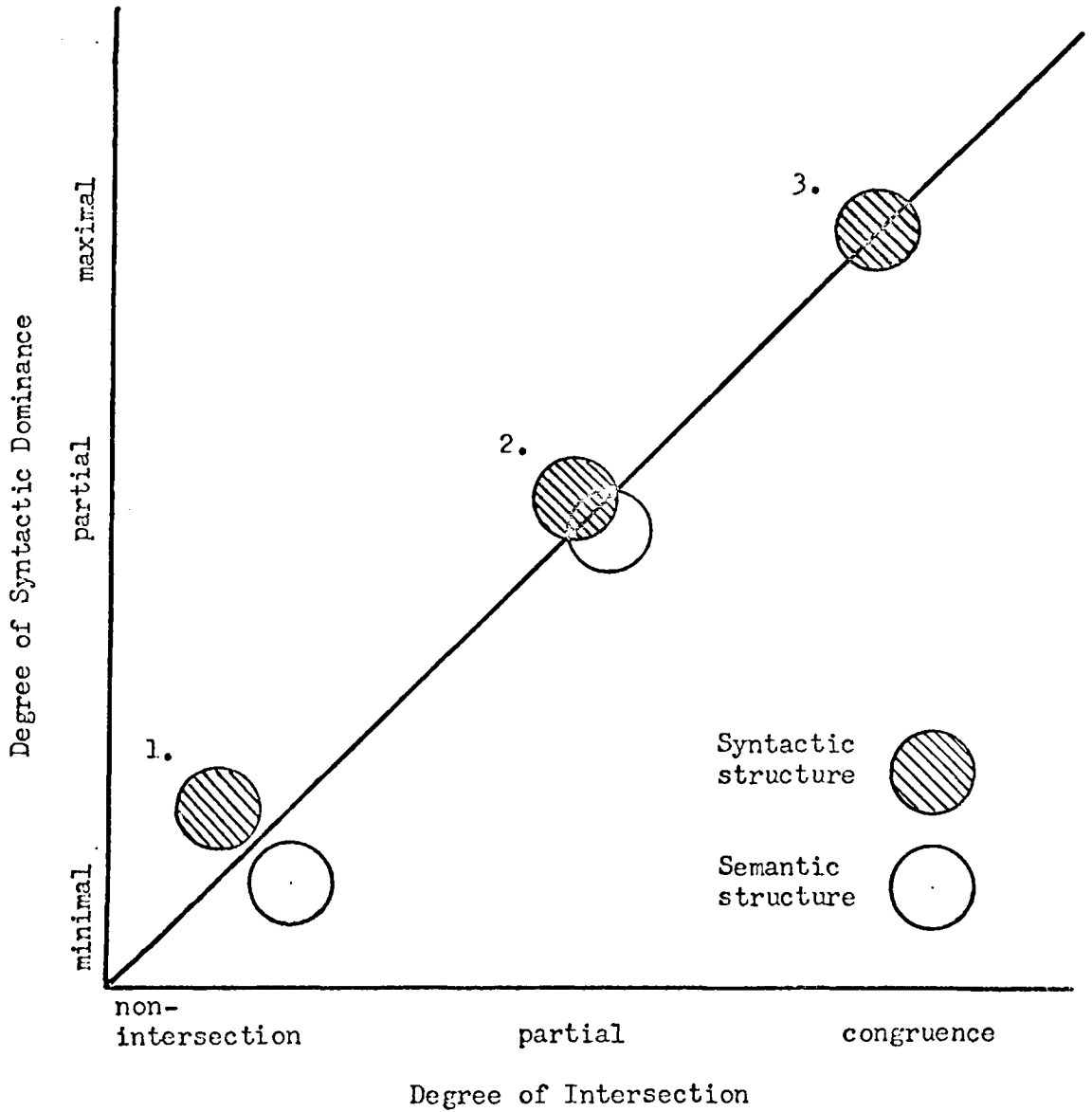
a contrast set. The concepts of structural intersection and syntactic dominance are purely heuristic devices. Structural intersection is a measure of interference resulting from the condition of simultaneous structuring. Syntactic dominance is a measure of the direction and magnitude of that interference. Together, the two variables comprise a statement, for any simultaneously structured terminology set, of the alternatives available to the speaker when he must make a decision concerning appropriate syntactic and/or semantic verbal behavior.

The test of this hypothesis will be comparative and cross-cultural. We will examine the degree of structural intersection and syntactic dominance of three simultaneously structured terminology sets: (1) Western Apache classificatory verb stems, (2) Spanish gender markers, and (3) Thai noun classifiers.

The Model of Structural Intersection

The analysis of structural intersection may be facilitated by phrasing the hypothesis as a model. In this model (Figure 3) simultaneously structured terminology sets are appropriately placed along a continuum predicated on an hypothesized positive correlation between structural intersection and syntactic dominance. The positions of three sets are shown and will be discussed in the present section.

The relationships between the syntactic and semantic structures of each set, represented by circles, are schematic. They refer only to three general conditions of non-intersection, partial intersection, and congruence. The line of possible positions is



Terminology Sets

- 1. Western Apache classificatory verb stems
- 2. Thai noun classifiers
- 3. Spanish gender markers

Figure 3. The model of structural intersection.

also schematic. For our purposes, we may assume that the correlation between the two variables is one-to-one.

Non-intersection

Western Apache classificatory verb stems comprise a simultaneously structured terminology set whose syntactic and semantic structures are non-intersecting (Figure 3). Basso (1968) has recently performed a componential analysis on these stems using procedures outlined in Chapter 3. Although he does not discuss the grammatical category at any length, Basso cites Davidson, Elford and Hoijer (1963), and states that:

...as in Navaho, Western Apache classificatory verb stems are characteristically distributed in neuter verbs, which denote members of the object category at rest, and active verbs which refer to (1) the movement or handling of members of the object category; (2) the throwing or dropping of them; and (3) their free movement in space (Basso 1968: 253).

In addition, "nonclassificatory verb stems are characteristically not so distributed" (Davidson et al 1963: 31).

Basso describes the verb stems as a contrast set in the following terms:

Despite the fact that as a set Athapaskan classificatory verb stems occur only with certain types of neuter and active verbs, it is important to understand that the choice between individual verb stems is not governed by internal syntactical rules but by extra-linguistic considerations, namely the object that is being talked about.... The speaker must decide that a specific object belongs to a particular category and label it accordingly. In so doing, he classifies a portion of his environment (Basso 1968: 252-253).

This statement is remarkably similar to ones made by Burling concerning Burmese classifiers (Burling 1965: 244, 248). (Quoted in Chapter 1).

The contrast set consists of 13 segregates (Basso 1968: 255-257) having the referents of nouns as their denotata. Analysis reveals that "seven semantic dimensions are sufficient to define the categories labelled by Western Apache classificatory verb stems" (Basso 1968: 258). Among these are such dimensions as "Animal/non-animal," "Rigidity/non-rigidity," "Portability/non-portability," etc. Each dimension is composed of either two or three components so that a total of 16 components are differentially combined in the componential definitions of the segregates (Basso 1968: 258).

Of the 13 segregates, only one must be disjunctively defined. The verb stem designating "Category IV" is componentially defined as either (1) non-animal, non-enclosed, "plastic," singular, non-rigid, and three times longer than wide or tall; or (2) non-animal, non-enclosed, "solid," and dual (Basso 1968: 259). Basso reports (1968: 259) that his informants were well aware of this disjunction and were quick to point it out.

This terminology set of Western Apache classificatory verb stems is an example of structural non-intersection and minimal syntactic dominance. The set is simultaneously structured and both a syntactic and a semantic analysis may be adequately performed on its terms. Since we are primarily concerned with the failure of our componential analysis of Thai noun classifiers, it is particularly

interesting to note the elegance of Basso's semantic description of the Apache verb stems.

Congruence

As Lyons points out (1968: 288), gender is a common grammatical category which in some ways is quite similar to noun classifiers. He also points out that:

...the recognition of gender as a grammatical category is logically independent of any particular semantic association that might be established between the gender of a noun and the physical or other properties of the persons or objects denoted by that noun.... The degree of correspondence between the classification of nouns by grammatical gender and a classification of the persons and objects denoted by them according to the relevant 'natural' properties will vary considerably from language to language. It is well-known that in the Indo-European languages many words which denote inanimate objects are 'masculine' or 'feminine' in gender; to this degree 'natural' and grammatical gender fail to correspond (Lyons 1968: 284).

It is clear that gender is a grammatical category in Spanish. It is an obligatory noun suffix manifested by the masculine /-o/ or feminine /-a/ in the vast majority of Spanish nouns. As such, gender markers require similar manifestations of the elements of noun phrases, e.g., deictics and adjectives. Tagmemically this is accomplished through a series of agreement rules between nouns and their modifiers in noun phrase syntagmemes.

It is not so clear that the terminology set of Spanish gender markers is also a contrast set. We will argue that it is for the following reason: the gender markers are segregates in that they are linguistic symbols (in this case bound morphemes) which label or designate classes of denotata (the referents of Spanish nouns).

We cannot argue, however, that the terminology set has a semantic structure. In terms of our hypothesis, this is due to the complete dominance of its syntactic structure (Figure 3). Spanish gender illustrates the highest possible degree of structural intersection and syntactic dominance. At this extreme there is essentially no semantic structure to be analyzed. We can put in no better terms than did Meillet:

Once the category has been created, one is led to apply it throughout the language. The grammatical machinery compels all animate nouns to be either masculine or feminine. And the apportionment between the two genders can sometimes depend on very little. It is then often difficult to distinguish between cases in which the distinction had a clear meaning and those in which a gender was attributed to this or that word, simply because the language assigned every noun to one of a fixed number of "genders." (Meillet 1964: 124, referring to Indo-European languages in general. Originally published in 1923.)

Partial Intersection

Thai noun classifiers have been dealt with at length in Chapter 4. We will only reiterate here that they comprise a simultaneously structured terminology set and that, while a relatively satisfactory syntactic analysis has been performed, the semantic analysis was entirely inadequate.

In the context of the hypothesis of simultaneous structuring, the terminology set of Thai noun classifiers was treated as if its syntactic and semantic structures were not interdependent, linked, or otherwise related. This position did not lead to a further understanding of the problems involved in the tagmemic and componential analyses of the set.

Viewed in terms of the model of structural intersection, the relationship between the syntactic and semantic structures of Thai noun classifiers is clarified. The hypothesis of a positive correlation between structural intersection and syntactic dominance allows us to proceed from the fact of an inadequate semantic analysis to a description of factors underlying that inadequacy.

For Thai noun classifiers, the description entails a statement of partial structural intersection coupled with a partial dominance of the syntactic structure over the semantic structure (Figure 3). The relationship between the pair of Thai noun classifier structures is neither the non-intersection, minimal dominance position exhibited by Western Apache classificatory verb stems nor the congruence, maximal dominance position described for Spanish gender markers.

If the relationship between the syntactic and semantic structures of Thai noun classifiers were the same as that between the syntactic and semantic structures of Western Apache verb stems, then we would expect a componential analysis of the Thai data to be at least as adequate as that performed on the Apache data. This, of course, is not the case.

On the other hand, if the relationship between the Thai structures were the same as that between the structures of Spanish gender markers, we would expect the syntactic structure of noun classifiers to completely overshadow the set's semantic structure. Again, this is not the case. While Spanish gender markers are apparently

devoid of semantic structure, Thai noun classifiers are intriguing in their manifestations of multiple semantic components and dimensions.

The simultaneous structure of the terminology set of Thai noun classifiers is unlike that of either Western Apache verb stems or Spanish gender markers. Therefore, it must occupy a different position along the continuum established by the hypothesis of structural intersection. From the comparisons made above, it seems clear that the set of Thai noun classifiers must be placed on the continuum near the point indicated for it in Figure 3.

Non-simultaneous Structuring

It will be recalled that a terminology set may be either a grammatical category or a contrast set or both. Only in the latter case may it be said to exhibit simultaneous structuring. Furthermore, the model of structural intersection applies only to simultaneously structured terminology sets.

The larger number of formal semantic investigations have been done on terminology sets which are only contrast sets (see Sturtevant 1964 for a survey and bibliography). Kinship terms, for instance, are most often merely a sub-set of some noun category. The sub-set, in turn, is defined not by any linguistic criteria (as is the case for Thai noun classifier sub-sets), but solely by virtue of comprising a contrast set whose designata refer to some meaningfully related set of objects or activities in the real world.

Other terminology sets, such as color categories (Conklin 1964) and pronominal systems (Buchler and Freeze 1966), are often

similarly structured only as contrast sets. This assertion must, of course, be verified for each language, but it is noteworthy that in neither of the above cited articles are the terminology sets considered as grammatical categories or formally constituted sub-sets of such categories.

Many terminology sets, on the other hand, are structured only as grammatical categories. Here the primary consideration is the notion of "culturally relevant environment." Nouns are perhaps the best example of this situation.

Note that the cognitive relation of contrast is not equivalent to the relation of class exclusion in formal logic and set theory. The three categories 'hamburger,' 'hot dog,' and 'rainbow' are mutually exclusive in membership. But in writing rules for classifying hamburgers I must say something about hot dogs, whereas I can ignore rainbows.... The segregates 'hamburger' and 'rainbow,' even though they have no members in common, do not function as distinctive alternatives in any uncontrived classifying context familiar to me (Frake 1962: 79).

Although they are not all members of the same contrast set, the segregates 'hamburger,' 'hot dog,' and 'rainbow' are all lexical manifestations of the English grammatical category "noun."

The import of this discussion is that those terminology sets which are not simultaneously structured will not be affected by the propositions of the hypothesis of structural intersection. If the terminology set is only a grammatical category, we would expect that only a syntactic analysis could be performed upon its terms. On the other hand, if the terminology set is only a contrast set, then we could expect only a semantic analysis to adequately describe its structure.

Conclusion

The model of structural intersection is based on the hypothesis that the syntactic and semantic structures of simultaneously structured terminology sets may intersect and that the degree of intersection is directly related to the degree of syntactic dominance. The model allows us to compare and contrast a number of such terminology sets as to their differing degrees of structural intersection. It also provides us with a means of discussing the difficulty of performing componential analyses on certain sets.

For these reasons, the hypothesis of structural intersection may be viewed as an expansion and improvement of the simpler hypothesis of simultaneous structuring. The earlier hypothesis could not account for the fact that some simultaneously structured terminology sets could be successfully analyzed semantically while others could not. Furthermore, the initial hypothesis could not discriminate between the failure of a semantic analysis of Spanish gender markers and the failure of such an analysis of Thai noun classifiers. The hypothesis and model of structural intersection is designed to accomplish these tasks, or at least to point us in the right direction toward their accomplishment.

It is one thing to show where the problems lie. It is quite another to solve them. The hypothesis of structural intersection is a proposition for problem identification and description. It is not a method of problem solution. Nothing presented in this paper would lead us to deny Burling's negative conclusion that componential

analysis is "not up to the task" of describing the semantic structure of Burmese numeral classifiers or any other similar terminology set.

Burling's pessimism is well taken, but perhaps for the wrong reasons. It would appear that in his analysis of Burmese classifiers he operates in terms of the hypothesis of simultaneous structuring -- either positing or assuming that the syntactic and semantic structures of the set are independent of each other. We learn that a componential analysis is inadequate, but we are given no clue as to why. Burling's conclusion is that something is wrong with componential analysis (1965: 264).

From the broader perspective of the hypothesis of structural intersection, we see that nothing is wrong with componential analysis, but, until we can somehow isolate and deal with the dominance of syntactic structures over semantic structures, the componential analysis of certain terminology sets is precluded.

One final issue should be taken up with respect to Burling's article on Burmese classifiers. As we noted in Chapter 1, Burling maintains that:

...for the most part...the Burmese speaker's choice of classifier is governed by extralinguistic requirements - the avoidance of nonsense - rather than the intralinguistic requirements of avoiding nongrammaticality (Burling 1965: 248).

The analysis of Thai noun classifiers in Chapter 4 and the adequacy of the model of structural intersection point in just the opposite direction. Unless Thai classifiers are radically different from Burmese classifiers -- and this appears doubtful -- we can

hardly escape the conclusion that the requirements of grammaticality far outweigh the requirements of semanticity.

An interesting implication of the model of structural intersection is that another quadrant of the "graph" shown in Figure 3 may exist wherein structural intersection is positively correlated with increasing degrees of semantic dominance. In this quadrant, we would be dealing with the art of poetry where syntax is seldom allowed to interfere with the imaginative expression of ideas, feelings, and convictions. We would be required to broaden our conceptualization of semantics to include connotative meaning, but the rewards of such an undertaking might be well worth the effort.

These criticisms and comments should not be taken as condemnations of Burling's work in descriptive semantics. Hopefully, they are constructive. Certainly, they have been stimulated by Burling's own challenges (1964, 1965) to develop more effective approaches to "that most slippery of linguistic problems, the relation of structure to meaning" (Burling 1965: 244).

As the title of this thesis indicates, we have been interested in understanding the phenomena of Thai noun classifiers and other similarly structured terminology sets. In order to achieve this understanding, we first developed an hypothesis of simultaneous structuring. While this hypothesis gave us a useful unit of analysis -- the simultaneously structured terminology set -- it did not provide us with insights into its internal structure.

Expanding upon the first hypothesis, we introduced the hypothesis of structural intersection and phrased it as a model as an aid to analysis. This second hypothesis proved successful in its ability to describe the nature of relationships between the syntactic and semantic structures of terminology sets. We have most certainly not solved "the problem" of Thai noun classifiers, but hopefully we have suggested an answer to the question "Thai noun classifiers -- syntax or semantics?"

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