



University of  
Massachusetts  
Amherst

## Mass/Count Distinctions in Thai Nominals

Item Type	article;article
Authors	Stein, Mark J.
Download date	2025-03-20 07:54:36
Link to Item	<a href="https://hdl.handle.net/20.500.14394/50153">https://hdl.handle.net/20.500.14394/50153</a>

Mass/Count Distinctions  
in Thai Nominals

Mark J. Stein  
University of Massachusetts/Amherst

## 1.0 Introduction <sup>1</sup>

In this paper, I will propose and discuss a fragment of the syntax and semantics of Thai. I will assume that Thai is a formal language, that the surface categorial structure of Thai is the formal object off of which one does semantic interpretation, and that this formal object can be arrived at within some "autonomous syntax" framework. The interesting questions for universal grammar then are:

1) Are the categories (syntactic, semantic and lexical) needed for a proper analysis of another particular language, English, adequate for or demanded in a proper analysis of Thai? Given a negative answer to 1) we may then ask

2) If there are distinctions that are marked in English, and if English is a formal language in which syntactic distinctions receive semantic interpretation, how can these interpretations be accounted for in a language in which these matters are not marked syntactically and hence not part of the interpretation of the sentence?

A brief example illustrating both questions might help:

1') In Word and Object, Quine discusses the ontogenesis of reference in terms of singular terms and general terms. "If a term admits the definite and indefinite article and the plural ending, then normally under our perfected adult usage it is a general term." (p.90)<sup>2</sup> Thus, boy is a general term, a boy, the boy and boys are singular terms. Before a general term can stand on its own-before we can predicate something of it, or before it can take part in transformations, etc. -it must first be somehow fattened up by a determiner or a plural marking to form a singular term. Thus, while we can not say in English

(1) boy came out the other end<sup>3</sup>

we can, by adding a determiner or plural, make the sentence grammatical

(2) The boy came out the other end.

Within a Montague fragment of English, these facts have been accounted for by having boy as syntactically a common noun, i.e. of category t//e.<sup>4</sup> The expression will receive an interpretation through the mediating step of an initial translation into an intensional logic.

A mapping is defined from the syntactic categories of English to the syntactic categories (called semantic types) of the intensional logic.

It is then this resulting expression that receives an interpretation.

While boy is a CN, a boy, the boy, and boys are syntactically term phrases of semantic type  $\langle\langle s, \langle\langle s, e \rangle, t \rangle \rangle, t \rangle$ , sets of properties of individual concepts. The determiners a and the are either introduced syncategorematically, or are defined expressions of type T/CN. In this Montague fragment then, the empirical claim is made that there is a clear syntactic distinction between expressions such as boy and the boy. The semantic fact that they denote different entities in the world-sets of individual concepts vs. sets of properties of individual concepts- is reflected in their linguistic behavior. There is a direct correlation between semantic interpretation and syntactic structure. In this sense then, English is behaving as a formal language; its syntactic structure is there solely to do the semantics off of. Thus, we see that an adequate syntax and semantics of English requires a CN,T distinction, or in more standard transformational terms, a NOM,NP distinction. Such conclusion have been reached largely independently within Chomskyan and Montague analyses of English.

But now to return to the Quine quote and to Thai. Thai is a language that marks neither for the indefinite or definite determiner, nor for plurality. On autonomous grounds there is no justification for positing a DET category in Thai. Given our assumptions of the opening paragraph, we may not posit a null determiner and then proceed to give it an interpretation. But if this is so, certain categories, crucial to a grammar of English at the most basic levels are not present in Thai. Is it possible that Thai does not have a CN,T distinction? This will be further discussed while a grammar of Thai is being proposed.

2') English is a language that marks NPs morphologically for plurality. Thai does not. How then is it possible for a Thai speaker to infer or understand plurality in his own language? To progress in answering 2'), I assume without discussion that though there may not be universal linguistic categories (indeed, that is what this study looks at), there are at least universal categories of human reason. For example, man universally can distinguish one from many; man universally can understand when another wants to refer to a particular person vs. any old person satisfying a particular predicate. I thus assume that a Thai speaker can understand the difference between 'a man' and 'the man' even though determiners are not part of his language. In a like manner, the Thai speaker can understand when a nominal ought to be understood as plural. This should be so even though it is not part of the interpretation of the syntax of Thai. Pragmatic and lexical considerations must somehow intervene to "give" the plural or singular readings. This will also be further discussed once a grammar of Thai is proposed.

## 2.0 Methodology: Parochialism

This paper goes at universal grammar in a strictly parochial manner.

Rather than making initial assumptions about the presence of certain distinctions in the syntax (e.g. all languages have determiners, or all languages have the CN,T distinction), and then examining the consequences of such a move; and rather than presupposing certain universal lexical distinctions (e.g. all languages mark nouns as either plus or minus count), I will initially only try to construct a tight grammar of Thai. A tight grammar of a natural language is a theory of that language such that a small change in one parameter will have implications throughout the theory. This method of doing syntax is not meant to abjure universal grammar. It does however go at the problem of a theory of universal grammar by means of a theory of a particular language. In practice, this is almost always the way things are done.

As in syntax, the problem of parochialism should also be discussed with respect to the constructing of a semantic theory of natural language. The problem here is a bit more complex. The "problems" of logic that the logician sees have often been hopelessly parochial, though they may not see matters this way. Two examples suffice:

1) Much of 20th century modern logic has been preoccupied with the problem of definite descriptions. Are the questions raised in this domain translatable to problems in a language without determiners? Closely akin to this we note that

2) Type theory was developed as a foundation for mathematics. The distributive<sup>5</sup> sense of class membership is crucial for this. Corresponding to this is the natural language notion of a +count noun. Virtually all discussion of the semantics of natural languages in the philosophical and logical literature use only count nouns as examples.<sup>6</sup> Both English and other languages though have -count nouns. Some languages indeed might not even have the +count distinction. Indeed. Where does logic help us then?

What we need is a parochialism to counter English parochialism. What happens then when semantic analysis meets a world other than the one mirrored in English? Such a question can be sensibly approached, I think, only by an interpretation of a natural language whose syntax has been arrived at autonomously. What is wanted is an interpretation of Thai, and not a translation into English.

This paper, then, will be a discussion of the syntax and semantics of Thai. The general framework in which the work is done is that of a semantics along the lines of Montague's PTQ, though without the invoking of intensions. The emphasis will be on discussing how distinctions made in English need not and can not be made in a grammar of Thai. Crucially, I will argue that an analysis of Thai, unlike standard analyses of English can not mark nouns as +count in the lexicon. The inability of having such a marking, rather than being a rather idiosyncratic and isolated fact about the grammar of Thai, will be seen to nicely explain an entire range of disparate facts in Thai. The general sections of the paper will be as follows:

- a) an introduction of the bare nominal in Thai, and an exhibition of its various quantifier readings
- b) an introduction of classifiers and quantified nominals in Thai and an informal discussion of individuation
- c) a proposed parochial semantics and an explanation of the semantics by means of
  - c1) a universal "head convention" for giving priority to the head of an NP
  - c2) discussion of the "reading" for such a semantics
  - c3) discussion of the count/mass distinction in English and Thai.
  - c4) discussion of features not marked in Thai such as plurality

Finally, I shall end with some reflections on what kind of logistic seems most adept for an analysis of Thai, and how the results of this analysis lead one to such a conclusion.

### 3.0 The Thai Bare Nominal

Thai is an SVO language. It does not mark syntactically for tense, gender or number. Thus, a sentence such as (3)

- (3)  $\checkmark$  Khaw kin  
'he' 'eat'

may variously mean 'he eats' or 'he ate', 'she eats', 'she ate', 'they eat', or 'they ate'. The interpretation is vague and not ambiguous with respect to tense and gender and number. In addition to pronouns and proper names in subject position here, bare nominals are also found:

- (4)  $\hat{p}$ h $\check{u}$ chay kin  
'man' 'eat'

How though are we to read this sentence? Judging from the vagueness of the pronoun,  $\check{h}$ aw we would expect a wide range of quantified readings for the bare nominal. This turns out to be the case. The sentence may in varying contexts be read as 'all men eat', 'some men eat', 'the generic kind man eats' etc. In this respect, the bare nominal in Thai resembles the behavior of the bare plural in English. In Reference to Kinds in English, Carlson discusses the inferring of quantification in bare plurals in English.<sup>7</sup> Noting no syntactic arguments for the existence of null quantifiers or determiners in English, Carlson argues that the various quantifier readings are not represented formally in the semantics, but are inferred. Below are a list of various quantified readings for bare nominals in Thai. Following each Thai sentence is a description of a preferred quantifier reading and of a possible English translation.

- (5)  $\check{m}$ aa pen sàtlianluuk duây nom      universal reading:  
'dog' 'be'      'mammal'      All dogs are mammals-Eng  
generic or kind reading  
The dog is a mammal-Eng

- (6) maa haw  
'dog' 'bark'  
English: Most dogs bark.  
Dogs bark.
- (7) maa khiy bon sanaam  
'dog' 'shit' 'on' 'lawn'  
English: Some dogs shit on my lawn.  
Dogs shit on my lawn.
- 8) maa kra caay pay tua  
'dog' 'widespread'  
English- Dogs are widespread.  
Note that here the predicate applies to the kind dog and not to individual dogs.
- (9) jan yaak ca? sii rot  
'John' 'want' 'to' 'buy' 'car'  
English- John wants to buy a car  
on either the de dicto or de re reading or  
John wants to buy cars on the de dicto reading
- (10) jan mai hen cut bon phiin  
'John' 'not' 'see' 'spot' 'on' 'floor'  
This may mean 'John didn't see spots on the floor' or 'John didn't see a spot on the floor' with either wide or narrow scope reading for a spot. The wide scope reading could just as easily be translated into the English definite the spot.

Caution must be exercised in evaluating the appropriate quantifier readings that I have given on the right. They are informal; I am not claiming that a grammar of Thai must employ the vocabulary on the right. I have listed appropriate English translations for the sentences, though it should be apparent that the translations are indeterminate, and that the purpose of our analysis must ultimately be to give an interpretation of a natural language, and not a translation into another natural language.

Informally, we can already see a problem with presenting an adequate "quantifier" reading for the bare nominals. A quantifier tells us what values our variables are to range over. Given a set, such as the set of men (in English), a quantifier when applied to such an expression tells us two things:

- 1) that the set is to be individuated
- 2) which member of that set are chosen; all of them, every one of them, each of them, etc.

To give a quantifier interpretation of bare nominals would then require that a method of individuation exist for the bare Thai nominal. Such a problem however can be confronted only after considering the general means by which explicit quantification is done in Thai. This follows.

#### 4.0 Quantifiers and Classifiers in Thai

Thai differs from English also in that it is not possible to

quantify a head noun directly. Thus, while in English

(11) Every man

is a well formed NP, the corresponding translation into Thai

(12) khon thuk  
'man' 'every'

is never well formed.<sup>8</sup> In English, we think of man, the CN, as denoting the set of men- of all individual men such as John, and Fred. What the quantifier then does is somehow restrict the domain of application. It tells us which men to consider in evaluating the truth conditions of a sentence in which (11) is embedded. In the case of (11), we must consider every man in that set; i.e. consider all values of the variable x, where x ranges over members of the set man'.

In Thai, one can not quantify over khon unrestrictedly. Rather, one must look at khon in a "particular way," and then quantify over these entities that are gotten by looking at khon in this way.

As always, I will try to avoid lacing my discussion with Englishism that would somehow taint the analysis before it was even done-thus in reality preventing an analysis. Thus, it would not be fair for me at this point to say that khon is a set of men, for the plural marking on men serves to individuate the set of man w.r.t. individual men. But, of course, the problem of quantification is precisely the problem of: over what values are my variables going to range? Deciding on individual men presupposes an answer, and hence we can not do an adequate analysis by using such Englishism.

Corresponding to the English, every man under its normal interpretation is the Thai

(13) khon thuk khon  
'man' 'every' 'man'

The second instance of khon is known as the classifier of the phrase. Given this classifier, this particular classifier, the variable of quantification will range over individual men. However, there are also a whole host of other possible classifiers. We could say:

(14) khon thuk khuu 'every pair of man'  
'man' 'every' 'pair'

(15) khon thuk muu 'every group of man'  
'man' 'every' 'group'

Intuitively, the interpretation of (14) and (15) is quite straightforward. Consider the set (individual?) man and then index that set w.r.t. the indexing of pairhood or grouphood. In simpler cases,

the classifier will simply involve a partitioning of the set. Phan, 'species' is an example of a word that induces a partitioning. Then, quantify over these things whatever they may be. In (14) we quantify over pairs of men (man?), in (15) we quantify over groups of men (man?). Note that pending a complete semantic analysis it is uncertain whether to give the informal interpretation as involving groups of either the singular man or the plural men. In any event, informally, the classifier causes little conceptual difficulty. It is interesting to note that whatever the partitive construction in English, these Thai NPs are something like it.

At this point we can ask: What can be a classifier in Thai? Is the set a closed set? What is its relationship to nouns in Thai? Are classifiers listed in the mental lexicon? It is clear that all classifiers are themselves nouns in Thai as well as in their partitive English translations. They are some subset of the set of nouns. Does this mean that classifiers need by listed as such (as classifiers) in the lexicon? Let us consider the consequences of not listing them separately. If classifiers were not listed separately, then we would have expressions well-formed in Thai such as

(16) khon thúk ma<sup>h</sup>muang<sup>h</sup>  
'man''every''mango'

Now, if one asks a native speaker whether they can say (16), the answer is a clear no. But why is it No? Because (16) simply doesn't make sense. After all, how could we index the set of man w.r.t. mango-hood? I have no idea. What is important it that this is not a valid worry for me as a linguist. We may have a grammar that generates (16) and indeed any combination of head noun, quantifier, and classifier, and not worry about whether the resulting expressions make sense or are asinine or whatever.

In addition to the obvious simplicity of such a proposal, and its resultant simplification of the lexicon of Thai, this free-wheeling proposal is advantageous in that it would give a more direct explanation of metaphor and other literary devices in Thai. Thus, if we use an animal classifier for a man as in

(17) khamooy baang tua  
'thief' 'some' 'animal classifier for body'

we immediately realize the strangeness of this assertion in its indexing of man w.r.t. some way that animals are indexed. It is such a strangeness that permits one to express a derogatory attitude towards a group subtly. We may find the nominal amusing or amoral, but not ungrammatical. The absence of certain classifier/head-noun co-occurrences is thus simply a matter of selectional restrictions, and thus can on demand be broken.



## 5.0 The Semantics

In the preceding pages, we have anecdotally discussed various features of the structure of the nominal in Thai. Consider simple phrase structure rules such as the following

$$\text{Nom} \text{ ---- } \text{Nom} \left\{ \begin{array}{c} \text{Quantifier Phrase} \\ S \end{array} \right\}$$

$$\text{QP} \text{ ---- } \text{Q} \quad \text{Nom}$$

Certain empirical predictions are embodied in these PS rules, predictions that are born out:

5.01 Thai has bare nominals. Any lexical noun may serve as a full NP. This was discussed in 3.0

5.02 Thai has syntactically unrestricted recursion on NPs. (Henceforth I will use the words "NP" and "Nom" interchangeably.) This prediction is born out by sentences such as

(18)  $\overset{\vee}{\text{sat}}$   $\overset{\vee}{\text{thuk}}$   $\overset{\wedge}{\text{pheet}}$   $\overset{\vee}{\text{thuk}}$   $\overset{\wedge}{\text{phan}}$  'every gender of  
'animal' 'every' 'gender' 'every' 'species' 'every species of animal'

Though this particular phrase is accepted by native speakers, clearly most such examples involving recursion on NPs will be ruled out on pragmatic grounds. For example, (19) will be rejected though it is predicted to be grammatical:

(19)  $\overset{\vee}{\text{khon}}$   $\overset{\vee}{\text{baan}}$   $\overset{\vee}{\text{khon}}$   $\overset{\vee}{\text{thuk}}$   $\overset{\vee}{\text{khon}}$  'some every man'  
'man' 'some' 'man' 'every' 'man'

5.03 [ Q NP ] acts as a syntactic unit. This is evidenced in certain extraposition phenomenon. For example in (20):

(20):  $\overset{\vee}{\text{muu}}$   $\overset{\vee}{\text{saam}}$   $\overset{\vee}{\text{tua}}$   $\overset{\wedge}{\text{nai}}$   $\overset{\wedge}{\text{baan}}$   $\Rightarrow$   $\overset{\vee}{\text{muu}}$   $\overset{\wedge}{\text{nai}}$   $\overset{\wedge}{\text{baan}}$   $\overset{\vee}{\text{saam}}$   $\overset{\vee}{\text{tua}}$   
'pig' '3' 'Cl' 'in' 'house'

5.04 There are no listings for classifiers in the lexicon. Hence any noun (nominal) may serve as a classifier.

Additionally, there are some extra syntactic/semantic facts that must be accounted for:

5.06 There is no syntactic evidence for a singular/plural distinction marked on nouns.

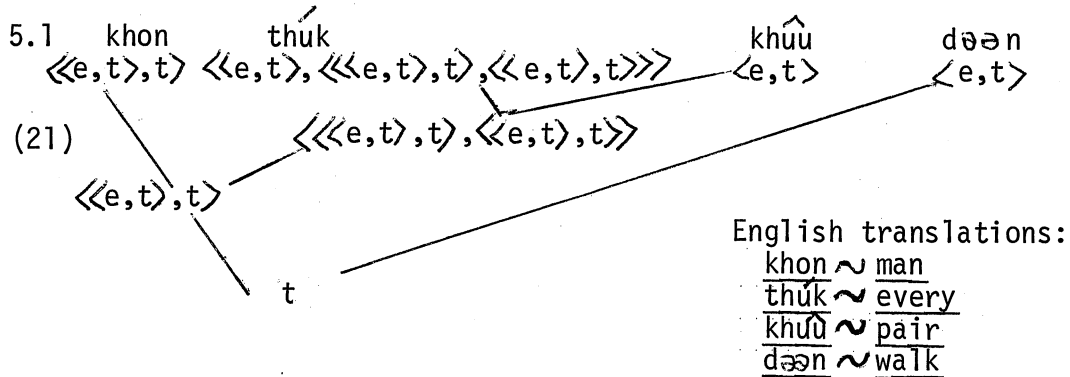
5.07 There is no one anaphor in Thai. This is the CN anaphor in English. Thus, in English, we have sentences such as "The boy in the corner is smarter than the one at the board." There is no analogous one anaphor in Thai.

5.08 There appear to be only one kind of syntactic relative clause in Thai. This is predicted by the PS rules I have given, and the inability to distinguish NP and Nom categories. (see Sornhiran)<sup>9</sup>

5.09 Those markers 'a' and 'the' and 'plural' which typically distinguish singular and general terms or CNs and Ts in English are absent in Thai.

5.010 The behavior of Thai bare nominals is more akin to that of bare plurals and mass terms in English.

I present a non-intensional interpretation for a simple Thai sentence containing a quantified NP. Following the formalism will be an informal reading of the formalism in which no expressions not already found in Thai can be used in the reading of the formalism.



Let P,Q,R be variables ranging over expressions of type  $\langle e,t \rangle$   
 Let  $\lambda, \alpha$  be variables ranging over expressions of type  $\langle \langle e,t \rangle, t \rangle$

$\underline{khon} \Rightarrow khon'$   
 $\underline{thúk} \Rightarrow \lambda P \lambda \lambda Q \lambda y [[P(y) \ \& \ \lambda(y)] \rightarrow Q(y)]$

$\underline{thúk} \ \underline{khúu} \Rightarrow \lambda P \lambda \lambda Q \lambda y [[P(y) \ \& \ \lambda(y)] \rightarrow Q(y)](khúu')$   
 $\lambda \lambda Q \lambda y [[khúu'(y) \ \& \ \lambda(y)] \rightarrow Q(y)]$

$\underline{khon} \ \underline{thúk} \ \underline{khúu} \Rightarrow \lambda \lambda Q \lambda y [[khúu'(y) \ \& \ \lambda(y)] \rightarrow Q(y)](khon')$   
 $\lambda Q \lambda y [[khúu'(y) \ \& \ khon'(y)] \rightarrow Q(y)]$

$\underline{khon} \ \underline{thúk} \ \underline{khúu} \ \underline{dǎən} \Rightarrow \lambda Q \lambda y [[khúu'(y) \ \& \ khon'(y)] \rightarrow Q(y)](dǎən')$   
 $\lambda y [[khúu'(y) \ \& \ khon'(y)] \rightarrow dǎən'(y)]$

We may consider the expression on the right as the translation of the Thai sentence on the left into an expression in a non-intensional logic. The translation of khon thúk khúu dǎən then reads something like 'For all y, (y ranging over entities of type e), such that they/he jointly satisfy the condition of being (a) set of man, and being (a) pair, those y satisfy the condition of walk(ing).

To be a type-theoretic logic, functions of type n+1 must apply

to arguments of type  $n$ . This holds true in our translation except for the expression "khon'(y)" where khon' is of level  $n+2$  and  $y$  is of level  $n$ . We introduce a convention for the interpretation of such expressions:

$$(22) \bigwedge y[[\text{khuu}'(y) \ \& \ \text{khon}'(y)] \rightarrow \text{d}\text{\ae}n'(y)] \equiv \\ \bigwedge y[[\text{khuu}'(y) \ \& \ \bigvee x[x(y) \ \& \ \text{khon}'(x)]] \rightarrow \text{d}\text{\ae}n'(y)]$$

or more generally, if  $y$  is of level  $n$  and  $\mathcal{D}$  of level  $n+2$ , then we understand  $\mathcal{D}(y)$  to mean

$$\bigvee x[x(y) \ \& \ \mathcal{D}(x)] \text{ where } x \text{ is of level } n+1$$

In our informal reading of the above sentence, it was crucial that I did not fall back on English locutions. Thus, in talking about the interpretation of khon, be it of type  $\langle e, t \rangle$  or of type  $\langle \langle e, t \rangle, t \rangle$  we must be careful not to fall back into parochialisms of English, thus forcing into the Thai logic distinctions that should not be formally made in Thai. Thus, note that in the informal translation, I used the locution, "such that they/he jointly satisfy. . ." This does not show a sloppiness or lack of commitment on my use of pronouns. Rather, it is a conscious attempt to give an interpretation for Thai expressions in the real world, and not a translation into English. As mentioned earlier, the pronoun khaw is vague and not ambiguous between singular and plural readings. Note also that khon is translated as 'a set of man', and not as 'a set of men'. This reflects the fact that khon is unmarked and unmarkable for number. Accordingly, the awkward -count partitive expression is used.

5.2 In this section, I wish to discuss the motivation for the interpretation of 21) given in 5.1:

### 5.2.1 The Head Convention

We noted earlier that it is advantageous not to have a separate listing for classifiers in the lexicon. Given this, I have proposed in 5.1 an analysis in which all nouns (and hence classifiers) and predicates are listed in the lexicon as being of the same type  $\langle e, t \rangle$ . However, if an expression is to serve as the head of an NP, its type becomes  $\langle \langle e, t \rangle, t \rangle$ . Khon is the head of the NP shown in (21). The motivation behind this move is to give some favored status to such a position. It is the position to which things get predicated. Additionally, upstepping the type insures that we may have recursion on NPs. Note that khon as head and khon thuk khuu are both of syntactic category  $\langle \langle e, t \rangle, t \rangle$ .

Head Convention: If  $\alpha$  is of category  $X$  and is to serve as the head of a phrase, then  $\alpha$  is of category  $\langle X, t \rangle$  and is interpreted as the power set of  $X$ .

The advantage of construing the head noun as the power set of its corresponding lexical entry will become apparent later.

5.2.2. How to Read

We have given a formal representation in 5.1 of a Thai sentence in an extensional logic. How though is this formal representation to be read so that it can provide for an interpretation of the Thai expression? The answer is not obvious. Given an expression such as "khon'(x)" we may variously view khon mereologically or not. That is, the function-argument will be read as standard distributive set membership on the non-mereological interpretation; it will be read collectively on the mereological interpretation. The latter is said in English roughly by "x is khon".

I proceed with a reading of (22)

$$(22) \ \wedge y[[\hat{k}huu'(y) \ \& \ \forall x[x(y) \ \& \ khon'(x)]] \rightarrow d\ae n'(y)]$$

Consider a distributive reading for such an expression:

1. y is a  $\hat{k}huu$ (.pair) and
2. There is some set, x, such that it is an element of the power set of khon' and
3. the pair y is an element of this subset then
4. the pair, y, walks

This reading is, however, unacceptable. Look at 3. y is a pair, and yet we have said that it is an element of some subset of khon(i.e. man). However, the element of the subset of khon would not normally be construed to be pairs, but rather individuals of the like of Tom and Dick.

How then can we construe (22)? Note that the problem does not come up if we consider a Thai noun which in English would be labelled as a mass noun. Corresponding to

$$(23) \ \begin{array}{ccccccc} \acute{a}y & s\grave{a}khriim & thuk & su\grave{a}n & yen & \text{'every portion of} \\ \text{'ice-cream'} & \text{'every''portion'} & \text{'cold'} & \text{ice-cream is cold'} \end{array}$$

we have

$$(24) \ \wedge y[[su\grave{a}n'(y) \ \& \ \forall x[x(y) \ \& \ \acute{a}y \ skriim'(x)]] \rightarrow yen'(y)].$$

This will read as follows:

- For all individuals y, if
1. y is a portion and
  2. There is some set, x, such that it is an element of the power set of ice-cream (i.e. such that it is a subset of ice cream) and
  3. x(y), i.e. such that portion y is in this subset, then
  4. the portion, y, is cold.

Note that here we do not find the corresponding problems found in our earlier example. Ice cream has no "natural" means of individuation. Hence, if ice-cream is of type  $\langle\langle e,t \rangle, t \rangle$  it still ranges over subsets of ice-cream. However, each of these subsets is itself ice-cream. If ice-cream is construed mereologically, then the effect of up-stepping ice-cream from type  $\langle e,t \rangle$  to  $\langle\langle e,t \rangle, t \rangle$  will be semantically nil. We can say of upstepping that it doesn't hurt. It doesn't fundamentally change the interpretation of the word ice cream.

We may now proceed to read "x(y)" as

3'. y individuates x

In effect x(y) tells us in doing quantification, just what it is that we are to quantify over. In this case it is over portions of ice cream.

We have seen that the proposed reading for the formalism has no problem when we are working with what correspond to the -count nouns in English (such as ice cream). But what about the +count nouns in English such as man? How are their Thai counterparts to be interpreted? Consider the hypothesis that the Thai lexicon, unlike that of English can not mark for count/mass.

Let us return to example 22), the example in which we previously had trouble "reading" an interpretation. We have seen that this trouble was largely a problem in how to construe function-argument in Thai: what does khon'(x) really say? Working backwards from our supposed -count example, let us apply the same reading to what we though were +count nouns such as khon. Under the mereological reading, (22) now reads:

- For all individuals y, if
1. y is a pair and
  2. there is some set x which is a subset of khon  $\langle e,t \rangle$   
(This subset is, under a mereological reading, itself khon or man and
  3. x(y), i.e. y individuates x, i.e. khon or man is individuated with respect to pairhood, then
  4. y walks.

The analysis works!

The analysis as so far presented has permitted a unified treatment of quantified nominals in Thai. This was done by abjuring the notion of lexical marking for count/mass. Indeed, for a unified analysis one must do without the distinction.

Additionally, we have seen that the analysis adds semantic plausibility to our initially ad-hoc "head convention". Treating the

head of a nominal as the power set of its corresponding lexical entry is seen to have no untoward implications for the semantics: to repeat a familiar example, every subset of ice cream is itself ice cream. And, any combination of these subsets is ice cream again. No matter how you cut things, it's still ice cream. Despite the type differences of ice cream $\langle\langle e,t \rangle, t \rangle$  and ice cream $\langle e,t \rangle$ , meaning is somehow preserved.

#### 6.00 Four additional supports for the theory

6.1 We have argued that countability is not a feature marked on lexical items. If this is so, we might expect that there would be certain lexical items that are clearly vague with respect to countability. This is indeed the case with certain classifiers. Thus, the classifier suən may in varying circumstances mean either 'group' or 'portion'. For example, with ice cream it is easier for it to mean 'portion', with man, it is easier for it to mean 'group'. One would not expect this to happen in, e.g. partitive constructions in English where countability is more closely linked to the lexical items themselves. I know of no corresponding English word used in partitive expressions (i.e. as the "classifier" of these partitive expressions) that is vague with respect to countability. <sup>10</sup>

6.2 In Thai there is no lexical marking of countability. Whatever is a head will end up being construed mereologically. We would thus expect that anaphoric behavior that is typical of +count nouns is not to be found in a language that can not mark that distinction. Remember earlier I mentioned that the CN anaphor, one has no equivalent in Thai. Note however that one can additionally not serve as the anaphor for mass nouns. Consider this example from Baker (p. 238):

(25) The mud on his boot was darker than the  $\left. \begin{array}{l} *one \\ mud \end{array} \right\}$  on his coat. <sup>11</sup>

Even though one looks like a CN here, because it is not acting as anaphor for a count noun, the sentence is ungrammatical. Of course, as we have seen the same results hold for Thai. (This suggests a close tie between CNs and the notion of countability, but I can not fully explore that here. It's probably the most interesting question though!)

6.3 Thirdly, we have constructed a logic in which no explicit mention of plurality is given. If there is no count/mass distinction, one can not count the members of the sets in (21); it make no sense to ask for a sets plurality. Thus, mereological individuals have no plurals. How then is the Thai speaker to infer plurality in his language? Two clear options seem open to us: First, some mass nouns will have classifiers that are inherently plural as opposed to singular. A classifier such as muu, 'group' will individuate the set of khon, 'man', with respect to grouphood; and this will somehow inherently involve some notion of plural individuation. We consider

men and not individuals, each of which is a man. This is a rather uninteresting way to figure out what in another language is accounted for syntactically or morphologically. Secondly, consider again

(26) khon thuk khon dæn

Previously, we mentioned that this means that every individual man walks. How do we know this? Neither the classifier nor its head are marked for plurality. There is nothing inherent about the meaning of any lexical item that suggest plurality or singularity. Consideration of the sentence

(27) khon thuk muu dæn  
'man' 'every' 'group' 'walk'

is enough to convince us that dæn is by itself vague; either individuals or groups may walk. dæn may be predicated of either single people or of plural groups of people. However, a consideration of the type, semantic type, of expressions as dictated by the head convention will give us our desired singular reading in which the variable of quantification informally seems to range over individual men. For, in our translation into the extensional logic,  $x(y)$  is construed to mean that  $y$  individuates  $x$ . This will amount to saying that  $y$ , khon, individuates khon. The only instance where this could plausibly be the case is where the method of individuation is by individual men. (The logic does not force this.). Under our type theory, it is natural that a head could have itself as classifier in order to naturally individuate itself.

#### 6.4 The Bare Nominal Revisited

Finally, we must return to an analysis of bare nominals. We have seen that because recursion must be allowed on nominals and because there are no overt markings such as determiners to distinguish CNS from terms in Thai, it is best to construct the bare nominal as being of the same semantic type as a quantified nominal.

Intuitively though we see that without the presence of overt quantifiers, no natural means of individuation for a bare nominal is present. Thus, we have an entire range of readings for the bare nominal in

(28) khon dæn  
'man' 'walk'

Previously, we introduced a convention for expressions such as khon'(y) where  $y$  is of type  $e$  and khon' of type  $\langle\langle e,t \rangle, t \rangle$ .

$$\mathcal{Y}(y) \equiv \forall x[x(y) \ \& \ \mathcal{Y}(x)]$$





framework. Thai is a language that lacks determiners and plural marking. Its bare nominals may occur unquantified. It permits recursion on noun phrases. It has been claimed to have only one type of relative clause. In all these respects, Thai, unlike English, seems not to make a nominal, noun phrase distinction; or in categorial terms, seems not to make a common noun, term phrase distinction.

How a language could not make a CN,T distinction seems initially perplexing. In English, CNs are the type of entities that can be quantified. However, what this amounts to saying is that for every common noun we have a means of individuation and a quantification over those entities that are the result of such individuation. Quantification and individuation are hence crucially tied to the CN,T distinction. By taking a quantifier such as every, the CN, boy, shows that it has been (is?) individuated. This explanation is further evidenced by noting that there are a whole class of nouns in English, the mass nouns, that do not take direct quantification. We may not quantify the mass noun mud with every. These mass nouns are precisely the nouns that lack means of natural individuation.

If we postulate that Thai is not a language that permits a count/mass marking in its lexicon, then for no noun will it be the case that that noun possesses an inherent means of individuation. Any grammatical construction demanding a means of individuation will thus not exist in Thai. Thus, direct quantification, plurality marking and determiners will all be absent from the language.

The count/mass distinction is one of the most basic distinctions that a language can draw. In formulating a logistic for natural language, how one is to "read" a function-argument expression depends crucially on whether the function is marked for countability and hence for individuation or not. If the noun is +count, we may construe the function-argument relationship distributively, if the noun is not individuated, we may construe the function-argument relationship collectively.

This result suggests that languages will differ fundamentally in formal structure depending solely on whether they mark nouns lexically for the count/mass distinction. A formalism such as that found in Principia Mathematica, because it assumes a distributive interpretation of the function-argument relationship, will be successful mainly in the analysis of count nouns in languages such as English that contain the distinction. For languages that do not make such a distinction, i.e. for languages that do not mark for count/mass, a more adequate logistic will be one that does not rely on notions of inherent individuation. Such a logic is Lesniewski's Mereology<sup>13</sup> or its reformulation by Henry S. Leonard and Nelson Goodman in "The Calculus of Individuals and its Uses."<sup>14</sup>

Endnotes

<sup>1</sup> I 'd like to thank Emmon Bach for knowing all the interesting questions. Irene Heim, Barbara Partee and the third year seminar class also helped me along. A special thanks goes to Panit Chotibut for acting as (the-a-every-all-each) Thai informant.

<sup>2</sup> W.V.O. Quine, Word and Object (Cambridge, MA: The MIT Press, 1969), 90.

<sup>3</sup> This sentence might be considered good on the mass reading. Put a boy through the universal meat grinder and what comes out the other end?

<sup>4</sup> see Richard Montague, "The Proper Treatment of Quantification in Ordinary English," in Formal Philosophy: Selected Papers of Richard Montague, ed. Richmond H. Thomason (New Haven: Yale University Press, 1974), 247-70.

<sup>5</sup> "The expression 'A is an element of the class of b's,' in which the terms 'element of' and 'the class of' are used distributively, means simply that A is a b. If however, we interpret the terms 'element of' and 'the class of' collectively, then our original expression means that A is a part (proper or improper) of the whole consisting of b's, that is, that A is a part of the object that has the following two properties. (1) every b is part of it, and (2) every part of it has a common part with a b."

taken from Czeslaw Lejewski, "Lesniewski, Stanisław" in The Encyclopaedia of Philosophy, Vol. 4 (New York: Macmillan Publishing Co., 1967), 443.

<sup>6</sup> Though see Francis Jeffrey Pelletier, "A Bibliography of Recent Work on Mass Terms," Synthese, 31 (1975), 523-26.

<sup>7</sup> Greg Carlson, "Reference to Kinds in English," Diss. University of Massachusetts at Amherst, 1977 (Available through GLSA, Dept. of Linguistics, University of Massachusetts, Amherst, MA 01003).

<sup>8</sup> The expression thuk khon is well formed; however, this may be analyzed as being the result of the deletion of the head, khon, under identity with its classifier.

<sup>9</sup> Pasinee Sornhiran, "A Transformational Study of Relative Clauses in Thai," Diss. University of Texas at Austin, 1977.

<sup>10</sup> The classifier 'bit' in English does function in a way that parallels suən in Thai. We may say either  
a bit of matter

or

a bit of information.

In the latter case, information has been individuated into well defined units. This use of bit is, however, highly idiosyncratic. It co-occurs only with information.

<sup>11</sup> C.L. Baker, Introduction to Generative-Transformational Syntax (Englewood Cliffs, NJ: Prentice Hall, 1978), 238.

<sup>12</sup> Frederick Crews, "Being Reasonable" in The Random House Handbook-2nd ed. (New York: Random House, 1977), 68.

<sup>13</sup> see Eugene C. Luschei, The Logical Systems of Lesniewski (Amsterdam: North Holland, 1962).

<sup>14</sup> Henry S. Leonard and Nelson Goodman, "The Calculus of Individuals and its Uses," in The Journal of Symbolic Logic, Vol.V (1940), 45-55.