

언어 제 7 권 제 2 호(1982)

Universal Grammar of Matrix Proposition¹⁾

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1. Introduction

1.0. Introductory Remarks

Universal grammar means a grammar which can be used as a common core of all natural languages. Matrix Proposition is suggested as such a common core. Proposition is what is talked about a world. A world means a worldly phenomenon, both psychological and physical. The phenomenon is described with such terms as situation or behavior.

Human conception is a reality materialized on the basis of relative and hypothetical terms. No value units could ever be realized in absolute terms.

If we want to define constituent units which materialize the alleged phenomenon and describe relative functions among them, there must be a function proposition relevant to the phenomenon. And if a function proposition is to be used in investigating object languages, then it must be an abstract META-FUNCTION PROPOSITION, META-LANGUAGE.

1.1. Matrix Proposition

Kang(1980) suggested two kernel meta-propositions. One is 'AN IDENTIFICATION OF AN INDIVIDUAL OBJECT'. And the other is 'AN IDENTIFICATION OF AN INDIVIDUAL OBJECT AT A DISTRIBUTION'. That is a functional relation between a recognizer and an object being recognized. But the object is an individual incompatible with others.

1) 본 논문의 일부는 中大論文集 제25집(1981)에 실린 An Adaptability of Logical Calculus of Matrix Proposition as a Universal Grammar를 대폭 수정·보완한 것이다.

The same individual object can be described as a stimulus-situation(S) since it stimulates sensory organs of the recognizer. An identification of an individual is formulated as $\{=(S)\}$. This is a process of recognition that a recognizer gives a 'NAME' to an individual object. 'S' stands for STIMULUS and '=', an IDENTIFICATION by a recognizer. This is a hyponymy relation between DISTRIBUTION as a universal set and its subsets. The subset is the alleged STIMULUS. The recognizer is IDENTIFYING THE STIMULUS as being included in a DISTRIBUTION(D). This is a recognition of 'AN EXISTENCE OF AN INDIVIDUAL OBJECT AT A DISTRIBUTION'. This proposition is formulated as $\{(S,D)\}$ or $\exists(S)= (S,D)$. '∃' is an existential quantifier. The latter is a stative-meta-atomic proposition while the former is a zero-meta-atomic proposition. These are kernel meta-function atomic propositions. That is all that human beings are using as basic function units of cognitive conception.

Now the reader may wonder how we can describe PREDICATES which denote Motion. Motion can best be described as a TRANSFORMATION FROM ONE STATIVE-META-FUNCTION ATOMIC PROPOSITION TO ANOTHER. These are NON-STATIVE-META FUNCTION ATOMIC PROPOSITIONS. Matrix Proposition is a representative configuration of these Meta-Atomic Propositions. It is an Emic unit of Meta-Atomic Propositions.

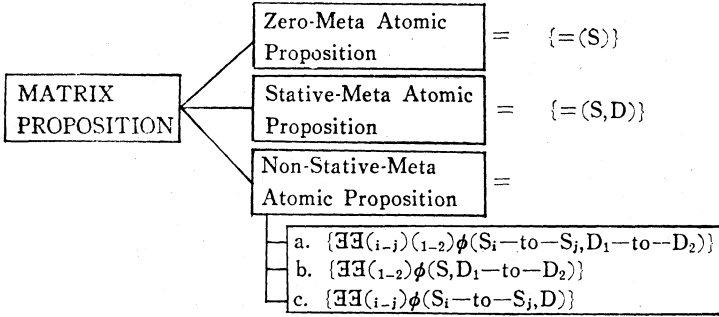
1.2. Occurrence Relation Formulae

The following two Formulae are about matrix proposition and OCCURRENCE RELATION FORMULAE of the matrix propositions.

Natural languages should be effectively and overtly investigated with these Matrix Propositions and occurrence relation formulae corresponding to them. Dialectic inference of the natural language must be first synchronic.

So far the dialectic inference applied by logicians has been mostly deductive and etical. I believe situations of natural languages manifest two dimensions, that is, Emical and Etical reality. This situation leads the writer to suggest a SYNCHRONIC UNIFIED DIALECTIC INFERENCE in the following section.

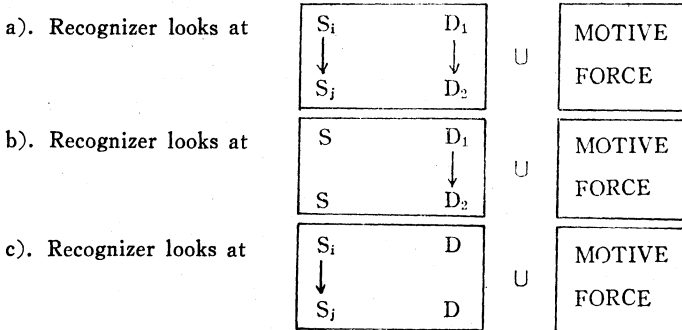
Formula 1: Matrix Proposition



Note: Atomic modality: a. Existential quantifier: \exists
 b. Transformational quantifier: $\exists\exists$

Formula 2: OCCURRENCE RELATION FORMULAE of the Matrix Proposition:

- a. Recognizer looks at an object against another:
 Recognizer looks at it and identifies: $=(S)$
- b. Recognizer looks at an object in a distribution:
 Recognizer looks at and identifies an object as existing at a locus: $=(S,D)$
- c. Recognizer looks at and identifies transformation from a state of existence of an object to another state as being influenced by some MOTIVE FORCE:



***Note: Downward arrow means a transformation and \cup , union,

2. Unified Dialectic

2.0. Introductory Remarks

Unified dialectic is suggested as a methodology of science. Dialectic here

means arts of human expressions and understanding of valid knowledge of phenomena of the universe and the rational functions working with them. Dia means two and logos means the rational principles that govern and develop the universe and definition of individual. Lektion means reading or version of a passage in a particular copy of a text according to dictionary. Mostly dialectic has been used as the art or practice of logical discussion as employed in investigating the truth of a theory or opinion or logical argumentation. Originally the Greek term dialectic was used for the art of conversation.

Plato regarded dialectic as the supreme philosophical method, the highest of human arts. It sought the unchanging essence of each thing. Later in the middle of dialogues dialectic was some kind of operation on hypotheses. Plato emphasized division as a method. Division consisted of a repeated analysis of genera into species, of more general notions into less general ones as a way of arriving at a definition when no further division is possible. This process is complemented by the opposite process of synthesis or collection.²⁾

Dialectic, to Heraclitus and the Neoplatonist Proclus, was a doctrine of a world process—not merely a process of thought but also found in history and in the universe as a whole.³⁾

But later Hegel took a view of it to be “the scientific application of the regularity found in the nature of thought.”

Once again I want to confirm that nowadays formal logic and whatever other types of logic may be understood as a method of seeking and arriving at the truth by reasoning.

Unified dialectic in this paper is suggested as a scientific methodology of an investigation of the supremely general abstract notions by some process of reasoning leading up to them from hypotheses for valid knowledge of the world and thought or concept.

2) Paul Edwards, ed. (1967), *The Encyclopedia of Philosophy*, Vol. 1 & 2, pp. 385-388.

3) *Ibid*, p. 388.

For Plato, true knowledge could be materialized from analyses called, divided, and unified and could be different depending on space and time.

We have already suggested a hypothesis that in deep structure, 'sentence, noun, verb, adjective, and adverb' are identical: 'S=N=V=Adj=Adv' when they are contrasting in surface structure: 'S≠N≠V≠Adj≠Adv'.

2.1. Unified Dialectic

Unified dialectic suggests a scientific application of the synchronic regularity found in the nature of hypothetical thought world.

The process of application is observation, analysis, and grouping of functional variants into Emic units.

Object of observation is the phenomena of both nature and thought.

Analysis of phenomena means to take in parts by the criteria arbitrarily established, and grouping or unifying means to classify componental elements of analysis into significant and functional units on the basis of workable principles and methodology.


This practice of unifying dialectic can be performed based upon 1. OCCURRENCE TYPE of phenomena (refer to Formula 2), 2. MATRIX PROPOSITION of the occurrence type (refer to Formula 1), 3. KERNEL DIALECTIC MODEL of question and answer (refer to Formula 3), 4. Semantic functors: STIMULUS, DISTRIBUTION, and RESPONSE, and 5. Criteria for grouping positional variants into relevant Emic units.

Any dialectic requires at least two partners, question and answer.

Answers are assertion or statements for a given question of phenomena. However may a paragraph be long, every sentence in it is an assertion. Broadly speaking every assertion is some kind of definition of the given phenomena. Sometimes it defines the universal set, sometimes the subsets of individuals.

The basic unit of a dialectic model of surface structure is a sentence. And the stimulus of the kernel dialectic model is an assertion as an answer, and the distribution of the stimulus sentence is a question of the preceding context.

Formula 3: Kernel Dialectic Model

Phenomena	 = WORLD AS IT IS. (Absolute reality)
Question	What is it? = DISTRIBUTION = Preceding context of assertion
Answer	It is a car. = STIMULUS = Assertion

Depending on the phenomena, one comes to form a question. Depending on the question, an answer comes about it.

Semantic functors are markers of mutual interrelationships among arguments in a given predicate within an occurrence type, but as a formula of kernel dialectic model shows, they can relate sentences. But it may be noted that the basic unit of semantic deep structure is a proposition, not sentences. Response could be materialized only through a transformation from one state to another.

Criteria for grouping positional variants into relevant Emic units are the same as the structuralists': 1. incompatibility, 2. semantic similarity, 3. mutually in complementary distribution, 4. distributional pattern congruity.

But the approach of this unified dialectic is synchronistic, inductive, and Emical whereas formal logic is etical and deductive. Criteria can be realized inductively. But once established, they work deductively. But inductive approach claims as general tide of practicing process of the unified dialectic. Next chapter will show a realization of an Emic unit, episememe.

The target of the Unified Dialectic is the description and explanation of the regularity of the structure of the world of both nature and thought. But the ever transcendental phenomena of the world should not be described by the term, a contradiction as Hegel adapted as MOTIVE FORCE of MOVEMENT. The better description must be friction, obstruction, implosion, explosion, cohesion, and so forth. Contradiction is an argumentative term. Collision among nuclei would not be described as that kind of term, contradiction or struggle. Seeds do not feel agony against the soil because it makes them sprout.

The motive force of movement of the universe should be postulated by the following hypotheses:

1. The world, mentalistic or materialistic, is realized as being composed

of more than two elements which differ in quality and quantity.

2. The first hypothesis causes movement among componential elements.
3. Each element seeks after freedom from bondage caused by others.
4. Freedom gets performed with equilibrium among elements.
5. Equilibrium results in security, rest.
6. Unification of movement and rest materializes the world.

The world of both nature and thought transforms, endlessly. But human thought looks as seeking after value units of rest.

The world is a coexistential reality of movement and rest.

Analysis breaks phenomena of the world into componential parts.

And the unified dialectic unifies those componential parts into Emic value units based upon hypothesis.

In the next section I will illustrate how an episememe could be realized as an EMIC VALUE UNIT.

3. What is an Episememe?⁴⁾

3.0. Introductory Remarks

An episememe is a linking and intermediate unit between genuine deep structure, or propositioneme, and surface structure, or tagmeme (sentence).

What an episememe is should be explained in terms of, TAXEME⁵⁾ and TAGMEME.⁶⁾ Componential (immediate) function units which constitute a sentence are termed as taxemes. They are syntactic functors. And besides these, there are modality elements that decompose sentences into parts such as a person's attitude or topicalization, modulation, tense, aspect, mood, etc... Modality is modification symbols, while taxemes are kernel elements.

Taxemes, when combined together, form grammatical forms. The minimal

4) Eugene A. Nida (1952), *A Synopsis of English Syntax*, trans. by Akira Ota, Taishukan, Tokyo, 1957, pp. N, 3, 4, 5, 6, 14.

5) Ibid.

6) Ibid.

grammatical form is called TAGMEME, or sentenceme.

The meaning of the taxeme is called SEMEME and the meaning of tagmeme is called EPISEMEME. While a sentenceme is a syntactic unit, an episememe is a semantic unit corresponding to it. Episememe must be a construction of semantic value units. An episememe is a structural meaning of sentences. We may call an episememe the deep structure of sentences. It is necessary to distinguish tagmeme, propositioneme and episememe from one another. For example, in English there are three taxemes: subject, object and propositional phrases. Roughly speaking, taxeme corresponds to syntactic function marker; sememe, to semantic functor or deep case. The Matrix Proposition admits two basic deep cases: S(stimulus) and D(distribution). Tagmemes are syntactic structures. Propositionemes are genuine semantic structures based on occurrence types. And episememes are combined structures of 1) projection types as consisting of semantic functors (propositioneme components) and syntactic functors (tagmeme components) and 2) modality(excluding Atomic Modality).

3.1. Definition of an Episememe

An episememe is a significant and functional deep structure unit of sentences in a given language. What are the TENTATIVE HYPOTHESIS on it?

CRITERIA of distinguishing one episememe from another at an identical distribution is (1) INCOMPATIBILITY.

Criteria of identifying allo-episememes into the same episememe unit are; (2) allo-episememes should show SEMANTIC SIMILARITY; (3) their projection types should be mutually in complementary distribution; (4) their distributional patterns of the projection types should manifest pattern congruity.

An episememe is a deep structure unit. An episememe is a structure which shows idiosyncratic language characteristics but that as derived or generated from semantic structure. Thus we cannot say that an episememe is a pure surface structure or genuine deep structure. Genuine deep structure could be only that of propositioneme. I mean the former has to include

modality elements as parts while the latter does not.

Sememe corresponds to deep case or argument of proposition. Taxemes of syntax are syntactic functors and sememes of semantics are semantic functors. At the beginning of this section I stated that the meaning of taxeme is called SEMEME. Sememe has broader meaning extending to that of morphemes. But here it should be limited only to the deep case or function of argument.

Because of modality elements, we might be able to say that an episememe unit is partly a surface structure unit as representing deep structure meaning at the same time. Genuine deep structure must be only those of propositionemes. Anyway semantic functors and syntactic functors linked together form projection types. Propositioneme units are universal when episememes are not.

The term, projection type forces us to show projection rules from WHAT to WHAT. The first WHAT here refers to deep structure, that is meta-propositionemes, and the second WHAT, to surface structure such as subject or object PP in English. Syntactic functors are related semantic functors.

We may then wonder where we can draw semantic functors of sentences from. Could we have any configuration which supplies us such functors regularly? As having been said, deep structure unit is proposition. And now we are looking for some kind of CONFIGURATION of META-PROPOSITIONS as META-LANGUAGE, which could serve as UNIVERSAL GRAMMAR. Without such configuration of meta-proposition we cannot try to prove a realization of an episememe. It is because S.S. is generated out of D.S., that is proposition. Allo-propositions are limited within the subsets of COMBINATION rule while allo-episememes could be extended to those of COMBINATION and PERMUTATION and REFLEXIVE COMBINATION.

3.2. Meta-Language⁷⁾

Natural language is an object language of investigation.

7) H.Y. Kang (1980), Chapter 4 and 5.

Meta-language is the language of investigation.

MATRIX PROPOSITION⁸⁾ is suggested in Formula 1 as the meta-language of UNIVERSAL GRAMMAR. And Formula 2 described OCCURRENCE type of the Matrix Proposition.

In Formula 1, zero-meta atomic proposition is an identification of an individual, $\{=(x)\}$.

One-meta atomic proposition is an identification of an individual in a distribution, this is a universal set to subset hyponymy relation, while zero proposition is that of one subset against another incompatibility relation. Stative proposition denotes an EXISTENCE of an INDIVIDUAL, $\{\exists(x)\}$.

This suggests that the complicated human thoughts are entirely constructed upon only these two kernel meta-atomic propositions.

Non-stative-meta atomic propositions are compounds of stative-meta propositions as being composed by transformation from some stative-meta proposition to others and describe the PREDICATES of MOTION while stative-meta atomic propositions describe the PREDICATES of REST.

And the term 'Matrix of Matrix Proposition' implies the womb which gives out all three meta atomic propositions. The arguments, S, D, and R stand for STIMULUS, DISTRIBUTION, and RESPONSE, respectively. These are SEMANTIC FUNCTORS of propositions. Projection means that from semantic functors to syntactic functors. The semantic functors are the very genuine and the deepest cases. The conventional deep cases such as AGENTIVE, OBJECTIVE, INSTRUMENTAL, etc. are pseudo-deep cases, or we may call them the intermediate deep cases between genuine semantic functors and syntactic functors. For our convenience, we may analyze the whole proposition into an argument such as $\{I\}$, $\{B\}$, $\{C\}$, meaning the instrumental case, the benefactive case and the commitative case, in order to use them as semantic functors along with S, D, R semantic functors such as $(\phi(D_1, S, D_2, \{I\}))$. The argumentized cases represent a whole proposition in the COMPOUND META-PROPOSITIONS.

8) Ibid.

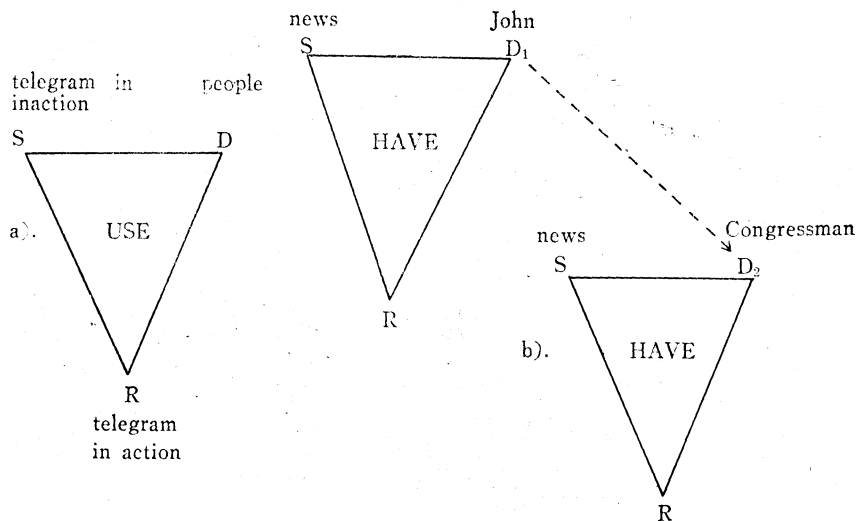
3.3. Verification of an Episememe

Since we do not have any statement formulated upon meta-propositions so far, we have to start examining from surface structure sentence to the deep structure formula of meta-propositions backwards. Here is a sample sentence:

‘JOHN SENT THE NEWS TO THE CONGRESSMAN BY TELEGRAM.’

If we reduce this sample sentence to the actual situation(OCCURRENCE phenomena) and draw a diagram of deep structure and extract META-ATOMIC PROPOSITION formula relevant to it, we can get the following Diagram 1 and Table 1 and 2:

Diagram 1: (for the sample sentence)



****Note:** This is a diagram out of which we can extract meta-proposition relevant to the sample sentence.

According to Table 1, we can see that the sample sentence is built upon the complex meta-proposition. The proposition consists of one transformational quantifier $\exists\exists(1-2)$, a predicate SEND, and four semantic functors (arguments).

Table 1: Complex Meta-proposition from Diagram 1a. and 1b.

{θ} (theta) Meta-proposition UNION {ζ} (zeta) Meta-proposition		
$\{\exists\exists_{(1-1)}(S_i-S_j, D)\}$	$\cup \{\exists\exists_{(1-2)} (= (S, D_1)) \cup (= S, D_2)\}$	⇒
{θ}	$\cup \{\exists\exists_{(1-2)}(S, D_1, D_2)\}$	⇒
	$\{\exists\exists_{(1-2)}(S, D_1, D_2, \{\theta\})\}$	⇒
	$\{\exists\exists_{(1-2)}(S, D_1, D_2, \{I\})\}$	

Since the proposition contains four elements, it has $2^4=16$ subsets. If we extract each r number of subsets according to formula

$$nC_r = \frac{nPr}{r!} = \frac{n!}{(n-r)r!}$$

and ($n \geq r$) and $0! = 1$, then.

${}_4C_1 = 4$ subsets, ${}_4C_2 = 6$ subsets, ${}_4C_3 = 4$ subsets, and ${}_4C_4 = 1$ subset, and $\{\phi\}$.

Since elements are 4: $D_1, S, D_2, \{I\}$, there are 16 subsets:

$${}_4C_1 = \{D_1\}, \{S\}, \{D_2\}, \{I\} = 4$$

$${}_4C_2 = \{D_1, S\}, \{D_1, D_2\}, \{D_1, I\}, \{S, D_2\}, \{S, I\}, \{D_2, I\} = 6;$$

$${}_4C_3 = \{D_1, S, D_2\}, \{D_1, S, I\}, \{D_1, D_2, I\}, \{S, D_2, I\} = 4;$$

$${}_4C_4 = \frac{{}^4P^4}{4!} = \frac{4!}{(4-4)!} = \frac{4!}{0^4!} = 1 = \{D_1, S, D_2, \{I\}\}, \text{ and } \{\phi\}.$$

Table 2: SEMANTIC FEATURES relevant to the sample sentence

Predicate	SEND
Semantic functors	$D_1, S, D_2, \{I\}$ or 1, 2, 3, 4
Syntactic functors	Subj, Obj. p.p., p.p. or a, b, c, d
Meta-proposition	$\exists\exists_{(1-2)}\phi(D_1, S, D_2, \{I\})$
Extension	$D_1 = \text{John}, S = \text{news}, D_2 = \text{Congressman}, \{I\} = \text{telegram}$
Projection types	as in Table 3
Allo-propositions	as in Table 3
Distribution of projection types	as in Table 3 (preceding context is distribution)
Modality	tense, aspect, mood, juncture, scala, etc.

These are the maximum number of allo-propositions that the sample sentence could embrace. Now let us give numerals, 1, 2, 3, and 4 for each $D_1, S, D_2, \{I\}$ and alphabet, a, b, c, and d for English term, subject, object, and pp. (Refer to Table 2 and 3).

Now we can examine HOW MANY SEMANTIC FEATURES the sample sentence is consisted of?

3. 4. Realization of an Episememe

3. 4. 1. Verification 1: Semantic similarity among allo-episememes

In the Table 3, each allo-episememe is projected (generated) from corresponding allo-proposition. And the semantic structures of the allo-episememes are their allo-proposition structures.

Consequently, if there could be found any semantic similarity among the universal set of metapropositions and its subsets, then we could say that there is a semantic similarity among allo-propositions. The universal set is composed of 1, 2, 3, and 4 semantic functors. And all of the allo-propositions consist of more than one semantic functors except the null subset. We can conclude that all allo-episememes are generated from the same one META-PROPOSITION: $\{\exists\exists_{(1-2)}\phi\{D_1, S, D_2, \{I\}\}\}$.

3. 4. 2. Verification 2: COMPLEMENTARY DISTRIBUTIONS among projection types as having been influenced by the immediate DISTRIBUTION of each allo-episememe. In Table 3, the immediate distribution is the preceding context within the DISCOURSE as UNIT OF REFERENCE.

If we examine projection types from A through L in Table 3, then we cannot find any identical projection types and the preceding context corresponding to each exclusive projection type manifests visible distinctions among them. Significant absence of projection channels is not marked here.

This proves that the projection types from which each allo-episememe has been generated show that each occurrence is exclusive and they are mutually in complementary distribution. We can also see that among the English syntactic structures there is distinctive contrast.

3. 4. 3. Verification 3: DISTRIBUTIONAL PATTERN CONGRUITY

Table 3: Allo-Propositions, Projection Types, Preceding Context, Allo-Epistememes and the English tagmemes of the Sample Sentence.

Propositioneme:		Epistememe:			Tagmeme:	
	Allo-proposition		Projection types	Preceding Context	Allo-epistememes	Eng. syntactic structure
4C ₄	$\phi(1, 2, 3, 4)$	A	1 → a	Who SENT 2 to 3	John SENT 2 to 3 by 4.	SVO pp pp to by
			2 → b			
			3 → c			
			4 → d			
4C ₃	$\phi(1, 2, 3)$	B	1 → a	Who SENT 2 to 3?	John SENT 2 to 3.	SVO pp to
			2 → b			
			3 → c			
			d			
4C ₃	$\phi(1, 2, 4)$	C	1 → a	Who SENT 2 by 4?	John SENT 2 by 4.	SVO pp by
			2 → b			
			c			
			4 → d			
4C ₃	$\phi(1, 3, 4)$	D	1 → a	Who SENT to 3 by 4?	John SENT to 3 by 4.	SV pp pp to by
			b			
			3 → c			
			4 → d			
4C ₃	$\phi(2, 3, 4)$	E	a	What SENT to 3 by 4?	News SENT to 3 by 4.	SV pp pp to by ↑ O
			2 ↘ b			
			3 → c			
			4 → d			
4C ₂	$\phi(1, 2)$	F	1 → a	Who SENT 2?	John SENT 2.	SVO
			2 → b			
4C ₂	$\phi(1, 3)$	G	1 → a	Who SENT () to 3?	John SENT () to 3	SV pp to
			b			
			3 → c	⊗		
			d			

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$\phi(1, 4)$	H	$1 \rightarrow a$ b c $4 \rightarrow d$	Who SENT () by 4? ⊗	John SENT by 4	SV pp by	
$\phi(2, 3)$	I	$2 \rightarrow a$ b $3 \rightarrow c$ d	What SENT to 3?	News SENT to 3.	SV pp ↑ to O	
$\phi(2, 4)$	J	$2 \rightarrow a$ b c $4 \rightarrow d$	What SENT by 4?	News SENT by 4.	SV pp ↑ by O	
$\phi(3, 4)$	K	a $3 \rightarrow b$ c $4 \rightarrow d$	What SENT () to 3?	Telegram SENT to 3.	SV pp ↑ to pp by	
C ₁	$\phi(1)$	L	$1 \rightarrow a$ b c d	Who SENT ()?	John SENT ().	SV ()
	$\phi(2)$	M	$2 \rightarrow a$ b c d	What SENT?	News SENT.	SV ↑ O
	$\phi(3)$	N	a b $3 \rightarrow c$ d	⊗		
	$\phi(4)$	O	a $4 \rightarrow b$ c d	What SENT? ()?	Telegram SENT ().	SV ↑ pp by

	$\phi(\phi)$	P	a			
			b			
			c	×		
			d			

**Note: x means no occurrence, and ⊗ no occurrence except conversation.

among the distributional patterns of allo-projection types of ζSEND} PRE-
 DICATEME with other predicatemes, say, ζPAY} PREDICATEME or
 ζGIVE} PREDICATEME.⁹⁾

The distributional patterns of allo-projection types of the said ζPAY} and
 ζGIVE} predicatemes manifest similar patterns as those of the ζSEND}
 predicateme. But I will omit a table showing the patterns of the projection
 types of the ζPAY} and ζGIVE} predicatemes.

Next the incompatibility among the sample sentence and another at the
 identical distribution could be shown easily with extension constraints.¹⁰⁾

As we have shown, the three proofs above beside the incompatibility
 test satisfy those TENTATIVELY established criteria.

Now we conclude that all allo-epistememes of the sample sentence could
 be grouped into the same EMIC EPISEMME UNIT based upon the se-
 mantically constructed underlying structure of META-PROPOSITION of
 the sample sentence.

Now it is time to crystalize the distinctions of formulae of the proposi-
 tioneme and the epistememe.

The intra-propositionally determined marker of allo-proposition and allo-
 epistememe is ~.

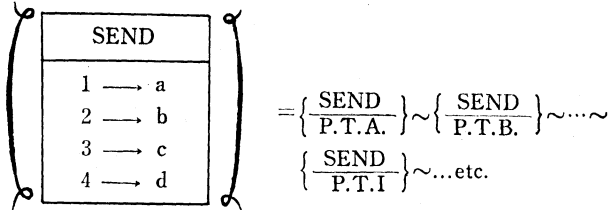
The inter-propositionally determined marker of allo-proposition and allo-
 epistememe is ∞.

Formula 4: PROPOSITIONEME FORMULA of the sample sentence:
 $\{SEND(1, 2, 3, 4)\} = \{\phi(1, 2, 3, 4) \sim \{\phi(1, 2, 3)\} \sim \{\phi(1, 2, 4)\} \sim \dots \sim \{\phi(\phi)\} \infty \dots$

The number of the allo-propositions could be determined only based
 upon COMBINATION RULE, but not upon PERMUTATION RULE.

9) Hyung-yul Kang (1980 : 208-212).

10) Ibid. p. 212, Table 10.



**NOTE: P.T.A. stands for 'projection type A' which as shown in Table 3 are allo-projection types that immediately induce allo-epistememes with PREDICATES and EXTENSIONS, later on with modification symbols, modality.

The number of allo-epistememe formula of the sample sentence is determined by the COMBINATION rule. If we put into our consideration the number of allo-epistememes determined based upon PERMUTATION rule, the number can increase much greater.

The number of subsets which could be built by 4 elements based upon the permutation rule is 64:

$${}_4P_1=4; {}_4P_2=12; {}_4P_3=24; {}_4P_4=24$$

Of course not all subsets are to survive as surface structure expressions. That's the way each predicate can have a property distinct from others. At the beginning of this section it was noted that the TAGMEME was composed of syntactic functors, taxemes.

This means that if we relate those modality features to each of the above allo-epistememes, then the number of allo-epistememes could be expanded up to a few hundreds. In other words, these hundreds of allo-epistememes are generated out of one and the same EPISTEMEME, that is the universal set of the allo-epistememes.

And when the permutation rule is applied to the universal set of the epistememe, a great number of INTER-PROPOSITIONALLY determined allo-epistememes could be materialized.

The universal set of epistememe has been generated out of the meta-proposition of the sample sentence. And the tagmemes are generated out of epistememes. Tagmemes are language specific, while propositionemes are uni-

versal. An episememe is a bridging structure between meta-propositions and tagmemes.

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