

CLASS NOUNS AND CLASSIFIERS IN THAI

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Various kinds of implicit semantic categorization, or set classification, exist in natural languages. Thai provides especially good data for one kind that differs in several respects from both classifier and folk taxonomy categorization. *Class nouns*, compounds consisting of *class term* heads and attributives which are frequently other nouns, are found in many languages, including English, but have not hitherto been examined from a formal point of view. In Thai, class nouns are treated as a distinct category because, perhaps, while many class terms are exclusively bound forms, many are also classifiers and may, in addition, be independent nouns. This paper examines class noun categorization and its relationship to both classifier categorization and folk taxonomy.

There are at least three major kinds of noun categorization in Thai: class noun categories, noun classifier categories, and folk taxonomies.

Folk taxonomies, which are comparable to Roschian semantic categories, may be defined as 'hierarchical non-agreement semantic categories', that is, sets of nouns organized according to semantic level. For example the noun *residence* can be the superordinate head of a taxonomy with the next level down, the basic level, consisting of the nouns *house*, *trailer*, *igloo*, and so on. Each of these nouns can be the basic level head of a subordinate level, for example under *house*, the subordinate level nouns *bungalow*, *Cape Cod*, *ranch*, *split-level*, and so on. The 'type and token'¹ hierarchies set up in such taxonomies are not based on agreement, and the nouns need not have any formal organizing feature in common. The semantic structure of such taxonomies has been investigated in great detail (Rosch 1977, Lakoff 1987).²

Noun classifier classes may be characterized as 'salient characteristic agreement categories'. A classifier category, or class, is a set of nouns that is implied by the classifier chosen to agree with the included nouns on the basis of salient physical

characteristics or kinesthetic image schemas (on which see below). These classes are minimally structured taxonomically, insofar as the classifier and the set of nouns which it heads form a single two-level class or hierarchical set. All nouns in a classifier set appear to belong to the same Roschian semantic level. Classifier classification in Thai has been investigated in some depth (Hundius and Kölver 1983, Conklin 1981, Hiranburana 1979), although much more needs to be done. A good discourse study, such as has been done for Mandarin (Erbaugh 1986) and Japanese (Clancy 1980), is especially needed.

Class nouns in Thai formally consist of a class term head followed by an attribute, usually a noun, i.e., [[N_{class}] + N]. The attribute may also be a class term, or it may be a verb or a member of another category. The question of how class term categorization fits into the semantic system of Thai (or, so far as this writer has been able to determine, any other language) has not been addressed, and the issue of the semantic relationship of class noun categories and classifier categories has remained uninvestigated in any detail. Class nouns have been described briefly by Haas (1964), and more recently by DeLancey (1986), who discusses the semantic structure of class noun classes. The latter concludes, 'the two categories, class term and classifier, can be described in very similar ways semantically, and lexically the two categories overlap to a considerable degree... They are clearly distinct only as syntactic categories' (DeLancey 1986:442).

First of all, one may attempt to set up a partial taxonomy for the extremely productive class term *khryân*, which has a wide semantic field focused on the idea 'gizmo', 'equipment'. The same lexical item is also a classifier, but it seems not to be a free noun. For the purposes of the present study, it is sufficient to give a random set of examples elicited orally. However, it should be noted that these constitute only a tiny fraction of the total number of class nouns built on this class term.

<u>Class Noun</u>	<u>Attrib gloss</u>	<u>CLN gloss</u>	<u>NCL</u>	<u>N C L</u> <u>category²</u>
<i>khryānbin</i>	to fly	airplane	<i>lam</i>	long hollow thing ⁴
<i>khryāndontrii</i>	music	instrument	<i>chín</i>	portable thing
<i>khryānyon</i>	vehicle	motor	<i>khryān</i>	gizmo
<i>khryānmyy</i>	hand	implement	<i>chín</i>	
<i>khryānphimdiid</i>	to typewrite	typewriter	<i>khryān</i>	
<i>khryānpradàb</i>	to decorate	ornament	<i>chín</i>	

Table 1. Head: Class Term *khryān* ‘gizmo, equipment’⁵

The category implied by the class term *khryān* includes at least three terms that belong semantically to a Roschian (taxonomic) superordinate level, namely the words for ‘musical instrument’, ‘tool, implement’, and ‘ornament’, as shown in Table 2.

<u>Superordinate Level Class Noun</u>	<u>CLN gloss</u>	<u>NCL</u>
<i>khryāndontrii</i> ⁶	instrument	<i>chín</i>
<i>khryānmyy</i>	implement	<i>chín</i>
<i>khryānpradàb</i>	ornament	<i>chín</i>

Table 2. Suprasuperordinate Level Head: CLT *khryān*

Each of these class nouns is the head of a basic level class consisting of nouns unrelated by form to *khryān*. Taking the first of these class nouns, *khryāndontrii* ‘musical instrument’, as an example,⁷ consider the list of some typical instruments of Thailand, all basic level nouns (*สอ* ‘Thai fiddle’ being an instrument morphologically distinct in Thai music from the violin, or ‘fiddle’ of English), in Table 3.

<u>BLN</u>	<u>BLN gloss</u>	<u>NCL</u>	<u>NCL gloss</u> ⁸
<i>khlùj</i>	flute	<i>law</i>	reed; NCL: reeds, flutes
<i>pieno</i>	piano	<i>lǎŋ</i>	NCL: house-like structures
<i>sɔɔ</i>	Thai fiddle	<i>khan</i>	handle; NCL: long, handled objects
<i>klɔɔŋ</i>	drum	<i>lûug</i>	child, offspring, fruit; NCL: fruits, 3-D objects in general
		<i>baj</i>	leaf; NCL: things made of leaves, baskets, rounded container-shaped objects, fruits, etc.

Table 3. Superordinate Level Head: CLN *khrÿaŋdontrii*

Each of these basic level nouns can, in turn, be the head of a subordinate level category. Consider Table 4, where the basic level noun *sɔɔ* ‘Thai fiddle’ is the head of its own subordinate level noun category. As may be seen from the diagram in Figure 1, such a category as a whole could be described as a taxonomy, descending from the class term head *khrÿaŋ* at a top-most level to a set of class nouns at a superordinate level, to a basic-level name-category consisting of *sɔɔ* ‘Thai fiddle’ and oth-er nouns unrelated by form to *khrÿaŋ*, and on down to the sub-ordinate level class nouns built on the basic level class term *sɔɔ*.

<u>Subordinate Level CLN</u>	<u>CLT gloss</u>	<u>CLN gloss</u>	<u>NCL</u>
<i>sɔɔ dŭaŋ</i>	bamboo trap	treble fiddle	<i>khan</i>
<i>sɔɔ ?ŭu</i>	loud	alto fiddle	<i>khan</i>

Table 4. Basic Level Head: BLN and CLT *sɔɔ*

All of the subordinate level examples in Table 4 take the same classifier, *khan*, that the basic level head noun *sɔɔ* does. This confirms the conclusion reached by Rosch (1977) concerning perception and classification of subordinate level objects and their corresponding subordinate level nouns,

namely, that unlike basic level nouns, regardless of how many subordinate level nouns there may be in a class, they provide very little, if any, new information beyond that given by the basic level noun with respect to external physical shape, which is the most prominent determining feature of semantic noun categories. Shape, of course, is also the salient feature upon which nearly all classifier categories are built. Considering the diversity of shapes among these instruments, it is not surprising that there is no common-ality of classifier assignment among the basic level nouns, even though they belong to a semantic category headed by a super-ordinate level class noun, *khrȳan dontrii* 'musical instrument', which itself takes yet another classifier (*chín* 'small portable thing'). Similarly, there is only partial commonality of classifier assignment among the three basic level nouns in Table 1, the words for 'airplane', 'motor', and 'typewriter', which also differ from the superordinate level nouns that take the classifier *chín*. Taken together, this is a clear demonstration that, strictly speaking, classifier categories have nothing to do with class term categories.

The apparently capricious failure of Thai classifier and class term categories to agree, remarked by DeLancey (1986), may now be addressed. He says, 'the categorizations coded by class terms and by classifiers need not coincide, and neither is entirely coherent; just as there is obviously no principled explanation for which elongated objects do or do not take the *lam* classifier, so there is no obvious pattern to the sets which do and do not take the *lam* class term' (DeLancey 1986). The idea that these FORMALLY distinct types of categories are not 'coherent' semantically, and that 'there is no principled explanation' or 'obvious pattern' for the establishment of EITHER class term or classifier classes should be discarded for several reasons.

First of all, it is clear from the preceding discussion that class terms, unlike classifiers, can occur at ANY or ALL semantic levels in Thai, including at least suprasuperordinate, superordinate, basic, and subordinate levels. Thus, it is not surprising that class term classes do not correspond to classifier classes. Classifier category heads, which generally govern only one level at a time,⁹ nearly all occur BETWEEN the basic and

superordinate levels, ranging from 'just above' the basic level, with classes built primarily on basic-level physical attributes, to 'just below' the superordinate level, with classes built primarily on kinesthetic image schemas--that is, prototypes involving human modeling founded on primary perceptions of the self as well as on the body's interaction with the physical world (Johnson 1987). Moreover, since ordinary subordinate level nouns regularly take the same classifier as the (basic level) head of their category, any set of class nouns at the subordinate level is also likely to have the same classifier, whether or not it corresponds etymologically to a common class term.

The problem lies in attempting to find a match between the semantic classes implied by class terms and those set up by classifiers. Since Thai freely builds new nouns of all kinds with class terms, and since a specifier of some sort (including as one option a classifier) is obligatory in the Specifier Phrase (SP) no matter what kind of noun (including an abstract noun) is being specified, it is obvious that an attempt to match class term and classifier categories amounts to attempting to reconcile form class with semantic class. In Thai, regardless of the morphological form of the noun (i.e., class nouns with class terms in common, class-noun-like prefixed nouns, non-class nouns, etc.), the classifier is determined by salient physical attributes and kinesthetic image schemas, for which reason very many nouns that are not 'readily discernible by shape' or do not belong 'to the immediate sphere of man' (Hundius and Kölver 1983:203-204, 208-209) are not classifiable at all. Moreover, due to the syntax rules of Thai, a class term is always the formal head of any simple noun-attributive 'compound', i.e., of any class noun. Thus, class terms do not build 'natural taxonomies' (in the sense classifiers have been said to do)--they build *form classes* consisting of class nouns at many semantic levels¹⁰--but the fact that the formative (the class term) is the head of the compound both formally and semantically results, nevertheless, in the establishment of semantic classes, which are, consequently, often quite strange.

A curious complication is the fact that when formal agreement occurs between the class term and the classifier in a

specifier phrase, for example in *khry̆anyon n̄y̆η khry̆aη* motor one NCL_[+GIZMO] 'one motor', creating what appears to be a con-cord class, a true taxonomic class also seems to be established. See Table 5, where only items occurring in the sample are included; many more occur in the lexicon.

<u>Basic Level CLN</u>	<u>Attrib gloss</u>	<u>CLN gloss</u>	<u>NCL</u>
<i>khry̆anyon</i>	vehicle	motor	<i>khry̆aη</i>
<i>khry̆anphimdiid</i>	to typewrite	typewriter	<i>khry̆aη</i>

Table 5. Concord Class: *khry̆aη*

The fully-marked, gender-like concord of this group of class nouns is striking morphologically. It may be noted that these class nouns are all basic level nouns;¹¹ since subordinate level nouns with these nouns as heads should also take the same classifier, the concord class could be of considerable size. It would be interesting to examine the modern Thai lexicon more fully to determine the extent of this sort of concord.¹²

Thai class nouns and their class terms cannot be understood in isolation. It is undoubtedly true that they are connected in many ways to classifiers. Yet due to this connection, assumptions have perhaps been too easily made about them. For this reason, it is important to take up some theoretical considerations concerning classifiers.

Classifiers have traditionally been approached primarily from either the descriptive or the historicist point of view. The historicist view on classifiers in general argues that since measures are universals, and measures usually belong to the same syntactic category as classifiers, the latter arose from the former (Greenberg 1972; DeLancey 1986). In fact, however, it would appear that while classifiers are indeed often related to measures, so many types of classifiers and types of classification are found in languages worldwide that it would seem both classifiers and measures must have arisen from a common source basic to language itself. That source would appear to be the fundamental, alinguistic classification that all humans--all

species, in fact--are genetically programmed to perform. This classification arises from the essentially digital decision-processing of all stimuli at the cellular level, such as ingest/do not ingest (a process no doubt based in turn on chemical reactions at the molecular level in both organic and inorganic compounding, such as bond/do not bond). Such differentiations imply classification of the physical world into perceptual categories, which in human languages have become highly complex and marked in various ways. Thus, folk taxonomy is centered on basic level human interaction with the external environment. This is the level at which 'we accurately distinguish tigers from elephants, chairs from tables, roses from daffodils, etc. One level down, things are much more difficult. It is much harder to distinguish one species of giraffe from another than it is to distinguish a giraffe from an elephant' (Lakoff 1987:269). As a great deal of psycholinguistic research has shown, the basic level is the level at which shape-based perceptions are most commonly named; these names are then used as class names for names at one or more subordinate levels. While there are superordinate levels above the basic level names, the superordinate levels are not shape-based in any meaningful sense (Rosch 1977). This indicates that folk taxonomies, which are found in all languages, are unrelated to the so-called natural taxonomies set up by the classifier systems found in many, but not all language systems of the world, because, although classifiers do belong to a taxonomic level above the basic level, this level too is primarily form-based: most classifiers have concrete physical-world referents that are readily identifiable with ideal prototypes or parts of them.

Speakers of classifier-rich languages such as Thai have, in many cases, a conscious choice in their classifier use,¹³ a choice present to a lesser extent also in class term use. This includes choice among classifiers and, in many languages, the choice whether to use a classifier at all. For example, one may choose to employ a non-classifying specifier--in Thai, repeating the noun itself in specifier position is the most common strategy, while in Japanese and Uzbek¹⁴ specifying forms of the numeral itself may be used--or one may choose not to use a specifier at

all, or to substitute a class noun for the classifier and its noun, as in Hungarian (Beckwith 1992). The variations in connotation and the implications for categorization have also been discussed,¹⁵ but much uncertainty still exists concerning the cognitive basis for classifier selection. The question to ask is, 'What is gained semantically by the use of classifiers?'"¹⁶ It is generally believed that classifiers do not qualify their nouns; but they do classify them: they explicitly place nouns within semantic sets or natural taxonomies that are hierarchically structured (insofar as they have two levels) and have real-world referents, being based on prototypical images and relationships founded in the physical world and particularly in human interaction, physical and mental, with it. Therefore, when a particular classifier--especially a less usual classifier--is chosen for a given noun, the speaker more or less consciously gives the full SP the vivid, but difficult to define, connotation arising from association of the noun in question with a particular image of a particular part of the real world and human interaction with it.¹⁷

One of the interesting features of class nouns in Thai is their limited ability to mimic classifier SPs, insofar as class terms also can sometimes be varied for effect. This is clearly the most important area where classifiers and class terms intersect. Since the sociolinguistic functions of classifier usage are thus also served (though apparently to a lesser extent) by class term usage, it is particularly important that a discourse study of Thai be undertaken to determine the scope of this variation for both classifiers and class terms.

In conclusion, class noun categories are non-hierarchical formal semantic sets which have semantically significant formatives, or class terms, in common, but which are categorized according to the semantics of the noun as a whole, regardless of the class term. In other words, a set of class nouns can be analyzed as a collection of tokens of the semantic category set up by the class term, but the latter is usually to be ignored so far as Roschian taxonomy is concerned. Class terms also do not belong to the same kind of classification system as classifiers, since categories set up by the former have no hierarchical or referential coherence. Nevertheless, class nouns are interesting

in their own right and deserve much more attention.

Notes

Abbreviations: BLN ‘Basic Level Noun’; CLN ‘Class Noun’; CLT ‘Class Term’; NCL ‘Noun Classifier’.

I would like to thank Krisadawan Hongladarom for very kindly offering to help me by serving as an informant. Without her insights and correction, I would not have been able even to begin this project. Since she returned to Thailand, I have made many changes and additions with respect to both data and theory. She is not, of course, responsible for any errors I may have committed. I also wish to thank my colleague Urpo Nikanne for reading a late draft of this paper and offering constructive comments for any errors, conceptual or otherwise, remaining in this paper.

1. On the other hand, some classifiers are not independent nouns, while some class terms are not classifiers or independent nouns, and so on (DeLancey 1986).
2. Terminology of Jackendoff (1990:23).
3. For a thorough discussion and bibliography of previous work, see Lakoff (1987). Also, in dealing with the ‘Spatial Structure of Objects’, Jackendoff discusses the problem of distinguishing between very similar lexical items, such as *running*, *jogging*, and *loping* or *throwing*, *tossing*, and *lobbing*. He concludes that ‘the members of each set can be identical in conceptual structure and differ only in the associated 3D model. But since the two sets differ syntactically, it follows that their conceptual structures must differ as well. That is, 3D model differences, although crucial in distinguishing word meanings, are invisible to syntax’ (Jackendoff 1990:34). This is essentially another way of saying, à la Rosch, that the members of each set of three verbs are subordinate-level verbs belonging to a basic-level conceptual head (which may or may not be expressed in the language by a separate, overt lexical item).
4. DeLancey briefly discusses the relationship between the

categories set up by class terms and classifiers, but is not able to make sense out of them (DeLancey 1986). In his structural semantic analysis of Thai nominals, Gething (1972) touches on nominal compound (class noun) formation. Other also have discussed this topic parenthetically, most usefully Hundius and Kölver (1983).

5. I am probably overlooking a tremendous body of research due to my inability to imagine under what key word (or 'category name') the material has been indexed and catalogued, but what I have been able to find (in recent work that seems somehow relevant) speaks generally of 'what linguists call compounds' (Lakeoff 1987:147) and is concerned above all with qualification. Lakeoff speaks of the differences among *topless dress*, *topless waitress*, *topless dancer*, *topless bar*, and *topless district* (Lakeoff 1987:148), wherein each compound could be said to be a class name containing a class term, for example, the class term *dress* in *topless dress*, *cocktail dress*, *party dress*, *wedding dress*, and *house dress*, where the examples clearly belong to the same category; if English had This-type classifiers, these compounds would all probably be classified by a classifier for dresses. However, this is not the case if random examples off compounds with the class term *bar* are considered, namely, *topless bar*, *go-go bar*, *stand bar*, *sand bar*, and *candy bar*. Clearly, several classifier-type classes are implied. Since, however, English has only one unit classifier (head, which does not apply to any of these examples), compounds are conceptualized as consisting of qualifier and noun, rather than qualifier and class term with a classifier waiting in the wings.

6. The gloss for *khrÿan* is given as '1.n. 'apparatus, instrument, machine'. 2.clf:technical contrivances, machines' by Hundius and Kölver (1983:201). However, my informant stated that *khrÿan* is not a free noun. Similarly, she not only insisted that *lam* is not a free noun, she found it difficult to accept any definition for this NCO at all, suggesting that I simply quote DeLancey's definition, 'the classifier for boats, airplanes, and some long cylindrical objects' (1986:441); note that the latter also says *lam* is not a noun (1986:439). Finally, she remarked that *chín* is used for small portable things.

7. Another word for airplane is *ryabin* (Hundius and Kolver 1983:196), which literally means 'fly(ing) boat'. Of course, the first airplanes to reach Thailand were undoubtedly seaplanes (English *flying boat* dates back to 1903), and in any case, the functional predecessors of these craft were the airships. (The word for 'airplane' in Tibetan is, similarly, *namdu*, 'skyboat'.) Since the usual classifier for boats, *rya*, and other long hollow objects in Thai is *lam*, the membership of all words for 'airplane' in the same class is perfectly understandable.

8. For abbreviations, see the beginning of the Notes section.

9. *khryāṅ sāaj*, the word for 'stringed' instruments in particular, is formed with the word for 'string', *sāaj*, and also takes the classifier *chín*.

10. The question of how one determines what level a given noun belongs to may of course be raised, but the only real problem is in determining how the levels that may be established relate to the basic level. One of the great contributions of the experimental psychologists, including prominently Eleanor Rosch, is their demonstration that the basic level consists of nouns distinguished according to physical attributes, unlike superordinate level names such as *musical instruments* (Rosch 1977:215), which clearly are not.

11. These glosses are largely taken from Hundius and Kolver (1983).

12. The best demonstration of this is the extensive discussion in Hundius and Kolver (1983).

13. Popper long ago came to similar conclusions from a quite different point of departure. He says in a later retrospective work that he came to the view that 'conjecture or hypothesis must have come before observation or perception: we have inborn expectation; we have latent inborn knowledge, in the form of latent expectations, to be activated by stimuli to which we react as a rule while engaged in active exploration' (Popper 1977:272). Cf. Jackendoff 1990:32-35.

14. It must be borne in mind that most classifier categories are to a large extent based on the prototypical, central members of each category (Lakeoff 1987), so that the membership of

some words in the category is not understandable in ISOLATION. In fact, native speakers of Mandarin, Thai, and other languages with classifier systems are often unsure, when asked, which classifier is 'correct' for less-commonly-used nouns. In such situations, Thai has at least two strategies that may be adopted. One may use a general classifier, such as *?an* for non-human referents, or simply retreat the head noun in toto in the SP. However, use of the latter expedient may have serious social ramifications for the speaker if other speech participants do know (or think they know) the 'correct' classifier.

15. Compounding in Thai is extremely productive for lexical items in all grammatical categories, including verbs, which can be formed in exactly the same fashion as CLNs. For example, the verb *? 'to adjoin, connect; to attach (to)', etc., forms a long list of compound verbs in Haas's dictionary (Haas 1964:203-204). Thus, ? is the formal and semantic head of a set of 'Class Verbs'.*

16. In at least one case, a class term, *phr?* (noun: 'monk, a Buddha image in context of worship'; class term), is the first class term element in a classifier, namely, *?* (Pro: '3rd ps. [honorific Pro for] royalty, deities, the Buddha'; classifier for the same) (Hundius and Kölver 1983:194); interestingly, the classifier for the noun *?* is either *?* or *?*.

17. Even *? 'airplane', the one example in my random selection that has a supposedly anomalous low-level classifier, lam (see note 4), is a basic level noun.*

18. Such an examination must be done carefully, bearing in mind the existence of null-classification via full repetition of the noun being classified. (The noun is placed in the specifier position instead of a classifier.) The phenomenon to be examined is that in which the classifier corresponds to only one constituent, the class term, or head of the class noun.

19. Similar conclusions have been reached by several earlier writers. 'A hungry animal divides the environment into edible and inedible things' (Popper 1976/1977:268, quoting Katz 1937). 'Even before the advent of man, classificatory ability must have been a component of fitness in biological evolution...organisms must be able to perceive similarities in

stimuli for survival...Thus, the recognition of similarities in patterns of sensory input is probably as old as the earliest forms of sense perception in living organisms' (R.E. Ricklefs 1973, cited in Johnson-Laird and Wason 1977:185,606). 'One of the most basic functions of all organisms is the cutting up of the environment into classifications by which nonidentical stimuli can be treated as equivalent' (Rosch 1976/1977).

20. This characterization of the basis of linguistic meaning is related to the 'experiential' approach of Lakoff, who defines it as 'an attempt to characterize meaning in terms of *the nature and experience of the organisms doing the thinking* (Lakoff 1987:266; italics in the original).

21. Mark Johnson (1987) argues convincingly that our cognitive processes are to a large extent dependent upon 'kinesthetic image schemas' formed very early in life (even before birth) through the body's physical experience of distinctions such as *in* and *out*, *empty* and *full*, *up* and *down*, and so on.

22. Becker (1975), Tai and Wang (1990), Erbaugh (1986).

23. Described in my paper 'Noun Classification in Uzbek' given at the American Oriental Society, Cambridge, 1992.

24. Especially by Hundius and Kolver (1983). For other languages, see Craig (1986), and Tai and Wang (1990).

25. Cf. Denny (1986).

26. In many (perhaps most) instances, classifiers clearly do not qualify their noun, but some nouns are particularized (specified not only as to number, but also semantically, as to subordinate level naming) by cognitive classifier choice (Tai and Wang 1990) to the point that it is difficult not to consider the classifier as a qualifier. For example, Thai ? is a word for several musical instruments that have a large number of individual sound-producing mechanisms; when the classifier ? (for house-like structures) is used with it, it means 'accordion'; and when the classifier ? (non-human things in general) is used, it means 'mouth organ, harmonica'. Surely this question would not be so difficult if we were willing to treat classifiers as a major category in language rather than as a peculiar, marginal phenomenon that needs to be pigeon-holed inside a more European category. In

other words, perhaps typical questions such as 'Are they nouns or are they qualifiers?' should rather be 'Are they specifiers or are they taxonomic specifiers?'

27. For an intense discussion of the richness available to language artists through judicious classifier usage, see Becker 1986.

References

- Becker, Alton L. 1975. A linguistic image of nature: The Burmes numerative classifier system. *International Journal of the sociology of language* 5.109-181.
- Beckwith, Christopher. 1992. Classifiers in Hungarian. *Approaches to Hungarian, Volume 4: The Structure of Hungarian*, ed. by I. Kenesei and Csaba Pléh, 197-206. Szeged: JATE.
- Clancy, Patricia. 1980. Referential choice in English and Japanese narrative discourse. *The pear stories*, ed. by Wallace Chafe, 127-202. Norwood, NJ: Ablex.
- Conklin, Nancy Faires. 1981. The semantics and syntax of numeral classification in Tai and Austronesian. Ann Arbor: University of Michigan dissertation.
- Craig, Collette (ed.) 1986. *Noun classes and categorization*. Amsterdam: John Benjamins.
- DeLancey, Scott. 1986. Toward a history of Tai classifier systems. *Noun classes and categorization*, ed. by Collette Craig, 437-452.
- Denny, J. Peter. 1986. The semantic role of noun classifiers. *Noun classes and categorization*, ed. by Collette Craig, 297-308.
- Erbaugh, Mary S. 1986. Taking stock: The Development of Chinese noun classifiers historically and in young children. *Noun classes and categorization*, ed. by Collette Craig, 399-436.
- Gething, Thomas W. 1972. Aspects of meaning in Thai nominals: a Study in structural semantics.
- Greenberg, Joseph. 1972. Numeral classifiers and substantive number: Problems in the genesis of a linguistic type.

- Stanford Working Papers in Language Universals 9.1-40.
- Haas, Mary. 1964. Thai-English student's dictionary. Stanford: Stanford University Press.
- Hiranburana, Sam Ang. 1979. A classification of Thai classifiers. *South-East Asian Linguistic Studies* 4.39-54. Canberra: Department of Linguistics, Research School of Pacific Studies, Australian National University.
- Hundius, Harald and Ulrike Kölver. 1983. Syntax and semantics of numeral classifiers in Thai. *Studies in Language* 7.2.165-214.
- Jackendoff, Ray. 1990. *Semantic structures*. Cambridge, MA: MIT Press.
- Johnson, Mark. 1987. *The body in the mind: The bodily basis of meaning, imagination, and reason*. Chicago: University of Chicago Press.
- P.N. Johnson-Laird and P.C. Watson (ed.) *Thinking: Readings in cognitive science*. Cambridge: Cambridge University Press.
- Lakoff, George. 1987. *Women, fire, and dangerous things: What categories of Chicago Press*.
- Popper, Karl. 1977. On hypotheses. *Thinking: Readings in cognitive science*. ed. by P.N. Johnson-Laird and P.C. Wason, 257-273. Cambridge: Cambridge University Press.
- Ricklefs, R.E. 1973. *Ecology*. Newton, MA: Chiron.
- Rosch, Eleanor. 1977. Human categorization. *Studies in cross-cultural psychology*. ed. by N. Warren, 1-49. London: Academic.
- Tai, James and Liangqing Wang. 1990. A semantic study of the classifier tiao. *Journal of the Chinese language teachers' association* 25.35-56.