機能言語学

JASFL *Occasional Papers*

Volume 3 No. 1 Autumn 2004

JASFL
Occasional Papers

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JASFL Occasional Papers

Volume 3 Number 1 Autumn 2004

Articles（論文）

JASFL Occasional Papers Volume 3 No. 1 2004

Lexicogrammatical Resources in Spoken and Written Texts*

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Abstract

This paper examines written and spoken academic texts, specifically, the texts introducing some important notions of Systemic Functional Theory. The aim of the paper is to observe the way in which academic knowledge is constructed by the lexicogrammatical resources characteristic to each of the two modes of language: nominalization in the written mode, and complicated rhetorical structure in the spoken mode. The analysis will prove that, even though the spoken language is not frequently used in the higher education, it has enough power and resources to construct no less complex knowledge than the written one, and could be used as the resource to construct a dynamic nature of phenomena.

Introduction

Throughout our lives, we keep learning, and most of what we learn, whether it is written in a book or spoken by a teacher, we learn through language. Language plays a central role in education and could said to be a "vehicle of learning" (Halliday 1989: 96). Our concern in this thesis, then, is to examine *how* language functions to construct knowledge; what kind of lexicogrammatical resources are used, and how they are incorporated into overall textual patterns.

"Language," however is not the homogeneous entity, but is the superordinate term to cover various styles and "ways of meaning" which are differently organized with different lexicogrammatical resources. This thesis focuses on two modes of meaning, spoken and written language, and examines the lexicogrammatical resources these two modes of language have developed for constructing knowledge. Academic discourses, especially those of the higher education, favor the written mode of meaning. Spoken language has been considered to be "by its nature, usually unstructured, superficial and low" (McRoberts 1981. qtd. in Halliday 1989: 77), and "was given little or no recognition in education thinking" (Halliday 1989: 96).

However, we must recognize the crucial role of spoken language in learning and its capability in constructing knowledge. The aim of this thesis is to analyze academic texts on linguistics produced in the written and spoken language, and to observe the lexicogrammatical resources functioning in several steps in the knowledge construction. Section 1 summarizes the characteristic lexicogrammatical resources written and spoken languages have developed. In Section 2, we introduce the study of Wignell, Martin and Eggins (1993) to establish the

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* This paper is the revised version of the master's thesis presented to the Graduate School of International Cultural Studies, Tohoku University, in January 2002.

model for analyzing academic discourses. In the final section, the model is applied to some specialized texts on linguistics. The texts are classified as spoken or written text. The analysis will prove that, even though written and spoken languages use different kinds of lexicogrammatical recourses and their patterns, they are equally competent in constructing specialized knowledge. The investigation of the lexical and grammatical differences in the texts will then lead to the discussion of the semantic difference in the created knowledge itself.

1. Spoken and Written Modes of Meaning

One of the aggregate forms of meaning properties resulting from a number of contextual factors is known as spoken and written language. The term does not only mean that the text is spoken through the oral channel or written through the graphic channel. As we will see later, the spoken and written language refers to the modes of meaning with different uses of lexicogrammatical resources and their patterns.

Between the two modes of meaning, spoken language has been considered to be "unstructured, superficial and low" (McRoberts 1981. qtd. in Halliday 1989: 77). Halliday (1987, 1989), however, argues that spoken language has different kind of complexity and regulations from that of written language, and that "neither is more organized than the other, but they are organized in different ways" (1987: 71). The complexity of each of the two modes could be summarized as follows:

1. High Lexical Density: Written language has a complexity in the organization of nominal groups, which results in high lexical density. The complex nominal groups encapsulate information and represent relations between phenomena in single clauses.
2. Grammatical Complexity: Spoken language has a complexity in the organization of clause complexes, which results in the deep and complex taxis organization. The taxis organization represents relations between phenomena in a form of clauses related to each other in a number of different logico-semantic relations.[1]

Academic discourses, especially those of the higher education, favor the written mode of meaning. The discourse like the example below, which centers around nominalized 'things' (highlighted in italics), seems to be a 'typical' academic discourse:

> The "miracle" of *Japan's postwar economic recovery*, especially *the penetration of international markets* during the 1970s and 1980s, captured *the imagination of the world.* Actually, this was the second such period of *extraordinary industrial expansion and growing technological sophistication*, the first being the period of *economic modernization* during the last half of the nineteenth century. In both instances, *Japan's dogged pursuit of rapid economic growth* at first attracted *little attention* from the rest of the world. Japan was considered of *such minor importance* as to pose *no significant threat* to *the economic interests of others.* (from Hayes 1992)

However, we must recognize the crucial role of the spoken language in learning, and its capability in constructing knowledge. What gives spoken language such power is its equal, but different kind of, complexity with the written one. This section lays out the

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[1] The term "logico-semantic relation" refers to a very wide range of possible relationships between events constructed by natural language, such as temporal and causal-conditional relations. I use the term following Halliday (1994) and Halliday and Matthiessen (1999), in order to distinguish it from the restricted use of the term "logic" in mathematic and science fields. Halliday and Matthiessen (1999: Chap. 3) discuss the distinction between these two kinds of logic with the term "natural logic" for the former and "prepositional logic" for the latter.

lexicogrammatical resources characteristic to each of the two modes of meaning.

1.1 Lexicogrammatical Resources in Written Language: Nominalization

Written language often utilizes nominalizing resource. The discussion of nominalization in this section is based on Halliday and Matthiessen (1999: Chap. 6).

Nominalization concerns the ideational metafunction of language and is enabled by the stratified language system. Systemic Functional Theory (SFT) conceptualizes language as the stratified system with three levels: semantics, lexicogrammar, and phonology/graphology. In the semantic stratum, the ideational system interprets the world in the forms of (i) sequence of events, which consists of several events logico-semantically connected by some relators, (ii) event, which is interpreted as the configuration of some participants and circumstances gathered around a process, and (iii) human or non-human participants in an event.

Congruently, these phenomena are realized in the lexicogrammatical stratum as (i) clause complex, or a sequence of clauses connected by some conjunctions, (ii) clause, which consists of a verbal group with nominal groups and prepositional phrases gathered around it, and (iii) nominal group, which has a number of components including Deictic, Numerative, Epithet, Classifier, Thing, and Qualifier. The congruent relation between the two strata is shown visually in Figure 1-1.

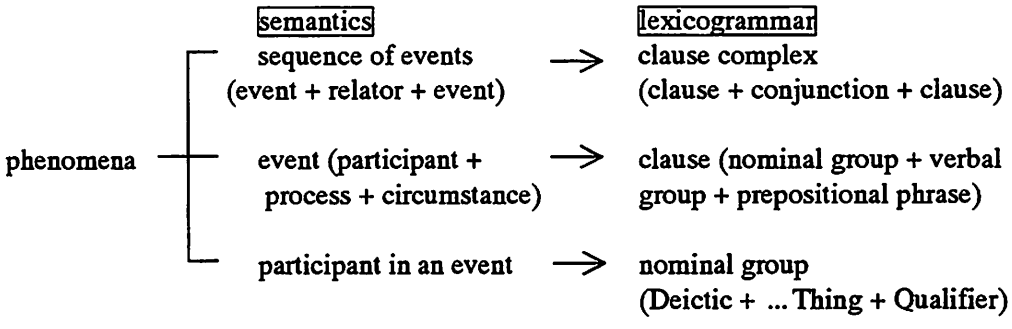

Fig. 1-1: Realizational relation between the semantics and lexicogrammar

However, the stratified system provides us with the alternative way of realization. The choices in each stratum are independent of those in the other strata, and might result in the incongruent realization. The incongruence between the choices in two strata is referred to as grammatical metaphor. The typical case of grammatical metaphor is nominalization, where an event in the semantic stratum is realized by a nominal group in the lexicogrammar.

What enables the metaphorical realization is the organization of nominal groups. A nominal group has a complex organization with numerous components, which allows infinite expansion as shown in the following example:

Deictic	Numerative	Epithet	Classifier	Thing	Qualifier
				trains	
			electric	trains	
		splendid	electric	trains	
	two	splendid	electric	trains	
those	two	splendid	electric	trains	
those	two	splendid	electric	trains	with pantographs

(adopted from Halliday 1994: 191)

Such organization provides nominal groups with semantic potential to capture the complex phenomena which would have been realized by a clause or a clause complex congruently. Figure 1-2 shows that the same phenomenon can be realized in a nominal group as well as in a clause and a clause complex:

clause complex	if	iodine	is absent	from the diet,	then	the thyroid gland	does not work	properly
	relator	participant	process	circumstance	relator	participant	process	circumstance

clause	an absence of iodine	results in	malfunction of the thyroid gland
	participant	process	participant

nominal group	malfunction	of the thyroid gland	resulting from an absence of iodine
	Thing	Qualifier 1	Qualifier 2

(adapted from Weston 1994: 72)

Fig. 1-2: Three ways of realization in the lexicogrammar

This example shows that a sequence of events can be realized not only in a clause complex, but also in a clause or a nominal group. The stratified language system and independency between the strata thus widen the range of options we can use to 'mean' with language.

One of the significant effects resulting from choosing nominalized expressions is 'reification' of phenomena. That is, various evens are semantically constructed as 'thing', and thus become participants which can participate in other events. The participants can persist through a text by the use of cohesive devises such as reference and repetition. On the other hand, a clause which centers around a process does not have the persistency. Matthiessen and Halliday (1999: 133-134) argue the complementarity in the temporal unfolding of processes and participants as follows:

> Whatever the mode of occurrence of any figure [=event], it will always unfold in time. This temporal unfolding is construed as an inherent property of the process itself, realized grammatically as tense and aspect. Whereas on the one hand in its manifestation as process, the figure unfolds in time, in its manifestation as participant, on the other hand, it persists through time — whether or not the participant undergoes a change of state. (...) This same distinction also appears in the temporal unfolding of a text, where participants have the potential to persist as discourse referents, but process are excluded, unless they are turned into honorary participants through the use of grammatical metaphor.

Thus we can say that nominalization is the resource which turns evanescent events into

persistent participants which can be repeatedly referred to in a text.

The repetition of reference enables the accumulation of information which plays the central role in the construction of knowledge. Consider the following example:

Ill-balanced meal may result in the absence of iodine
It causes the malfunction of the thyroid gland.
It is a symptom called...

The first clause uses a metaphorical expression *the absence of iodine.* It reifies and perpetuates a transient event which has happened to someone in the specific point in the time frame, such as "John did not take enough iodine from his diet." The reified phenomenon is maintained by the use of reference *it* in the next clause, and used as the starting point for the next information, in this case, what is caused by it. Second clause has another reified expression *the malfunction of the thyroid gland* which, in turn, is referred to in the third clause by *it* and used as the starting point for the further information. Such accumulation pattern resulting from nominalization is a characteristic way of organizing academic texts in the written language.

1.2 Lexicogrammatical Resources in Spoken Language: Rhetorical Structure

The spoken language has developed different way to organize the information. According to Halliday (1987, 1989), the spoken language favors more intricate clause complexes than the written language:

> The natural consequence of the spoken language's preference for representing things as processes is that it has to be able to represent not one process after another in isolation but whole configurations of processes related to each other in a number of different ways. This is what the clause complex is about. (Halliday, 1989: 86)

He also argues that such clause complex relations not only "could run to considerable length and depth" (1987: 58), but also could be "remarkably well formed" (1987: 59). That is, although the clause complex organization becomes extremely intricate, the speaker never gets lost, and the text always ends up with "all brackets closed and all structural promises fulfilled" (ibid.). This indicates the characteristic competence of the spoken language for constructing logico-semantic relation in a form of sequences of processes, because, as is found by Halliday, these intricate clause complexes "were difficult to follow in writing" (ibid.).

However, the relation between clauses is not captured enough if we look merely at clause complexes. This thesis will adopt the Rhetorical Structure Theory (RST) to capture the rhetorical relations which obtain between the clauses connected beyond the grammatical units such as clause complexes. Rhetorical structure is the organization of clauses connected with each other through various semantic relations. These relations are "defined in terms of the function of segments of text, that is, in terms of the work they do in enabling the writer to achieve the goals for which the text was written" (Matthiessen 1988: 289). For example, in the following text which consists of three clauses, "the goal for which the text was written" is to command someone to take the coffee cup away from the speaker's office.

e.g.1-1
1. Someone left a coffee cup in my office over the weekend
2. Would the owner please come and get it
3. as I think things are starting to grow?

(from Matthiessen 1988: 293)

We can postulate Clause 2 as being the most central of the three clauses to the writer's purpose. Clause 1 and 3 semantically depend on Clause 2: Clause 3 represents the motivation for the speaker's command, and Clause 1 gives the background information for the following clauses. The semantic relation between these clauses is referred to as 'Nucleus-Satellite' relation with Clause 2 as the Nucleus and Clause 1 and 3 as its Satellites. Figure 1-3 shows the visual representation of the organization of the whole text. (The graphic convention is based on Matthiessen 1988.)

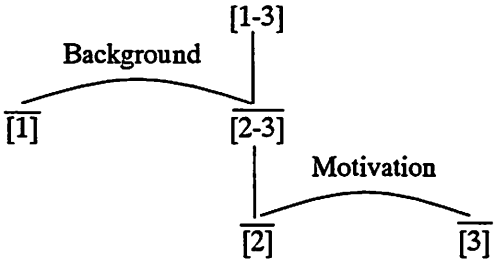

Fig. 1-3: Relational analysis of the 'coffee cup' text

In addition to the 'Nucleus-Satellite' relation, we can find another type of relation called 'List', which occurs when two parts of a text stand equal status to each other. 'List' relation is represented by the two descendent parts from a List node as shown in Figure 1-4.

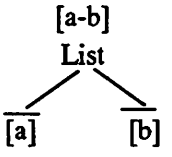

Fig. 1-4: Visual representation of the List relation

'Nucleus-Satellite' and 'List' are the relations that exist in the semantic level. However, these semantic relations could be realized by lexicogrammatical resources. Matthiessen (1988) argues that clause complexes are the grammaticalization of the rhetorical organization of discourse with parataxis as the grammaticalization of the List relation and hypotaxis as the realization of the Nucleus-Satellite relation.

Parataxis is the relation between the clauses with the equal grammatical statuses such as *Mary went to the park and John stayed home*, whereas hypotaxis is the relation where one element is dependent on another such as *When she went to the park, Mary met John.* Hypotaxis should be distinguished from embedding where one element becomes a constituent of the other, like *I met yesterday* in *He is the man I met yesterday*, where *the man I met yesterday* functions as a single element as a whole. Both of the taxis relations are not necessarily realized explicitly by conjunctions. Conjunctions simply function to signal the logico-semantic relations between messages. If the relations are perceivable without them, they can be left implicit.[2] Figure 1-5 summarizes the realizational relation between the organizations in semantic and grammatical levels.

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[2] Martin (1991: 183-184) suggests the criteria that an implicit conjunction can be recognized when we can insert a conjunction without changing the meaning relation between the clauses. In the analysis below, the reconstructed conjunctions will be put in brackets as in *I didn't buy them. [because] They were too expensive.*

Semantics		Lexicogrammar
'List'	→	parataxis (two elements have equal status)
'Nucleus-Satellite'	→	hypotaxis (one element depends on another but is not a constituent of it)

Fig. 1-5: Realizational relation of the rhetorical structure

The grammatical realization of the discourse semantic organization proposed by Matthiessen is illustrated by the following example.

e.g.1-2

Our teacher says that
1. if your neighbour has a new baby
2 and you don't know whether it's a he or a she
3. if you call it 'it'
4. well then the neighbour will be very offended.

(from Matthiessen 1988: 303)

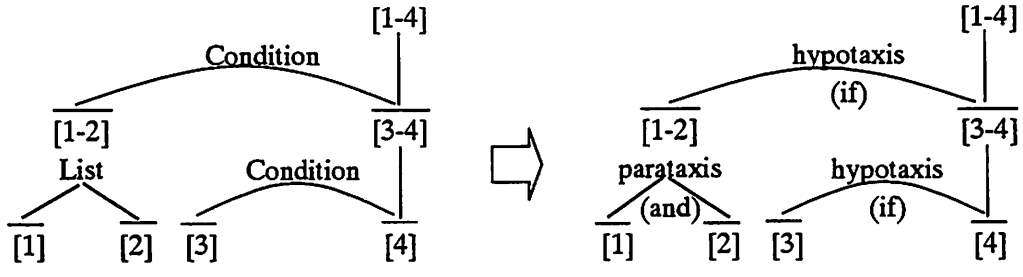

Fig. 1-6: Relational analysis of semantic and grammatical structures of the 'neighbor' text

The semantic organization of the example is shown in the left-hand figure in Figure 1-6, where we can see two conditional relations in different levels: one is between Clause 4, which functions as the Nucleus of the entire text, and Clause 3, which functions as the Satellite; the other is between Clause 1-2, which are connected by the List relation, and the rest of the text. The figure in the right shows the grammatical organization of the example. Notice the correspondence between the two organizations; the Nucleus- Satellite relations in the semantic organization correspond to hypotactic relations which are explicitly realized by the conjunctions *if*s, and the List relation corresponds to a paratactic relation realized by the conjunction *and*.

However, lexicogrammatical realizational resources of the discourse rhetorical structure is not limited to taxis relations. Using the following examples,

1. Because the poem was appalling, Trillian frowned. [taxis]
2. The poem was appalling. Consequently Trillian frowned. [cohesion]

Martin (1992: 17-19) argues the necessity to capture the functional 'continuity' between taxis, which is the structural relation *inside* a clause complex, and cohesion, which is the non-structural relation *between* clause complexes. The semantic resemblance between the two examples above shows that cohesion functions as a possible alternative for realizing the same discourse organization as the taxis relation. Martin also suggests several other lexicogrammatical resources to realize the discourse organization. For example, he points out that the use of antonym in adjacent clause complexes (e.g. *with the bigger breeds of dog, they're stood on the ground... with the smaller breeds of dog such as Corgis...*) represents the

semantic relation of comparison between the clause complexes (202).

To conclude, the discourse semantics is more abstract than lexicogrammar and generalizes across various lexicogrammatical resources as its realizational means. In the analysis of the discourse rhetorical structures of spoken academic texts in the final section, we will observe various lexicogrammatical resources which contribute for the construction of intricate discourse structures and help the listeners to recognize the expected discourse organization.

2. Models of Analysis

2.1 Knowledge as Meaning

SFT takes the constructivist view on language, in which Halliday and Matthiessen (1999: 603) argue that "to 'know' something is to have transformed some portion of experience into meaning." In other words, it is language that construes our experience and constructs our world of events and objects. Reality is unknown without the language that interprets it. This may also be the case with academic discourses. Knowledge does not 'exist' before the wordings that interpret and express it. Our concern then is how language functions to construct knowledge and what type of grammatical patterns and lexicogrammatical resources build up academic discourses.

When we think of the function of language in academic discourses, we usually think of technical terms that describe and analyze the various objects and phenomena in the world which are not familiar to us. Academic knowledge is thus often conceived as something achieved through understanding and remembering of such technical terms.

However, the story is more than that. It is the grammar and the lexicogrammatical patterns in the entire text that create knowledge, as technical terms themselves are constructed by the grammar. Halliday and Martin (1993: 4) state the significance of the grammar in the scientific academic texts:

> It would be impossible to create a discourse of organized knowledge without them [technical terms]. But they are not the whole story. The distinctive quality of scientific language lies in the lexico-grammar (the 'wording') as a whole, and any response it engenders in the reader is a response to the total pattern of the discourse.

The next section introduces the work which explores some of the grammatical resources and their patterns used to construct specialized geographical knowledge. The work will provide us with the model for analyzing texts on linguistics in which we will compare the uses of lexicogrammatical resources characteristic to spoken and written languages.

2.2 Analysis Model: Three Steps in the Construction of Geographical Knowledge

Wignell, Martin and Eggins (1993) analyse a geography textbook used in a junior high-school, and classifies the three steps in which the geographical knowledge is constructed. The three steps and the lexico- grammatical recourses used in each step could be summarized as below.

Three steps in the geography textbook

1. Naming and Defining: the step where language labels the geographical phenomena with technical terms and defines them.
2. Setting up of taxonomies: the step where language categorizes phenomena in an ordered, systematic classification based on the principle of superordination (where something is a type of something else), or composition (where something is a part of something else).
3. Explaining: the step where language explains the process or mechanism in which a

geographical phenomenon occurs.

Lexicogrammatical resources contributing to the three steps

1. Lexicogrammatical resource which functions for naming is verbal process which labels a geographical phenomenon with a technical term.

e.g.

When air contains a lot of water vapour,	we say	that the humidity is high.
[phenomenon]	[verbal process]	[technical term]

e.g.

Thus green plants	are called	producers.
[phenomenon]	[verbal process]	[technical term]

Lexicogrammatical resource which functions for defining is identifying process which relates a technical term with its definition.

e.g.

Prevailing winds	are	winds which blow from one direction for long period during the year.
[technical term]	[identifying process]	[definition]

2. Lexicogrammatical resource which functions for construction of taxonomies is intensive or possessive relational process which relates a subclass to its class.

e.g.

Physical geography	is	a science
[Carrier: sub-class]	[intensive relational process]	[Attribute: class]

e.g.

Desert landforms	consist mainly of	those due to erosion and those due to deposition
[Carrier: class]	[possessive relational process]	[Attribute: sub-class]

3. Lexicogrammatical resource which functions for explanation is a implication sequence which connects events logico-semantically, and shows that an event occurs as the result of some other events.

e.g.

when rain falls,	then carbon dioxide dissolves in rain,	then water soaks into ground...
[event 1]	[event 2]	[event 3]

In the text analysis in the next section, I will adopt these three steps, naming and defining, setting up of taxonomies, and explanation, to specialized texts on linguistics.

3. Analysis: Lexicogrammatical Resources to Construct Knowledge

3.1 Data

In order to explore the function of language to construct specialized knowledge, this section analyzes the academic discourses on linguistics, specifically on SFT. Even though we use language everyday, the theory of language is not familiar to the most people. Construction of linguistic discourses requires special ways of meaning, which will provide us with appropriate data for the analysis.

SFT postulates text as a unit of analysis. Text is the unit of discourse in terms of its function in use. That is, "text-completion has to do with a user's perception of it as useable

on its own" (Scott and Thompson 1984: 1). For the usability of academic discourses depends on the fact that we can achieve some specialized notions or terms from them, this thesis postulates as a unit of analysis the portion of discourse which deals with and fully explains one particular concept from SFT. This roughly corresponds to a section in a written material and a scene taken in one setting in a spoken material.

In order to compare the use of lexicogrammatical resources in written and spoken language, we use two types of texts taken from the following materials. They will be referred to as "spoken text" and "written text" for the easy reminder of their contextual aspects:

1. "Spoken text" [Tenor: Specialist (teachers or scholars) to non-specialist (students or audience); Mode: Spontaneous speech through the oral channel]
   The texts in which teachers teach SFT to their students or teach something adopting some concepts from SFT in the classrooms, or scholars explain some basic concepts from SFT.[3]
   The texts are transcribed from the following material:
   Videotape (a teaching material for introducing SFT): University of Wollongong. 1995. *Introduction to Language in a Social Context / Text and Context* (EDGA 976)

2. "Written text" [Tenor: Specialist (the author) to non-specialist or specialist (the reader), Mode: Prepared writing through the graphic channel]
   The texts dealing with the same topics as the videotape texts. These are excerpted from the written literature on SFT listed below:
   Halliday, M.A.K. 1994. *An Introduction to Functional Grammar.* 2nd edition. London: Edward Arnold.
   Halliday, M.A.K and Christian M.I.M. Matthiessen. 1999. *Construing Experience through Meaning.* New York/ London: Cassell.
   Halliday, M.A.K. and Ruquaiya Hasan. 1985. *Language, Context, and Text: Aspects of Language in a Social- semiotic Perspective.* Victoria: Deakin University.

I have chosen three subject-matters: "three metafunctions," "cohesion and coherence," and "modality." For each of the subject-matters, we have chosen texts from the both types of texts, "spoken" and "written text." All the texts are numbered for ease of reference and shown in the appendix. "Spoken texts" are transcribed from the videotape. Uncertain parts are in parentheses, and inaudible parts are represented by blanks in parentheses.

The following sections first investigate the "written text" and examine how nominalization and its cooperation with other lexicogrammatical items function in each step of the knowledge construction model adopted from Wignell et al. (see Section 2-2). Then, we will move on to the "spoken text," and examine how it constructs the same knowledge without nominalizing resources.

3.2 Naming and Defining

3.2.1 Naming and Defining in the Written Language

Written language uses verbal process and relational process for naming and defining. This is the same as what Wignell et al discovered through his investigation. For example, the following part from a "written text" defines the notion "co-referentiality" using identifying relational process *is referred to.*

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[3] This type of text excludes "narration text" in which the narrator explains some basic concepts from SFT [Tenor: Specialist (the narrator) to non-specialist (the audience), Mode: Prepared speech through the oral channel]. The reason for this is that the fact that the text uses oral channel, as is mentioned in Section 1.1, does not indicated that the text is in spoken mode. Narration texts are, in fact, prepared in advance, and could be called written text spoken through the oral channel.

e.g.3-1(from Text 2-1)
Example 5.3
I had a little nut tree
Nothing would it bear
But a silver nutmeg
And a golden pear.

The pronoun *it* refers to no other nut tree but the one that has already been mentioned as *a little nut tree*; the situational referents of both are the same thing. In the literature on the discussion of textual continuity, this relationship of situational identity of reference is referred to as CO-REFERENTIALITY.

this relationship of situational identity of reference	is referred to as	CO-REFERENTIALITY
[phenomenon]	[identifying relational process]	[label]

Notice the function of nominalization. Before the phenomenon is labeled with a technical term, it is nominalized and constructed as a 'thing', such as *relationship of situational identity of reference.* We can observe the process of generalizing and abstracting accompanying the construction of a concrete phenomenon into the nominalized expression. The excerpted part begins with the concrete description "*it* refers to *a little nut tree.*" It describes the relation between the specific participants *it* and *a little nut tree*, and cannot be used for the basis of general knowledge. Then the concrete participants disappear and the process is replaced by a general 'thing' as the phenomenon is reconstructed as *the situational referents of both are the same,* and then as *relationship of situational identity of referents.* Finally, the technical term is introduced when the highly generalized and abstracted thing, *relationship of situational identity of referents,* is labelled as *co-referentiality* using the relational process *is referred to.*

Such defining process enables the construction of the technical terms which generalize across the various specific events. Figure 3-1 summarizes the cooperation of relational process and nominalization in the step of naming and defining. Nominalized phenomena are squared, technical terms are in shade, and the processes used for the construction of knowledge are underlined throughout this section.

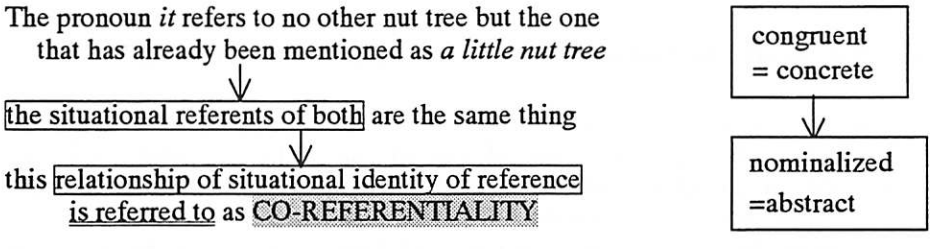


Fig. 3-1: Nominalization and the definition of the term "co-referentiality"
: nominalized expression : technical term
double underlined the processes used for the construction of knowledge

However, in most written academic texts, the process of nominalization is not explicitly shown. In such case, we are supposed to know the congruent meaning of nominalized things. This type of definition is illustrated by the following part defining the technical term "modality."

e.g. 3-2 (from Text 3-1)
In a proposition, the meaning of the positive and negative poles is asserting and denying: positive 'it is so', negative 'it isn't so'. There are two kinds of intermediate possibilities: (i) degrees of probability: 'possibly / probably / certainly'; (ii) degrees of usuality: 'sometimes / usually / always'. The former are equivalent to 'either yes or no', i.e. maybe yes, maybe no, with different degrees of likelihood attached. The later are equivalent to 'both yes and no', i.e. sometimes yes, sometimes no, with different degrees of oftenness attached. It is these scales of probability and usuality to which the term 'modality' strictly belongs.

[to] these scales of probability and usuality	the term 'modality'	belongs
[phenomena]	[label]	[relational process]

This text does not have the congruent expressions for the nominalized phenomena *degrees of probability* and *degrees of usuality.* These expressions are supposed to be interpreted as the generalization of the infinite numbers of specific expressions of likelihood and oftenness such as "A is likely to be B", "A is very likely to be B", and "A is most likely to be B", or "A often is B", "A very often is B", and "A most often is B." These generalized 'things' persist through the text as *different degrees of likelihood* and *different degrees of oftenness* with the help of cohesive devices of synonymy and repetition. They are then combined into one expression *scales of probability and usuality,* and labeled with the technical term "modality" in the final clause, where the relational process *belongs* functions for naming and defining. Figure 3-2 summarizes the cooperation of nominalization, cohesive devices, and the relational process in this example.

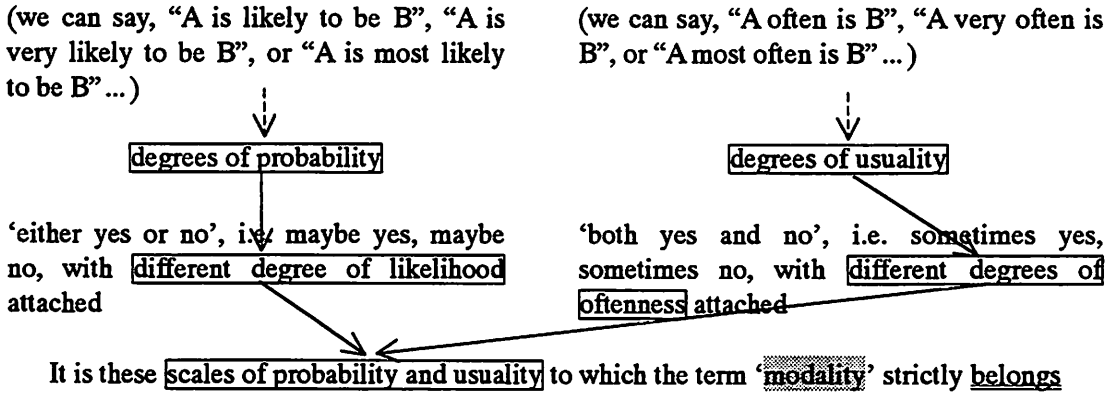


Fig. 3-2: Nominalization and the definition of the term "modality"

These two examples lead to the conclusion that nominalization in the analyzed texts are used for the abstraction and generalization of phenomena. The process packs much information into a nominal group that can be labeled in a single clause through the naming function of relational process or verbal process. The technical terms produced through such a process generalize across different possible situations and form the basis for the next steps in the knowledge construction, as we will see in Section 3.3 and 3.4.

3.2.2 Naming and Defining in the Spoken Language

As we have seen in the last section, written language defines technical terms in single clauses using nominalization and relational or verbal process. For example, "modality" is defined in a clause *It is these scales of probability and usuality to which the term 'modality' strictly belongs.* The nominalized expression, *scales of probability and usuality,* 'condenses' many specific congruent descriptions.

The same technical concept is also constructable in spoken language. However, the spoken language, which uses far less nominalizing resource, uses a different kind of resource for naming and defining. It is its rhetorical structure which organizes clauses into the functional whole. Consider the following example from a "spoken text," where the same concept "modality" is introduced.

e.g. 3-3 (from Text 3-2)
Teacher: 1. We're going to become very very scientific, 2. because in science we'd like to talk about making inferences. 3. [that is] We have a look at what we found out, 4. and when we do this, 5. we use very soft language. 6. I'll give you another term for soft language. 7. Here it is. 8. Here. It's called low modality.

It	[is] called	low modality
[phenomenon]	[verbal process]	[label]

The final clause also uses the verbal process *call* to label the phenomenon *It* with the technical term "low modality". We shall now focus on the defining process of the term *soft language* to which the pronoun *It* refers to. Notice the function of rhetorical structure which circumlocutionally, but effectively defines the term. Figure 3-3 shows the rhetorical structure of the Clauses from 1 to 5. The lexicogrammatical resources to realize the semantic structure are shown in parenthesis.

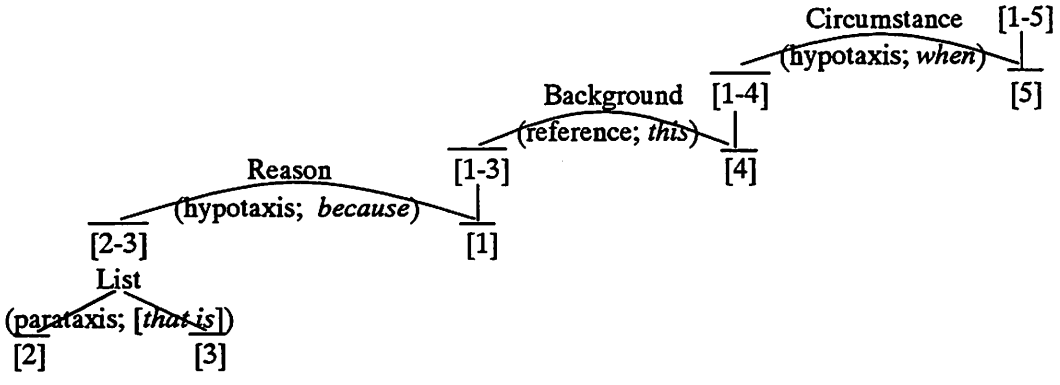


Fig. 3-3: Relational analysis of the 'modality (1)' text

Figure 3-3 shows the rhetorical 'nesting', that is, the internal recurrence of the hierarchical relations. Clause 5 is the Nucleus of the whole with the rest of the text as its Satellite representing its circumstance. Within the Satellite portion, Clause 4 functions as the Nucleus, with Clause 1-3 as its Satellite providing the background for the action described in Clause 4. Clause 1-3 in turn has its own Nucleus, Clause 1, and the Satellite, Clause 2 and 3, which represents the reason for the statement described in Clause 1.

The rhetorical nesting is reflected in the grammatical organization of the text. The Circumstance and Reason relations are realized in the hypotactic clause combinings explicitly marked by the conjunctions *when* and *because* respectively. Pronoun *this* in Clause 4, which refers not to a specific thing but to the entire action described in Clause 1-3, serves to connect the portion to Clause 4 as its background. The List relation is coded as the paratactic clause combining which is implicitly connected by the relation of restatement. We could append the conjunction *that is* to express the implicit relation.

As the structure shows, the text has no explicit definition of the term "soft language" such as "soft language is/refers to something." Rather, the text explains the concept through the description of circumstances and backgrounds in which we actually use "soft language." This

kind of definition is enabled by the rhetorical structure where all parts of a discourse collaborate to form a whole through the recurrence of hierarchical relations. That is, one portion describes the reason for something, which forms the background information of something else, which in turn gives circumstantial information for the main statement. With such organization all the parts of the text are ultimately related to the clause *we use soft language.* Thus the spoken language can 'concentrate' information in the central clause without the help of nominalization.

Let us consider one more example where a teacher explains more about "low modality" in a more complicated way. This is the part where the teacher asks a question and a student gives an answer to it. Notice that the answer plays important role in the definition of "low modality."

e.g. 3-4 (from Text 3-2)
Teacher: 1. What we mean by soft language... 2. I'll put it in a cloud, 3. because that's soft, too. (1.) Low modality language is where we say things like, "The cuttlefish could possibly have eaten some fish." 4. Now, why would we say, "could possibly"? 5. [or] Why would we... why wouldn't we say, "6. The cuttlefish ate fish"? 7. Go on, (Tedian)?
Student: 8. Because (we really don't know) 9. it really ate it?

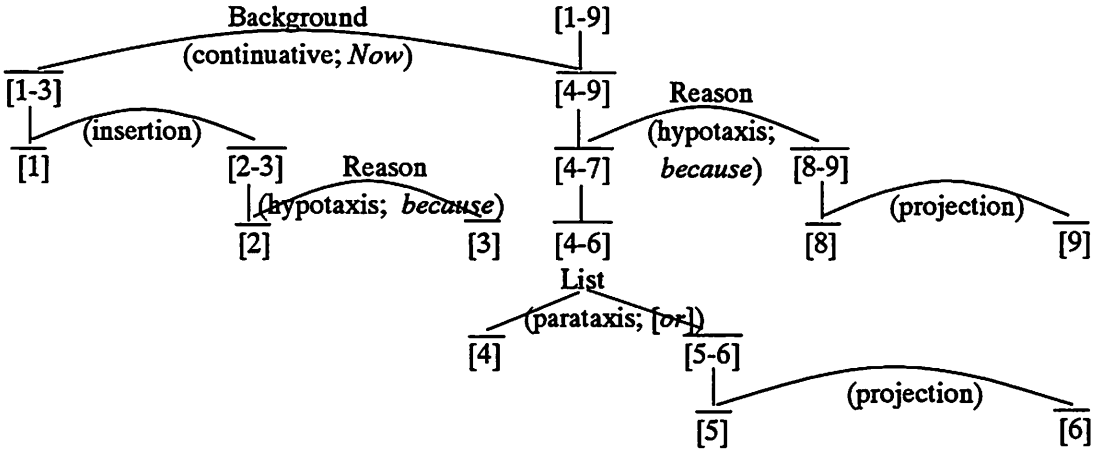


Fig. 3-4: Relational analysis of the 'modality (2)' text

Figure 3-4 shows the rhetorical structure of the text with its lexicogrammatical realization in parenthesis. The main purpose of the text is to request an answer for the question "why do we say 'could possibly'?" Thus we can postulate that a cluster of clauses from Clause 4 to 5-6, which are connected in the List relation, functions as the Nucleus of the whole text. The other clauses are all related to the Nucleus as its Satellites. We can find a Reason relation between Clause 8-9 and Clause 4-7, because Clause 8-9 provides the reason for which we use the phrase "could possibly." This portion grammatically depends on the Nucleus portion through the hypotactic relation explicitly realized by the conjunction *because.* Clause 1-3 provides the background for the rest of the text, stating that "could possibly" is the phrase expressing "low modality." The Background relation is realized by the use of the continuative *now,* which signals the transfer of the textual stages from the background information to the main statement of the text.

With this rhetorical organization, where all the parts of the text are incorporated into the nesting and cooperate to explain the central message of the text, we can construct the knowledge about the technical concept "low modality" in terms of the circumstance where we use it and the reason why we choose it. Notice the contribution of the student's answer for the construction of the entire rhetorical structure. It is manipulated in discourse to function as the Satellite in the Reason relation with the teacher's question as its Nucleus. This might

indicate that the teacher uses the question effectively to elicit an answer from her student which fills the missing piece of the aimed rhetorical structure.

These two examples prove that the analyzed spoken text uses rhetorical structure effectively in the naming and defining step of the knowledge construction. Spoken texts lead the speaker and the listener to the understanding of technical concepts through the description of the circumstances we actually use them and the reasons to choose them. The process is enabled by the use of rhetorical structure in which all the Satellites semantically and grammatically concentrate at their Nucleus.

3.3 Setting up of Taxonomy

3.3.1 Taxonomy in the Written Language

For the construction of taxonomy, written language utilizes the technical terms produced through the naming and defining process where technical labels are given to nominalized phenomena. In the step of setting up taxonomy, language functions to categorize these technical labels into taxonomic orders. Consider the following part from a "written text" where "content plane," which refers to both semantics and lexicogrammar in the language system, is sub-categorized into three kinds of meaning it produces.

e.g. 3-7 (from Text 1-1)
The content plane of a natural language is functionally diverse: it extends over a spectrum of three distinct modes of meaning, ideational, interpersonal and textual.

it [the content plane of a natural language]	extends over	ideational, interpersonal and textual meaning
[class]	[circumstantial relational process]	[sub-class]

The main resource for categorizing in written texts is circumstantial or possessive relational process such as *spread, exist in,* and *have.* In this example, the circumstantial relational process *extends over* relates the whole (*content plane*) to its parts (*ideational, interpersonal,* and *textual meaning*), and constructs the taxonomy shown in Figure 3-6.

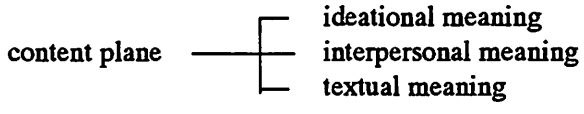


Fig. 3-6: Compositional order constructed by the 'three metafunctions' text

The important point to make about the construction of taxonomy in this text is that the phenomena incorporated into the taxonomy are those technical terms which are introduced through the step of naming and defining like we have seen in Section 3.2.1, where phenomena are reified and labeled so that they are constructed as 'things'. For example, "content plane" is introduced in the text through the defining process "we might refer to the Hjelmslevian notion of 'content plane' as incorporating both a grammar and a semantics." The definition contains the word "grammar" and "semantics" which themselves are technical terms that are introduced in the preceding text, "Grammar, or the system of wording" and "Semantics, or the system of meaning," respectively. The iterated process is schematically shown in Figure 3-7.

We might refer to	the Hjelmslevian notion of "content plane"	as incorporating both a grammar and a semantics
[verbal process]	[technical term]	[phenomenon]

Grammar,	or	the system of wording
[technical-term]		[phenomenon]

Semantics,	or	the system of meaning
[technical-term]		[phenomenon]

Fig. 3-7: The defining process of the term "content plane"

The other three technical terms, ideational, interpersonal, and textual meanings, are also produced through the similar processes:

The ideational metafunction	is concerned with	construing experience
[technical term]	[relational process]	[phenomenon 1]
and it	is...	a resource for reflecting on the world
	[relational process]	[phenomenon 2]

The interpersonal metafunction	is concerned with	enacting interpersonal relations through language,	with the adoption and assignment of speech roles,	with the negotiation of attitudes
[technical term]	[relational process]	[phenomenon 1]	[phenomenon 2]	[phenomenon 3]

The textual metafunction	is ... concerned with	organizing ideational and interpersonal meaning as discourse
[technical term]	[relational process]	[phenomenon 1]
It	is	the ongoing creation of a semiotic realm of reality
	[relational process]	[phenomenon 2]

These naming and defining processes sometimes occur near the categorization part (three technical terms "ideational," "interpersonal," and "textual metafunctions" are introduced right after the categorizing process), and sometimes take place in the distant part (the defining of the term "content plain" and the categorizing process has more than three pages between them). However, the technical concepts in the written text can be referred to beyond the long distance because they have the labels which can be pointed to by the lexical cohesion. Unlike the grammatical cohesive devices such as reference and ellipsis, which connects the items in adjacent units, lexical cohesive devices, especially the repetition, can work between remote items.

In summary, we can say that the written language uses nominalization for compacting information in forms of 'things' which are readily incorporated into taxonomy. That is, various phenomena should be reified through the nominalization and labeled with technical terms through the verbal process or relational process, so that the they are maintained through the text by cohesive devices and categorized into taxonomy through the relational process. The cooperation of condensing function of nominalization and categorizing function of relational process is shown graphically in Figure 3-8.

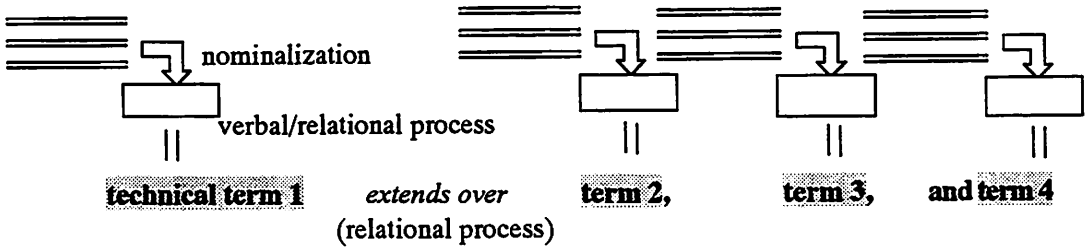


Fig. 3-8: Construction of taxonomy in the written text

3.3.2 Taxonomy in the Spoken Language

As we have seen in the last section, the written language sub-categorizes a class into its sub-classes in a single relational clause, because phenomena are already constructed as 'things' which can participate in the categorizing process. On the other hand, the spoken language, which does not use nominalizing resource, uses different kind of resource for the categorization of phenomena. It is its rhetorical structure which constructs clauses into hierarchical relations. Consider the following example from a "spoken text," where the function of language is sub-categorized into three metafunctions.

e.g. 3-8 (from Text 1-2)
1. ...that is, of all the infinite numbers of things we can do with language, the available choices fall into three main groups or metafunctions. 2. Firstly, we make meanings about the world around us. 3. This is the ideational, or experiential metafunction, close to our traditional notion of content. 4. Secondly, we use language 5. to interact in the world around us 6. and to act ( ). 7. This is called the interpersonal metafunction. 8. And finally, we use language 9. to make meaning for texts, whole stretches of discourse as a (post) isolated words or sentences. 10. This is called the textual metafunction.

Figure 3-9 shows the rhetorical structure of the text with its lexicogrammatical realization in parenthesis.

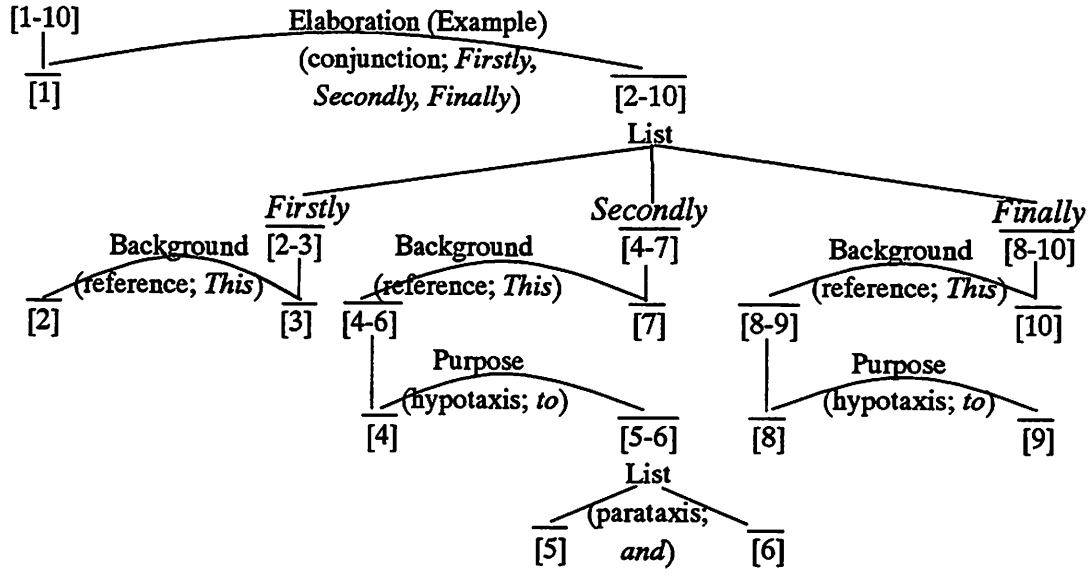


Fig. 3-9: Relational analysis of the 'three metafunctions' text

Clause 1 functions as the Nucleus of the whole text, and the rest of the text functions as its Satellite exemplifying the different situations where we use language. The Satellite portion consists of three clusters of clauses, Clause 2-3, 4-7, and 8-10 diverging from the List node. The conjunctive cohesive devices, *Firstly, Secondly,* and *Finally,* placed at the beginning of the each Satellite portion, serve to construct such semantic organization. Each of these three Satellite portions has its own internal organization built up by the Background and Purpose relations.

Notice that the taxonomy is first introduced as the hyponymic relation between *events,* that is, the hyponymic relation between the Nucleus statement and its exemplifying descriptions. Each description is then concluded with the naming process, like *This is called the textual metafunction.* Reference *This,* which refers not to the specific element but to the whole description, serves to relate the whole description to the technical term. The whole structure consequently constructs the taxonomy shown in Figure 3-10.

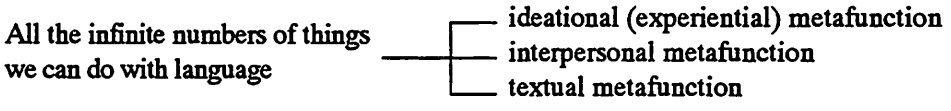


Fig. 3-10: Superordinate order constructed by 'three metafunctions' text

Notice the identity of the structural organization between the rhetorical structure of the text and the taxonomic structure produced through the text; the Nucleus-Satellite organization of the text where three Satellite portions are connected to one Nucleus is parallel to the hyponymic relation between the phenomena where one phenomenon is sub-categorized into three technical terms. This example clearly illustrates the way spoken text constructs the taxonomic relation through the rhetorical organization of the text.

3.4 Explanation

The knowledge construction model we have based so far was first proposed by Wignell et al. when they analyzed a geography textbook (see Section 2.2). In the model, the explanation is the step where language functions to describe the process and mechanism in which a certain geographical phenomenon occurs. The function of the language in the explanation step, therefore, is to construct an implication sequence which represents a sequence of events logically and temporally related to each other.

In the linguistics text we are analyzing, however, the main purpose of explanation is to construct the network of relationships between technical notions. The network accumulates information and form the basis for explaining other more complicated notions. This section explores the textual organization of the whole text which produces such an accumulation pattern.

3.4.1 Explanation in the Written Language

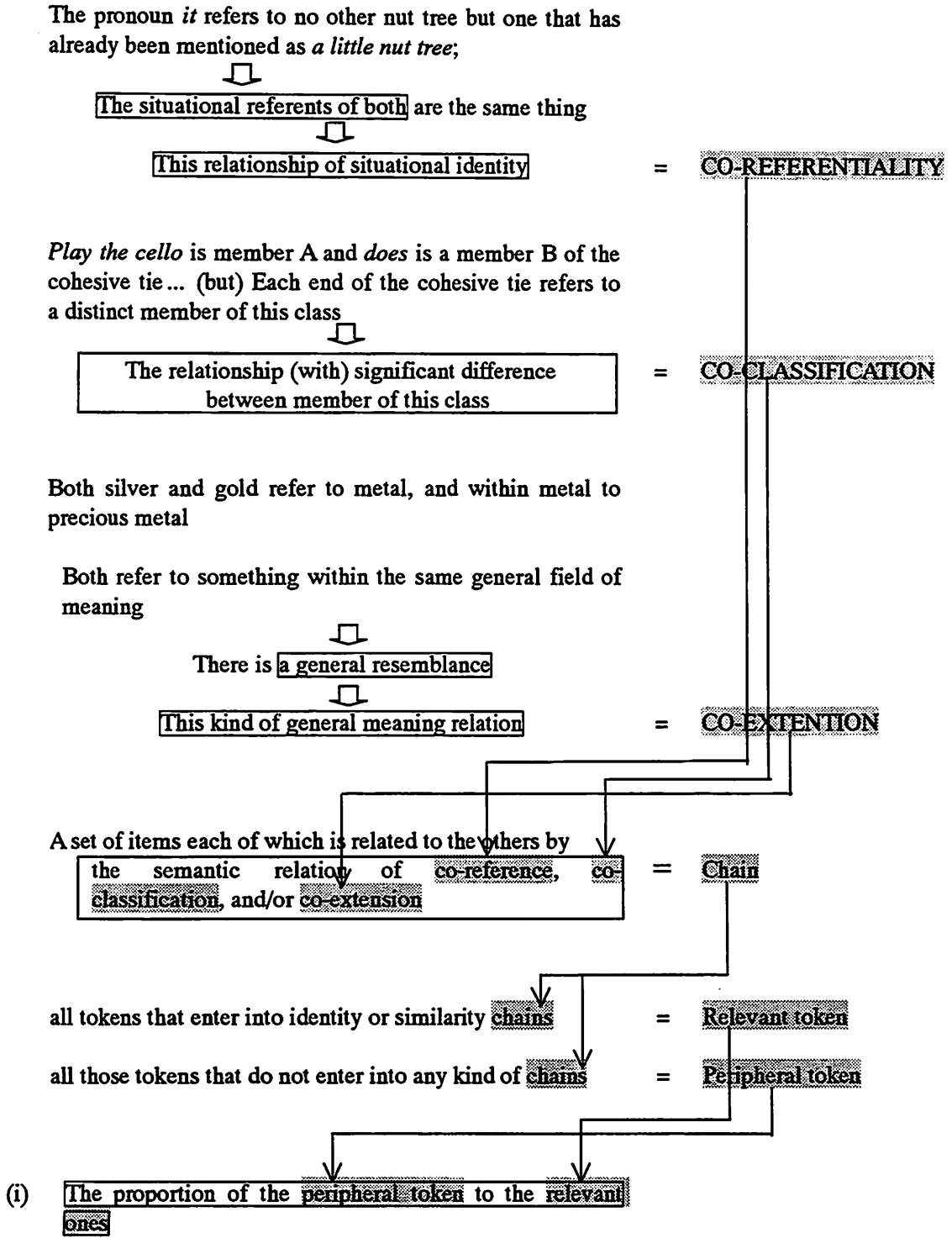
For the explanation of a complex phenomenon, written language utilizes reified technical terms and their cooperation with the cohesive devices. Cohesion is the resource in our language which ties information together and enables us to track the same entity in the development of a text. The main cohesive device contributing to the tracking of information in the explanation step is repetition including morphological repetition, such as *co-reference* and *co-referentiality,* for it enables us to refer to the phenomenon from any place of the text.

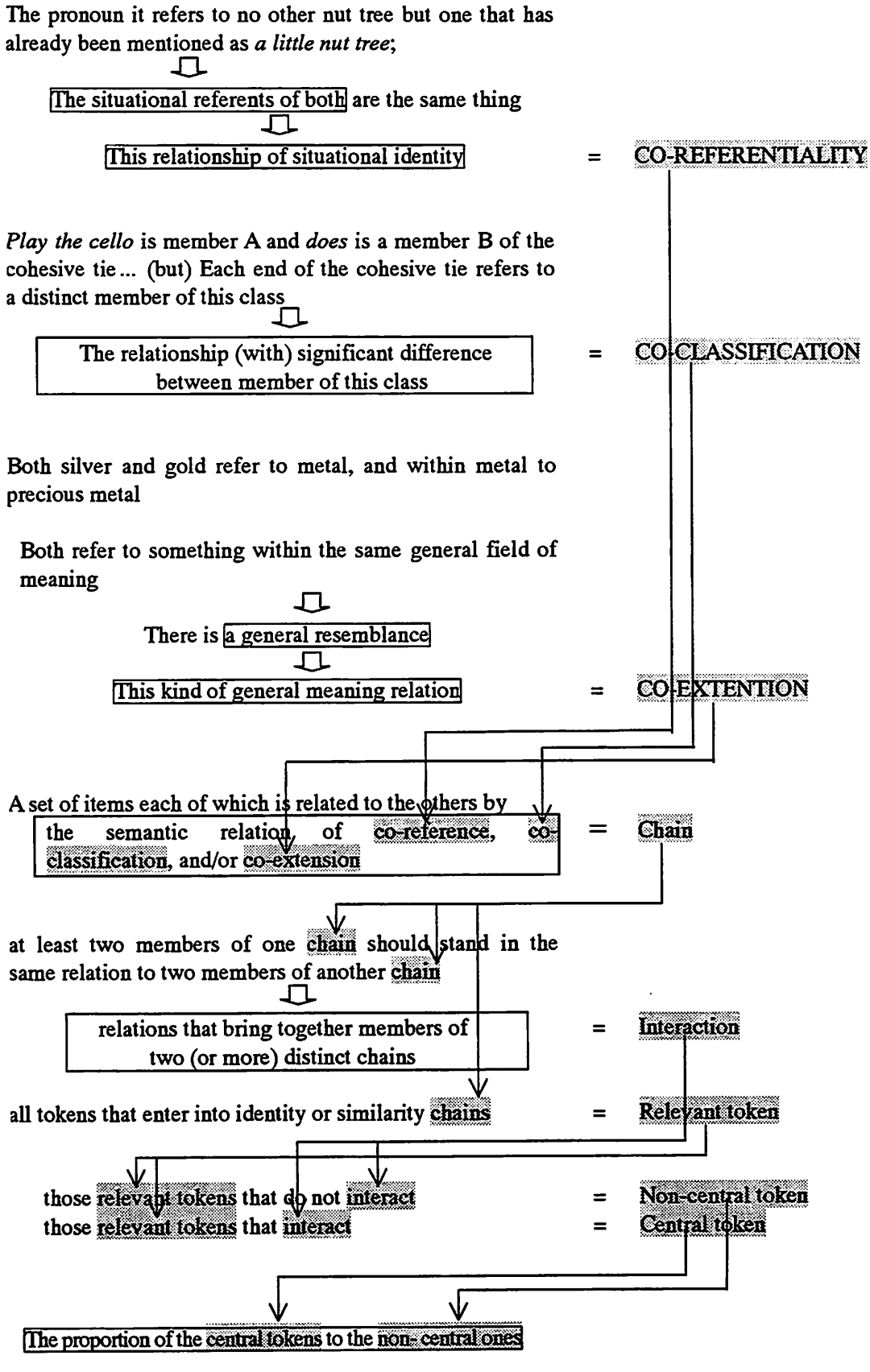
However, to be referred to by cohesive devices, various phenomena must be constructed as 'things'. That is the reason written text often uses nominalization and labeling resources. Reified and labeled phenomena can be repeatedly referred to and reused as the resource to explain other phenomena, and the phenomena are then used for the explanation of the other phenomena. Such chain of explanations constructs the network of information and highly condensed technical terms.[4]

For the illustration of the explanation process in the written language, this section analyzes the written text which explains the complicated notion "coherence" (Text 2-1). Coherence of a text is the result of numerous linguistic phenomena such as existence of cohesive ties and their collaborations, and requires accumulated information for its explanation. The analyzed text are shown in the appendix. Figure 3-11 schematically shows the network of the technical terms and accumulation process in the text. Nominalized phenomena are squared, technical terms are shown in shade, verbal or relational process used for the naming and defining is represented as equal sign, and cohesive ties created by lexical cohesion are represented as arrows.

[4] Martin (1993: 172) and Halliday (1998: 221-222) call such accumulating process of information accompanying the production of technical terms "distillation." This happens when a compacted phenomenon enters into the language system and is repeatedly used, so that it accumulates much information until it cannot be unpacked into the congruent expression.

Figure 3-11: The cycle of explanation and accumulation of information in 'coherence' text




The pronoun it refers to no other nut tree but one that has already been mentioned as *a little nut tree*;
The situational referents of both are the same thing
This relationship of situational identity = CO-REFERENTIALITY
Play the cello is member A and *does* is a member B of the cohesive tie... (but) Each end of the cohesive tie refers to a distinct member of this class
The relationship (with) significant difference between member of this class = CO-CLASSIFICATION
Both silver and gold refer to metal, and within metal to precious metal
Both refer to something within the same general field of meaning
There is a general resemblance
This kind of general meaning relation = CO-EXTENTION
A set of items each of which is related to the others by the semantic relation of co-reference, co-classification, and/or co-extension = Chain
at least two members of one chain should stand in the same relation to two members of another chain
relations that bring together members of two (or more) distinct chains = Interaction
all tokens that enter into identity or similarity chains = Relevant token
those relevant tokens that do not interact = Non-central token
those relevant tokens that interact = Central token
(ii) The proportion of the central tokens to the non- central ones

The pronoun *it* refers to no other nut tree but one that has already been mentioned as *a little nut tree*;

The situational referents of both are the same thing

This relationship of situational identity = CO-REFERENTIALITY

Play the cello is member A and *does* is a member B of the cohesive tie... (but) Each end of the cohesive tie refers to a distinct member of this class

The relationship (with) significant difference between member of this class = CO-CLASSIFICATION

Both silver and gold refer to metal, and within metal to precious metal

Both refer to something within the same general field of meaning

There is a general resemblance

This kind of general meaning relation = CO-EXTENTION

A set of items each of which is related to the others by the semantic relation of co-reference, co-classification, and/or co-extension = Chain

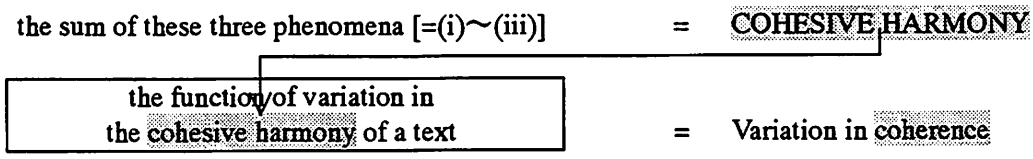
at least two members of one chain should stand in the same relation to two members of another chain

relations that bring together members of two (or more) distinct chains = Interaction

When the text is not too long, the chain interaction within it can be visually displayed.

This visual display highlights the continuities and the discontinuities in the text.

(iii) The breaks in the picture of interaction



The figure shows the network of technical terms where the technical terms produced through nominalization enter into the chain of explanation: a phenomenon is constructed as thing and labeled with a technical term; the technical term persists through the text by the cohesion, and it becomes part of the explanation of another technical term, which in turn is used for explaining the other technical term. For example, the congruent phenomenon, *The pronoun* it *refers to no other nut tree but the one that has already been mentioned as* a litter nut tree, is constructed as the abstract thing *this relationship of situational identity* by nominalization, and then labeled as "*co-referentiality.*" The term persists through the text by the cohesive device of repetition *co-reference* and is used to explain another technical term "*chain,*" which in turn becomes the part of the explanation of the terms "*relevant token*" and "*peripheral token.*" The cycle accumulates information, because a technical term produced through the cycle 'stocks' all the information used to explain the technical terms that come before it. Therefore, for example, the term "peripheral token" stocks the information about what a "chain" is, and between what kind of items the relation of "co-referentiality" occurs. Therefore, as we proceed downwards in Figure 3-11, the more information is accumulated.

Notice the crucial role of nominalization in the explanation cycle. The cycle always begins with concrete, congruent phenomenon, and it is not until they are constructed as 'things' that they are labeled and enter into the explanation cycle.

The cycle produces three highly condensed phenomena: (i) *the proportion of the peripheral token to the relevant token,* (ii) *the proportion of the central tokens to the non-central ones,* and (iii) *the brakes in the picture of interaction.* These are subsumed under the superordinate phenomenon, *the sum of these three phenomena,* and then labeled as *cohesive harmony* with the use of the relational process *referred to.* The concept "coherence," which is the main topic of the whole text, is explained in terms of this highly abstracted and condensed phenomenon in the final sentence, *the variation in coherence is the function of variation in the cohesive harmony of a text.* As the concept "coherence" is introduced at the terminal point of the accumulation cycle, it obtains the vast information stored in it through the development of the whole text. Figure 3-12 visually displays the cycle of explanation and the accumulation of information into a single technical term.

The analysis clearly proves that the reification of phenomena is indispensable for the explanation step in the written language.

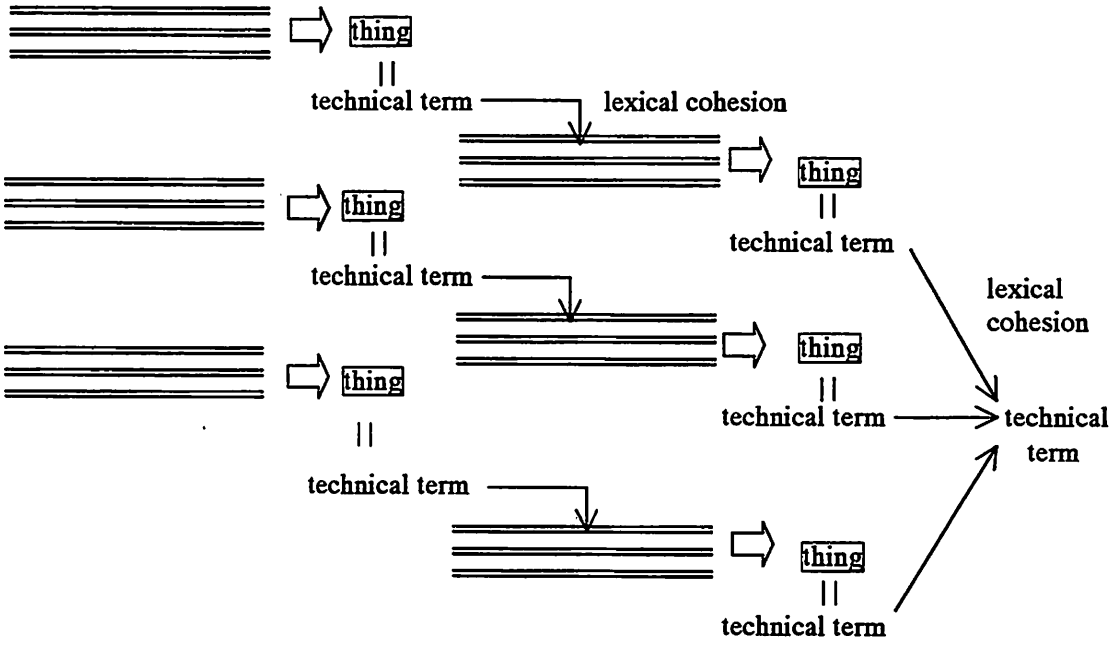


Fig. 3-12: Cycle of explanation and accumulation of information

3.4.2 Explanation in the Spoken Language

We have seen in the last section that in the written language condensation of information through the nominalization functions to accumulate all the information in the text into the final sentence, *variation in coherence is the function of variation in the cohesive harmony of a text.* Such accumulation process enables the explanation of the complicated phenomenon "coherence."

The same concept is also constructable in the spoken language. However, the spoken language, which does not use nominalizing resource, uses different resource for the explanation. It is its deep and intricate rhetorical structure which organizes clauses into the functional whole. Consider the following example from "spoken text," where the same concept "coherence" is explained.

e.g. 3-9 (from Text 2-2)
1. The coherence is 2. really when you have these cohesive ties of the two elements relating of meaning... related to each other. 3. These ties themselves collaborating with each other 4. so that the same sorts of relations are being produced for a large number of ties of the same type, 5. so that if "John is very intelligent. 6. He also works hard," 7. now, *working hard* and *being intelligent* are something that could be related, 8. and you could say... 9. you know, "She ran there, 10. and when she got to the place, 11. she saw that something was there, 12. and she picked that something..." 13. Now you see, each time... what you're doing is that you're saying *she went, she ran, she got,* 14. this is the same sorts of relations, 15. and these relations, when you have these relations multiplying, as it were, 16. and creating a consistency, 17. that's when, in my view, you get coherence. Yeah.

Figure 3-13 shows the rhetorical structure of the text with its lexicogrammatical realization in parenthesis. It shows that Clause 17 *that's when...you get coherence* is the Nucleus of the whole text. The rest of the text all functions as its Satellite describing the circumstance when a text has coherence. The Satellite portion has extremely complex internal organization resulting form repeated hierarchical relations. Inside the Satellite

portion, we can postulate a text relation of Background between Clause 15-16 and Clause 1-14, with Clause 15-16 as the Nucleus inside the Satellite portion and Clause 1-14 as its Satellite, because Clause 1-14 can be seen to provide background information to understand the statement described in Clauses 15 and 16. This Nucleus-Satellite relation is grammatically reflected in the uses of reference *these* in Clause 15, which points not only to *the same sorts of relations* in Clause 14, but also to the same phrase in Clause 4, the phrase explained in Clause 2-3 and exemplified in Clause 5-14.

The Satellite portion Clause 1-14 could be divided into two parts: Clause 1-4 which has two more Circumstance relations inside it realized by the conjunctions *when* and *so that*, and Clause 5-14 which provides examples for the phenomena described in the Nucleus Clause 1-4. Clause 5-14 itself has its internal organization built up by the Nucleus-Satellite and List relations.

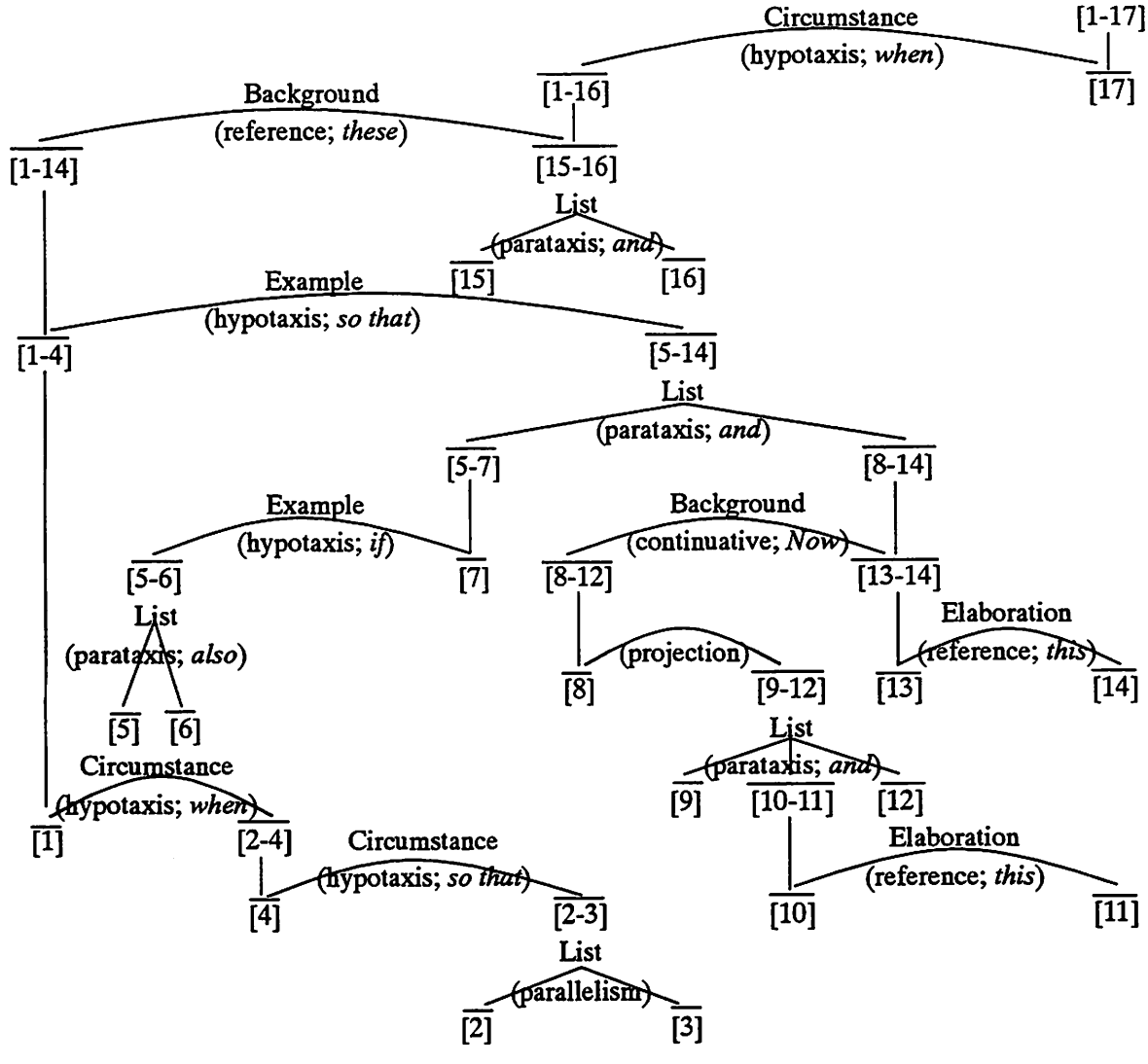


Fig. 3-13: Relational analysis of 'cohesion and coherence' text

The organization shows that all parts of the text collaborate to form a whole through the reoccurrence of hierarchical relations among its parts. With such organization, all the parts of the text are ultimately related to the final clause, and all the information is accumulated to explain the circumstance where "you get coherence." The analysis clearly illustrates that spoken text effectively uses its rhetorical structure to construct the network of events and to explain a complex concept. Figure 3-14 visually displays the recurrence of the Nucleus-

Satellite relations and the resultant accumulation of information into a single clause.

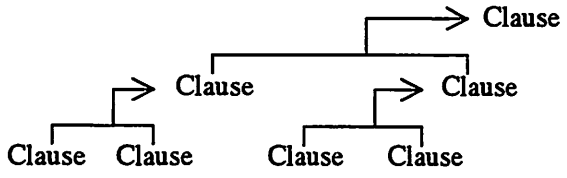


Fig. 3-14: Repetition of Nucleus-Satellite relations and accumulation of information

3.5 Summary

In this section, we have examined the lexicogrammatical resources functioning in the three steps of knowledge construction in spoken and written texts. What we have discovered through the analysis is the following:

i) The written language uses many nominalization. In the naming and defining step, the nominalized and condensed phenomena are labelled with technical terms by relational or verbal process.
ii) The technical terms persist through text by lexical cohesion, and are repeatedly used as the basis for setting up taxonomy and for the explanation of other terms.
iii) In the step of setting up taxonomy, relational process functions to incorporate the technical terms into the relation of class and sub-class.
iv) In the explanation step, the technical terms enter into the cycle of explanation where one term is used for the explanation of another, which in turn is used for the explanation of the other. The accumulation process consequently produces highly condensed information which is used for explaining a complicated notion.
v) The spoken language seldom uses nominalization. Instead, it effectively uses its rhetorical structure in the three steps of knowledge construction.
vi) In the step of naming and defining, the rhetorical structure organizes clauses so that the technical terms are defined in terms of the circumstances and purposes where and for which we use them.
vii) In the step of setting up taxonomy, rhetorical structures of the spoken text function to construct the hyponymic relation between 'events', which is then re-interpreted as the taxonomic relation between the technical terms.
viii) In the explanation step, the recurrence of the Nucleus-Satellite relations accumulates information into a single clause and explains a specialized concept in terms of the complicated circumstance in which it occurs.

Thus we can conclude that both of the two modes of language effectively construct specialized knowledge by utilizing the resources which have characteristically developed in each type of language: nominalization in written language and rhetorical structure in spoken language. Figure 3-15 visually displays the difference in the use of lexicogrammatical resources of written and spoken language in the three steps of constructing knowledge.

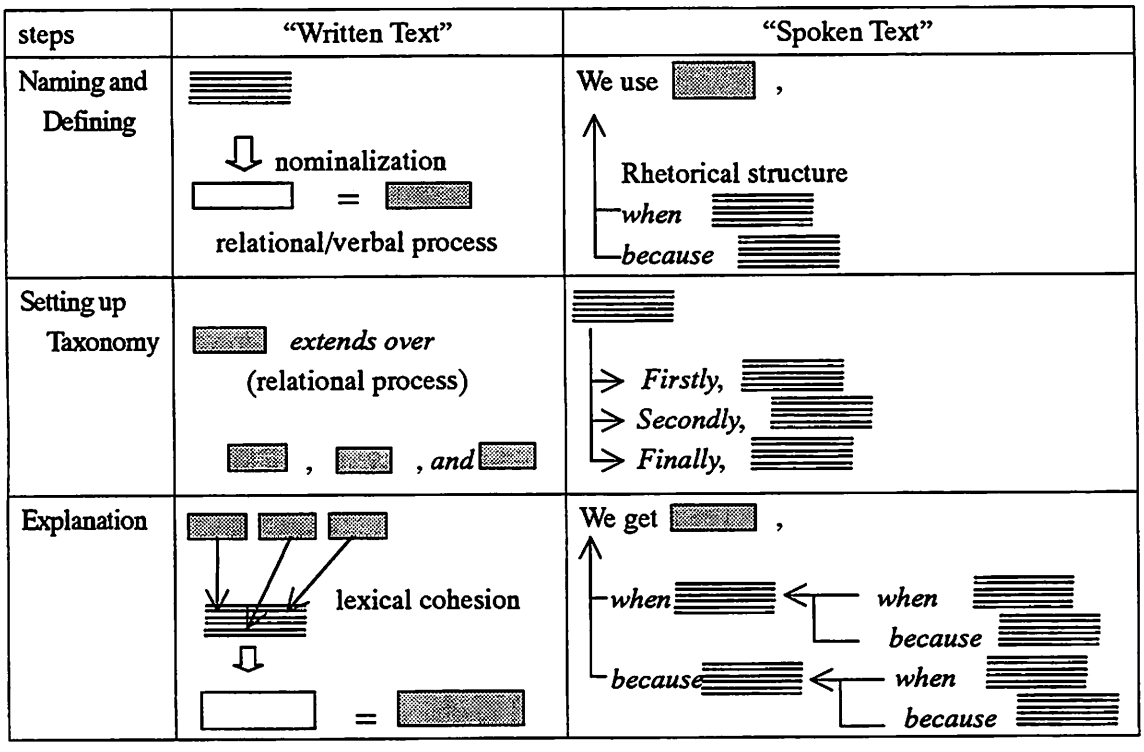


Fig. 3-15: Summary of lexico-grammatical resources used in the two modes of meaning

3.6 Construction of Knowledge and the Ways of Meaning

The issues we have been discussing so far are about the grammatical characteristic of texts. Now we turn to their semantic property. So far, we have observed two ways of constructing specialized knowledge, one being the written mode of constructing knowledge with nominalization, and the other being that of the spoken mode with rhetorical structure.

In comparing these two modes of texts, I have said several times that they construct the "same" knowledge in different ways. Actually, however, they do not construct the "same" knowledge. As is mentioned in Section 2.1, SFT takes the constructivist view on language, in which Halliday (1987: 80) argues that "the notion of different ways of meaning implies, rather, that there are different ways of knowing, and of learning." Language does not only represent the knowledge that already exists in the outer world; rather, language itself constructs knowledge. As for the two types of texts we have analyzed here, even though they seem to deal with the same subject-matter, they construct two different kinds of reality through their different ways of meaning.

The difference in the nature of knowledge constructed by the two types of texts could be summarized as follows: while written language constructs phenomena as abstract 'things', spoken language constructs phenomena as sequence of 'events' logico-semantically related to each other. Let us look more closely to each of these two modes of meaning. Nominalizing resource of the written mode produces abstract 'things' that are detached from particular time and participants. Recall the increase of abstractness we observed in the process of nominalization. The following example clearly illustrates the point:

> Both silver and gold refer to metal, and within metal to precious metal → Both refer to something within the same general field of meaning → There is a general resemblance → I refer to this kind of general meaning relation as CO-

EXTENTION (from Text 2-1)

In the congruent expression *both silver and gold refer to metal, and within metal to precious metal*, there are concrete participants engaging in the process: *silver, gold* and *precious metal*, and the role-relationships between the participants are explicitly realized: *gold* and *silver* are the Identified and *metal* is the Identifier. In other words, this description is strongly connected to the particular example the author used for the explanation. However, as the description is restated as *Both refer to something within the same general field of meaning*, and then as *There is a general resemblance*, the phenomenon is abstracted, and in the final nominalized expression, *general meaning relation*, there is no clear participant or process, and the lack of tense resulting from the reification of the process indicates the separation of the phenomenon from the particular time frame. It enables the writer and readers to generalize across different possible contexts, and to construct abstract model of reality. In other words, the concrete 'event' is re-constructed into an abstract 'thing' that cannot be sensually experienced.

The reified and abstracted 'things' are labeled, and persist through the text. These 'things' could be easily used as the resource to set up taxonomies or to explain other notions, because things can be related to each other in a single relational process such as *The content plane of a natural language... extends over... ideational, interpersonal and textual,* and *similarity chain is the relation of co-classification or co-extension.* This type of discourse patterning organizes the network of relations between 'things' and presents a *synoptic* view on reality.

Spoken language, on the other hand, constructs phenomena as a sequence of clauses and organizes them into a rhetorical structure. With this discourse pattering, the logico-semantic relations between events are explicitly realized. For example, while the written mode of language constructs the notion "modality" as a reified and abstracted thing such as *different degree of likelihood and different degree of oftenness*, the spoken mode of language constructs it in terms of the concrete circumstance in which it is used, as shown in the following example:

> (α)Low modality language is where we say things like "The cuttlefish could possibly have eaten some fish."...($\beta\ \alpha$)because we really don't know ($\beta\ \beta$)it really ate it.

Moreover, the technical terms in spoken language are understood as something directly associated with the particular contexts in which they are used, because the clause, unlike the nominalized expression, explicitly shows the concrete participants, such as *we, cuttlefish* and *fish*, participating in a process, and the time the process occurs.

This type of discourse is accessible for the majority of students, because it reflects their daily experience of the reality in the form of sequence of concrete events accompanied by reasons and purposes for which they occur. In short, spoken language organizes the network of relations between 'events', and presents *dynamic* view on reality in which phenomena happen and interrelate in a continuous flow of time.

Thus it is apparent that the difference in grammar is deeply associated with the difference in meaning. The association could be interpreted in both of the two following ways: we can say that deploying different lexicogrammatical resources results in the difference in the constructed knowledge; or that written and spoken discourses may already diverge at the semantic level, so that they use different lexicogrammatical resources to embody the difference.

In either way, these two modes of meaning have been proved to have enough resource for constructing specialized knowledge. Spoken mode tends to be used in primary education and gradually dismissed in the higher education. However, the analysis has indicated that every phenomenon can be understood in both of the two complementary perspectives: the synoptic and dynamic. Spoken and written modes are not just alternative ways to represent the same

reality; they are the resources in our language which widen our ways of meaning, and let us construct the world from different perspectives and realize the different nature of phenomena. Spoken language in education might enable us to exploit the different features of language and meaning power in different ways from written language.

Conclusion

This thesis focused on the two modes of meaning, spoken and written language, and examined the lexicogrammatical resources they have developed for constructing knowledge, specifically, for functioning in the three steps proposed by Wignell et al. (1993): naming and defining, setting up taxonomy, and explanation. The investigation of the lexical and grammatical differences in the texts has also revealed the semantic difference in the constructed knowledge itself.

The written language often utilizes nominalizing resource, and produces many reified phenomena, which persist through the text by lexical cohesion, and are repeatedly used as the basis for setting up taxonomy and for explaining other phenomena. This type of discourse patterning organizes the network of relations between 'things'. The spoken language uses far less nominalization. Instead, it effectively uses its rhetorical structure in the three steps of knowledge construction. This type of discourse patterning organizes the network of relations between 'events'.

The analysis has proved that even though they are the different languages which are differently organized with different lexicogrammatical resources, these two modes of meaning equally have the power for constructing specialized knowledge. They provide us with the complementary perspectives on phenomena, and widen the potential of language we mean with and construct our world with.

Appendix: Analyzed Texts

Text 1-1 Subject-matter: three metafunctions; Text type: written text

1.3 Metafunctional diversification; the ideational metafunction

The content plane of a natural language is functionally diverse: it extends over a spectrum of three distinct modes of meaning, ideational, interpersonal and textual. These highly generalized functions of the linguistic system are referred to in our theory as **metafunctions**. The **ideational** metafunction is concerned with construing experience—it is language as a theory of reality, as a resource for reflecting on the world. (For the distinction of the ideational into **logical** and **experiential** see Chapter 13, Section 13.2.) The **interpersonal** metafunction is concerned with enacting interpersonal relations through language, with the adoption and assignment of speech roles, with the negotiation of attitudes, and so on—it is language in the praxis of intersubjectivity, as a resource for interacting with others. The **textual** metafunction is an enabling one; it is concerned with organizing ideational and interpersonal meaning as discourse—as meaning that is contextualized and shared. But this does not mean processing some preexisting body of information; rather it is the ongoing creation of a semiotic realm of reality (cf. Matthiessen, 1992, and Section 1.3 below.)

(from Halliday and Matthiessen 1999: 7-9)

Text 1-2 Subject-matter: three metafunctions; Text type: spoken text

In this subject, we will be concentrating on the options in meaning available to us and how these are expressed in the lexicogrammar. As we progress through the course, we will see that meaning itself, the level of semantics, is a complex notion. We tend to think of meaning as something which we refer to the content of an individual word, something concrete, which we can refer to and look up in the dictionary, like 'table' or 'chair'. The meaning is much much more than that. It is much more than the traditional notion of content that we are used to, and it is found in grammatical patterns as well as in words. Halliday argues that there are three broad areas of meaning related to what it is that we do with language, that is, of all the infinite numbers of things we can do with language, the available choices fall into three main groups or metafunctions. Firstly, we make meanings about the world around us. This is the ideational, or experiential metafunction, close to our traditional notion of content. Secondly, we use language to interact in the world around us and to act ( ). This is called the interpersonal metafunction. And finally, we use language to make meaning for texts, whole stretches of discourse as a (post) isolated words or sentences. This is called the textual metafunction. For instance, when we talk with people, we use language to construct the subject-matter, or the ideational meanings that we are making. Topics are not given, but are constructed by us through the choices we make. If we want to change the subject-matter, we change the ideational aspects of our language. Some parts of language change, not according to subject-matter, but according to the way we are interacting in the world, the roles we're adopting. These interpersonal aspects of meaning require different language resources to be used. We all know that the way we talk to our friends is different from the way we talk to, say, a school principal who is senior to us, or student who is junior to us. To use language appropriately on such different circumstances, we draw on the interpersonal aspects of our language. And the language changes again according to whether it is spoken or written. Written and spoken texts are put together in different ways, and this is yet another aspect of language to consider. To use language appropriately in both written and spoken settings, we draw on the textual aspects of our language. In this way, we can then see how language works as the resource for constructing meaning.

(from University of Wollongong 1995: *Episode 1. A Functional Model of Language*)

Text 2-1 Subject-matter: cohesion and coherence; Text type: written text

Cohesive Tie

In talking about texture, the concept that is most important is that of a TIE. The term itself implies a relation: you cannot have a tie without two members, and the members cannot appear in a tie unless

there is a relation between them. Let us draw a picture of the tie:

If you think of a text as a continuous space in which individual messages follow each other, then the items that function as the two ends of the tie—the A and the B—are spatially separated from each other; A may be part of one message and B part of another. But there is a link between the two, depicted above by the two-headed arrow. The nature of this link is semantic: the two terms of any tie are tied together through some meaning relation. Such semantic relations form the basis for cohesion between the messages of a text. There are certain kinds of meaning relation that may obtain between the two members. For instance take the first two lines of the rhyme in Example 5.3.

Example 5.3
I had a little nut tree
Nothing would it bear
But a silver nutmeg
And a golden pear.

Then thinking of *little nut tree* in line 1 as member A and *it* in line 2 as member B you can see that the semantic relation between the two is the identity of reference. The pronoun *it* refers to no other nut tree but the one that has already been mentioned as *a little nut tree*; the situational referents of both are the same thing. In the literature on the discussion of textual continuity, this relationship of situational identity of reference is referred to as CO-REFERENTIALITY.

Imagine now that we have two other sentences (see Example 5.4).

Example 5.4
I play the cello. My husband does, too.

Then following the earlier practice, we could say that *play the cello* is member A and *does* is a member B of the cohesive tie. But this time the relationship is not of referential identity. The cello playing that I do is a different situational event form the cello playing that my husband does. So the relation here is not of co-referentiality, but of the kind that could be described as CO-CLASSIFICATION. In this type of meaning relation, the things, processes, or circumstances to which A and B refer belong to an identical class, but each end of the cohesive tie refers to a distinct member of this class. Thus there is a significant difference between member of this class. Thus there is a significant difference between co-referentiality and co-classification.

A third kind of semantic relation between the two members of a tie is exemplified by *silver* and *golden* in the last two liens of Example 5.3. Here the relationship is neither of co-reference nor of co-classification; it is, rather, that both refer to something within the same general field of meaning. Thus both silver and gold refer to metal, and within metal to precious metal; their primary class affiliation is not identical—unlike two separate acts of playing the cello—but there is a general resemblance. Fro want of a better term, I refer to this kind of general meaning relation as CO-EXTENSION.

These three semantic relations of co-referentiality, co-classification, and co-extension are

precisely what ties the two members of a tie, and the existence of such ties is essential to texture. The longer the text, the truer this statement.

(...)

A technical term that has appeared in this discussion is COHESIVE CHAIN. What is a cohesive chain? As the analysis provided in Figure 5.3 shows, a chain is formed by a set of items each of which is related to the others by the semantic relation of co-reference, co-classification, and/or co-extension. Taking the type of relation into account, we can sub-categorise chains into two types: IDENTITY CHAINS and SIMILARITY CHAINS. Again, both of these are exemplified in Figure 5.3. Thus chain 1 with *girl, she*, etc, is an identity chain. The relation between the members of an identity chain is that of co-reference: every member of the chain refers to the same thing, event, or whatever, as in this chain, where each item refers to the same girl. This particular identity chain is text-exhaustive, i.e. it runs from the beginning to the end of the text. This, I would suggest tentatively, is a characteristic of short narratives: texts of this category normally contain at least one text-exhaustive identity chain.

Now, turning to similarity chains, an example of which is provided by chain 2 in Figure 5.3 with *went, walk*, etc.: the members of a similarity chain are related to each other either by co-classification or co-extension. Each such chain is made up of items that refer to non-identical members of the same class of things, events, etc., or to members of non-identical but related classes of things, events, etc.

(...)

One obvious interpretation is that lexical selection is Text 5.2 do not divide themselves into a homogeneous set of semantic groupings. The fairly large percentage of tokens that fall outside chains—i.e. are PERIPHERAL—prevent a consistent reconstitution of the field of the text. This can then be seen as part of the reason why Text 5.2 coheres less well than Text 5.1.

Chain interaction

Convincing as this explanation seems, it just will not work; though, no doubt, there is a good deal of truth in it. In the first place the high percentage of peripheral tokens does not necessarily entail ambiguity; Example 5.17 has only 64 per cent of its lexical tokens in chains, yet it contains no ambiguity. True, it could not be described as a coherent text. But the fact that a high percentage of lexical tokens are RELEVANT—i.e. enter into chains—does not necessarily entail coherence. There is no better proof of this than a list such as follows.

Example 5.18
girls bananas two spend shopkeeper
apples own girls dollars grapes
buy fifty sell cents shopkeeper
girls fruit

No one could possibly describe this list as a coherent text, though 100 per cent of its tokens are subsumed in chains. So we are still far from any linguistic fact that can be unequivocally correlated with variation in coherence.

It is important to recall here that in constructing chains, we are concerned with components of messages. Our entire analysis has revolved around components rather than whole messages as such. On the other hand, it is only message as message that has any textual viability; and it is only at the rank of clause or above that a lexico-grammatical unit is contextually viable: it is only at this rank—or above—that a linguistic unit can encode a complete message. Although the chains go a long way towards building the foundation for coherence, they are not sufficient; we need to include some relations that are characteristic of

those between the components of a message. This is the relation that I refer to as CHAIN INTERACTION.

By chain interaction I mean relations that bring together members of two (or more) distinct chains. These relations are essentially grammatical. For example, if we take chain (a) *girl* and chain (e) *went, walk, got* from Table 5.7, we would note that *girl* is in an identical grammatical relation with *went* and *got—girl* is the ACTOR of the ACTION *went* and *got*. We can say, then that in Text 5.1, chains (a) and (e) interact. A minimum requirement for chain interaction is that **at least two members** of one chain should stand in the same relation to **two members** of another chain. This requirement is important for two reasons:

1. The relations that lead to chain interaction are the very ones that exist between the constituents of a clauses or of a group, for example, doer, doing; sayer, saying; doing, done-to; or quality, qualified, etc. If a single such relation were considered sufficient for chain interaction, then by definition every member of the chains would interact with some member. This would be tantamount to saying that anything that is a clause or a group is, *per se*, responsible for coherence. Moreover, there would be no need to differentiate between chain formation and chain interaction; since the former by itself would be a measure of chain interaction. But this is surely wrong since a random list of clauses or groups would not necessarily be coherent; nor does chaining entail coherence (see discussion of Example 5.18 above).
2. The second reason is deeper still. The recurrence of a relation between two chains is indicative of two vectors of unity. The first vector of unity is indicated by the semantic similarity that permits members to be part of the same chain; the second vector of unity indicates the semantic similarity that unites at least pairs of members from two chains. The rationale for this is simple to find: in a coherent text one says similar kinds of things about similar phenomena. For example, the girl in Text 5.1 does not simply go home, she also gets home; she does not simple fall asleep, she also wakes up, and so on.

When the text is not too long, the chain interaction within it can be visually displayed. This visual display highlights the continuities and the discontinuities in the text. Figures 5.4 and 5.5 display the chain interaction in Text 5.1 and 5.2 respectively.

Each rectangle in these figures represents a (part of a) chain; the chain labels used here are the same as in Table 5.7 and 5.8. If Figure 5.4 is compared with Table 5.7, you will see that (a) *girl* contains 17 members, though the rectangle (a) in Figure 5.4 contains only 11 of these: this is because only 11 of the 17 members of chain (a) qualify as interacting with some other chain(s). Thus although the rectangles bear chain labels, they need not represent complete chains. When there is chain interaction, two items of each chain interact with two items of at least one other; each interacting segment of the chain—two or more members—is boxed together to make the interaction display easier to follow. Thus in Figure 5.4, the first and second entries of *girl* interact with (e) *went* and *got*; the second and third *girl* entries interact with (c) *home*; the third and fourth girl entries interact with (h) *took, had*, and so on.

Each arrow in these figures has a roman number to allow easy reference. They can be glossed as follows:

Any two chains linked by an arrow marked

i are in 'actor action' relation (for example, *girl went*);
ii are in 'action acted-upon' relation (for example, *took teddybear*)
iii are in 'action and/or actor location' relation (for example, *girl got home*)
iv are in 'saying text' relation (for example, *said words*)
v are in 'attribute attribuand' relation (for example, *lovely teddybear*)

Those members of the chain that enter into interaction (and would thus appear in displays of the type shown in Figures 5.4 and 5.5) are known as CENTRAL TOKENS; the remaining members of the chain are NON-CENTRAL. We thus have the following classification of the total lexical tokens of a text:

1. Relevant tokens: All tokens that enter into identity or similarity chains; these divide into:
   (a) Central tokens: those relevant tokens that interact;
   (b) Non-central tokens: those relevant tokens that do not interact;
2. Peripheral tokens: All those tokens that do not enter into any kind of chains, for instance *cuddled* in Text 5.1 and *hat* in Text 5.2.

Having established the framework throughout this section, we can now state fairly definitely what the linguistic correlates of variation in coherence will be:

1. The lower the proportion of the peripheral tokens to the relevant ones, the more coherent the text is likely to be. Note that in Text 5.1, relevant tokens form 90.5 per cent of the total while in Text 5.2, they make up only 76 per cent.
2. The higher the proportion of the central tokens to the non-central ones, the more coherent the text is likely to be. The central tokens of Text 5.1 (see Figure 5.4) constitute 65 per cent of the relevant tokens while for Text 5.2, this figure is only 36 per cent.
3. The fewer the breaks in the picture of interaction, the more coherent the text. In Figure 5.4, the entire set of interacting chains is related, with chains (a) and (b) functioning as FOCAL CHAINS, each of which interacts with a larger number of other chains. In Figure 5.5, there is a clear break.

(...)

I have referred to the sum of these three phenomena as COHESIVE HARMONY; and a briefer claim about coherence could be formulated thus:

variation in coherence is the function of variation in the cohesive harmony of a text.

(from Halliday and Hasan 1985: 73-74, 84, 90-94)

Text 2-2 Subject-matter: cohesion and coherence; Text type: spoken text

That cohesion uh, is, uh, something that we perceive as meaning relation between any two elements within the text. And this sorts of relations of meaning can exist between hundreds of pairs of items within any one text. But this is quite different from saying that the text is coherent, because take... take a simple example, like for example if you say, "John is very intelligent. He loves peaches," the *he*, you could say, could be understood as perhaps *John*, because this is all I have said. This is the likeliest meaning relation that you establish between *he* and *John*, but this is not a coherent text. The coherence is really when you have these cohesive ties of the two elements relating of meaning... related to each other. These ties themselves collaborating with each other so that the same sorts of relations are being produced for a large number of ties of the same type. So that if "John is very intelligent. He also works hard," now, *working hard* and *being intelligent* are something that could be related, and you could say... you know, "She ran there, and when she got to the place, she saw that something was there, and she picked that something..." Now you see, each time... what you're doing is that you're saying *she went, she ran, she got*, this is the same sorts of relations, and these relations, when you have these relations multiplying, as it were, and creating a consistency, that's when, in my view, you get coherence. Yeah.

(from University of Wollongong 1995: *Episode 7. Making Connections*)

Text 3-1 Subject-matter: modality; Text type: written text

4.5 Polarity and modality

POLARITY is the choice between positive and negative, as in *is / isn't, do / don't.* Typically, in English, polarity is expressed in the Finite element; each Finite verbal operator has two forms, one positive, *is, was, has, can,* etc., the other negative, *isn't, wasn't, hasn't, can't* (or *is not, cannot*...), etc. It was pointed out earlier (Chapter 3) that this is the reason why the Finite element is thematic in a yes/no interrogative clause: such a clause is precisely a request

for information regarding polarity.

The Finite element is inherently either positive or negative; its polarity does not figure as a separate constituent. It is true that the negative is realized as a distinct morpheme *n't* or *not*; but this is an element in the structure of the verbal group, not in the structure of the clause.

However, the possibilities are not limited to a choice between yes and no. There are intermediate degrees: various kinds of indeterminacy that fall in between, like 'sometimes' or 'maybe'. These intermediate degrees, between the positive and negative poles, are known collectively as MODALITY.

But there is more than one way of getting from 'yes' to 'no'. In order to account for this, we need to refer to the distinction between propositions ('information', i.e. statements and questions) and proposals ('goods-&-services', i.e. offers and commands).

(1) Propositions. In a proposition, the meaning of the positive and negative poles is asserting and denying: positive 'it is so', negative 'it isn't so'. There are two kinds of intermediate possibilities: (i) degrees of probability: 'possibly / probably / certainly'; (ii) degrees of usuality: 'sometimes / usually / always'. The former are equivalent to 'either yes or no', i.e. maybe yes, maybe no, with different degrees of likelihood attached. The later are equivalent to 'both yes and no', i.e. sometimes yes, sometimes no, with different degrees of oftenness attached. It is these scales of probability and usuality to which the term 'modality' strictly belongs. I shall refer to these, to keep them distinct, as MODALIZATION.

Both probability and usuality can be expressed in the same three ways: (a) by a finite modal operator in the verbal group (see Table 4(3) above), e.g. *that will be John, he'll sit there all day*; (b) by a modal Adjunct of (i) probability or (ii) usuality (see Table 3(3) above), e.g. *that's probably John, he usually sits there all day*; (c) by both together, e.g. *that'll probably be John, he'll usually sit there all day.*

Note that in a statement the modality is an expression of the speaker's opinion; *that will be John* 'that's John, I think'; whereas in a question it is a request for the listener's opinion: *will that be John*? 'is that John d'you think?' Note also that even a high value modal ('certainly', 'always') is less determinate than a polar form: *that's certainly John* is less certain than *that's John*; *it always rains in summer* is less invariable than *it rains in summer.* In other words, you only say you are certain when you are not.

(from Halliday 1994: 88-89)

Text 3-2 Subject-matter: modality; Text type: spoken text

Teacher: We're going to become very very scientific, because in science we'd like to talk about making inferences. We have a look at what we found out, and when we do this, we use very soft language. I'll give you another term for soft language. Here it is. Here. It's called low modality. What we mean by soft language... I'll put it in a cloud, because that's soft, too. Low modality language is where we say things like, "The cuttlefish could possibly have eaten some fish." Now, why would we say, "could possibly"? Why would we... why wouldn't we say, "The cuttlefish ate fish"? Go on, (Tedian)?

Student: Because (we really don't know) it really ate it?

Teacher: No. We... why do we think it might have eaten it? Because we think it's a carnivore, right? We don't know for sure, but where did we find the fish? Go on, (Tina)?

Student: In its hood thing?

Teacher: In its hood thing. Yes, we found some fish. How many fish did you find, Vanessa?

Student: Four.

Teacher: Four. Four fish up in here. Now, we're not really sure whether those fish got there

by accident, or whether the...the actual cuttlefish really ate them. We didn't get right down into looking at the contents of its stomach, but when you use soft language like that, it's called low modality. Now, can anybody think of...of some other words that we can use? I'll put them in purple, so that we can get them going together. What else...what did I say ( )? I said, "could possibly." What else could we write? Good soft language. What are some other words that could soften it?

Student: Might.

Teacher: Might. Well done. It might have eaten a fish. Any other (set) you can think of? ...Could have. Yes, you've got the idea. Now, that's on the second side of the page, when you're just using your ideas out of you own head. You won't ( ), you didn't see it, and that's what we call (insides) making inferences.

Narrator: During the stage of modeling their writing, the teacher explains, where in the structure of their text that they need to use modality.

Teacher: Now have a look at the back. This is where we're asking you to make your inferences and make your predictions about what the creatures might do. Emma.

Student: With material ones ( ) which is ( ).

Teacher: Yes, that's right. Now we don't know for sure, so, do you think we should say, "Fish swim in this way"? (Were) we there observing them swimming? So what are we going to do? Yes, we're going to use all the softening words, that low modality, and if you get to the stage of reading real science reports and real science magazines, all the top scientists do that all the time, right? They don't say "This will happen" or "That will happen." They...they would say "This might happen" "Perhaps." There's another good...there's another good word we can add. Can you think of any more softening words that we should put on the board? "Perhaps." ..."Maybe"? Yes. You've got the idea very well. We don't usually talk about ourselves when we're writing a science report. That's why we use this...the soft words, this low modality. We say, instead of saying, "I think," we say, "It could perhaps be a ( ) before," and that let you know that that's what you think rather than what you saw.

(from University of Wollongong 1995: *Episode 5. Interacting in the World through Language*)

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JASFL Occasional Papers Volume 3 No. 1 2004

On the Multi-Layer Structure of Metafunctions

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Abstract

The theoretical framework of three metafunctions is pursued. Though it is disputable whether Ideational domain should be subdivided into Experiential and Logical subcategories or not, the three layers of Ideational, Interpersonal and Textual are important tool of analysis in Systemic Linguistics. This paper is a theoretical exemplification of how such multi-layer structure of metafunctions is understood. From another viewpoint of a historical one, the triad of field, tenor, and mode of context situation has longer history than that of metafunctions. In addition, the term *Ideational* replaced *Experiential,* and later Experiential became parallel to Logical component. Currently, both Experiential and Logical are considered to be subdomains of Ideational metafunction.

1. Introduction

'Metafunction' is a major tool of Systemic Functional Linguistics (SFL) in analyses of not only verbal texts but also other genres such as paintings and music. In the present paper, it will be exemplified how meanings of verbal expressions are analyzed from the viewpoint of metafunctions, partly using intonation as examples.

Metafunctions are divided into three categories in general: Ideational, Interpersonal and Textual. In another viewpoint, one of the three is further classified into two subcategories: Ideational into Experiential and Logical. It is sometimes confusing whether metafunctions consist of three or four domains. One of the major concerns in the present paper is to pursue the legitimacy of the framework of metafunctions in that it should be considered to consist of three major distinctions, or it should be classified as four subcategories including the subdivision of Experiential and Logical.

First, we will look at an entire picture of the framework of SFL. Below is the figure from the homepage of Professor Noboru Yamaguchi at Tohoku University.[1]

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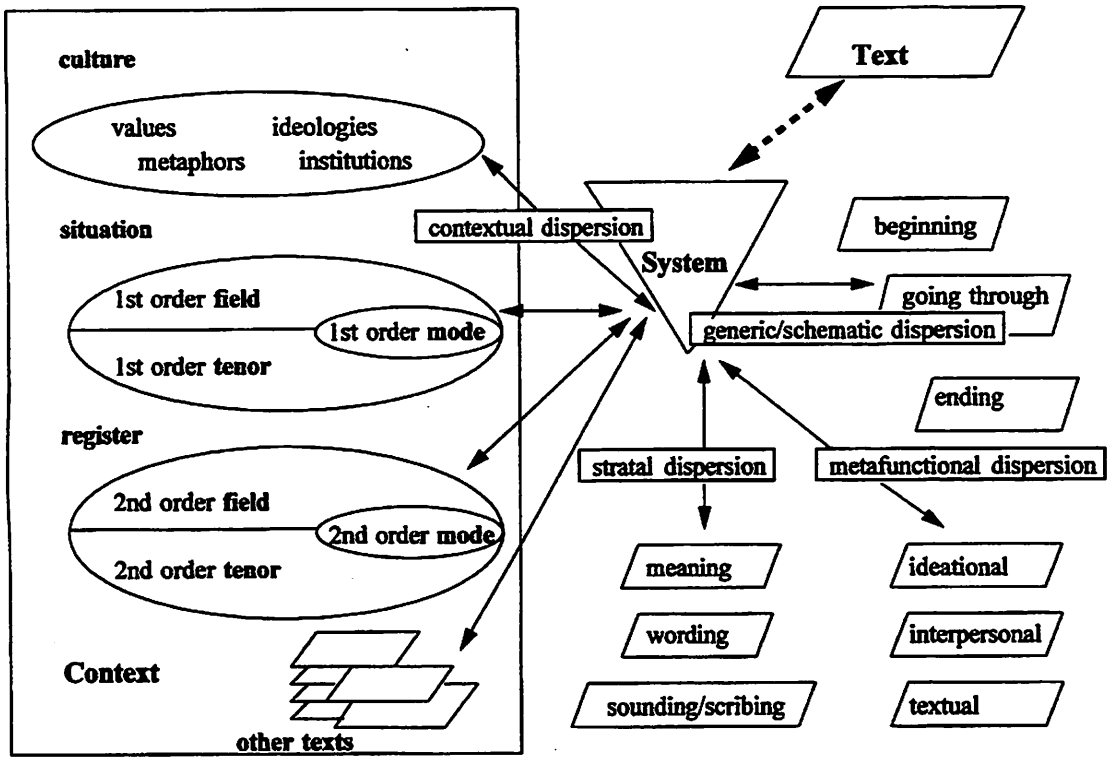
[1] The reprinting of the figure, together with the next one (2) below, is permitted by Professor Yamaguchi. I hereby express my cordial gratitude for this reprinting. The URL to see this figure is: http://www.intcul.tohoku.ac.jp/~yamaguchi/systemic_room_supplement/sft_profile/text_system_context.html

(1) Text, System & Context

Meanings as an analogy of light dispersion through a prism



This illustration well depicts how text is analyzed in SFL. A text is considered as input; through a prism—called System in (1), as in the name of *Systemic* Linguistics, suggesting the process of selection(s) from input to output—, it is analyzed from various viewpoints of culture, situation, register, strata, and metafunction. Though each of these is depicted as independent stratum in this figure, some of them are linked: e.g. metafunction and situation/register.

The three-layer structure of the three metafunction is what I should like to present in the following sections. In this figure, such layer structure is found not only with metafunctions, but also in strata of meaning—wording—sounding / scribing, and the generic / schematic structure of beginning—going-through—ending. It is not accidental that they consist of three-constituents each; as shown in section 3 below, the three constituents are necessarily related.

Next is another figure from Professor Noboru Yamaguchi's homepage,[2] on the cover of the translation of Halliday (1994) into Japanese (Yamaguchi and Kakehi (2001)). According to this illustration, metafunctions are depicted as part of the SFL frameworks, such as logico-semantic relations, ranks, strata, taxis. In my understanding, these elements are interrelated, hence it would be difficult to show such overlapping in a two-dimension chart.

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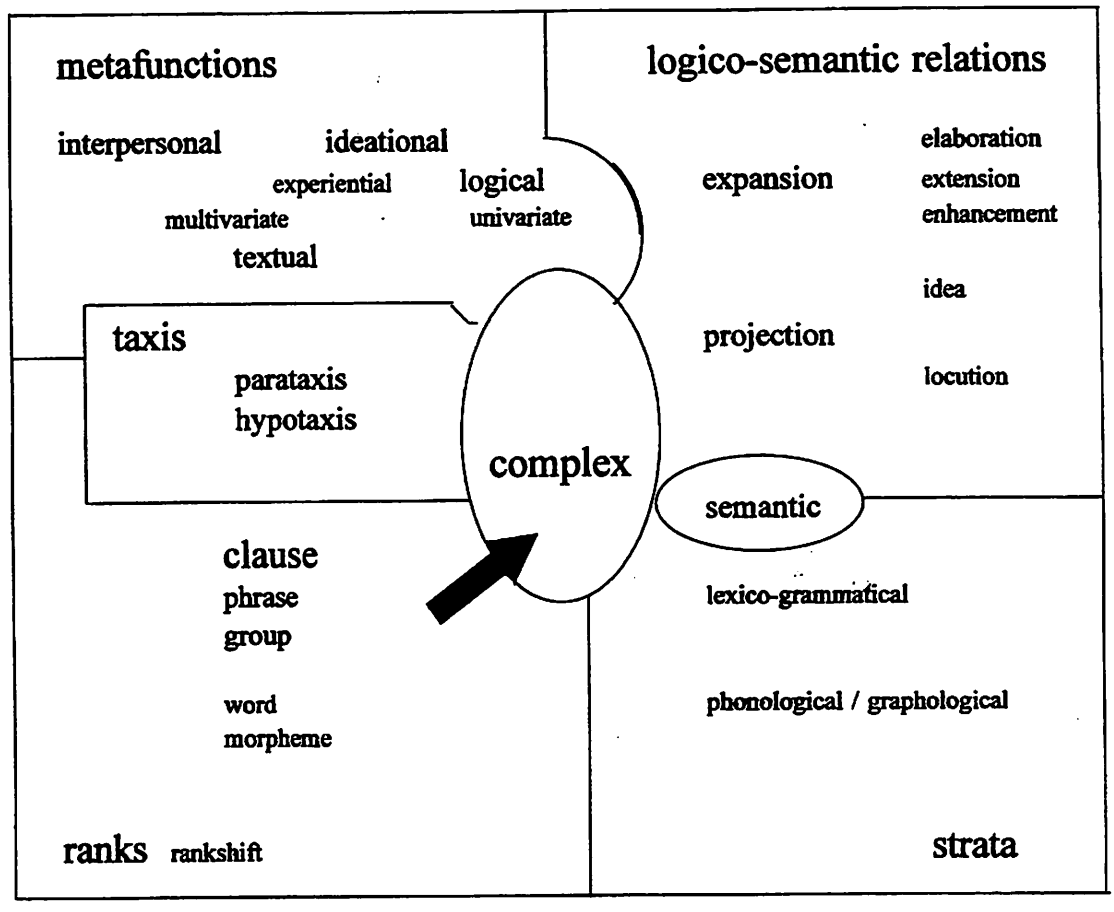
[2] The URL for this figure on line:
http://www.intcul.tohoku.ac.jp/~yamaguchi/systemic_room_supplement/semiotics_of_complexing.html

(2)



Partially overlapping with another figure (1) in that there shown the relative position of the 'devices,' this picture also visualizes the basic concept of SFL. In this illustration, it is characteristic that *complex* occupies the center position, with other constituents surrounding it.

As for the way how metafunctions are interrelated, the two figures (1) and (2) differ from one another. In (1), the three are completely parallel. In (2), however, Ideational is divided into Experiential and Logical, and the other two of Interpersonal and Textual are away from the center. It is suggesting that Interpersonal domain is the farthest from *complex*, the center of the mandara. The next to *complex* is Logical component, which is also meaningful. In addition, Logical component is noticed as *univariate* while the others, including Expriential, are multivariate.

In the following sections, the focus will be laid on metafunctions among others, except in section 2 where the idea of an American phonologist Pike will be introduced.

2. American Structurism vs. SFL

In this section, a conceptual contrast will be made between American Structurism and SFL. The main focus will be laid on the comparison of the layers of intonation system in Pike (1945) and the strata in SFL, which is sketched in (1) above. Pike (1945) is a study of intonation in American English, one of the earliest references for that subject in the new

world.

Pike (1945: 171) illustrates the types of layers of intonation system as concentric circles, which he calls 'an onion.' Considering the fact that this diagram is included in the last section of his monograph, this is the essence of how he recognized the intonation system of American English in terms of one of the fields of linguistics. His approach to intonation system seems to be a typical product of American Structurism in those days. It is common with the idea of the triplet concentric circles of the metafunctions, introduced below, that meanings can be diagrammed as layer structure.

The center of the circles is dubbed as *SOUNDS TYPES AND SEQUENCES (PHONETICS),* while the most peripheral one being *SPEECH-GRADIENT CHARACTERISTICS.* For the ease of looking each layer horizontally, the arrangement will be converted into plain listings in the table below. The outermost layer (speech-gradient characteristics) will be put on the first line, and the innermost one being on the last line. For the purpose of reference, the numbers will be assigned to each line, which are not original in Pike (1945). Typography of capital letters is maintained.

(3)

1. SPEECH-GRADIENT CHARACTERISTICS
2. SUPERIMPOSED ON LINEAR STRUCTURE
3. AGE AND SEX CHARACTERISTICS
4. Personal Differences
5. General Quality of Harshness, Resonance etc. from Articulation, Set of Throat, Vocal Cords, Lips, Tongue, Lungs
6. General Modification of Key, Pitch Gap, Rate, Loudness, Abruptness, Crescendo, Decrescendo
7. General Type of Utterance—Song, Whisper, Speech Aloud, Falsetto
8. LINGUISTIC STRUCTURE—SYSTEMATIC CONTRASTS
9. SUPERIMPOSED ON LINEAR STRUCTURE
10. Contrasts of Rhythm, Pause and Sentence Stress
11. Intonation Contours with Internal Structure
12. Four Contrastive Pitch Levels
13. LINEAR STRUCTURE
14. Words and Intricate Structure of Sequences of Words (Syntax)
15. Morphemes and Intricate Structure of Sequences of Morphemes (Morphology)
16. Phonemes and Intricate Structure of Sequences of Phonemes (Phonology)
17. SOUND TYPES AND SEQUENCES (PHONETICS)

It seems at the first glance at the original diagram in Pike (1945:171) that different kinds of items are mixed in the listing: i.e., headings, notes and contents. Before analyzing the items and contrasting them with the SFL strata, the mixture should be reorganized.

The first key, it seems, to decipher this complicated listing is the distinction of those lines in capital letters and those in normal ways. The capital-letter lines are for indicating the headings or titles, or notes. The other lines are the inventories under the headings. To take an example from the third and fourth lines; AGE AND SEX CHARACTERISTICS (line 3) are equivalent to Personal Differences (line 4).

The second key is the repetition of the note-like comments of LINEAR STRUCTURE or SUPERIMPOSED ON LINEAR STRUCTURE. These comments appear in lines 2, 9, and 13. The first line (SPEECH-GRADIENT CHARACTERISTICS) is the general title for this diagram, for example. The repetition of the note-like comments may suggest that these 17 lines of layers can be classified into three groups: lines 2 through 7, 8 through 12, and 13

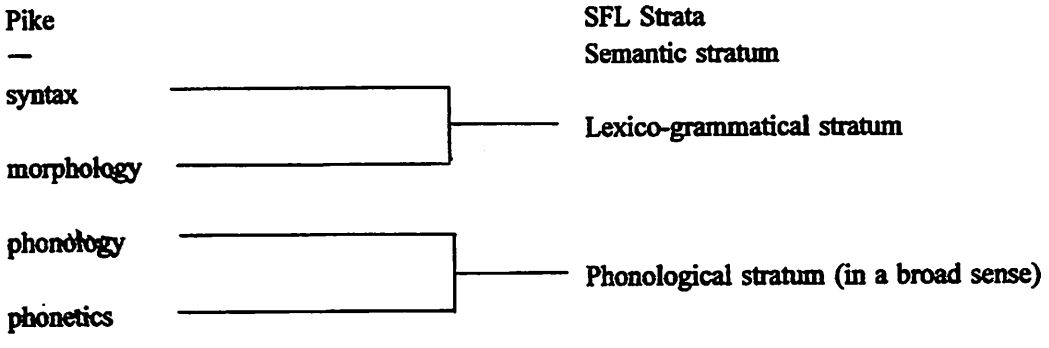
through 17. The listing of the first group represents phonetic features, whereas that of the second one lists phonological elements. The last group contains the four sections of linguistics.

Whereas the first two notes in the lines 2 and 9 are SUPERIMPOSED ON LINEAR STRUCTURE, the last one is only LINEAR STRUCTURE, without SUPERIMPOSED ON. This implies that line 19 contains four fields of linguistics: syntax, morphology, phonology, and phonetics. These four sections were ALL of the linguistics at that time, when semantics and pragmatics had been outside of the concern of linguists. Hence, the first two groups had to be something that were added on the basis of the major four departments of linguistics.

As is clear from the parenthesized four classification of syntax, morphology, phonology and phonetics, this arrangement is based on the 'tradition' of American Structurism. That is to say, the first step to investigate a given language is phonetics in the sense that human speech sound is a physical entity; hence we can depend on a methodology in phonetics which is close to natural science. As the next step, such speech sounds are classified and analyzed in the framework of phonology. In a broad sense, both phonetics and phonology deal spoken language. Contrastively, morphology and syntax are not confined to spoken mode. In the American Structurism tradition, linguistics had been assumed to pursue these four section. That means 'meaning' had been excluded from the main stream of that school.

Those inner layers assumed by Pike will partly correspond to the Lexico-grammatical and Phonological strata within the SFL scheme. The division of phonetics, phonology, and so on, is the strata in the Systemic terminology. In my understanding, the correspondence between the two frameworks will be as follows:

(4)



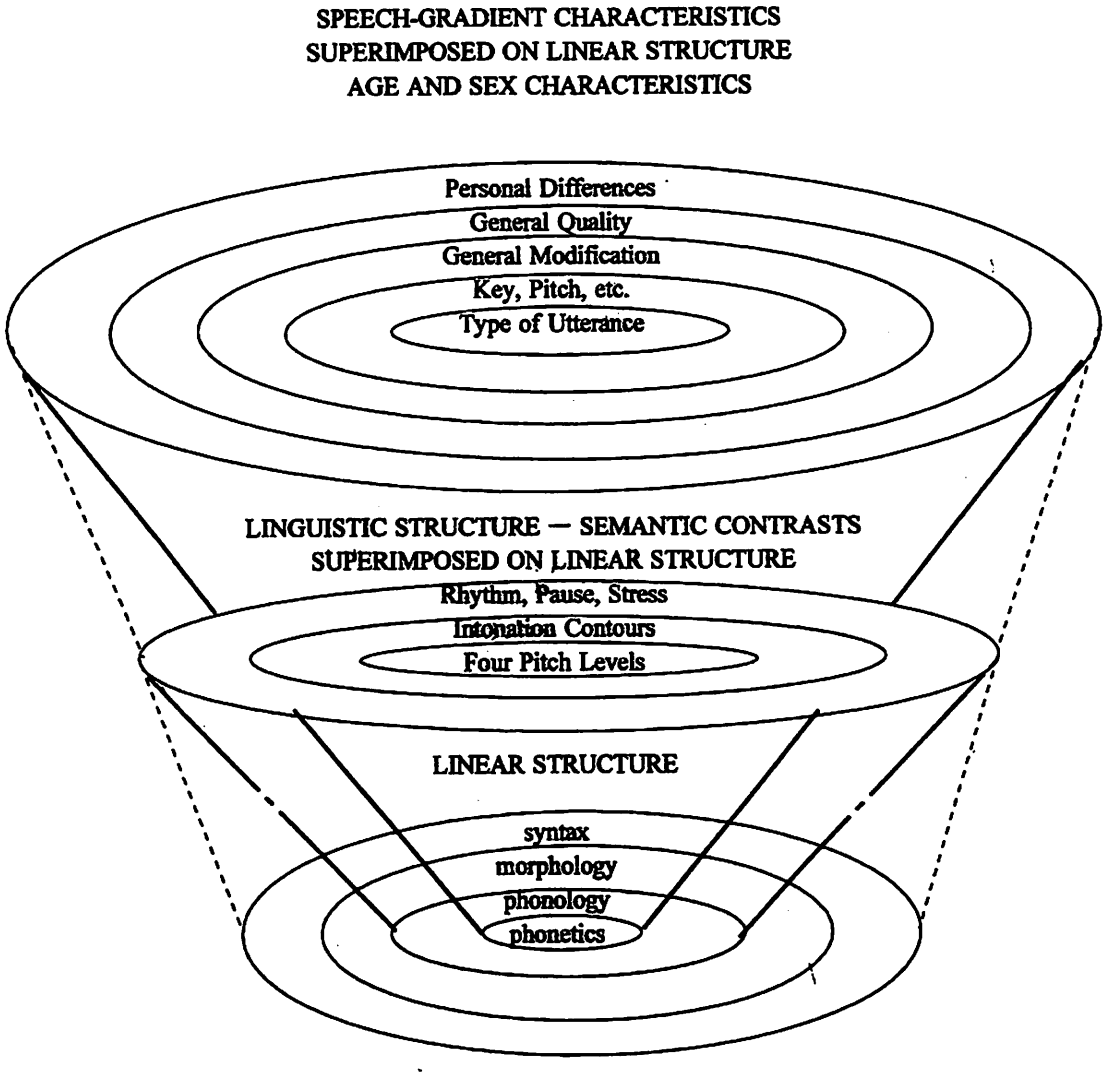
It will be understood that phonology within the SFL scheme include the sphere of phonetics as indicated by my note 'in a broad sense' in the parenthesis. Syntax and morphology in the Structurism tradition are integrated into Logico-semantic stratum in the Systemic Linguistics. Generally, the terminology and classification are simpler in SFL than in American Structurism.

The Semantic stratum of the SFL scheme is not able to find its counterpart in Pike's circles. This is because the Structurism linguists, including Pike, did not reach the realm to pursue the domain of semantics and above. Hence, we must stop the direct comparison of the frameworks between American Structurism and SFL.

My revised version for Pike's illustration is a three-dimensional one, maintaining the concentric circle structure. One of the major purposes of this revision is to eliminate the overlap of the phonetic features in the first group and the phonological elements of the

second group, both of which are included in the domains of phonetics and phonology of the third group. Another aim of this re-illustration is the literal realization of the notion 'SUPERIMPOSED ON LINEAR STRUCTURE.' In order to picturize the superimposition, three-dimensional concept is necessary. Thus, the concentric circles have turned into three layers, with the headings thrown out of the circles. The size of the circles are differentiated so that the first one should be largest, and the last one smallest. The capital-letter lines are remained as such except the last line (PHONETICS), each heading being shortened for the sake of simplicity.

(5) Pike's 'onion' model—revised



With this demonstration, Pike's intention has become clarified; more detail —those items in the first two layers— is given for phonetics and phonology than for syntax and morphology among the four sections, since this framework is based on the study of intonation in Pike (1945). The first layer is reflected on the phonetic domain of the LINEAR STRUCTURE, and the second circle is projected on the phonology counterpart. It is interesting that the phonetic features are extraposed on the top of the triplet circles, which can be considered as the outermost on the one hand, and the innermost concentric circle of LINEAR STRUCTURE on the other. Phonological component occupies the middle position

in two-fold sense: of the three layers, it is the second one, and in the four-section LINEAR STRUCTURE, it is located in the inner one together with the morphology domain.

To summarize; in American Structurism, each of the strata (in the SFL sense) —i.e. phonetics, phonology, morphology and syntax—is inorganically separated, and the pursuit of the interrelationship between these sections is rare. This observation can be typified, at least in Pike (1945), that interpersonal and textual perspective can not be found between the lines. This is not to deny, however, the scholastic value of Structurism; it is just to point out the methodological difference between formalism in the Structurist tradition and Halliday's functionalism. Historically it is ascertained that American Structurism had not taken semantics and beyond into account. Bolinger (1986, 1989) is in line with such Structurism approach in that though phonetic details are given for intonation system of American English, few semantic analyses are given.

3. The Definition of Three Metafunctions

In this section, various aspects of the SFL explanation are contrasted with regard to three metafunctions. Among them, Halliday (1979/2002) is one of the most important and the earliest references when discussing the meaning and function of metafunctions.

First, let us briefly review the history of the terminology. It was in Halliday (1970b) that the concepts first appeared in the literature. The triplet ideational, interpersonal and textual was established at that time, but the terms for these three was *function* and *meaning potential. (Halliday (1970b/2002: 174-175))*. In 1973 the rubric was changed into *macro-function,* maintaining the framework of triplet. One of the triad, i.e. Ideational metafunction, is replaced by *Experiential* in the 1974 publication (Halliday (1974)), which will be suggestive in the discussion of the statuses of Ideational, Experiential and Logical domains in next section. These were dubbed as merely *function* at that time. Then, in Halliday (1979) these framework had been developed to greater extent, again using the term *meaning potential* (Halliday (1979/2002: 198)). Halliday (1985a) used the term metafunction instead of *macro-function.* In the present paper, *metafunction* will be solely adopted.

Now here is an introductory sketch with concise definitions in chapter 2 of Halliday (1994). Below is a sketchy table where various aspects concerning three metafunctions are woven into.

(6)

Metafunction	Paraphrase	Structure	Others
Ideational	Clause as Representation	Process	
Interpersonal	Clause as Exchange	Mood + Residue	Polarity, Modality
Textual	Clause as Message	Theme+Rheme, Old+New Information	

Ideational Processes include the following six: Material, Mental, Relational, Behavioural, Verbal, Existential. The items of the column 'Paraphrase' represent the titles of chapters 3, 4 and 5 of Halliday (1994), respectively. These headings represent what the three metafunctions stand for. Later in the concluding section, this table will be enlarged so that more comprehensive picture of the three metafunctions be presented.

Before pursuing new images of metafunctions, we will briefly review how they have

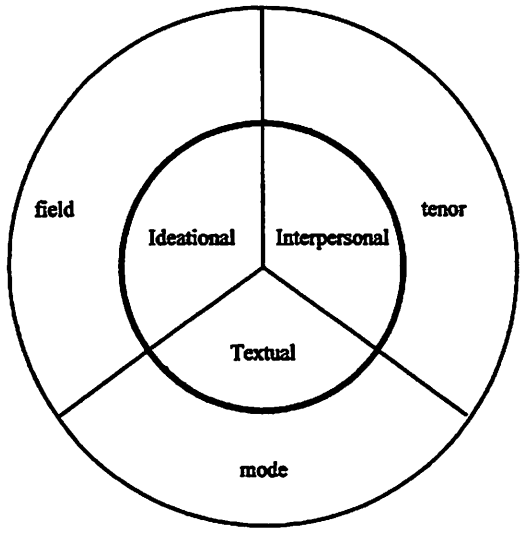
been explicated. It seems that Halliday (1979/2002:217) most concisely summarizes the difference of the three metafunctions:

(7)

> ... ideational meanings reflect the *field* of social action, interpersonal meanings reflect the *tenor* of social relationships and textual meanings reflect the *mode* of operation of the language within the situation. (italics added)

The triplet terms *field, tenor* and *mode* constitute the three elements of context of situation, which is another important framework of SFL. This triplet set of the elements of context of situation is parallel to the three metafunctions within the internal domain of linguistics. As the terms shows themselves, context of situation lies outside the domain represented by metafunctions. Halliday (1985b:2002: 284) contrasts these two facets as *Situation* and *Lexicogrammar.* Here the relationship between the two aspects will be diagrammed as below:

(8)



The double-layer structure of this illustration comes from the necessity of depicting the relationship between metafunctions and context of situation: *metafunction* is a concept based on the internal function of language, whereas context of situation is rather *meta*linguistic. It follows then that the equal division of one circle into three parts is different from the unequal positioning in concentric circles for metafunction for intonation to appear in (16) in the next section. It is not appropriate in the present paper to include the domain of context of situation in considering the framework of conclusive sphere of metafunctions; it will be given to next occasion.

With regard to the preference of the triad correspondence of context of situation and metafunction in (8), however, it must be emphasized that the scheme of the former is useful for that of metafunction. This three-to-three correspondence is neat *vis-à-vis* a three-to-four version, in which the Ideational domain is divided into two.

More detailed explanation for the three metafunctions is given in Halliday (1981/2002: 230):

(9)

> A text is a polyphonic composition of ideational, interpersonal and textual "voices". The ideational voice provides the content: the things, facts and reports; processes, participants and circumstances; the logical relations of different kinds. The interpersonal voice provides the interaction: mood, modality, person, polarity, attitude, comment, key. The textual voice provides the organization: thematic and informational prominence; grammatical and lexical cohesion among the parts. The "character" of the text is its pattern of selections in these various voices, and the way they are combined into a single whole.

In section 6.2. in Halliday (1994), some useful insight in regard to Interpersonal and Textual metafunction is given, related to intonation. It is strange, however, those comments for Ideational counterpart, parallel to these two, can not be found in that subsection. When the Ideational metafunction is divided into two subcategories of logical and experience, the former includes *things* and *names, things* being the title of subsection 6.2.3. of Halliday (1994). Enumerated below are explications for the two metafunctions from 6.2.4.:

(10) Interpersonal
- The interpersonal meanings are expressed by the intonation contour.
- Interpersonal meanings tend to be scattered prosodically.

Textual
- ...by the 'Mood' block, which may be repeated as a tag at the end, and by expression of modality which may recur throughout the clause.
- ...textual meanings tend to be realized by the order in which things occur, and especially by placing of boundaries.
- The textual meaning of the clause is expressed by what is put first (the Theme); by what is phonologically prominent (and tend to be put last—the New, signed by information focus); and by conjunctions and relatives which if present must occur in initial position.

An insightful reference to Pike[3] by Halliday is physical metaphors of the three metafunctions, together with 'abstract' icons of particle, field and wave (Halliday (1979/2002: 209-211)). Here Ideational metafunction is substituted by Experiential (see (14) below for details of Experiential domain).

(11)

metafunction	Pike's image	Halliday's image
Experiential	particle	elemental
Interpersonal	field	prosodic
Textual	wave	culminative—periodic

The reason is not given in Halliday (1979) why these metaphors are adopted as analogy of metafunctions, though the idea itself seems inspiring. Halliday (1981/2002: 239) comments that 'the details of this interpretation are not quite the same as those worked out by Pike.' Further, it is mystifying that this metaphor is not cited in Halliday (1985, 1994) which are indispensable references in SFL. Halliday's images will be presented in section 6 below, with slight modification from those in Halliday (1981).

As for the Textual analogy to wave, we can refer to Halliday (1981/2002: 233):

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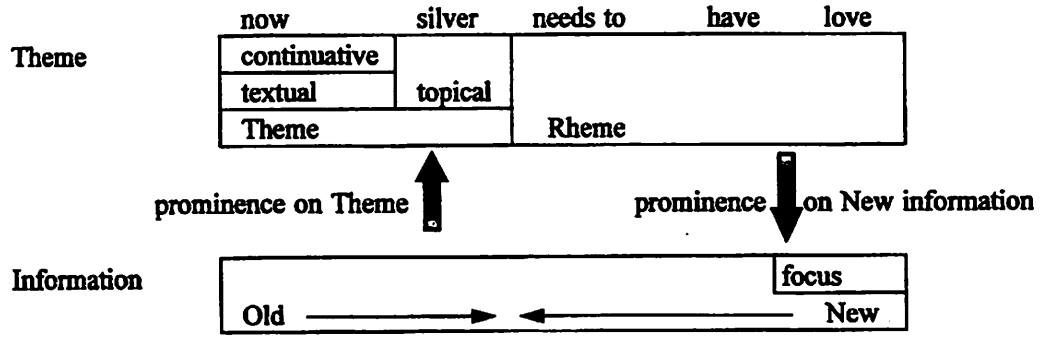
[3] Pike, Kenneth L. (1959) 'Language as particle, wave and field.' *Texas Quarterly* 2.

(12)

In its "textual" aspect, a clause has a wave-like periodic structure created by the tension between theme—rheme (where theme is the prominent element) and given—new (where new is the prominent element); the result is a pattern of diminuendo—crescendo, with a peak of prominence at each end. There is a balance of development (i) away from the theme, and (ii) towards the new.

This can be schematized as below with the excerpt from 'silver text' in Halliday (1994: Appendix 1):

(13)



In the Theme + Rheme structure, prominence is fallen on Theme and then gradually reduced toward Rheme—a decrescendo pattern described in (12) above. Contrastively, Old information is not prominent in general but increasing by heightened toward the end of the utterance of New information, which is a case of crescendo. With these two prominent heights at both ends, each utterance is provided with boundaries by Textual metafunction.

There is one curious point for Interpersonal illustration in Halliday (1979/2002: 210): only the intonation contour is presented in Figure 12 besides the Mood + Residue structure. In Figure 13 in the next page, however, Modality/Mood structure is shown. Since the intonation contour is expressed with one line, it looks like 'wave' which is assigned to the image of Textual metafunction. This may be contradictory with the 'field' metaphor given for Interpersonal metafunction. Later in section 6, it will be exemplified how analysis should be done including this point using the example.

Now we are ready to discuss the Experiential and Logical subdomains. Halliday (1994:36, table 2(3) in chapter 2) summarizes the Experiential and Logical components as follows:

(14)

	Definition (kind of meaning)	Favoured type of structure
experiential	construing a model of experience	segmental (based on constituency)
logical	constructing logical relations	iterative

These definitions are, however, tautological and seem to lack in substantial explanation. The only suggestion by Halliday himself, though omitted in (14) above, is the item for 'Corresponding status of clause'; for the Experiential component, the heading 'clause as representation' is given, but none for the Logical counterpart. It will lead to an assumption that Experiential metafunction is more important to represent the Ideational component than Logical, at least as parallel status to Interpersonal metafunction as 'clause as exchange' and Textual as 'clause as message.' As a conclusion drawn from a brief review here, experiential

component is partially equivalent to Ideational metafunction. This is fortified with the 'historical facts' that the triplet was Experiential, Interpersonal and Textual in Halliday (1974,1979). Logical component occupies relatively smaller portion.

Now, let us think about the order of context of situation and metafunctions. The origin of context of situation dates back to 1964 when Halliday, McIntosh and Strevens wrote about the three aspects of field, tenor and mode. That of metafunctions is Halliday (1970), as far as I can tell. Then, it would be natural to assume that each metafunction corresponds to field, tenor and mode respectively. It was later, maybe in Halliday (1979), that Ideational domain was divided into two subcategories of Experiential and Logical.

There is one insightful remark for the source of each metafunction in Halliday (1984/2002: 311). SFL owes its background to the following predecessors:

(15)

Ideational:	Boas, Sapir, Whorf
Interpersonal:	Malinowski, Firth
Textual:	Mathesius, Prague school

It is interesting in that though the three metafunctions are unified triplet, each source is diversified. It will be another topic to investigate and contrast these sources.

4. The Concentric Structure of Three Metafunctions in Intonation

When considering the 'meaning' of the text, whether it is spoken or written, the three metafunctions are more important than other schema depicted in (2), such as Taxis, Ranks, and Strata. Taxis is a systemic selection of 'syntactic' nature. Rank is a distinction of 'length' of linguistic unit: morpheme, word, group, phrase and clause. Strata correspond to the 'traditional' section of phonetics, phonology, morphology, syntax, semantics and pragmatics.[4]

In this section, it will be examined that the three metafunctions are more directly related to intonation than other frameworks of SFL. In later sections, some amendment will be added to the SFL scheme considering the result attained from such discussion.

First, the domain of intonation. My hypothesis on the layer structure of the three metafunction can be illustrated as the triplet concentric circles, as far as meaning conveyed by intonation is concerned (see the discussion below the diagram). Ideational metafunction is divided into two subcategories of logical and experiential components with dotted line, the size being similar to each other in spite of a brief review of these two subcategories in section 3 above[5]:

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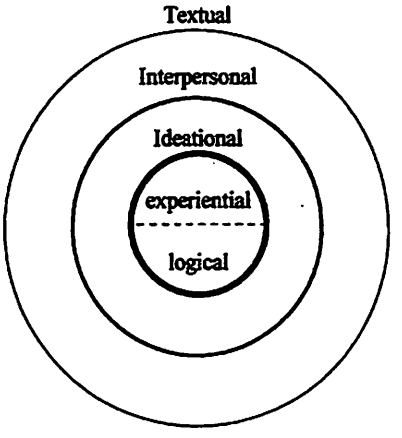
[4] For the correspondence between Strata in the SFL framework and traditional sections, see Kadooka (2001).

[5] In Kadooka (2003:13), the subdivision into logical and experiential components was not done. The idea of the concentric circles to signify the relative positions of the three metafunctions originates in Kadooka (2003).

(16)



Now let us examine whether this order of the three metafunctions fit into reality or not. The following definition of the three metafunctions is intended only for those meaning conveyed by intonation. More 'authentic,' or close-to-the-physical-world definition will be given in next section.

Ideational metafunction should be innermost in the sense that this domain is concerned with 'what is said' in the utterance, hence it forms the core of the text. Both Interpersonal and Textual metafunctions are based on the content of Ideational domain, with the presupposition in the Experiential and/or Logical subcategories. In other words, the meaning and/or nuance related to these two metafunctions presuppose the logical reality manifested by Ideational department. To put it in still other way, Interpersonal and Textual meaning/nuance is added on the basis of the content of Ideational metafunction.

To be more concrete; Interpersonal metafunction deals with the aspects of 'who said something to whom.' In this expression, *something* is dealt with Ideational metafunction, and the relationship between the speaker and the hearer is controlled by Interpersonal department. Textual metafunction works in such a direction as to make the text coherent. Such Textual metafunction is completed either within one clause, or across the boundaries of single clauses. Tone concord, tone sequence, paratone are the examples of Textual metafunction in intonation.[6] Both tone concord and tone sequence are self-conclusive within one clause, while paratone should necessarily go beyond the borders of clauses. If there is no necessity of the text to be coherent—for instance, it is short enough to be understood immediately—Textual metafunction can be optional.

If the order of the metafunctions were reversed, one of the possibilities were the case in which Textual were the innermost and hence most substantial. If so, where would be the *content* of the text? As exemplified in the paragraph just above, Textual metafunction is optional and indispensable as at least the Ideational domain as is necessary for the linguistic world. Ideational content is indispensable in any text, on the other hand. As a conclusion, this reverse order is impossible at all.

Another possibility would be that Interpersonal were the core of the concentric circles.

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[6] Section 10 in Chapter 8 (Halliday(1994)) is devoted to the first two phenomena of tone concord and tone sequence. See Wennerstrom (2001) for paratone.

In that case, the same question would be effective as counterevidence. When contrasting the importance of Interpersonal and Ideational metafunctions with regard to the core content, again Ideational should be positioned more centralized. Interpersonal division is subsidiary to the Ideational metafunction as what makes text meaningful. It has become evident through these examinations that the text must have some logical reality that can be judged either true or false. As a result, Ideational metafunction should occupy the innermost position.

One of the reasons why Ideational domain must evaluated as the core: it is divided into two subcategories of Experiential and Logical. If the content in the Ideational domain were not abundant, it could not be plausible to divide it into more minute subdomains.

The next step to investigate the order of the three metafunctions is that between Interpersonal and Textual metafunctions. It should be concluded that Interpersonal must be positioned more interior than Textual counterpart. The reason is that any text cannot be existent without interpersonal relation; there must be speaker or writer, and hearer(s) or reader(s), whereas it can go without Textual organizations in the sense that there is no indispensable elements such as the logical content of the Ideational domain and the participants in Interpersonal metafunction. Notice that Processes, realization of Textual metafunction and the topic of Chapter 5 in Halliday (1994), is now outside of the current discussion. Here those related to Textual metafunction must be interpreted as something that makes text coherent.

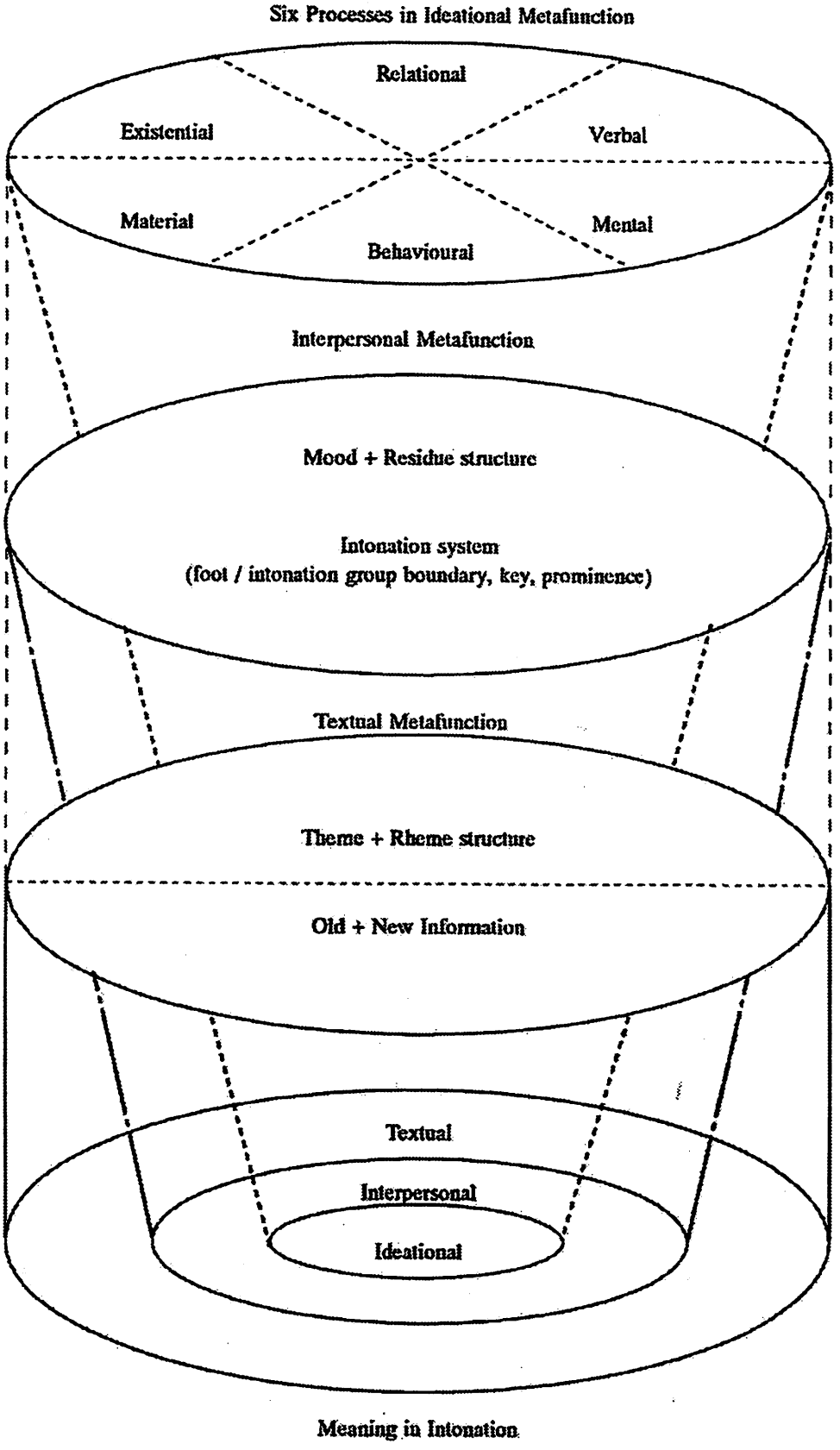
Notice that this triple concentric circle is intended to exemplify the meaning structure INHERENT TO INTONATION. That is to say, individual metafunctional systems are not included in the consideration in (16) such as Process for Ideational, Mood + Residue structure for Interpersonal, Theme + Rheme structure and Old + New information. Hence, there will be no resemblance between (16) and the one like (8), though both are visualized with circles.

5. New Images of Metafunction

Following the lines done for the revision of Pike's concentric circles of intonation system in section 2, let us draw again a picture of the three metafunctions, taking the meaning conveyed by intonation into an account as well as the three layers of metafunctions. This time, the sizes of the circles are equalized, since it is not necessary to imitate Pike's onion model (5), in which the sizes of the three circles are differentiated..

In a sense, this three-dimensional chart can be converted into a 'ordinary' two-dimensional table such as Figure 13 in Halliday (1979/2002: 211), apart from the basement concentric circle in which three metafunctions are put together. Here Ideational component is NOT divided into logical and experiential subcategories for the sake of simplicity of the illustration.

(17)


Six Processes in Ideational Metafunction
Relational
Existential
Verbal
Material
Mental
Behavioural
Interpersonal Metafunction
Mood + Residue structure
Intonation system
(foot / intonation group boundary, key, prominence)
Textual Metafunction
Theme + Rheme structure
Old + New Information
Textual
Interpersonal
Ideational
Meaning in Intonation

As for the lines connecting those circles of the upper three and the inner or outer smaller ones in the bottom, some verbal supplement would be necessary.

First, the Ideational sphere. The selection from the six Process types is projected to the Ideational domain, which occupies the innermost circle at the bottom. This means that in any utterance, content should be classified into any of the six Process types, since these six Processes are mutually exclusive. In other words, these six Processes make a system network. In what is related to intonation, the Ideational metafunction makes the core of the utterance: what is manifested verbally.

The second circle is concerned with the Mood + Residue structure, the system related to the Interpersonal metafunction. In Tench (1996:20)'s expression, this metafunction reflects '[n]ot what they said, but the way they said it.' This 'way' will include those facets concerned with Textual metafunction. The Interpersonal layer is reflected to the domain sandwiched between Ideational and Textual metafunctions at the bottom concentric circle. It means that Interpersonal metafunction is positioned as the middle of the three; it always comes between Ideational and Textual metafunctions. Interpersonal nuances, defined in Kadooka (2001), is directly concerned with this domain. When it is necessary to take intonation into consideration, those aspects must be added to this sphere such as foot / intonation group boundary, key and prominence.

The Textual layer consists of the two system structures of Theme + Rheme and Old + New information. Since its counterpart at the basement circle is outermost, the lines linking these two domains are 'straightforward' or vertical. One of the missions of the Textual metafunction is to mark the boundaries in the utterances. Typically, and unmarkedly, the utterance-initial position is simultaneously marked with Theme/Old information, whereas the terminal position is realized by Rheme/New information.[7] Both Theme and New information, when realized in the clause-final positions, receive phonological prominence. This job of making a text ordered is indicated as the outermost position of the three metafunctions.

As for the first three layers, multi-dimensional analyses have been made adopting all the methods listed above for the same text: for example, an analysis for 'the silver text' in Appendix 1 in Halliday (1994). In proportion with the three layers of metafunction, such structure was depicted as the overlapping three circles in (17). It should be emphasized here that the concentric circle of the basement is additional to these triplet set of framework.

6. Text Analysis: An Example

In this section, we will analyze a one-utterance text as a case study, taken from Halliday (1979), with the metafunction framework and the emphasis on intonation at the same time. The purpose of these analyses is to investigate how similar, or how different, are the meaning structures within and outside the domain of intonation. If the two dimensions of the structure are similar, a four-layer illustration such as (17) is unnecessary; if they are dissimilar to each other, then, to examine how different is the next step of the research.

Below is the example from Halliday (1979/2002: 210-211), with the intonation

[7] Figure 9 in Halliday (1979/2002: 208) appropriately presents this combination of the Theme + Rheme structure and Old + New information.

transcription:[8]

(18) //4 ∧ on / **Sunday per//1 haps we'll** / take the / children to the / **circus // 2 shall we//**

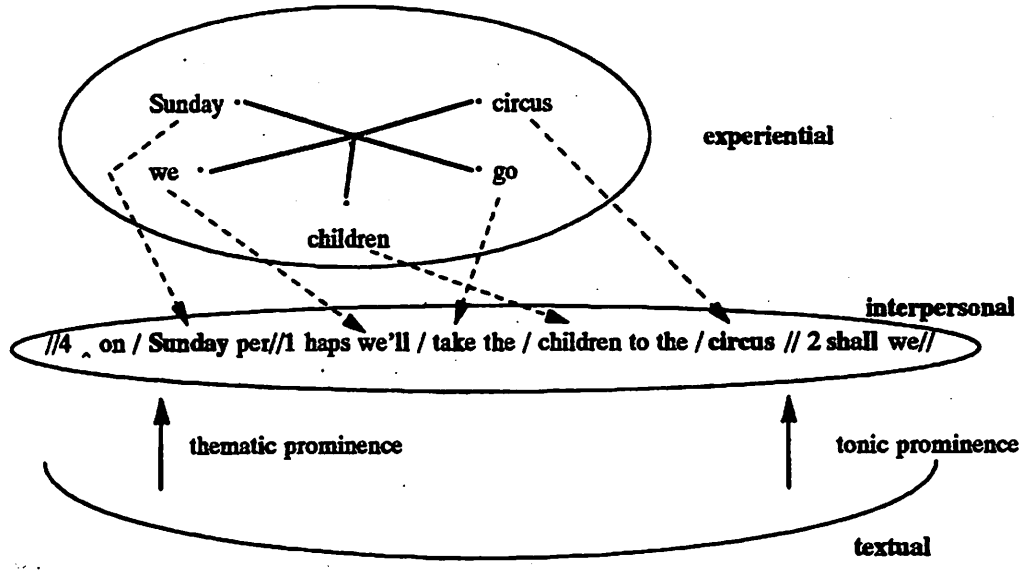
This utterance consists of three tone groups, separated by double slashes. The first tone is realized as a fall-rise with the prominence on *Sunday,* indicated by bold type. The second group consists of four feet distinguished with single slashes, the prominence fallen on the last word *circus* with the falling tone. The third tone group is a tag question *shall we,* with the steep rise Tone 2 toward the end of the whole utterance.

In Halliday's interpretation, intonation is almost exclusively related to Interpersonal metafunction. Another domain of interpersonal nature is Modality/Mood; in the example above, *perhaps* carries Modality, and *we'll* is Mood, in which *we* is Subject and *will ('ll)* is Finite. It must be noticeable that the foot boundaries are inconsistent with these Modality/Mood structure. A Modality adverb *perhaps,* for example, is divided into two feet, the first syllable belonging to the first tone group while the second syllable to the second group. This is because of the regulation of foot structure that the first syllable of a given tone group must be either a stressed syllable or a silent beat indicated by a caret (∧).

The most enigmatic point at the moment is what the 'field'-like structure looks like; intonation contour in Figure 12 in Halliday (1979/2002: 210) is a line of F0 frequency signifying the movement of the voice pitch, and does not look like a two-dimensional 'field.' From the beginning of this modeling, hinted by Pike's work, this kind of analogy does not have to be logically strict. In other words, we can freely draw pictures to represent the images we have in mind.

Below is the realization of the multi-layer picture of three metafunctions, based on the images of each domain in Halliday (1979/2002: 210). In the Interpersonal sphere, transcription of intonation pattern is adopted with key, tonic and boundaries of feet and intonation groups, instead of intonation contour.

(19)

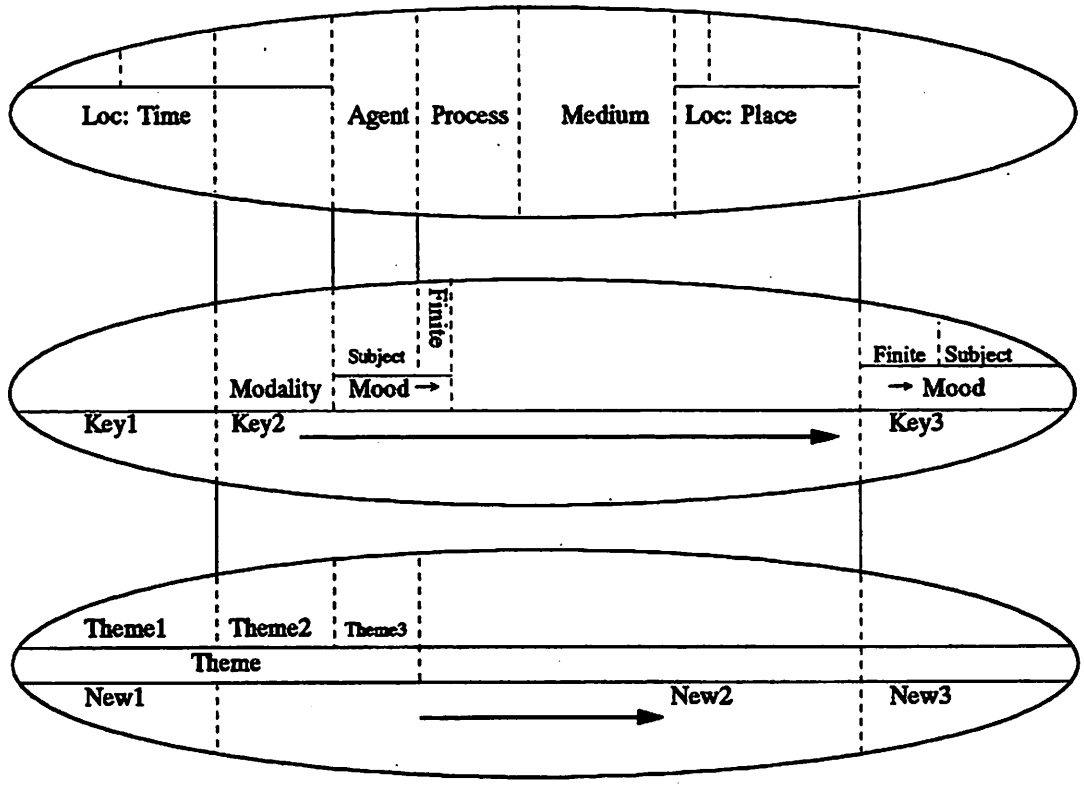


[8] For details of intonation transcription, refer to Halliday (1967, 1970a, 1979/2002), for example. Here the minimum explanation will be given.

With this multi-layer interpretation, it is well demonstrated how each word is realized in each layer and how it is related to each other across the layer boundaries. The five 'particles' in Experiential domain are linked to the corresponding lexical item in the intonation transcription in Interpersonal metafunction. The arrows of the two prominent peaks in Textual domain point to the tonic syllables in Interpersonal sphere. Thus, it is intuitively understood from this illustration that the three layers are organically related to each other, and that they form one text as *meaning potential.*

Next is the reorganization of Figure 13 in Halliday (1979/2002: 211) into a similar multi-layer model.

(20) //4 ∧ on / **Sunday** per//1 haps we' ll / take the / children to the / **circus** // **2 shall** we//



Keys 1 through 3 in Interpersonal domain is another tag for intonation groups, focusing on speaker's mental attitude. Key 1 in this case is the first tone group with a fall-rise Tone 4, Key 2 is the second tone group of Tone 1 falling tone, and Key 3 is realized as rising Tone 2.

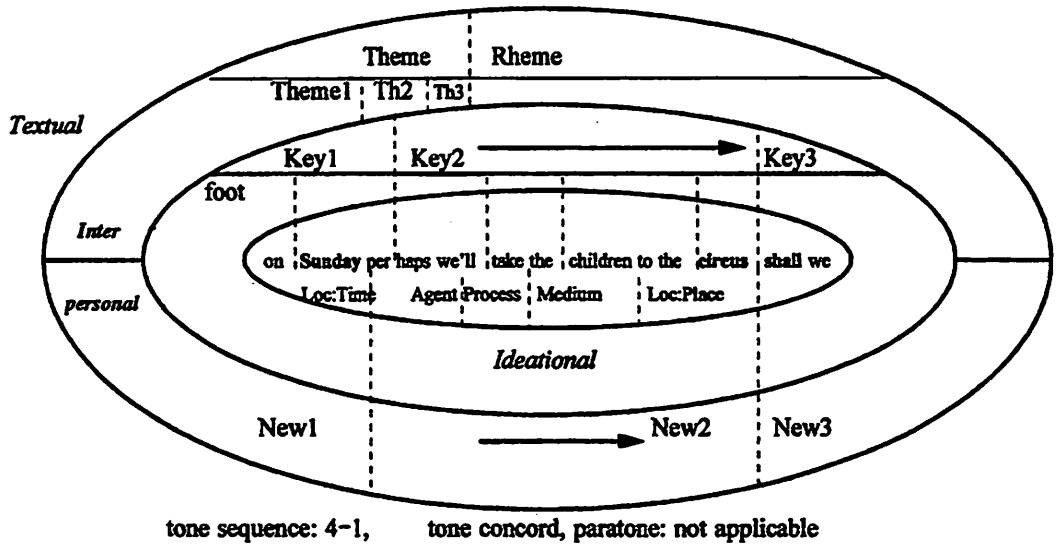
Exceptional to the canonical information structure is that the first phrase *on Sunday* is not an Old information, but a New one. This is not a crucial violation of basic ordering in the information structure, because there are many exceptions like this. In other words, it is not an inviolable regulation that all clauses must be initiated with Old information. This is further endorsed indirectly with the fact that the violation to the thematic structure is fatal, at least for English, that Theme should be the first element in the utterance or the text.

The change from the two-dimension original table into a three-dimensional one (20) is

virtually nothing. This is because the comparison across the layers is possible with box tables like Figure 13 in Halliday (1979/2002: 211). In comparing (19) and (20), however, the former is more fruitful in that the individual pictures are meaningfully linked together to make the relation of each layer explicit.

The last diagram in this section is a concentric triplet circle of intonation meaning. Before that, we need the context of situation for the text (18). Let us postulate that this utterance is made by one of the parents to another suggesting to take their children to circus. The date of the utterance will be a few days before the intended Sunday. Then the drawing is like this:

(21)



tone sequence: 4-1, tone concord, paratone: not applicable

Textual metafunction is the outermost circle, divided into two spheres of the Theme + Rheme structure on the upper half and the information structure in the lower counterpart. Interpersonal domain occupies the middle circle, and it is further separated into feet and tone group boundaries. Ideational metafunction is indicated as the innermost circle. This concentric diagram is superior to the box table in that two Textual structure can be presented with two ways of separation patterns; in (21) the thematic structure and the information structure are separated to upper and lower ways, and both can be equally parallel to Interpersonal metafunction.

When comparing (20) and (21), the latter seems preferable in that the three metafunctions are closely linked to each other. In (21), each layer is independent, since the circles are distant to each other.

In chapter 8, section 10 in Halliday (1994), tone sequence 1-4 is defined as hypotaxis. In the above text, Tone 2 is added as a tag question following the tone sequence 1-4. A typical realization of hypotactic relation is exemplified with an example as follows:

(22) //4 ∧ as / soon / as she'd / packed her/ **bags she //1 left / home //**

When compared with a typical hypotaxis like this, *on Sunday* in (18), only referring to a certain date, the hypotactic relation is weaker.

7. Concluding Remarks

So far, we have pursued how metafunctions must take their stand in the SFL scheme. In the course of discussion, it was found that Pike's analysis for intonation structure looks similar to the multi-layer picture of metafunctions. This implies that human language can be methodologically analyzed similarly, across the boundaries of linguistic schools.

As a part of summary of the present paper, an enlarged version of a table of three metafunctions is presented below:

	Ideational	Interpersonal	Textual
source	Boas, Sapir, Whorf	Malinowski, Firth	Mathesius, Prague school
context of situation	field	tenor	mode
subdomain	Experiential / Logical	–	–
Halliday 1981	things, facts, reports, processes, participants, circumstances, logical relations	mood, modality, person, polarity, attitude, comment, key	prominence, cohesion
Pike's analogy	particle	field	wave
Halliday's analogy	elemental	prosodic	culminative/periodic

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JASFL Occasional Papers Volume 3 No. 1 2004

An Attempt to Elucidate Textual Organization in Japanese

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Abstract

There has been some confusion as to how Theme can be identified and how texts are organized in Japanese among systemicits in the field of Japanese language studies. In the present paper, through a critical review of four notable attempts to identify Theme in Japanese, I will argue the following two things: (1) The Japanese language has at least two types of Theme, i.e., topic Theme and peg Theme. The former provides its clause or clause-complex with an entity to be talked about (or a topic), whereas the latter relates the clause(-complex) to what has gone before in the text. These two Themes are two separate grammatical recourses in Japanese. (2) Clause-final Processes in Theme-less clauses can contribute to textual organization in such a way that they accommodate topic information and function as textual peg, hanging their clause(-complex) on what has gone before. And I will finally suggest that (3) a Process-oriented textual theory needs to be explored in elucidating textual dynamism in Japanese. It will also be noted that the theory that initial position in the clause is thematic needs to undertake a critical investigation before it is applied to textual analysis in Japanese.

1. Introduction

Systemicists have rigorously investigated textual organization in Japanese with the notion of 'Theme,' and produced some significant results during the last ten years (e.g., Hori, 1995; Sasaki, 1997; Thomson, 1998a, 1998b; Tsukada, 1997). Their linguistic investigations have made an important step into the textual world of the Japanese language. But any further advance into this linguistic world seems to be prevented for two reasons: (1) disagreement on how Theme should be defined, and (2) the employment of the notion of ellipsis.

The first reason is a fundamental one. Each systemicist in the field of Japanese language studies seems to have his/her own definition of Theme. Theme must be defined with a common terminology. Otherwise, we do not know what can be done with the notion of Theme; consequently, any further constructive development in textual studies in Japanese cannot be expected.

The second reason is also important. This is because the notion of ellipsis often serves as an easy solution to the case where no Theme can be found in the data, when a Theme is 'recovered' at initial position in all Theme-less clauses. The recovery of Themes also leads to the exclusion of clause-final Processes from textual studies. This exclusion is not desirable, since, as we will see later, clause-final Processes can function as textual 'peg,' making successively-occurring Theme-less clauses textually cohesive against what has gone

before in the text.

In the present paper, I will attempt to do the following. Through a critical review of four notable attempts to identify Theme in Japanese, I will first examine what type of Theme is recognizable in Japanese. I will then criticize the employment of ellipsis in textual analysis in Japanese, and show how clause-final Processes participate in textual organization. Finally, I will suggest the necessity to explore a Process-oriented textual theory.

2. Four Attempts to Identify Themes in Japanese

I will first look at Halliday's definition of Theme in English before the review of the four attempts at Theme identification in Japanese. This is because all of the four attempts to be reviewed below depart from Halliday's definition of Theme in one way or another and his definition provides the review of the four attempts with a common terminology.

2.1. Halliday's Theme, Realization of Three Functions[1]

According to Halliday, Theme (in English) can be defined in three ways. The first definition is concerned with the intra-clausal function which organizes "the syntax of the English clause" (Halliday, 1976: 180), and provides "the point of departure" at initial position in the clause (Halliday, 1967: 213; Halliday, 1994: 38). For ease of later discussion, let us call this function the 'departure function.' The following example, taken from Halliday (1994: 39), may illustrate this function.

(1) Once upon a time | there were three bears.
Theme | Rheme

The second definition is concerned with "what is being talked about" in the clause (Halliday, 1967: 212). Let us call this function the 'topic function.' The following example, taken from Halliday (1994: 41), illustrates this function.

(2) This teapot | was what the duke gave to my aunt.
Theme | Rheme

This clause talks about 'this teapot,' and this Theme is given a description in the Rheme segment, where the Theme is talked about.

The third definition is concerned with text formation. This function is concerned with distinguishing between "text and non-text—lists of words, or random sets of sentences" (Halliday, 1976: 28), and with "the coherence between part of the text and every other part" (Halliday and Hasan, 1985: 45). This discourse semantic function is described metaphorically as "the peg on which the message is hung" (Halliday, 1970: 161). In short, Theme relates the clause to what has gone before in the text. Let us call this function the 'peg function.' The following example, taken from Davis (1995: 21), illustrates this function. The Theme under investigation is bold-faced.

(3) In a dingy laboratory in Bonn lies a submarine-shaped metal cylinder. **It** is about three

[1] In summarizing Halliday's definition of Theme, I am greatly indebted to Fries (1994, 1995a, 1995b, 1995c, 1995d), Downing (1991) and Yamaguchi (1998).

meters long...

The 'it' in the second clause hangs the clause on the first one by referring to 'a submarine-shaped metal cylinder.'

According to Halliday, these three functions (i.e. departure, topic and peg function) are realized all at once at initial position in the clause and are the same thing, as far as the English language is concerned.[2]

2.2. Review of Four Attempts

The four attempts to be reviewed here are Hori (1995), Tsukada (1997), Sasaki (1997), and Thomson (1998a, 1998b). The review will identify peg Theme and topic Theme as recognizable Themes in Japanese. Peg Theme is realized by *wa*-phrases, and topic Theme is realized by nominative phrases. Departure Theme (or function) is a concept yet to be defined explicitly. We do not know whether or not the Japanese language has departure Theme. The review will also call attention to the negative consequence of the employment of the notion of ellipsis in Theme identification in Japanese. This will necessitate investigating the contribution of clause-final Process to textual organization, which will be the task of section 3.

Let me now start reviewing the four attempts.

2.2.1. Hori's (1995) Attempt

Hori's (1995) attempt to identify Theme in Japanese is based on the assumption that Theme realizes topic function. There is no discussion of Theme identification from the viewpoints of departure or peg function.

For Hori, Japanese Theme provides the clause with what is being talked about in it. The topic function is realized by *wa*-phrases. Hori (1995) gives the example below. The Theme is bold-faced.[3]

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[2] According to Fries (1994), the descriptions of 'the point of departure' and 'the peg on which the message is hung' are metaphorical, and the core function of Theme is the provision of a framework within which the Theme in the clause can be interpreted (Fries, 1994, 1995a, 1995d). The framework function accommodates the other metaphorically identified thematic functions. In short, there is just one thematic function in English. Downing (1991), however, argues that topic and departure function are two separate functions. Agreeing with Downing, Yamaguchi (1998) goes on to argue that topic-oriented definition of Theme (Halliday, 1967) is not compatible with departure-oriented definition (e.g., Halliday, 1994), on the ground that the latter is closely associated with the development of texts (e.g., Fries, 1995d) but the former is not. If Downing's and Yamaguchi's arguments are correct, then it should be said that there are (at least) two types of thematic function in English.

[3] Throughout the present paper, emphasis in the example is given by the author, and original emphasis, if any, is ignored. Grammatical annotations and English translation are also the author's except for the English translation in Hori's and Thomson's examples (but some of their translation has been slightly modified by the author, so that the resulting translation becomes more equivalent to the original Japanese.)

(4) **Aiteno hito-wa** têpu-ni haira-nai-n desu ne?[4]
(other/people-PT/tape-LOC/enter-not-GEN/be/SFP)
'**Other people** aren't going to be recorded, are they?'

Since Theme is realized by a *wa*-phrase, it does not have to occur in initial position in the clause. This is exemplified by the following two examples from Hori (1995). Themes are bold-faced.

(5a) Têpu-ni **aiteno hito-wa** haira-nai-n desu ne?
(tape-LOC/**other/people-PT**/enter-not-GEN/be/SFP)
(5b) Têpu-ni haira-nai-n desu ne, **aiteno/hito-wa**?
(tape-LOC/enter-not-GEN/be/SFP,/**other/people-PT**)

Clauses (4), (5a) and (5b) have the same experiential meaning. The difference is the location of the Theme.

Problem in Hori's Attempt

No doubt, *wa* is thematic. But Hori's attempt has the following problem. It is true that *wa*-phrases often realize topic function. But it is wrong to assume that topic function is realized by *wa*-phrases. Consider the following example. The nominative[5] phrase is bold-faced for ease of discussion.

(6) Têpu-ni **aiteno hito-ga** haira-nai-n desu ne?
(tape-LOC/**other/people-MON**/entere-not-GEN/be/SFP)
'**Other people** aren't going to be recorded, are they?'

This example is obtained by replacing the particle *wa* in example (5a) with the nominative case marker *ga*. Example (6) thus contains no *wa*-phrase. If topic function is to be realized by *wa*-phrases, then we have to conclude that this example does not contain any information about what is being talked about in the clause. This sounds intuitively wrong, since it is reasonable to assume that this clause still talks about 'other people.' Judging from the comparison of examples (5a) and (6), it is reasonable to assume that not the *wa*-phrase (or the semantic property of the particle *wa*) but the nominative function which can be recognized in the *wa*-phrase presents information about what is being talked about in the clause.[6] To put this in another way, topic function can be equated with nominative

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[4] I will refer to the particle *wa* as a peg Theme marker (or PT) throughout the paper. SFP stands for sentence-final particle.

[5] I adopt Mikami's interpretation of nominative in the present paper. Mikami (1970: 41) says that nominative phrases realize ER roles in Japanese. The ER role realizes the 'doer' (e.g., Actor) role in a verb clause, or the 'be-er' (e.g., Carrier) role in a noun or adjectival clauses.

[6] According to a standard theory proposed by Kokugogaku (National Language Studies) grammarians (e.g., Matsushita, 1930; Ôno, 1978; Kitahara, 1981; Kindaichi, 1988), a *wa*-phrase is assumed to present given information, whereas a *ga*-phrase is assumed to present new information. Consider the following examples, taken from Ôno (1978: 24, 34).

1. Watashi-**wa** Ôno desu.
(I-PT/Ôno/am)
'I am Ôno.'
2. Watashi-**ga** Ôno desu.
(I-MON/Ôno/am)
'I am Ôno.'

Ôno explains the difference between these two examples as follows. When the speaker assumes that

function.

2.2.2. Tsukada's (1997) Attempt

Tsukada's (1997) attempt to identify Theme is characterized by the following two points. (1) Theme is assumed to realize departure function. (2) His Theme analysis points out that *wa*-phrases realize peg function.

Tsukada claims that anything that occurs at initial position in the clause is thematic. Consider the following examples in Tsukada (1997). Themes are bold-faced.

(7) **Dorobô-ga** kinko-o kagi-de ake-ta
(**thief-NOM**/safe-ACC/key-with/open-PAST)
'**The thief** opened the safe with the key.'

(8) **Kinko-wa** dorobô-ga kagi-de ake-ta.
(**safe-PT**/thief-NOM/key-with/open-PAST)
'**The safe** the thief opened with the key.'

(9) **Shidonî-de** tanoshii jikan-o sugoshite-kudasai.
(**Sydney-LOC**/enjoyable/time-ACC/spend-please.)
'Please spend an enjoyable time **in Sydney**.'

Tsukada's Theme analysis is consistent, but it lacks something very important, i.e., the explanation about why clause-initial elements are thematic in Japanese. The notion of departure function is given no definition.

Next, his analysis points out the peg function of *wa*, although he maintains that *wa* is not thematic. Consider the following example, taken from Tsukada (1997).

(10) A: Kinko-ga dô-shita-n-desu ka?
(safe-NOM/how-did-GEN-be/QST[7])
B: **Kinko-wa** dorobô-ga kagi-de aketa.
(**safe-PT**/thief-NOM/key-with/opened)
'A: What happened to the safe?
B: **As for the safe,** the thief opened [it] with the key.'

He explains why the clause-initial element in B's remark is realized by a *wa*-phrase as

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the listener is aware of the existence of the speaker, example 1 is employed. There the entity '*watashi*' is presented as given information, and realized in a *wa*-phrase. When the speaker assumes that the listener knows that someone must be Ôno but does not know that the speaker is Ôno, example 2 is employed. There the entity '*watashi*' is presented as new information, and is realized in a *ga*-phrase. Both clause-initial phrases function as nominative.

This standard theory can be re-stated as follows. A *wa*-phrase is used to carry over a topic (e.g., 'I', the speaker Ôno) from the previous situation (e.g., the situation where the listener gets to know the existence of the speaker, and the speaker is aware of this) to the current one (e.g., the situation where the speaker starts talking about himself after having been convinced that his existence is an established fact for the listener); otherwise, a *ga*-phrase is used. There is no experiential difference between *wa*- and *ga*-phrases. I assume that this theory is correct and can be applied to examples (5a) and (6).

[7] QST stands for 'question'.

follows. What is referred to by the expression *kinko* has already been mentioned by A, so B presents this expression as given information by attaching it to the "given information marker *wa*" (Tsukada, 1997: 139). The theory behind this is that *wa* is concerned with the distinction between given and new information and is not thematic. This theoretical decision is understandable, since Halliday (1976: 180) states that given-new is a discourse semantic variable that is independent of Theme-Rheme.

However, if this theory is to be adopted in Theme identification in Japanese, then we would fail to analyze some crucial thematic developments in Japanese texts. This is because, as exemplified by example (10), crucial thematic developments in Japanese texts are often facilitated by the 'given-ness' of the particle *wa*.[8] The given-ness should be interpreted as thematic peg function.[9]

2.2.3. Sasaki's (1997) Attempt

Sasaki's attempt is significant for two reasons: (1) He recognizes that topic function (realized typically by *wa*-phrases) and departure function (realized by clause-initial elements) are two separate functions. He also points out that (2) topic function is not only realized by *wa*-phrases but also by *ga*-phrases.

Sasaki assumes that Japanese texts are organized hierarchically with two types of Theme: 'local-clausal Theme' and 'transclausal Theme.' Local-clausal Theme is in charge of thematic organization within a clause, whereas transclausal Theme superordinates the entire clause-complex and realizes topic function. Consider the following example (taken from Sasaki 1997). The transclausal Theme is bold-faced, and local-clausal Themes are underlined.

(11) (i) **Soitsu-wa** iseebi dewa-naku, (ii) ...semi ebi datta.
(**that-PT**/lobster/is-not+and,/ ...cicada/prawn/was)
(iii) Seimeiryoku-mo tsuyoku, (iv) kurai tokoro-ni oku-to,
(Vitality-also/strong+and,/ dark/place-LOC/put-when,)
(v) mizu-ga nakunat-temo
(water-NOM/does+not+exist-even+if)
(vi) isshûkan gurai-wa kakujituni ikiteiru,
(one+week/about-PT/definitely/live,)
(vii) to Hide-san-ni kiita+koto+ga+aru.
(QT[10]/Hide-*san*-from/have+heard)
'(i) **That one** was not a lobster; (ii) [it] was a cicada prawn.... (iii) [Its] vitality is also strong [=it is a very strong creature], and (iv) if [you] put [it] in a dark place, (v) even if there is no water, (vi) [it] can definitely live for at least a week, (vii) I heard so from Hide-san.'

The clause-complex-initial phrase *soitsu-wa* (functioning as transclausal Theme) superordinates the following clauses (ii) to (vi) by providing them with the topic 'that one.' However, each of the following clauses (ii) to (vii) has its own starting point. Sasaki recognizes that topic and departure function are two independent functions.

Sasaki also points out that topic function can be realized by nominative *ga*-phrases.

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[8] See, for instance, the analysis of thematic development in Thomson (1998b: 19).
[9] Halliday (1994: 37) says that *wa* is thematic. This is wrong if the term 'thematic' is used to refer to topic function. But this is correct if 'thematic' is used to refer to peg function.
[10] QT stands for 'quotation marker'.

Consider the following example, taken from Sasaki (1997).

(12) (i) **Maeto-onaji suchuwâdesu-ga** yattekite,
(**same/stewardess-NOM**/came+up+to+me+and)
(ii) bokuno-tonari-ni koshi-o/oroshi,
(my-next-LOC/waist-ACC/lower+and)
(iii) mô daijôbu-ka to (iv) tazuneta.
(now/OK-QST/QT/ asked)
'(i) **The same stewardess** came up to me, and (ii) sat next to me, and (iii) whether or not I was OK now, (iv) [she] asked.'

Clauses (i), (ii) and (iv) talk about 'the same stewardess.' This can be taken as further evidence that not *wa* but nominative function realizes topic function.

2.2.4. Thomson's (1998a, 1998b) Attempt

Thomson's attempt to identify Theme is significant in that it is the first systematic approach to Japanese Theme that takes thematic development in the text into consideration. Her approach is characterized by (1) the assumption that clause-initial-ness (or departure function) realizes topic and departure function, and (2) the employment of the notion of ellipsis to provide Theme-less clauses with Themes.

Characteristic 1
Her starting point in identifying Theme in Japanese is the same as Tsukada's (1997): that is to say, whatever occurs at initial position in the clause must be Theme. Consider examples (13) and (14) below. Both are taken from Thomson (1998b: 10, 11). Themes are bold-faced.

(13) **Itami-wa** nai.
(**Pain-PT**/does+not+exist)
'**Pain** does not exist.'

(14) **Sono hoka-ni-wa** donna monooto-mo nakatta.
(**that/other-LOC-PT**/any/sound-even/did+not+exist)
'**Other than that**, there was no other sound.'

These clause-initial elements realize topic and peg function. Let us take a closer look at Thomson's Theme from the viewpoint of the three thematic functions.

Topic Function: Thomson (1998b: 13) says that clause-initial elements provide their clause(-complex) with a framework within which their Rheme can be interpreted. The 'framework,' however, is another term for nominative function or topic. Consider the following example in Thomson (1998b: 13). The Theme is bold-faced.

(15) (i) **Kanojo-wa** sô itte, (ii) kubi-o furi
(**she-PT**/that/say+and,/ head-OCC/shake+and)
(iii) seki-kara tachiagatte,
(seat-from/stand+up+and,)
(iv) totemo sutekina egao-o boku-ni muketekureta.
(very/nice/smile-ACC/I-LOC/showed.)
'(i) **She** said that and (ii) shook her head, (iii) stood up from the seat and (iv) gave me a very nice smile.'

In this example, the phrase *kanojo-wa* is assumed to function as Theme for the whole clause-complex. This is because *kanojo-wa* provides all of the constituent clauses of the clause-complex with the Actor to be described in those clauses or with a nominative entity to be talked about in the clauses. Thomson's Theme realizes topic function.

Peg Function: Thomson's Theme also realizes peg function. Thomson (1998b: 19) gives the following example. The peg Theme is bold-faced.

(16) (i) Omakeni boku-wa koi-o shiteite,
(In+addition+to+it/I-PT/romantic+feeling-ACC/have+and,)
(ii) **sono koi-wa** hidoku yayakoshii basho-ni boku-o hakondeita.
(**that/romantic+feeling-PT**/terribly/complicated/palce-LOC/I-ACC/had+brought.)
'In addition to it, I fell in love with her, and **my loving heart** had brought me to a terribly complicated situation.'

The phrase *sono-koi-wa* hangs clause (ii) on clause (i) by referring to *koi* in clause (i). The Theme in example (15) also realizes peg function. The text-initial *wa*-phrase in (15) refers to the nominative entity introduced earlier at initial position in the paragraph in which example (15) appears. The initial part of the paragraph is already given as example (12) above. '*Kanojo-wa*' in (15) refers to the nominative entity '*maeto-onaji suchuwâdesu-ga*' in (12), and realizes both topic and peg function.[11]

Departure Function: Thomson attempts to describe what clause-initial-ness means in functional terms. According to her, point of departure is "movement away from the point of departure," which creates "directionality that is going somewhere." And she goes on to claim that the "destination is the Rheme" (Thomson, 1998b: 12). But she fails to explicitly explain the significance of clause-initial-ness itself, to which I will come back later.

Characteristic 2
It should be noted that when a Theme cannot be found, Thomson recovers it as a (coreferential) 'zero' at initial position in the clause. Consider the following example, taken from Thomson (1998b: 14). Coreferential zeros are bold-faced.

(17) (i) Boku-wa kao-o agete,
(I-PT/face-ACC/lift+and)
(ii) **[zero]** hokkai-no-jôkû-ni ukanda kurai kumo-o nagame,
(northern-sea-GEN-sky-LOC/float/dark/clouds-ACC/watch+and)
(iii) **[zero]** jibun-ga kore-made-no-jinsei-no-katei-de ushinattekita
ôku-no-mono-mo [sic—KN] koto-o kangaeta.
(I-NOM now-until-GEN-life-GEN-process-in/have+lost/
many-GEN-things-even/things-ACC/thought)
(iv) **[zero]** Ushinawareta jikan, shini aruiwa satte-itta hitobito,
mô modoru koto-no-nai omoi [kôiu koto-o kangaeta]
(lost/time,/died/or/gone/people,never/return/thing-GEN-not+exist/
feeling/[these/things-ACC/thought])
'(i) I lifted my head and (ii) **[I]** looked at the dark clouds floating in the sky over the northern sea and (iii) **[I]** thought about the many losses in my life up until now. (iv) **[I]** [thought about the following things:] time which was lost; people who are dead or gone; feelings that do not return.'

I will give critical comments on Thomson's approach in the next section.

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[11] It should be noted the phrase *sono koi-wa* in (16) also realizes topic function in clause (ii).

2.3. Four Comments and Summary

I will summarize the four attempts through four comments on Thomson's attempt.

Comment 1: Clause-initial elements do not always realize topic function, which is already demonstrated by Hori's examples. Departure and topic function should be regarded as two independent functions, as Sasaki's analysis suggests.

Comment 2: As Tsukada's approach suggests, peg and topic function should also be regarded as two independent functions. These two functions are often conflated with each other. Indeed, most *wa*-phrases we have seen realize both peg and topic function. But they are realized separately when a circumstantial element *partially* refers to what has gone before in the text. In this case, the circumstantial element realizes peg function and is given in a *wa*-phrase, and the topic is typically given in a nominative *ga*-phrase. Consider the third clause in the example below, which is taken from Kubota (2001). The peg Theme is bold-faced, and the nominative phrase underlined.

(18) (i) Fukamaru aki-no-hi-o uke-nagara,
(deepening/autumn-GEN-day-ACC/having+it+behind-while,)
(ii) Kaijô Jieitai-no-kankanshiki-ga Sagami-wan-jô-de okonawareta.
(Maritime/Self+Defense+Force-GEN-naval+review-NOM/Sagami-Bay-on-LOC/was+held.)
(iii) Nisshôki-ga hirugaeru **goeikan *Shirane*-no-kankyô-ni-wa,** jieitai kôkan-o shitagaeta môningu-sugata-no-Murayama-san-ga tatteita.
(flag+of+Rising+Sun-NOM/flap/**escort+ship/Shirane-GEN-bridge+deck-LOC-PT**,Defence+Force/high+officials-ACC/be+accompanied+by/morning+suit-appearance-GEN-Murayama-Mr-MON/was+standing.)

'(i) Having a deepening autumn day as its background, (ii) a naval review of [Japan's] Naval Defense Force was held on Sagami Bay. (iii) **On the bridge deck of the escort ship *Shirane*,** where the flag of the Rising Sun was flapping, Mr. Murayama, dressed in a morning suit, was standing, accompanied by some high ranking officials of the Defense Force.'

The circumstantial element 'on the bridge deck of the escort ship *Shirane*' in (iii) partially refers to the 'naval review' in (ii),[12] and is given in a *wa*-phrase. Hung on what has gone before in the text, clause (iii) is then given a topic by the nominative phrase '*môningu-sugata-no-Murayama-san-ga.*'

Given Comments 1 and 2, it can be said that there are at least two types of Theme in Japanese: peg Theme and topic Theme. Peg Theme relates the clause to what has gone before in the text. Topic Theme provides the clause with an entity to be talked about in it.

Comment 3: Thomson's assumption that clause-initial elements are thematic in Japanese is not theoretically viable for two reasons. First, Thomson mistakes departure function (or Theme) for topic function. The clause-initial elements which are critically investigated from a textual point of view by Thomson (1998a, 1998b) are all normative entities, where departure function is interpreted as the directionality implied by the *experiential* content of a

[12] The rationale employed here is the assumption that the location of 'on the bridge deck of the escort ship *Shirane*' has already mentioned partially by the 'naval review'; thus the location is given as 'given' information.

Theme (e.g., Actor) towards its Rheme (Thomson, 1998b: 12). Text-initial elements may not be a nominative entity in Japanese, as Hori's examples suggest. The experiential directionality does not have to be inclicated at initial position in the clause. The scond reason is that if whatever occurs in initial position in the clause has to be thematic, a great portion of the text may have to be interpreted as thematic, where the notion of Theme would lose its explanatory power. Example(11) is one such example. Departure function may or may not be thmatic. Critical investigation is needed before this 'thematic' notion is applied to textual analysis in Japanese.

Comment 4: The notion of ellipsis allows Thomson to recover 'missing' topic Themes. But there is the possibility that the notion of ellipsis does not make sense in Japanese textual studies. First, as Hori's examples suggest, Japanese topic Themes do not need to occur in initial position in the clause; unlike English topical Themes, they do not have a fixed position for them to be realized in the clause. Second, Japanese topic Themes are not obligatory elements in the clause. They are realized in the clause only when they need to be realized (e.g., Horiguchi, 1995: Chapter 3; Nanri, 2001). In short, the Japanese topic Theme does not have a fixed position for its linguistic realization and is not an obligatory clausal constituent. Under these linguistic circumstances, the employment of the notion of ellipsis in Japanese textual studies does not make sense. Ikegami (1982: 20) says that only when the clause constituent under investigation is highly expected to occur in a fixed position in the clause does it make sense to assume that the constituent is ellipsed. This is because 'missing' topic Themes are not ellisped. They are simply not there. Thus coreferential 'zero' cannot exist.[13] The notion of ellipsis should not be employed in Japanese textual studies.

To sum up, there are at least two types of Theme recognizable in Japanese: peg and topic Theme. Theme may or may not appear at initial position in the clause. Whether or not clause-initial elements are thematic in Japanese needs further investigation. The employment of the notion of ellipsis in Theme identification is not acceptable. Coreferential 'zero' is an unnecessary grammatical category in Japanese.

The last point regarding 'zero' leaves us one urgent task: the treatment of Theme-less clauses. If nothing is allowed to be recovered, how can we account for the topic coherence found between Theme-less clauses? In (16), for instance, it is reasonable to assume that all the Theme-less clauses talk about *boku* (I) in one way or another. But if those clauses do not contain a topic Theme in any linguistic form, then how is it possible to explain that those clauses talk about *boku*? I will attempt to answer this question in the remainder of the paper.

3. Topic Theme-Process Association

Horiguchi (1995: Chapter 3) points out that the recovery of the same topic Theme in successively-occurring clauses makes the text unacceptable. I argued that coreferential zeros do not exist in Theme-less clauses. The only theory which satisfies these two conditions would be this: once a topic Theme is associated with its Process in the same clause, the same topic Theme is kept associated with the Processes in the non-rankshited clauses to follow until the text introduces a new topic Theme. Example (19), taken from Imaizumi (1997: 28-29), illustrates this. Topic Themes are underlined, and clause-final Processes in non-rankshifted clauses are bold-faced.

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[13] One still might want to argue that 'ellipsed' nominative phrases take a covert form zero. But if it is sheer zero, then such a grammatical category does not have to exist.

(19) (i) Shôsetsuka-ga genkôryô 500-en (...)-o **te-ni-ireru** tame,
(novelist-MON/manuscript+payment/500-yen-ACC/**obtain**/ for+the+purpose)
(ii) [shimekiri-ga sematta]-genkô-o hisshide **kaiteiru** tokoro+e,
([deadline-MON/close+at+hand]-manuscript-ACC/desperately/ **is+writing**/when)
(iii) tonarino-ie-kara jazu bando-no-renshû-no-sôon.
(next-house-from/jazz/band-GEN-practice-GEN-noises)
(iv) Monku-o ii-ni **itta**-hazu ga,
(complaint-ACC/convey-to/**has+gone**-intention/ but)
(v) [sono ie-no-okusan dearu] jazu shingâ-ni **kantaisarete**,
([that/house-GEN-wife/be]jazz/singer-by/**be+welcomed**)
(vi) bando-no-renchû-to isshoni **utai**
(band-GEN-members-with/together/**sing**)
(vii) **odotte** (viii) tanoshii toki-o **sugoshiteshimau**.
(**dance+and**/ enjoyable/time-ACC/**has+spent**)
(ix) **Kitakusuru**-to,
(**return**-when)
(x) tsuma-ga **shittoshite**, (xi) **fukigenna kao**.
(wife-MON/**become+jealous+and**,/**unpleasant/face**)
'(i) A novelist intends to **obtain** 500-yen for manuscript writing; for this purpose (ii) [he] **is** desperately **writing** a manuscript whose deadline is close at hand, and then (iii) the loud noise of a jazz band practice [is heard] from the next house. (iv) [He] **goes** next door to complain [about the noise] but (v) [he] **is welcomed** by the house wife-jazz singer [living in the house], and (vi) [he] **sings** together with the members of the jazz band, and (vii) **dances** and (viii) **spends** a nice time. (ix) When [he] **gets back home**, (x) [his] wife **has become jealous**, and (xi) **looks sullen**.'

In clause (i), the topic Theme *shôsetsuka-ga* 'a novelist' is associated with the Process *te ni ireru* 'obtain.' After this semantic association, the topic Theme continues to be associated with the Processes in non-rankshifted clauses that follow (i.e., 'is writing' in (ii), 'goes' in (iv), 'is welcomed' in (v), 'sings' (vi), 'dances' (vii), 'spends' in (viii), and 'gets back home' in (ix)), until a new topic Theme ('his wife') is introduced in the text. The organization of this text is graphically represented in Figure 1.

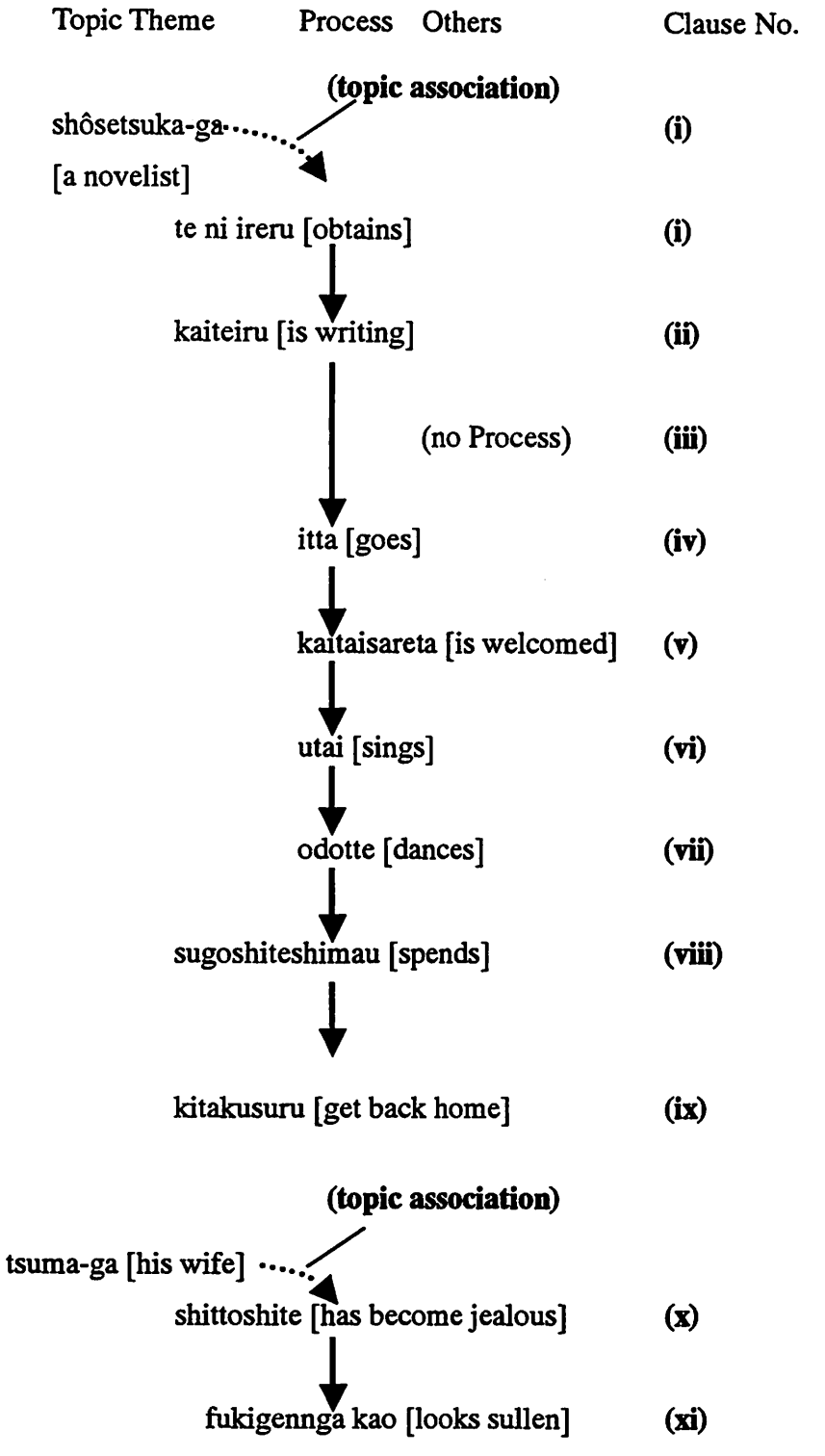

Figure 1. Organization of example (19)

The same theory of semantic association can be used to explain the topic coherence found in the first three clauses in (17). In clause (i), the topic Theme '*boku-wa*' is

associated with the Process '*agete*'. The same topic Theme is kept associated with the Processes '*nagame*' and '*kangae*' in clauses (ii) and (iii).

One little problem remains. How should the text-final three minor clauses in (17) be treated? Before I answer this question, I need to explain the binding function of Processes in Japanese.

3.1. Binding Function

A Process realizes 'binding' function in Japanese within the clause. The Process assigns experiential roles to entities and binds them together in a clause. Consider the following example.

(20)	John-ga	Nancy-ni	purezento-o	moratta.
	(John-NOM/	Nancy-LOC/	present-ACC/	received)
	Receiver	Giver	Goal	Process

'John received a present from Nancy.'

This clause introduces three entities: 'John,' 'Nancy' and 'a present'. 'John' and 'Nancy' are presented as the Receiver and Giver of the present respectively, and the present as a Goal. These experiential roles are determined by the Process, which is obvious when (20) is compared with (21) below.

(21)	John-ga	Nancy-ni	purezento-o	miseteageta.
	(John-NOM/	Nancy-LOC/	present-ACC/	showed)
	Receiver	Giver	Phenomenon	Process

'John showed Nancy a present.'

This clause is identical with clause (20) except for the clause-final Process. But in (21) 'Nancy' is presented as the Giver of the service of showing a present, 'John' as the Receiver of the service, and the present as a Phenomenon.

The point here is not the result of experiential role assignment, but the process of the assignment: that is to say, the process where the entities are semantically linked to the Process and converted into clause constituents. The Process binds clause constituents together. This binding function works as textual peg at the inter-clausal level, which I will show in the next subsection.

3.2. Process as Textual Peg

Having identified the binding function of the verb, we can now relate minor clauses to what has gone before in the text without recovering anything. Let us return to example (17), which is reproduced below as example (22). This reproduced text contains no recovered items. Minor clauses are bold-faced.

(22) (i) Boku-wa kao-o agete, (ii) hokkai no jôkû ni ukanda kurai kumo-o nagame, (iii) jibun-ga kore made-no-jinsei-no-katei-de ushinattekita ôku-no mono-mo [sic—KN] koto-o kangaeta. (iv) **Ushinawareta jikan**, (v) **shini aruiwa satte-itta hitobito**, (vi) **mô modoru koto no nai omoi**.

'(i) I lifted my head and (ii) looked at the dark clouds floating in the sky over the northern sea and (iii) thought about the many losses in my life up until now. (iv) **Time which was lost**, (v) **people who are dead or gone**, (vi) **feelings that do not return**.'

The last three minor clauses in this text can be regarded as functioning as Phenomena for the Process *kangaeta* 'thought' in the preceding clause (iii). Being assigned by this experiential function (i.e., Phenomenon) by the Process, those three clauses become part of clause (iii). Since clause (iii) is hung on what has gone before in the text by virtue of the topic Theme-Process association (which we have already seen), the last minor clauses are provided topic information, and become part of the text. The organization of the text in (22) is represented graphically in Figure 2.

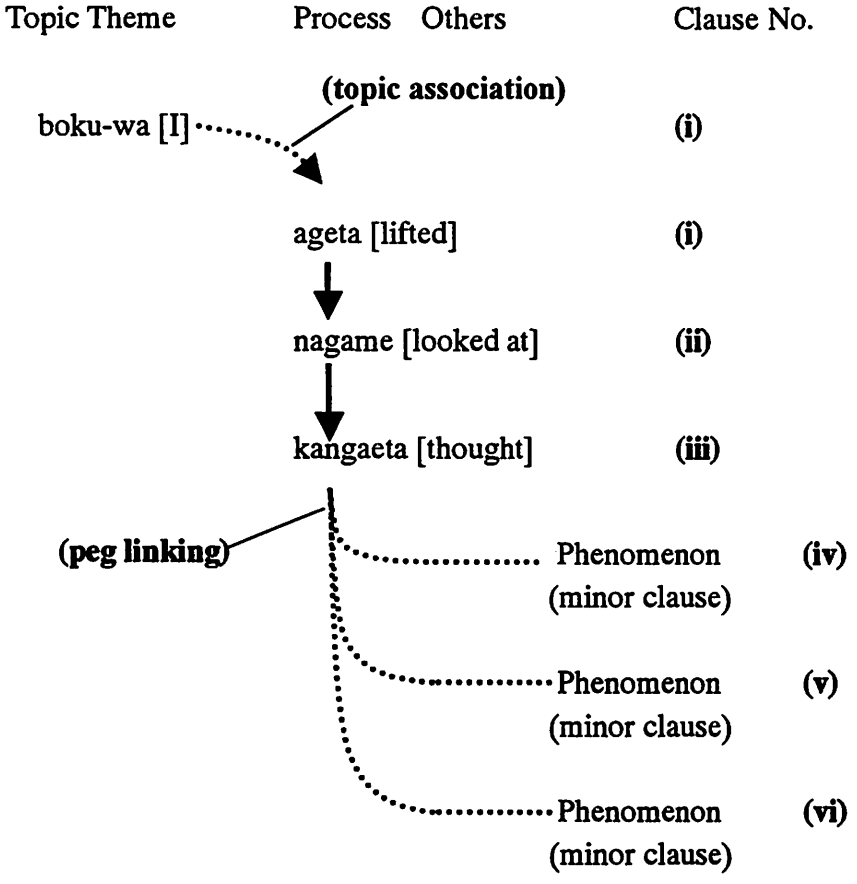

Figure 2. Organization of example (22)

4. Concluding Remarks

In the present paper, I first reviewed four notable attempts to identify Theme in Japanese. The review identified two types of Theme in Japanese: topic Theme and peg Theme. Topic Theme is realized by a nominative phrase, and provides the clause(-complex) with an entity to be talked about. Peg Theme is realized by a *wa*-phrase, and relates the clause(-complex) to what has gone before in the text. These two types of Theme often occur in initial position in the clause. When this is not the case, the clause-initial element may or may not be thematic.

I have also argued that the concept of ellipsis should not be employed in Theme analysis in Japanese. The employment of ellipsis in Theme analysis in Japanese inevitably requires the analyst to recover whatever s/he believes is missing, which may end up with

producing an unnatural text.

As a solution to the issue of ellipsis, I proposed the theory that the semantic association between a topic Theme and a Process is kept alive until the text introduces a new topic Theme and Processes realize textual peg function.

Systematic Process-Oriented Analysis Needed

To conclude the present paper, I would like to suggest the necessity to take a systematic Process-oriented approach to textual organization in Japanese.

Textually significant information can be encoded in clause-final Processes in many ways in Japanese. The peg function realized by clause-final Processes that we saw in the previous section is just one such way. To give a few more examples, I would list the following: (1) the degree of politeness, (2) modality, and (3) giving-receiving.

The Japanese language has developed a very complex system of honorification, which is most importantly realized in clause-final Processes. According to Hori (1995), those interpersonally-shaded Processes incorporate topic information and can actively participate in textual organization without realizing a topic Theme.

According to Maynard (1997: Chapter 6), certain modal or quasi-modal expressions (e.g., *noda, kotoda, daroo, to omou*) are closely associated with the provision of the writer's opinions in the genre of the newspaper column. Those (quasi-) modal expressions, which are attached to the right-hand side of the clause-final verb, also incorporate topic information and participate in constructing a rhetorical pattern in the text.

Giving-receiving expressions can be used to indicate who benefits from, and who performs, the action described in the clause without being accompanied by a topic Theme. A giving or receiving expression can also be attached to the right-hand side of the verb. The resulting clause-final compound verb also can participate in textual organization. Consider the following example, taken form Ototake (1998: 10). The giving verb is bold-faced.

(23) (i) [...] boku-no-ryôshin-wa, kesshite sonna koto-wa shinakatta.
(I-GEN-parents-PT,/never/such/a+thing-PT/did+not+do.)
(ii) Kinjo+no+hito-ni boku-no-sonzai-o shittemoraooto,
(neighbors-LOC/I-GEN-existence-ACC/to+let+them+know.)
(iii) itsudemo boku-o tsureteitte-**kureta.**
(always/I-ACC/take+around-**gave(to me)**.)
(iv) Imadekoso jûsû-senchi-no-te+ashi-ga aru ga,
(Now/ten+and+some-centimeters-GEN-hands+feet-NOM/I+have but,)
(v) tôji-wa dôtai-ni jagaimo-no koronto kuttsuiteiru-yôna mono.
(at+that+time-TP/body-LOC/potato-GEN/very+modestly/attached-appearance/entity.)
(vi) Kuma+no+nuiburumi-no-yôde, tachimachi kinjo-no-ninkimono-to natta.
(teddybear-GEN-like,/instantly/neighbors-GEN-popular+person-into/became.)

'(i) My parents never did that. (ii) To let the neighbors know about me, (iii) [they] always took me around **for my benefit** [whenever they went out]. (iv) Now [I] have hands and legs about fifteen centimeters long, but (v) at that time, [they] were like small potatoes attached to my body. (vi) [I] looked like a teddy bear, so [I] instantly became popular among the neighbors.'

Before the introduction of the compound verb '*tsureteitte-kureta*' (lit. gave me the service of taking me) in clause (iii), the text talks about 'my parents.' But after the introduction of the verb, it talks about 'me.' This shift in story line development is not indicated by the introduction of the topic Theme 'hands and legs about fifteen centimeters long' in (iv), but by the introduction the verb *kureta* in (iii).

Textually significant information can be presented at initial position in the clause. But it also can be presented at final position in the clause in Japanese. As suggested above, grammatical resources available for textual organization in the latter case are very rich. They might be even richer than the former case, which needs to be investigated systematically for the better understanding of textual organization in Japanese.

Theme-oriented textual analysis and clause-final Process-oriented textual analysis must be complimentary to each other. We cannot make any further progress in Japanese textual studies with the former analysis alone.

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JASFL Occasional Papers Volume 3 No. 1 2004

A Comparative Analysis of Various Features Found in Newspaper Editorials and Scientific Papers, Including 'Identifying Clauses'

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Abstract

In this paper, we seek common or different features shared by two powerful registers of 'newspaper editorials' and 'scientific papers' referred to in the papers by Trew (1979),Jenkins (1990), Fowler (1991), Halliday & Martin (1993), Halliday (1998), Imamura (2003) etc. One of the most common features shared by the two registers is that the Relational clauses, especially, the Identifying clauses, are very rich in either of the two. The Identifying clauses can easily have 'nominalization forms'. They are also peculiar in that they are reversible, namely, 'A is B.' can be reversed into 'B is A.'

However, our examinations of two kinds of newspaper editorials represented by *The Washington Post* and *The New York Times* and the most prestigious scientific journal, *Nature*, indicate that there is a big gap between the two registers in terms of frequency rate of nominalizations. The Relational processed clauses of the newspaper editorials are 193 out of 545 clauses (35.4%) , but those of the scientific journal are 280 out of 596 clauses (47%). The reason is that the scientists of *Nature* use a particular type of constructions called 'Verbalized relators' (Halliday, 1998: 218). The construction of 'Verbalized relators' can change congruent clauses into identifying clauses.

We conclude that scientific papers should have more necessity of forming identifying clauses, which lead to much more occurrences of 'Verbalized relators' constructions, which certainly serve to make scientific papers more depersonalized, rational and objective. Instead, newspaper editorials should use much more interpersonal functioning elements and more inter-clausal conjunctions to make up for the shortage of identifying clauses. Otherwise, newspaper editorials would lose their persuasive power.

1. Aim

In this paper we try to make it clear that there are some common or different features between two powerful registers, newspaper editorials and scientific papers. One of the common features is 'Nominalization' or 'Grammatical Metaphor'. It seems to us that newspaper editorials are a typical writing mode (Harvey, 2001; Imamura, 2003; Jenkins, 1990) showing that language is for power or ideology. On the contrary, scientific papers are also a discursive writing mode, but are required to present solid evidence supporting their arguments. However, the two registers definitely seem to assume their interests to be to 'depersonalize the discourse and give it a spurious air of being rational and objective' (Halliday, 1993:84). We will discuss the common or different features of the two registers

based on the three metafunctions (Halliday, 1994) on the lexicogrammatical stratification. They are Ideational, Interpersonal and Textual metafunctions. We will discuss the three metafunctions one by one in the sections of review or discussion or hypothesis.

2 Review

2.1. The Ideational metafunction

'The Ideational metafunction uses language to encode our experience of the world and to convey a picture of reality' (David Butt et al., 1995:13). In other words, the metafunction is concerned with the linguistic operations of our mind in which we should form or structure our experiences or our ideas in language. Halliday assumes that there should be six kinds of 'Processes', which are called 'Verbs' in the traditional grammar. The six Processes are defined as the notion of 'Transitivity' (Halliday, 1994). From the Transitivity point of view we have already noticed which process might be often used in what type of register. For example, 'Material' Process is most often used in stories for children. Two Processes, 'Material' and 'Relational', are very often used in ordinary novels. Generally speaking, the Relational Process is very much distinctive in terms of frequency in newspaper editorials (Trew, 1979; Jenkins, 1990; Fowler, 1991; Imamura, 2003). It is very true with scientific papers (Halliday & Martin, 1993; Halliday, 1998). The Relational processes constitute two types of clauses: 'Attributive Clauses' and 'Identifying Clauses'. Identifying Clauses are the typical writing mode representing the Grammatical Metaphor. Two 'Participants' of these clauses (A or B of a clause 'A is B.') are often nominalizations and can be reversible. 'A is B.' can become 'B is A.' In other words, the relationship between A and B in the clauses is 'tight fit' or 'impenetrable' from outside, say, from readers (Harvey, 2002:388). In newspaper editorials this type of the Identifying Clauses is cleverly used (Imamura, 2003).

2.2. The Interpersonal metafunction

The Interpersonal metafunction is usually realized by three types of expressions in English : Modal Finite (can, could, etc.) , Modal Adjunct (probably, clearly, etc.) , and Modal Predicate (be believed to, be capable, etc. including seem, etc.). The metafunction is closely related with the notion of 'Modality'. The function of this notion is that any utterance or paper can be subdued or fuzzy, sounding very personal or subjective. It seems to us that there is some misconception towards scientific papers among laymen, who tend to think that all the scientific papers are always explicit and objective. However, it is not true. Scientific papers as well as the newspaper editorials use many words or phrases of Modality (Oshima, 1996).

2.3. The Textual metafunction

The Textual metafunction is concerned with two main topics: thematic development of a text and cohesion of a text. *Cohesion in English* (Halliday and Hasan (1976)) reveals that there are five kinds of linguistic mechanism of keeping English texts cohesive: reference, substitution, ellipsis, conjunction and lexical cohesion. We will focus on four categories of the inter-clausal conjunctions: additive, adversative, causal and temporal. It is interesting for us to notice that newspaper editorials often use adversative conjunctions (however, but, etc.) and that their use of these conjunctions are subjective or 'internal' (Halliday & Hasan's term) , not objective or 'external' (ibid) (Oshima & Takahashi, 1996). We are again afraid that laymen are not interested in the two distinctions of 'internal' and 'external'. However, it

would be important for us to be very careful of the two distinctions.

3 Hypotheses

As we have said, we try to make it clear what features might be shared by the two registers, newspaper editorials and scientific papers, and what features might be differentiated between the two registers. We have assumed three pieces of hypotheses based on the three metafunctions of Ideational, Interpersonal, and Textual.

The first hypothesis is in regard to the Ideational metafunction.

(1) Both newspaper editorials and scientific papers should show some similarity in terms of frequency rate of Relational clauses.

Relational clauses have two types of clauses, Attribute Clauses and Identifying Clauses. Identifying Clauses are rich in Nominalizations or 'Grammatical Metaphor', since they look rational or objective.

The second hypothesis concerns the Interpersonal metafunction. The writers of both newspaper editorials and scientific papers are always consciously or unconsciously very keen to the response of their readership.

(2) The writers of newspaper editorials should use more Modality related elements than those of scientific papers, although the latter should also try not to impose on the reader.

Newspaper editorials should be persuasive and need some solidarity with their readers. This is true with written language and even with scientific papers. As Barton (1995:222-3) says, 'this conception of argument as an interactive social collaboration rather than a pure intellectual competition may underlie aspects of argumentation in written language as well'.

The third hypothesis is related with the Textual metafunction, especially with inter-clausal conjunctions.

(3) Newspaper editorials should use many more inter-clausal conjunctions to establish some solidarity with readership, while scientific papers should also use inter-clausal conjunctions to make the papers look logical or plausible.

We do notice that the writers of newspaper editorials have used adversative conjunctions in an 'internal' or subjective way, although the editorials may look logical, but subjective. There is no reasonable relationship of the opposition between the previous clause and the present one. On the contrary, scientific papers should be basically discursive and need to show the sequence of cause and result in their arguments. In that environments, they are expected to use 'Causal' type of inter-clausal conjunctions.

4 Results and Arguments

We examined *The Washington Post* and *The New York Times* for the newspaper editorials, and *Nature* for scientific papers. We obtained these results for each of the three metafunctions.

Table (1) Results of the three metafunctions

	Newspaper editorials (*W.P., NY Times*) (12,000 words)	Scientific papers (*Nature*) (12,577 words)
Relational process	193 / 545 (35.4%)	280 / 596 (47%)
Modality elements	228	71
Inter-clausal conj	157	51

Judging from the above results, we have observed at least three things. One of our three findings is that the newspaper editorials show a much lower frequency rate of the Relational process than the scientific papers, although we have so far observed the higher frequency rate of this process which is almost 50% in newspaper editorials. The second is that the newspaper editorials have much more Modality related elements than the scientific papers. The third is that the inter-clausal (inter-sentential) conjunctions in the newspaper editorials are also much more than in the scientific papers. We think that the lower frequency of the Relational process could entail the less occurrence of nominalization, which might result in the lack of persuasive power, since the nominalizations are very effective in persuading the readers to agree to their particular ideologies. We wonder how the newspaper editorials can make up for the lower frequency rate of the nominalizations to maintain their persuasion. At the same time we wonder why the occurrence of the inter-clausal (inter-sentential) conjunctions as well as the Modality related elements is much less in the scientific papers than the newspaper editorials.

One of the answers to these questions might come from our new finding. That is about a new concept, 'Verbalised Relators' (Halliday, 1998:218). Their frequency figures of the two registers indicate a big gap ; 134 instances for scientific papers vs. 18 ones for newspaper editorials in terms of the frequency rate of 'Verbalised relators'. Before we discuss the verbalized relators in detail, we will have to examine whether the results could justify our three hypotheses. Our first hypothesis is as follows.

(4=1) Both newspaper editorials and scientific papers should show some similarity in terms of frequency rate of Relational clauses

Our conclusion to this is that this hypothesis cannot be proved, since we have to admit that there is a big difference between the two registers in terms of the frequency rate of Relational clauses. We have to conclude that scientific papers have to maintain nominalization as much as possible, since scientific papers have much stronger necessity to be rational and objective. This is very true with our data, which are from *Nature*, the most prestigious journal of science in the world. A spurious argument or analysis would be out of the question in this journal. In that sense, merely rhetorical kinds of arguments could not be penetrated into this kind of scientific paper.

Our next answer is to the following hypothesis.

(5=2) The writers of newspaper editorials should use more Modality related elements than those of scientific papers, although the latter should also try not to impose on the reader.

The following table shows the detailed result of Modality related elements found in the two registers.

Table (2) Detailed results of Modality related elements

	Newspaper Editorials	*Nature*
Modal Finites	191 (83.8%)	43 (60.67%)
Modal Adjuncts	14 (6.1%)	16 (22.5%)
Modal Predicates	23 (10.1%)	12 (16.9%)

The results in Table (2) can be further analyzed as shown in Tables (3) and (4).

Table (3) Actual instances of Modality related elements found in Newspaper Editorials

Modal Finites		Modal Adjuncts		Modal Predicates	
will	40	perhaps	2	seem	10
should	27	rightly	2	appear	6
must	24	always	2	possible	2
could	21	probably	1	most likely	2
can	19	indeed	1	likely	1
would	17	really	1	unlikely	1
have to	12	precisely	1	true	1
may	12	obviously	1		
need to	10	unfortunately	1		
might	8	to no one's surprise	1		
ought to	1	usually	1		

Table (4) Actual instances of Modality related elements found in *Nature*

Modal Finites		Modal Adjuncts		Modal Predicates	
can	12	probably	5	seem	4
should	7	surprisingly	2	possibility	2
will	6	approximately	2	necessary	2
may	5	roughly	1	possible	1
would	3	nearly	1	uncertain	1
could	3	perhaps	1	likelihood	1
cannot	3	often	1	likely	1
might	2	interestingly	1		
must	2	certainly	1		
		most notably	1		

The three Tables (2), (3), and (4) indicate that the hypothesis could be justified and that there are at least three big differences between the two registers in terms of Modality related elements. The first difference is that the biggest gap is in the Modal Finites. That is, Newspaper Editorials have 191 instances belonging to this category, but *Nature* has 43. The second difference is that the most often used Modal Finites (modal auxiliaries) are related with those of obligation or necessity in the newspaper editorials (*should, must, have to, need to, ought to:* 74 instances (38.7%)). However, those of *Nature* are 9 instances (20.9%). The third difference, surprisingly, is that the second most used Modal Finite is *must*, which is the strongest one in the scale of obligation. Taking these facts into consideration, we could conclude how stronger newspaper editorials' desire for power or ideology is than scientific papers like *Nature.*

It also seems to be well-known that even scientific papers express their statements indirectly to alleviate their arguments or to try to establish some solidarity with their readers. One good linguistic device for that purpose is a 'two-part structure' (Barton, 1995:231) such as *'of course ...but', 'to be sure ... but' 'true enough ... but'* etc. This kind of linguistic device is claimed to be on the borderline between Modality and Texture (Barton). However, it is obvious that newspaper editorials have much more Modality related elements (228) than scientific papers (71). Modality related elements might basically appeal to the hearts of their readers, which would not work in an awfully academic world, say, papers in *Nature.* Essentially science is not a rhetoric-creating world.

The third hypothesis is like this:

(6=3) Newspaper editorials should use much more inter-clausal conjunctions to establish some solidarity with readership, while scientific papers should also use inter-clausal conjunctions to make the papers look logical or plausible.

The next tables seem to show that the third hypothesis is also proved.

Table (5) Actual instances of inter-clausal (inter-sentential) conjunctions found in the two registers

	Newspaper Editorials	*Nature*
Additive	68 (43.3%)	26 (51.0%)
Adversative	69 (43.9%)	15 (27.5%)
Causal	3 (1.9%)	4 (7.8%)
Temporal	17 (10.8%)	6 (11.8%)

Table (6) Actual inter-clausal (inter-sentential) conjunctions found in newspaper editorials

Additive		Adversative		Causal		Temporal	
and	36	but	45	therefore	1	then	5
also	21	however	5	thereby	1	until now	2
and then	2	yet	4	otherwise	1	at the same time	2
in other words	2	actually	3			in the end	1
either~or~	2	at least	3			in the meantime	1
nor	1	instead	2			up to now	1
or	1	rather	2			at first	1
still	1	and yet	1			since then	1
in short	1	despite	1			first	1
on top of	1	at the very least	1			second	1
		in this case	1			meanwhile	1
		nevertheless	1				

Table (7) Actual inter-clausal (inter-sentential) conjunctions found in *Nature*

Additive		Adversative		Causal		Temporal	
in addition	4	however	7	therefore	3	finally	1
also	4	in contrast	5	consequently	1	first	1
thus	4	by contrast	1			next	1
similarly	3	nevertheless	1			at this moment	1
moreover	2	actually	1			then	1
briefly	1					thereafter	1
likewise	1						
more generally	1						
in these pictures	1						
in the present experiments	1						
as such	1						
in this instance	1						
in these experiments	1						
for example	1						

The results seem to show that our third hypothesis is also proved, since the occurrences of inter-clausal (inter-sentential) conjunctions in Newspaper Editorials or *Nature* indicate a huge gap. Our second finding is that the highest frequency rate is Adversative in newspaper editorials and that the highest one is Additive in scientific papers like *Nature*. Thirdly we found that the frequency differences between the first and second ranked category are small in the newspaper editorials and that those in the scientific papers are very big. In the newspaper editorials Adversative, the highest frequency rate, is 43.9% and Additive, the secondly highest one, is 43.3%. On the contrary, in the scientific papers, Additive, the highest frequency rate, is 51.0% and Adversative is 27.5%. These differences might allow us to conclude that newspaper editorials intrinsically manipulate their readers to make them agree to their ideologies by repeating or qualifying particular ideologies, where many kinds of Adversative or Additive inter-clausal (inter-sentential) conjunctions could work very effectively. We had also predicted that scientific papers should have much more Causal inter-clausal conjunctions. However, it is not supported by our examinations. The scientific papers have the smallest frequency rate of Causal, which is 7.8%. Nevertheless, this percentage of the Causal is still significant, compared with that of the newspaper editorials (1.9%).

We have come back to our fourth finding. That is, there is a big difference between newspaper editorials and scientific papers with respect to 'Verbalized Relators' as the following table shows.

Table (8) Actual occurrences of verbalized relators

Newspaper Editorials	*Nature*
18	134

The following example explains what the verbalized relators would be like.

(7) (a) Since she had regularly come back to her adopted motherland, she eventually published her first book about it.
(b) Regular trips back to her adopted motherland have resulted in her first book.

In the congruent clause-complex of (7-a), the conjunction, 'Since' is used to connect the two clauses. However, the highly nominalized clause of (7-b) has no conjunctions, but instead it uses the verbal group 'have resulted in' to connect the two nominal groups, 'Regular trips back to her adopted motherland and her first book. In that sense, 'resulted in' of the verb phrase is functioning as a sort of connective of the two groups. That is why this is called 'Verbalized relators'. This is a list representing eleven kinds of Verbalized relators.

(8) 'Verbalized relators' listed in (Halliday, 1998:218, Halliday, 1994:123, Halliday, 1993:91)
① Additive: *accompany, complement, combine with,* ... (Inter-clausal conjunctions)
② Alternative: *replace, alternate with, supplant,* ... (Inter-clausal conjunctions)
③ Adversative: *contrast with, distinguish,* ... (Inter-clausal conjunctions)
④ Causal: *accompany, arise from, cause, lead to,* ... (Inter-clausal conjunctions)
⑤ Temporal: *anticipate, co-occur with, follow, precede,* ... (Inter-clausal conjunctions)
⑥ Comparative: *approximate, compare with, resemble, simulate,* ... (Intra-clausal conjunctions)
⑦ Concessive: *conflict with, contradict, preclude,* ... (Intra-clausal Conjunctions)
⑧ Conditional: *apply to, be associated with, correlate with,* ... (Intra-clausal conjunctions)
⑨ Projecting: *deduce, prove, suggest,* ... (Projection)
⑩ Symbolizing: *define, mark, signal,* ...
⑪Identifying: *be, call, constitute, correspond to, express, mean, refer to,* (Nominalization)

(9) New 'Verbalized relators' found in *Nature*
① Additive: *be positioned,* ...
② Causal: *increase, prevent produce, prove, result in, result from, yield, provide, induce, be composed of, provide, create, span,* ...
③ Conditional: *dissociate into,* ...
④ Projecting: *indicate, hold, imply,* ...
⑤ Symbolizing: *show, reveal, demonstrate,* ...
⑥ Identifying: *be converted to be identified, be attributed, become, establish, be related to, involve, exhibit, feature, be translated, be manifested, remain, be described,* ...

These examples are actual instances of the use of Verbalized relators.

(10) Congruent clauses and Verbalized relator clauses
① (a) Semiconductors can conduct electricity better than insulators and less well than conductors.
(b) Their ability to conduct electricity is intermediate between conductors and insulators. (Martin, 1993:235-6)
② (a) When laser treatment reaches its effective limit , no further change of the structure can be observed.
(b) Beyond this point, continued laser treatment at the same intensity results in no observable change of the structure. (*Nature*, Vol.421, 2003:926)
③ (a) The 50-80 KeV ENA emissions are documented here. They are a small fraction of the total ENA emissions at all energies.
(b) The 50-80 Kev ENA emissions documented here represent a small fraction of the total ENA emissions at all energies. (*Nature*, Vol.421, 2003:922)

④ (a) The more species there are, the lower the mean PLD at local sites.
(b) Species richness was negatively correlated with mean PLD at local sites. (*Nature*, Vol.421,2003:935)

We could say that a much greater frequency of the Verbalized relators (134) in scientific papers leads to many more Relational clauses than those (18) in newspaper editorials. To make up for this much shortage of Relational clauses in newspaper editorials, but still to maintain their persuasive power, newspaper editorials have to rely on Modality related elements (*will, should, could, need, must, can,* may, seem,...) or on inter-clausal (inter-sentential) conjunctions (*but, however, also, actually, yet,* ...) as we have already seen.

5 Conclusion

In this paper, we have compared the two types of registers, newspaper editorials and scientific papers. In other words, we have examined what features are shared between the two registers and what features are differentiated. It seems to be well-known that nominalizations are rich in either of the two registers. It is also clear that the goal or purpose of the respective registers are very different. To sum up what we have studied about these topics, we might present two conclusions.

(i) Scientific papers are significantly more abundant in using nominalizations than newspaper editorials, since the constructions of nominalization allow scientists to describe their arguments in a rational or objective way. Nominalization constructions are much used to make identifying clauses. A typical one is 'A is B.' A/B is/are usually realized by nominalizations. The counterpart of the congruent type for this nominalization could be 'A. So B.' In the nominalization form, however, A is connected by B without a conjunction. The conjunction can be replaced by verb *'be.'* Besides, many kinds of 'Verbalized relators' very often replace conjunctions, which greatly serve to create nominalization constructions and to make scientific papers depersonalized, rational and objective.

(ii) Newspaper editorials are less abundant in using nominalization or 'Verbalized relator' than scientific papers, which might weaken the persuasive power of newspaper editorials. To make up for it, however, newspaper editorials have to use many more Modality related elements or inter-clausal (inter-sentential) conjunctions to maintain the manipulating power.

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JASFL Occasional Papers Volume 3 No. 1 2004

Constructions of Figures*

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Abstract

In the layer of semantics a sequence, a complex of figures, develops on the basis of three kinds of logico-semantic relations of expansion. Therefore, its development pattern comprises not only a temporally sequential one, which has been considered to be the typical case of sequence, but also a spatially concurrent pattern, and the pattern of not developing spatio-temporally but describing different aspects of the same entity, etc. These patterns are often intricately combined with each other to form the ideation base of texts. I discuss this problem by examining and rearranging the concepts and examples presented in IFG and CEM, and present another view on the ideation of constructions of figures and of texts.

1. An overview
1.1. Element, Figure, Sequence

First I will look at the preceding discussions briefly. The Part II of Halliday & Matthiessen (1999) (CEM, hereafter) discusses the ideation base concerning "how the phenomena of our experience are construed as categories and relationships of meaning"(p.48ff.). There they say that the most general category about human experience, a phenomenon, consists of three entities of **element**, **figure**, and **sequence**, and that a figure in the semantics is typically realized by a clause in the lexicogrammar. (An element that constitutes a part of a figure is realized by a group and/or a phrase, and a sequence of figures by a clause complex.) In contrast to figures, which are constructional and configurational units, sequences are not constructional units but of relational organization. The representation of a sequence is such as "A then B then C then D ...". This **temporal sequence** is the typical pattern of a sequence, and its sample is a series of "culinary operations", that is a recipe (p.119-20).

From the viewpoint of logico-semantic relations between figures, the temporal sequence is regarded as enhancement of expansion (p.117). According to CEM, "expansion and projection are trans-phenomenal categories in the sense that they are manifested over the system as a whole" (p.127). Therefore, it is quite reasonable to apply the device of expansion to various realization cases from context to semantics as well as cases from semantics to lexicogrammar.

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* This paper is a revised and modified version of the paper presented at the Autumn Conference of Japan Association of Systemic Functional Linguistics held at Tohoku University on October 7th, 2001.

1.2. Expansion in IFG

The concept of **expansion** was first presented as one of the relationships of modification between clauses in Halliday (1994: 7.2/p.218ff.) (IFG, hereafter). Here I will outline IFG's definition of three subcategories of expansion with examples (7.2/p.220 and 7.4/p.225ff.). (The prototypes are cited from Table 7(2); I omit hypotactic examples in order to understand the paratactic prototypes.)

1. **Elaboration** ('i.e.'): one clause expands another by elaborating on it (or some portion of it): restating in other words ((i) exposition), specifying in greater detail ((ii) exemplification), or adding an explanatory comment ((iii) clarification).
2. **Extension** ('and, or'): one clause expands another by extending beyond it: adding some new element ((i) addition), giving an exception to it, or offering an alternative ((ii) variation).
3. **Enhancement** ('so, yet, then'): one clause expands another by embellishing around it: qualifying it with some circumstantial feature of time ((i) temporal), place ((ii) spatial), means or comparison ((iii) manner), cause or condition ((iv) causal-conditional).

(1)(a) John didn't wait; he ran away. (prototype; clarification)
(b) That clock doesn't go; it's not working. (exposition)
(c) We used to have races—we used to have relays. (exemplification)
(d) Your face is the same as everybody else has—the two eyes so, nose in the middle, mouth under. (exemplification)
(e) Alice could only look puzzled: she was thinking of the pudding. (clarification)
(2)(a) John ran away, and Fred stayed behind. (prototype; addition: positive)
(b) I breed the poultry, and my husband looks after the garden. (addition: positive)
(c) They don't give any instructions, nor would it help if they did. (addition: negative)
(d) Don't stand there chattering to yourself like that, but tell me your name and your business. (variation: replacive)
(3)(a) John was scared, so he ran away. (prototype; causal-conditional: cause^effect)
(b) The three soldiers wandered about for a minute or two, and then quietly marched off after the others. (temporal: later time)
(c) Alice looked up, and there stood the Queen in front of them. (spatial: same place)
(d) Keep on subtracting the difference, and in that way you will arrive at the correct figure. (manner: means)
(e) The ends of his mouth might meet behind, and then I don't know what would happen to his head. (condition: positive)

2. Reconsideration of expansion and a sequence

2.1. Expansion between figures

Although IFG presents the concept of expansion and its subcategories as the relations between clauses (within clause complexes), here I will consider them to be the ones between figures so that I can better explain complicated realization patterns from context to semantics. (I will assume congruent cases; i.e. that one figure is realized by one clause.)

Let us be more specific. Each of the five examples of elaboration (1a-e) shows two different semantic representations of one and the same contextual phenomenon. In (1a), 《John didn't wait》 and 《John ran away》 show the identical fact; only the former represents the latter meaning negatively. These two figures are cognitive variants of the same reality. What I should say about (1c, d) is that, in exemplification, the following figure elaborates not on the whole preceding figure but on an element of the figure. That is,

the preceding element is lexico-semantically tied to the following corresponding element. In (1c),《relays》 is a species (hyponym) of the genus《races》. In (1d),《two eyes》,《nose》, and《mouth》are parts (co-meronyms) of the whole 《your face》. It is highly probable that these lexico-semantic relations between elements affect the relations between figures and accordingly play an important role in meaning-making process in a sequence. (The concepts of hyponymy and meronymy are shown as types of lexical cohesion in IFG (9.5/p.330ff.). However, the relations made by these devices are quite ideational.)

Out of two distinguishable fragments of experience, extension forms their respective figures. In (2a), although two events 《John ran away》 and 《Fred stayed behind》 share the same context, the events are in themselves independent of each other. (Probably we can disregard two distinct events that occur in two different contexts, as they cannot form a coherent text.) In (2d), compared to the state of affairs《to stand there chattering to yourself like that》, 《to tell me your name and your business》 is a new and different event; they are not in apposition to each other like the cases of elaboration.

Like extension, enhancement forms two different figures out of their corresponding events. However, these events happen successively, not concurrently with each other. Example (3a) congruently realizes the successive events 《John was scared》 and 《John ran away》 onto their corresponding figures in semantics. There the relation between them is construed (or reconstrued) as a cause-effect relation and textually represented with a conjunction "so". (3c) is an example of temporal sequence though it is given as the case of spatial: same place. Although the events 《Alice looked up》 and 《there stood the Queen in front of them》 are concurrent in themselves (or rather, the Queen had been there before Alice looked up), when we see the situation from the meaning-making point of view, there is successiveness in these events. This is because, as we have empathy with Alice, it is just after Alice looked up that she noticed that the Queen was standing in front of her. This perspective is essential, because what we call 'event', 'state of affairs', or 'situation' is not the thing or fact in itself but the one captured by our cognition and social interaction. Presupposing that the stories of Alice are fiction, we imagine the context in which a plot unfolds and enjoy the goings-on. This is because we recognize and live our lives in the reality, whether tangible or not, on the psychological and social dimensions.

2.2. Reclassification of the subcategories of expansion

Now, based on the outline mentioned above, I will argue that in elaboration and extension the meaning of a sequence does not change if the two figures composing the sequence are permuted. That is, they still represent the same situation. On the other hand, in enhancement, a sequence makes a different meaning or becomes nonsensical if its figures are permuted. Again in (1a), even if the two figures 《John ran away》 and 《John didn't wait》 are put in this order, these cognitive variants still represent the same reality. In (2a), the two events 《John ran away》 and 《Fred stayed behind》 happen simultaneously, and it is not that one is motivated by the other, so that they also realize the identical situation if the order is changed. Meanwhile in (3a), 《John was scared》 not merely occurs earlier than but also causes 《John ran away》, and not vice versa. Therefore, if permuted, they would be nonsensical. I will give another example of enhancement such as a culinary text: "wash 6 potatoes, slice, and deep-fry". If its composing figures were permuted, they would produce quite an inedible dish![1] The above argument is tabulated in Table 1.

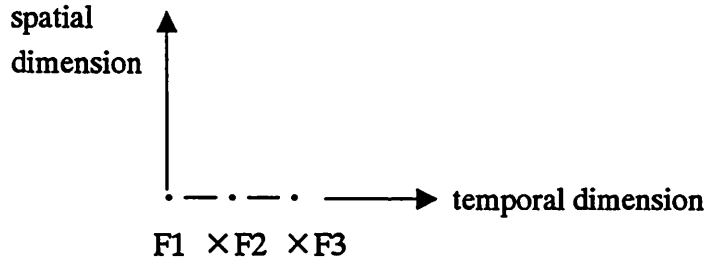
[1] I discussed the problem in detail in Sato (1998).

Table 1 Interrelation of complexes of figures with the subcategories of expansion and layers

expansion / layer	elaboration	extension	enhancement
context	Situation | Event ⇙ ⇘	Situation ⋀ Event 1 ‖ Event 2	Situation ⋀ Event 1→Event 2
semantics	Figure 1＊Figure 2 (=Figure 2＊Figure 1)	Figure 1＊Figure 2 (=Figure 2＊Figure1)	Figure 1 ^ Figure 2 (≠Figure 2 ^ Figure 1)
lexicogrammar	John didn't wait; he ran away. (=John ran away; he didn't wait.)	John ran away, and Fred stayed behind. (=Fred stayed behind, and John ran away.)	John was scared, so he ran away. (≠John ran away, so he was scared.)

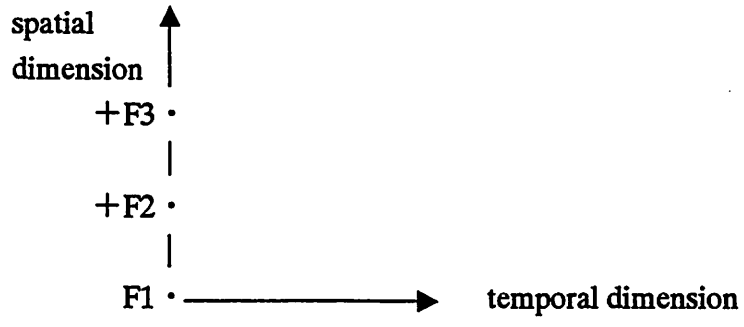
1 ‖ 2: 1 co-occurs with 2 1→2: 1 precedes 2 Event Figure: Event is realized by Figure
1＊2: one may put 1 & 2 in this order 1 ^ 2: one must put 1 & 2 in this order
('=' does not mean elaboration.)

I will also schematize Table 1. Each of the subcategories will be exemplified by further instances.



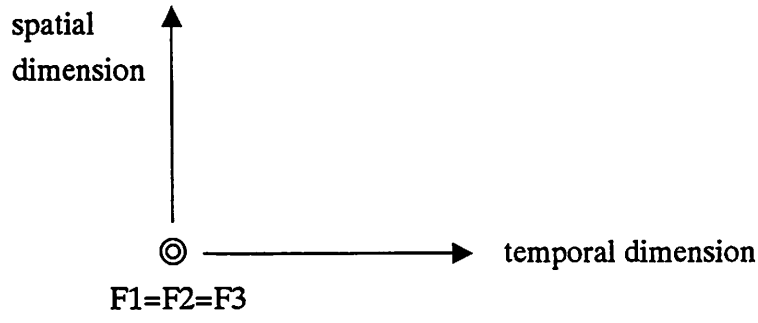
Wash 6 potatoes (F1), slice (F2), and deep-fry (F3). (a culinary text)

Fig.1-1 Development of enhancement



John came into the room (F1), Lucy stood in the doorway (F2), and Fred waited outside (F3). (IFG:222; modified)

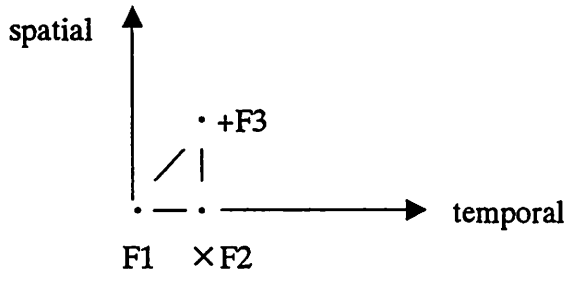
Fig.1-2 Development of extension



John is a college student(F1). He speaks French(F2), and he is very handsome(F3).

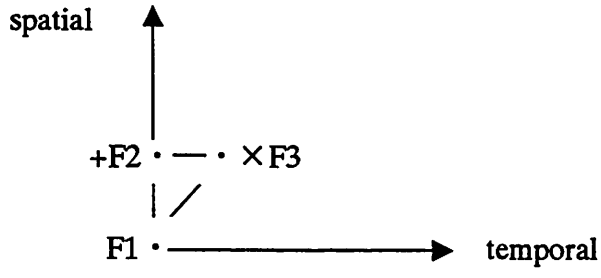
Fig.1-3 Development of elaboration

I will further add complex examples. Each of the three figures makes a multidimensional construction in the ideation base.



A ghost appeared(F1); John ran away(F2), and Fred stayed behind(F3).

Fig.1-4 Multidimensional construction(1)



Man is mortal(F1). Socrates is a man(F2). Therefore, Socrates is mortal(F3).

Fig.1-5 Multidimensional construction(2)

2.3. Reconsideration of a sequence

What is problematic concerning CEM's ideas is whether or not it is reasonable that they regard a temporal sequence as the prototype of a complex of figures, and that they consider a sequence to be not a constructional unit but of relational organization. The main reason of their conception is presumably that a sequence (as well as a figure and element) is formed in the ideation base. Together with 'move' in the interaction base, it produces 'message' in the text base (cf. CEM: 3.6/p.124). Meanwhile various organizations of text are dealt with not in the ideation base but on the text base (e.g. Generic Structure Potential (Hasan),

Rhetorical Structure Theory (Mann, Matthiessen & Thompson) (cf. Matthiessen 1995: 1.7)). Therefore, non-constructional, simply concatenated sequences of figures should be formed in the ideation base.

By contrast to this, as I have explained earlier using not a few examples, I argue that the logico-semantic relations between figures are formed in the ideation base, and that a temporal sequence is just one case of many construction patterns. One reason why this just one case has been considered typical is that every text realized lexico-grammatically appears in succession, or in the form of syntagm. However, this expression plane not necessarily reflects the content plane. (We should remember that Saussure said the "caractère linéaire du signifiant" but not "du signe" (Saussure, 1987: 103).)

This can easily be confirmed by using simple examples. Given the situation 《John left and then Tom left》 , we can not only say "John left before Tom left" but also "Tom left after John left". That is, when two events happen in succession, one can not merely present their figures in their order but permute them by means of conjunctive devices. On the other hand, even when the situation is such that two events occur simultaneously (《Mary laughed》 concurrent with 《Jane cried》), we have to realize one first, the other later ("Mary laughed but Jane cried" or "Jane cried but Mary laughed"), so long as the expression is linguistic.

To put it in other words, text as meaning in the semantic layer realizes events in the context of situation according as they occur, whether successively or concurrently. Text as wording in lexicogrammar, however, has to be realized as a sequence (sequence of clauses) in any case.

I will show one more example to understand the discussion better. The first half of the expository text on tea (i-iii) is generated as a temporal sequence (development by enhancement), as it reflects the historical, chronological facts in context. Meanwhile the sequence of clauses of the latter half of the text (iv-vi) represents not the author's extratextual concept but the rhetorical arrangement of what he means. The three clause complexes (iv-vi) (in lexicogrammar) realize the three concurrent figures (in semantics) which have made discrete the writer's intricate and undistinguishable idea about tea (in context).

Text 1 Tea

> (i)Tea began as a medicine and grew into a beverage. (ii)In China, in the eighth century, it entered the realm of poetry as one of the polite amusements. (iii)The fifteenth century saw Japan ennoble it into a religion of aestheticism—Teaism. (iv)Teaism is a cult founded on the adoration of the beautiful among the sordid facts of everyday existence. (v)It inculcates purity and harmony, the mystery of mutual charity, the romanticism of the social order. (vi)It is essentially a worship of the Imperfect, as it is a tender attempt to accomplish something possible in this impossible thing we know as life.
>
> (Kakuzo Okakura, *The book of Tea*, Tokyo: Kodansha International, 1989.)

3. Alternative concept of text construction

3.1. Enhancement type of text

In the following section, I will give and examine more text samples to find a variety of constructions of figures in the ideation base. We will confirm such a general tendency that, in the case of temporal sequences, that is the development of enhancement, they mainly

consist of material processes, and very often include a change in the state of Goals. This is exemplified by procedural texts, represented by recipes. A change in the state of a Goal is originally caused by the meaning of a material process in itself. When plural material processes are arranged syntagmatically to make a temporal sequence, changes accumulate to the extent that raw meat goes to a hamburger, for instance. By contrast to this, in the case of the development of elaboration and extension, no matter how many words may be accumulated, the accumulation will not change the state of the referents of participants. Relational processes are mainly used here. First, look at the following recipe sample:

Text 2 Artichoke chips

(i)Peel artichokes, (ii)cut into thin slices and (iii)place immediately in acidulated water—(iv)leave there for 20-30 minutes (v)and then pat dry with a clean absorbent cloth. ... (vi)Fry immediately in deep fat or oil. (vii)Serve at once. (text sample from CEM: 357; originally from N.B. Highton & R.B. Highton, *The Home Book of Vegetarian Cookery*; my serial numbers)

In this example all of the processes are material processes. Each of the signification of the processes affects and changes the state of its corresponding Goal, and the accumulation of such changes transfigures the referent coherent in the text. (In recipes, the Goal once presented in the first clause is generally deleted in the following clauses. One reason for this is presumably that there is no appropriate word for the intermediate state of affairs.) The lexico-grammatical and semantic analyses of Text 2 will be shown in Table 2.

Table 2 The lexico-grammatical and semantic analyses of Text 2

Text 2 in lexicogrammar (text as wording)	Text 2 in semantics (text as meaning)
	artichokes
(i) 1 peel artichokes	↓ peel
	artichokes peeled
(ii) ×2 cut into thin slices	↓ cut into thin slices
	[artichokes peeled] cut into thin slices
(iii) ×3 and place immediately in acidulated water	↓ place immediately in acidulated water
	[[artichokes peeled] sliced] placed immediately in acidulated water
(iv) ×4 leave there for 20-30 minutes	↓ leave for 20-30 minutes
	[[[artichokes peeled] sliced] placed in acidulated water] left for 20-30 min.
(v) ×5 and then pat dry with a clean absorbent cloth	↓ pat dry with a clean absorbent cloth
	[[[[artichokes peeled] sliced] placed in acidulated water] left for 20-30 min.] pat dried
(vi) ×6 fry immediately in deep fat or oil	↓ fry immediately in deep fat or oil
	[[[[[artichokes peeled] sliced] placed in acidulated water] left for 20-30 min.] pat dried] fried immediately in deep fat or oil
(vii) ×7 serve at once	↓ serve at once
	[[[[[[artichokes peeled] sliced] placed in acidulated water] left for 20-30 min.] pat dried] fried in deep fat or oil] served at once

Next, consider the following text. Although it is generally classified as one of the

expository texts, it shows a common trait to procedural texts.

Text 3 Desert streams

(i) After flash floods, desert streams from upland areas carry heavy loads of silt, sand and rock fragments.
(ii) As they reach the flatter area of desert basins
(iii) they slow down
(iv) and their waters may soak quickly into the basin floor.
(v) Then the streams drop their loads;
(vi) first they drop the heaviest material—the stones,
(vii) then [they drop] the sand
(viii) and finally [they drop] the silt.
(ix) Soon these short lived streams become choked by their own deposits
(x) and they spread their load in all directions.
(xi) After some time, fan or cone-shaped deposits of gravel, sand, silt and clay are formed around each valley or canyon outlet.
(xii) These are called alluvial fans.

(text sample from Martin, et al. 1997: 39; adapted from C. Sale, et al., *Our Changing World, Bk.1*; my serial numbers)

I will schematize the text with regard to the logico-semantic development of figures and their constituting elements.

Table 3 Semantic development of Text 3

Expansion	Time-related element	Place-related element	[macro-Theme] desert streams Object-related element	
(i) 1	after flash floods	from upland areas	loads of silt, sand,	desert streams
	↓	↓	rock fragments	(w/ water)
(ii) ×2 ×β	as they reach	flatter area of desert basins	↓	↓
(iii) α 1	(they slow down)		↓	↓
(iv) +2	↓	into the basin floor <------	----------	waters
(v) ×3 1	then		loads	streams
(vi) =2 1	first	(desert basins) <---------	--stones	↓
(vii) ×2	then	(") <---------	--sand	↓
(viii) ×3	finally	(") <---------	--silt	↓
	↓	↓	↓	↓
(ix) ×4 1	soon	↓	deposits	streams choked
(x) +2	↓	in all directions <---------	load (=silt, sand,	
	↓	↓	stones)	
	↓	↓	↓	
(xi) ×5	after some time	around valley/canyon outlet	fan/cone-shaped deposit	
			of gravel, sand, silt, clay	
(xii) =6			alluvial fans	

(Arrows indicate changes in time, place, and the state of objects.)

When we recognize and verbalize natural phenomena as well as human activities, we generally abstract three kinds of factors in forming them, which correspond to those of process, participant, and circumstance in transitivity. In this representation of a geological phenomenon of desert streams, two circumstantial elements of time and place and objects as participants are interrelated with each other to make a change in the whole state of affairs.

As time passes, the materials that compose streams change from a liquid into a solid form; and the objects cannot be dissociated from the place in which they change their forms (especially at the final stage). This is the reason why this text is rather complicated. What I should comment on Text 3 is that, in contrast to culinary texts, the processes of the text are in themselves not playing an important part in making meaning. This is because, from the interpersonal point of view, their speech functions are quite different. In recipes, material processes order the reader to do the job, while in scientific texts, even if the processes are material, they are not coercive but just descriptive. In the former case, the type of speech role is goods-&-services demanding ('command' type), whereas in the latter, information giving ('statement' type) (IFG: ch.4/p.68ff.).

3.2. Elaboration/extension type of text

Now compare the following text with the preceding one. The following is also of the expository type, though the relations between figures are very different.

Text 4 The numbat
(i) The numbat is an unmistakable slender marsupial with a pointed muzzle and short erect ears.
(ii) The body is reddish brown
(iii) but the rump is much darker
(iv) and [it] has about six white bars across it.
(v) The eye has a black stripe through it
(vi) and the long bushy tail is yellowish.
(vii) The toes are strongly clawed and very effective in digging out termites.
(viii) The tongue is extremely long, as in all mammalian ant or termite eaters.
(ix) Unlike most marsupials, the numbat is active during the day.
(x) It shelters in hollow logs.
(xi) It was once relatively common
(xii) but [it] now lives only in a small area of S.W. South australia.
(text sample from Martin, et al. 1997: 39; adapted from *The Concise Encyclopedia of Australia* 2nd ed.)

Table 4 Semantic development of Text 4

Expansion				[macro-Theme] the numbat Thematic element
(i)	1			the numbat
(ii)	=2	1		the body
(iii)		+2	1	but the rump
(iv)			=2	and [it]
(v)		+3		the eye
(vi)		+4		and the long bushy tail
(vii)		+5		the toes
(viii)		+6		the tongue
(ix)	=3	1		unlike most marsupials, (the numbat)
(x)		+2		it
(xi)	=4	1		it
(xii)		+2		but (it)

In Text 4, the first figure, realized by the first clause, presents the macro-Theme of the whole text, that is 《the numbat》 , and three constructional units of figures[2], (ii-viii), (ix-x), and (xi-xii), elaborate on the macro-Theme by exemplifying and clarifying the characters, habits and habitat of the animal (=2, =3, =4). Moreover, each of the three units are extended by adding related descriptions (1+2+3+4+5+6, 1+2, 1+2). This makes the text an encyclopedic article.

What should be noted here is that, in elaborating on the macro-Theme, Figure (ii) and the following figures are not just restating Figure (i) but specifying the constituting parts in detail. This is the relation of meronymy. I will show it by applying the convention of constituency used in IFG to represent the relation:

the numbat	the body	but the rump	the eye	and the ... tail	the toes	the tongue
1	=2 (1	+2	+3	+4	+5	+6)

Fig.2-1 Constituent analysis of meronymy in Figures (i-viii), Text 4

As I argued earlier, such a lexico-grammatical relation is reflected in the whole construction of text. I will also represent the constitutional pattern in Fig.2-2.

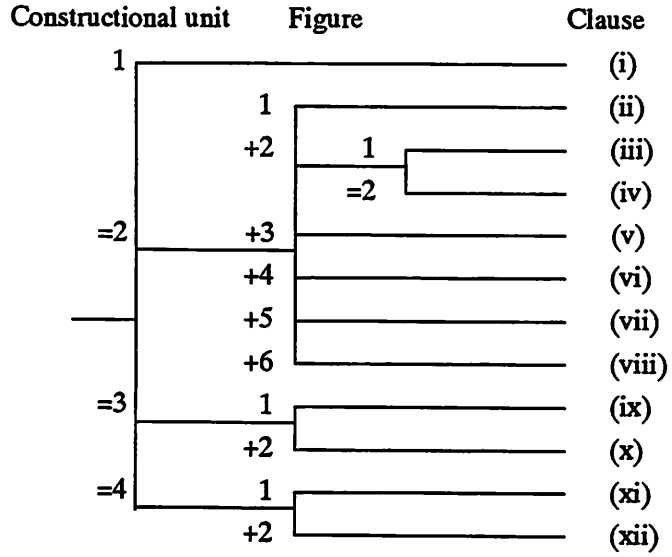


Fig.2-2 Constitutional pattern of Text 4

Now, in order to show that this textual pattern is not a sequence but a construction, I will change the order of composing figures.

Text 4' Permutation of figures in Text 4

(ix) Unlike most marsupials, the numbat is active during the day.
(x) It shelters in hollow logs.
(i) The numbat is an unmistakable slender marsupial with a pointed muzzle and short erect ears.
(vii) The toes are strongly clawed and very effective in digging out termites.
(viii) The tongue is extremely long, as in all mammalian ant or termite eaters.

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[2] In Sato (1999), I argued the necessity of such a concept, which I called a 'discourse-functional unit'.

(v) The eye has a black stripe through it
(vi) and the long busy tail is yellowish.
. . .

The permutation does not at all confuse or make incomprehensible the meaning of the text. This shows that the successive order of figures is not relevant to the forming of the text. What is relevant is that several figures constitute units, and each unit contributes to the making meaning of the whole text. To put it differently, it is not the case that first, figures are set in a sequence in the ideation base, and then they are rearranged rhetorically in the text base. Hence, the type of Text 4 is intrinsically constructional, not sequential.

In contrast to Text 4, Text 3 is intrinsically sequential, so that, if the composing figures are permutated, the text will be nonsensical or at least very confusing.

Text 3' Permutation of figures in Text 3
(i) After flash floods, desert streams from upland areas carry heavy loads of silt, sand and rock fragments.
(ix) Soon these short lived streams become choked by their own deposits
(x) and they spread their load in all directions.
(ii) As they reach the flatter area of desert basins
(iii) they slow down
(iv) and their waters may soak quickly into the basin floor.
. . .

I will briefly summarize the argument above in Table 5.

Table 5 Three types of text in relation to ideational and interpersonal metafunctions

metafunction / text sample	ideational metafunction		interpersonal metafunction
	field	complex of figures	speech function
Text 2 (artichoke chips)	culinary	sequential	goods-&-services demanding
Text 3 (desert streams)	geological	sequential	information giving
Text 4 (the numbat)	zoological	constructional	information giving

I also assert that concerning complexes of figures there is a cline from a sequence to a construction in the ideation base, which will be schematized in Fig. 3.[3]

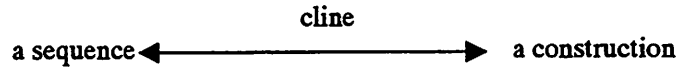

Fig.3 Cline from a sequence to a construction in the ideation base

[3] Professor Halliday agreed to my idea of a cline from sequences to constructions at JASFL 2001.

4. Conclusion

In this paper, critically examining CEM's idea of a sequence and applying the device of expansion presented in IFG, I have argued that there are three basic types of development in the construction of figures, and that they are formed in the ideation base in the semantic layer. The argument is fully supported by various sorts of actual text samples. It is to be hoped that it will contribute to a new conception of the construction of text.

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JASFL Occasional Papers Volume 3 No. 1 2004

Technocratic Discourse: Deploying Lexicogrammatical Resources for Technical Knowledge as Political Strategies*

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Abstract

This paper attempts to reveal the semiotic strategy that a government official document, which is called a Technocratic discourse, deploys to convince the public of the validity of a new policy. By comparing lexicogrammatical resources in a U.S. official document concerning 'the war against terrorism' with those in another kind of text, namely, scientific or Technical discourse, we shall prove that the semiotic resources for the Technocratic discourse have originally evolved in Technical texts from Newton onward, complying with the necessity of scientific argumentation. In Technical discourse, these lexicogrammatical resources construe technical knowledge efficiently, in a way readers can best follow the argumentation. Technocratic discourse, however, 'ventriloquates' the voice of professional scientists as a political strategy, constructing a version of reality which can justify the war. We will conclude the discussion by exploring the ideological background which induces technocrats or bureaucrats into the particular semiotic resources.

Introduction

Each social subcommunity has evolved its own meaning-making resources that are most suitable to accomplish tasks. Technocrats and bureaucrats form one such community and have their own resources to deploy as their political strategies. Bakhtin (qtd. in Lemke 1995:24) uses the term "voice" to refer to the social language of a particular group. Technocrats or bureaucrats tend to deploy the voice of professional scientists originally developed for scientific/technical argumentation.[1] Then the primary purpose of this paper is to shed light on the features of technocratic voice, and observe how they "ventriloquate" scientific/technical voice.

Ever since George Orwell (1946) provoked the issue of mystifying practices of political language, attempts have been made to grasp the features of political language, from various viewpoints in and out of linguistics. In spite of the good amount of research on lexical features of political language, relatively little attention has been paid to clarify its

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* This paper is the revised version of the master's thesis presented to the Department of Linguistic Functions, Graduate School of International Cultural Studies, Tohoku University, in January 2003.

[1] In this paper, we will take into account both hard (i.e., natural) and soft (i.e., social) sciences, and regard "scientific" as conveying the same meaning as "technical."

grammatical features. However, for the reason that grammatical features tend to be more covert and escape readers' critical awareness more than lexical ones, they can be a more powerful device to manipulate realities. This is where our theoretical framework, Systemic Functional Theory, can be the best analytical tool.

The analysis data for this paper are mainly obtained from the five Textual sources listed below. For the analysis of Technical discourse, we will consider several treatises on cloning technology and economics. As an instance of Technocratic discourse, we will observe one of the latest versions of official documents about U.S. military strategy: the 2002 edition of the annual report written by U.S. Defence Secretary. In official documents that intend to convince readers of the validity of a new policy, especially when it comes to be a recommendation of war, the government pays extra attention to WHAT to mean and HOW to say it in order to convince the public and allied nations. After the attacks on September 11, the Bush administration has made every effort to manipulate the kind of social reality which justifies "the war against terrorism." This paper will try to shed light on the role language plays in constructing that social reality. In order to clarify that the social reality constructed by the U.S. government is not the one and only reality, we will observe another version of social reality about "terrorism" constructed by Chomsky (2001).

In this paper, our purpose will be achieved by way of three steps. Prior to analysing the texts, we will outline general conceptions of Systemic Functional Theory in chapter 1, in order to establish the relevant background knowledge for this paper. Subsequently in chapter 2, we will examine the voice of professional scientists, using Systemic Functional Theory as an analytical tool. Then, as a final step, we will turn to the features of Technocratic voice, observing in what textual contexts they "ventriloquate" the voice of professional scientists, and what political effects can be obtained from the lexicogrammatical choices.

Materials for Text Analysis

Technocratic discourse Policy Making of Military Strategy

➢ **TEXT 1**: Donald H. Rumsfeld (Secretary of Defence). 2002. *Annual Report to the President and the Congress.*

Summary The 2002 edition of the annual report, prepared by the U.S. Defence Secretary, presents lessons learned from "the war against terrorism" and an overview of future defence strategy.

Technical discourse Treatises on Cloning Technology and Economics

➢ **TEXT 2**: I. Wilmut., A.E. Schnieke., J. McWhir., A.J. Kind., and K.H.S. Campbell. 1997. "Viable Offspring derived from Fetal and Adult Mammalian Cells." *Nature* 385: 810-813.

Summary Dr. Ian Wilmut and his colleagues report on their first success to create the cloned sheep Dolly copied from an adult cell.

➢ **TEXT 3**: Jane Maienschein. 2001. "On Cloning: Advocating History of Biology in the Public Interest." *Journal of the History of Biology* 34: 423-432.

Summary This treatise enumerates the historical events in the development of cloning technology, illustrating how modern technology to create Dolly comes into being.

➢ **TEXT 4**: Louis D. Hayes. 1992. *Introduction to Japanese Politics.* New York: Paragon House: 1-3.

Summary This treatise reports on Japan's postwar economic development as well as the

socio-economic mechanisms that enable the advancement.

Secondary Material
➢ Noam Chomsky. 2001. *9-11*. New York: Seven Stories Press.
Summary Noam Chomsky, as a political activist, comments on terrorism, U.S. foreign policy, and the root causes of the September 11th terrorist attack.

1. How to Analyse Political Texts with Systemic Functional Theory

The aim of this chapter is to set up a background knowledge in general, in an attempt to establish the theoretical framework for the examination of Technical/Technocratic discourses in the following chapters. We will begin by considering the past studies on the language of politics, clarifying what "Orwell's Problem" brings into question (→ 1.1). We will then move on to outline general conceptions of Systemic Functional Theory, with a particular focus on the concepts necessary for the analysis below (→ 1.2). Since Systemic Functional Theory covers a number of correlated semiotic or meaning-making systems in order to explain semioticising processes, it is not possible to explore every detail. Thus, the primary purpose of this chapter is to show where relevant systems are located in the overall theory, rather than to illustrate the whole architecture of the theory.

1.1. Language of Politics: Orwell's Problem

Over the past half-century, several articles have been devoted to the study of political language. As the role of written documents became vital in persuading people and gaining the public's trust, technocrats and bureaucrats have deliberately developed their own ways of meanings. To the best of my knowledge, the first writer to give attention to the political language is British writer and journalist George Orwell. Because of his pioneering works on the opacity of political language, and his vast influences on later works, the issue of mystifying practices of political language has been recognised as what we might call "Orwell's Problem" in a sense a bit different from the one used in the Chomskyan paradigm.[2]

Orwell's experience as a member of the British imperial police accumulated his distrust of politics as well as political language. In his essay (1946), Orwell provides the list of expressions that disturb readers' critical thoughts, including stale metaphors, idioms, and technical terms. In his later work (1949), these expressions are named Newspeak. He claims that Newspeaks are like aspirins, in that they are tempting for technocrats, anaesthetise a critical thought, and possibly bring about a corruption of a society.

Ever since Orwell provoked the issue, researches on political language have been widely carried out in and out of linguistics. Within the realm of Systemic Functional Theory, Lemke (1995, 2002) reveals an ideological motivation that tempts technocrats to use certain lexicogrammatical resources. It is proposed that there is a "Technocratic ideology" among policy makers that scientific/technical truth is 'objective' and 'special'. It is for this reason

[2] In the Chomskyan paradigm, "Orwell's Problem" questions why we know so little about certain things, given that we have so much evidence. It is used in pair with "Plato's Problem," which asks why we know so much about language, given that we have only fragmentary and impoverished linguistic experience.

that technocratic elites claim to set policy on the basis of technical knowledge, and by means of technical language. This issue will be taken up again in section 3.4.2. Hereafter, I will adopt his terminology "Technical discourse" and "Technocratic discourse" and use them in my own definitions. The two are distinguished in terms of the purpose and the writer-reader relationship:

Technical discourse
- Texts for conveying scientific/technical knowledge
- Written by a scientific/technical expert & Oriented to scientific/technical experts

Technocratic discourse
- Texts for proposing a new policy
- Written by an authoritative policy maker & Oriented to the non-professional public

Outside Systemic Functional Theory, Roland Barthes (1993) is among those who note the role of language in manipulating social realities. He discusses the semioticising processes by the ruling classes that construct their subjective ideas about society in the form of mythologies as natural and universal facts. He argues that the official vocabulary of African affairs develops in a way to conceal the status quo rather than to fully convey it. Here, his main concern is on nominal groups, lexical features of texts (see also 3.2.1.3).

In spite of these profound insights into the lexical features of political texts, relatively little attention has been paid to their grammatical features (except for Lemke 1995). While lexical items are overt and noticeable, grammatical patterns are covert and difficult to focus on. This is why the use of *chairman* in contrast with *chairperson* easily gets noticed, whereas their grammatical environments, which also contribute to create sexism, are rarely discussed. However, grammatical choices can be a more powerful device to manipulate reality because they escape readers' critical awareness. For this reason, the primary interest of this paper is to shed light on the grammatical features of political language. Systemic Functional Theory can be the best tool to analyse these features, since it assumes a unified model of wordings, comprising both grammar and lexis. Before moving on to the main task, we will outline the theoretical framework of language system.

1.2. Theoretical Framework: Systemic Functional Theory

In Systemic Functional Theory (hereafter SFT), reality is assumed to be construed/constructed in and through language. Reality is not a pre-existing entity that is just encoded in language. This conception persists through SFT and is called the social-semiotic construction of reality:

> The view we are adopting is a **constructivist** one, familiar from European linguistics in the work of Hjelmslev and Firth. According to this view, it is the grammar itself that construes experience, that constructs for us our world of events and objects. As Hjelmslev (1943) said, reality is unknowable; the only things that are known are our construals of it – that is, meanings. Meanings do not 'exist' before the wordings that realize them. (Halliday and Matthiessen 1999: 17; original emphasis)

In order to examine how a necessary version of reality for political text is constructed through language, we need to equip ourselves with the conceptions of SFT.

1.2.1. An Overview of SFT Model

In order to highlight some conceptions necessary for our analysis, it may be more useful to look closely at relevant systems rather than go into every system. The primary concern of the following sections is to locate the systems in question in the overall theoretical framework (i.e., give them "a semiotic address" in Matthiessen's term), and clarify the features of those systems.

In SFT, language is modelled according to several perspectives. Using Matthiessen's term, it is interpreted as a multidimensional semiotic system where semiotic dimensions intersect to define the architecture. Every subsystem of language is given its semiotic address in the architecture (Matthiessen 2002: 67, 90). Before moving onto the specific explanations, we will locate each subsystem in the intersection of two dimensions, the spectrum of metafunctions and the hierarchy of stratification. We can present the locations diagrammatically as follows:

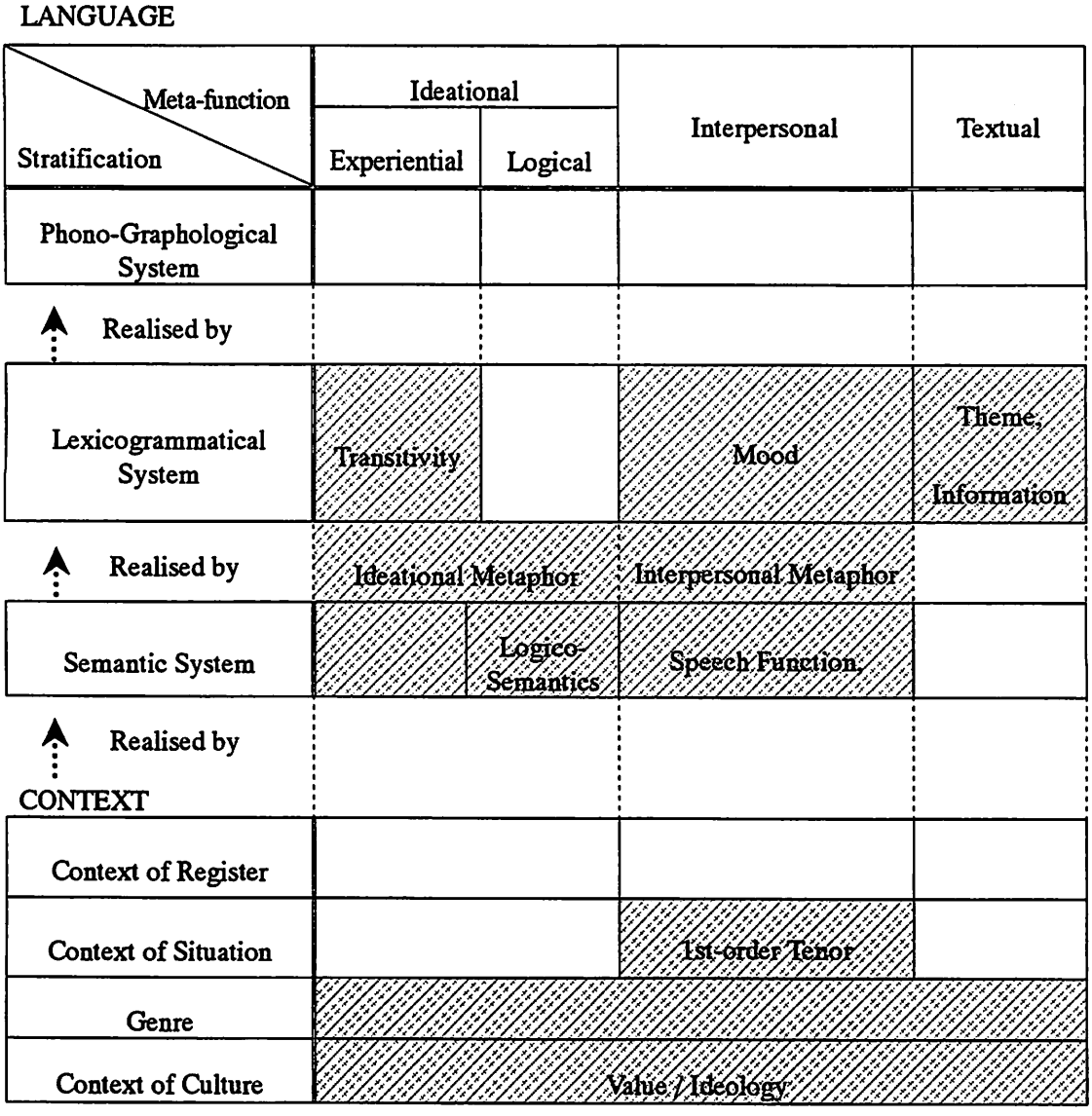


Figure 1-1 Semiotic Address: Intersection of Metafunction and Stratification

The rest of the chapter will explain the shadowed portion of the diagram in turn. First, metafunctional varieties will be considered in 1.2.2, observing the systems categorised into each metafunction. Next, the discussion will turn to the issue of grammatical metaphor in 1.2.3, considering metafunctional subtypes: ideational and interpersonal metaphors. Besides, stratified system of language will be considered as an underlying mechanism for producing the metaphor. Then, the discussion in 1.2.4 leaves language system for contextual one, focusing particularly on 1st-order tenor, genre, and value/ideology. Finally, three types of meaning-making time frames will be introduced in 1.2.5 under the title of semogenesis, in order to account for the meaning potential disparity among individuals.

1.2.2. Metafunction

As shown in Figure 1-1, the resources of language are organised into three types of metafunctions: ideational (experiential and logical), interpersonal, and textual. This distinction, together with the hierarchy of stratification, cross-classify the semiotic space, locating subsystems in the intersections. Following Yamaguchi (2002), these metafunctions can be characterised in the following way:

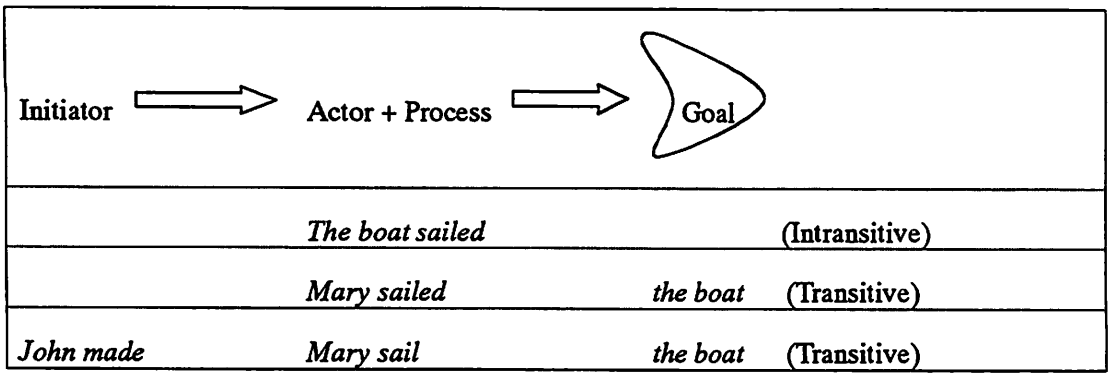
- **Ideational**: To construe/construct social semiotic realities as events (consisting of *process*, *participants*, *circumstances*) in social semiotic space by semioticising the material phenomena in material space.
- **Interpersonal**: To construe/construct social semiotic realities as interactions&exchanges (consisting of *interactional roles & exchangeable commodities*) in social semiotic space by semioticising the material phenomena in material space.
- **Textual**: To construe/construct semiotic realities as co-organisation (consisting of *bits*) in semiotic space by re-semioticising the social semiotic phenomena construed/constructed by semioticisation in social semiotic space.

For the sake of the text analysis below, we need to be equipped with the following systems: Transitivity from experiential metafunction, Logico-Semantics from logical metafunction, Mood and Speech Function from interpersonal metafunction, and Theme and Information from textual metafunction. Among them, interpersonal ones—Mood at lexicogrammatical level and Speech Function at semantic level—will be taken up in section 1.2.3, when the issue of grammatical metaphor is considered in relation to the hierarchy of stratification. The rest of the systems will be considered in turn.

1.2.2.1. Experiential Metafunction: Transitivity

The experiential metafunction serves to construe/construct the material phenomena in the form of process configuration "process + participants + circumstances." As Halliday (1994: 161) and others point out, there are two types of transitivity models for the construal: transitive and ergative. They serve as complementary perspectives which enable us to see the same configuration in different lights.

The transitive model interprets experiences linearly: Initiator may initiate a process which is acted out by Actor, which may in turn have an impact on Goal. This interpretation is diagrammatically shown in Figure 1-2.



	The boat sailed		(Intransitive)
	Mary sailed	*the boat*	(Transitive)
John made	*Mary sail*	*the boat*	(Transitive)

(adapted from Matthiessen 1995)

Figure 1-2 Transitive Interpretation: Material Process

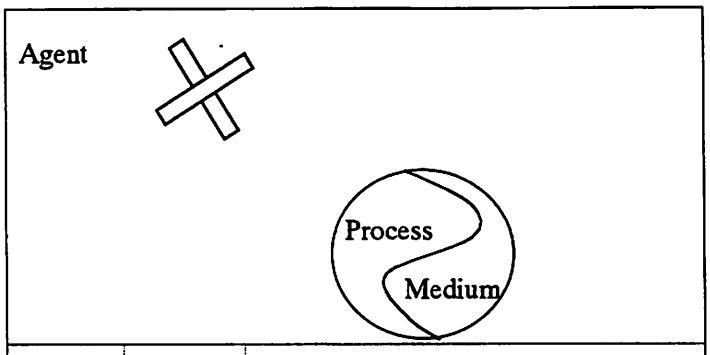
From this perspective, experiences are categorised into six types: material for the semantic field of 'doing & happening', behavioural for 'behaving', mental for 'sensing', verbal for 'saying', relational for 'being', and existential for 'existing'. Each process type has its own participants, which means that the Actor and the Goal in Figure 1-2 are only applicable to material process.[3]

Instead of the linear interpretation taken in the transitive model, the ergative model leans toward a nuclear interpretation of experiences. Experiences are categorised depending on whether the clause nucleus consisting of process + medium is externally caused by agent or self-caused. This interpretation is shown in Figure 1-3.

[3] We draw on the process types in Halliday (1994: 143). Key participants for each process type are shown below:

PROCESS TYPE		KEY PARTICIPANTS
Material	'doing & happening'	Actor, Goal
Behavioural	'behaving'	Behaver
Mental	'sensing'	Senser, Phenomenon
Verbal	'saying'	Sayer, Target
Relational	'being' (Attribution)	Carrier, Attribute
	(Identification)	Identified, Identifier; Token, Value
Existential	'existing'	Existent

Other categorisations are possible, as in Halliday and Matthiessen (1999: 129) or Matthiessen (1995: 210), where experiences fall into the four domains: 'doing & behaving', 'sensing', 'saying', and 'being & existing'.



Mary		*sailed the boat* (Effective)
		The boat sailed (Middle)

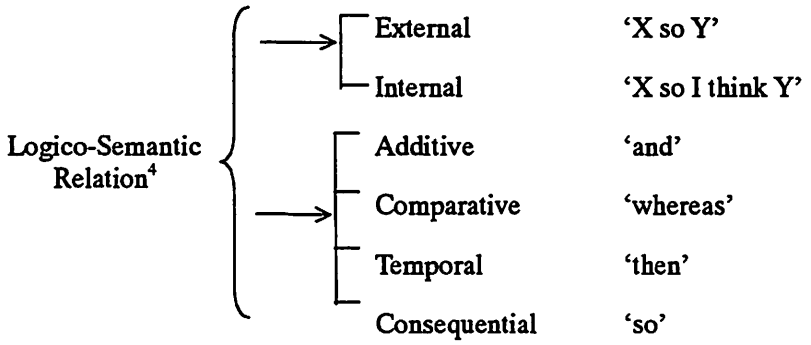
(adapted from Matthiessen 1995)

Figure 1-3 Ergative Interpretation: All Types of Processes

Using Halliday's (1994) terminology, medium is a participant through which the process is actualised, whereas agent is an external causation which brings about the process. When the combination of process + medium is semioticised as engendered by agent, the clause is effective (e.g., *Mary sailed the boat*); when it is semioticised as self-caused, the clause is middle (e.g., *The boat sailed*). Unlike the transitive one, the ergative model can capture all types of processes in the same terms. In section 3.2.1.1, we will use the ergative interpretation of experiences in order to foreground what is and is not semioticised as an external causation for the proposed policy.

1.2.2.2. Logical Metafunction: Logico-Semantics

Individual clauses are contextualised in the flow of text, related to the surrounding clauses through various logico-semantic relations. The system of logico-semantics is originally developed as a resource for combining clauses into clause complex, though the same mechanism is also at work in lower rank units, creating group/word/morpheme complexes. The system network for logico-semantic relations is shown in Figure 1-4.



(based on Martin 1992)

Figure 1-4 System Network for Logico-Semantic Relations

The system network above illustrates that the distinction between internal and external relations is recognised (originally developed in Halliday and Hasan 1976: 241) in addition to four main types of logico-semantic relations. These relations are either lexicalised by conjunctions or simply left implicit. External relations are concerned with experiential relations between the real-world events, while internal relations are concerned with rhetorical relations between the arguments in a text.[5] The following examples describe the difference:

e.g. Temporal/Sequential Relation
External: Ben came in **and then** had a drink.
Internal: Ben wasn't ready.
First he hadn't studied; and **second**, he'd been up all night.

In the former case, the temporal relation of *Ben had a drink* to *Ben came in* is supported by what is actually going on outside the text, while the sequential relation underlying *Ben hadn't studied* and *Ben had been up all night* in the latter example is made inside the text based on the writer/speaker's thinking space.

Martin (1992) develops "reticulum" as a way to display the semantic structure of an overall text, which consists of covariate[6] logico-semantic relations among ranking clauses. Having observed Martin's approach to logico-semantic relations, it turns out that his method of analysis suits the purpose of this paper; it enables us to capture the rhetorical development of a text as well as to distinguish between internal and external conjunctions. These are the issues I will take up in the following chapters.

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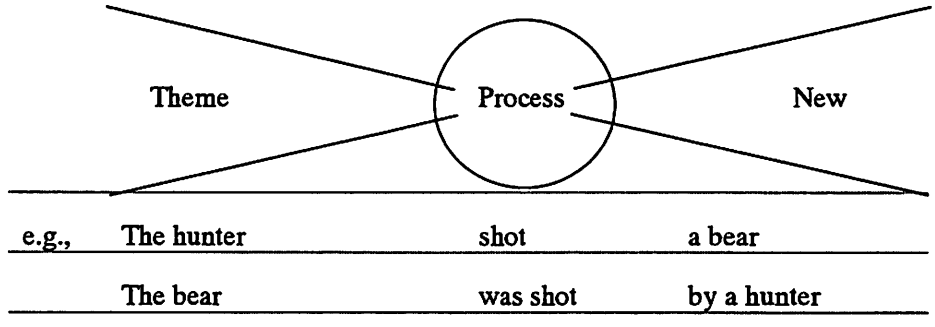
[4] Halliday (1994) assumes a different set of logico-semantic relations: projection and expansion. Expansion is further classified into elaboration, extension, and enhancement.
[5] Using Matthiessen's (1995: 308, 523) term, internal relation is a "semiotic" one, incorporating the meaning 'X so I conclude/infer/say/mean Y'.
[6] Following Martin (1992: 25) covariate structures are those in which a semantic interdependency is constructed between items, and dependent items themselves have the potential to be dependent on. They are used in contrast with multivariate and univariate structures.

1.2.2.3. Textual Metafunction: Theme, Information

In the domain of textual metafunction, a clause is organised as a message incorporating two kinds of textual prominence: Theme and New. The system of Theme assigns the constituents of a clause a departing point of a message (i.e., Theme), and the system of Information, a culmination of the message (i.e., New).

Halliday (1994: 37) defines Theme as follows: "Theme is the element which serves as the point of departure of the message; it is that with which the clause is concerned." In English, the function of Theme is realised by the first position in the clause, assigning the rest of the clause the function of Rheme.[7] On the other hand, the system of Information assigns a status of newsworthiness to the constituents of a clause. In spoken English, the New is realised phonologically by the place of a major pitch movement, while in written English the status is normally given to the elements at the end of the clause. In this manner, a clause simultaneously realises two types of textual structures[8]: Theme + Rheme and Given + New. This is diagrammatically shown in Figure 1-5.



(adapted from Matthiessen 1995: 517)

Figure 1-5 Two Types of Textual Prominence: Theme and New

As shown in Figure 1-5, the same ideational and interpersonal meanings are resemioticised as different messages in the area of textual metafunction. In a default case, the Theme of a clause tends to be selected from the Given rather than the New information. However, by manoeuvring Theme and Information structures, the writer/speaker can intend certain rhetorical effects. Those effects especially become clear when we consider a stretch of messages beyond a single clause. In chapter 2 and 3, we will show how the textual structures of Theme + Rheme and Given + New interplay to unfold the scientific argument and political debate.

1.2.3. Stratification and Grammatical Metaphor

As well as it is organised according to the spectrum of metafunctions, the architecture of language is modelled as a tri-stratal organisation comprising semantics, lexicogrammar, and

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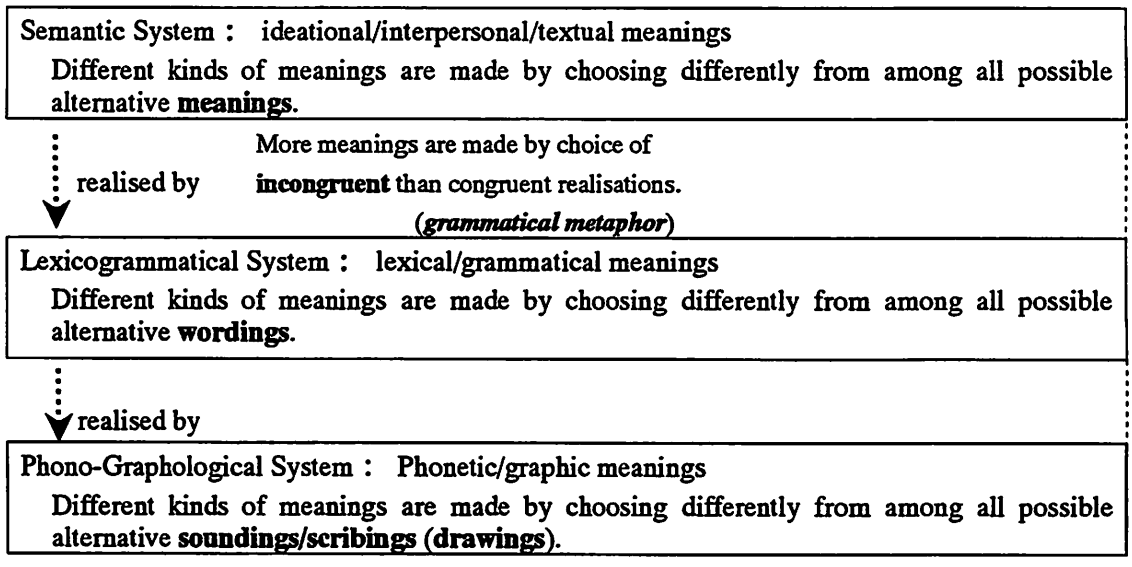
[7] The function of Theme is not in all languages realised by the first position in a clause. In Japanese, for example, Theme is realised by a constituent marked by the particle *-wa*.

[8] The Theme, in Halliday's (1994: 299) term, is writer/speaker-oriented, in that it is chosen as a point of departure for the writer/speaker. On the other hand, the Given is reader/listener-oriented, in that it is what the reader/listener is assumed to know or has an easy access to.

phono-graphology. In this section, we will observe the tri-stratal organisation of language system in order to explain the conception of grammatical metaphor.

1.2.3.1. Stratification of Language System

The perception of language as a stratified system was originally developed by Hjelmslev (qtd. in Martin 1992: 493), who originally set up the hierarchy of "content plane" and "expression plane" to depict the language system. SFT further enriches the system by stratifying the content plane into semantics and lexicogrammar. "Meanings" are made by the interaction of choices in these strata (Yamaguchi 2002). The diagram below enhances Figure 1-1, by providing the definition for each stratum:



(adopted from Yamaguchi: 2002)

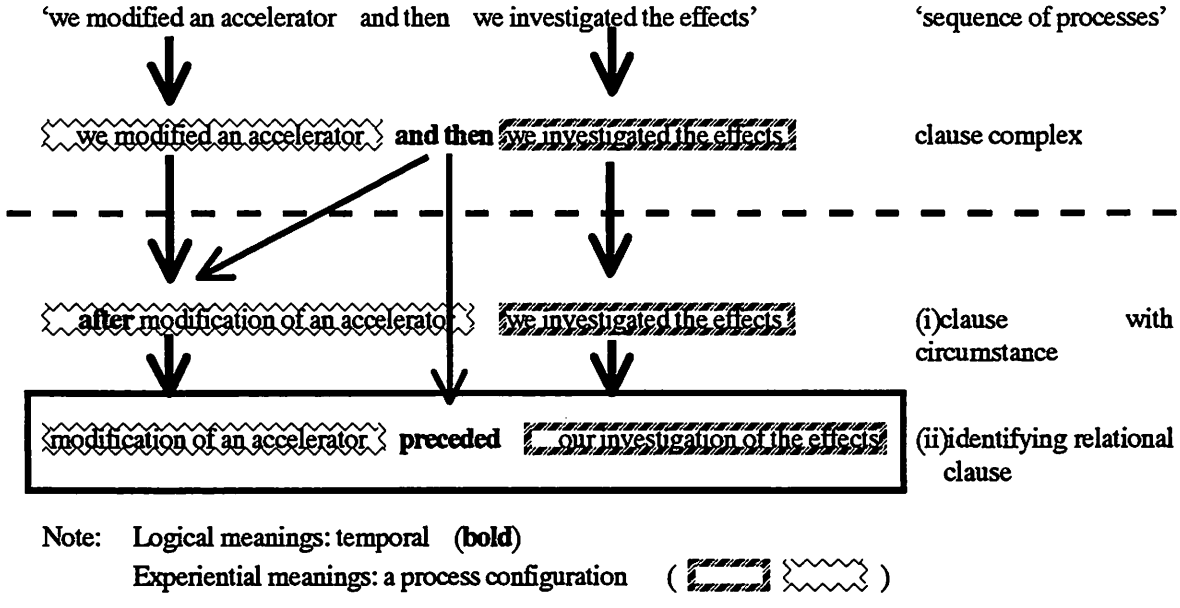
Figure 1-6 Language as Tri-stratal System

A matter of utmost concern in this paper is the realisational relationship between lexicogrammatical and semantic strata, which provides us with a way to create grammatical metaphor. Metaphor, in its traditional sense, is a transfer of one word (lexical item) to another, as *flood* used to indicate 'a large number' instead of its original meaning 'a moving mass of water' (example in Halliday 1994: 342). In SFT, the same mechanism is also applied to grammar – a transfer of one grammatical class to another. Any semantic category has its typical or "congruent" realisation pattern in lexicogrammar: people and things tend to be realised nominally, actions verbally, and logical relations conjunctively. It is when one semantic category is realised by an untypical or "incongruent" pattern, as if it were another semantic category, that grammatical metaphor arises.

Halliday (1994) takes up ideational and interpersonal metaphors as instances of grammatical metaphor. In addition, Martin (1992: 416) recognises textual metaphor in order to explain the use of experiential and interpersonal resources for the purpose of textual organisations. For the analysis of chapter 2 and 3, the explanation of ideational and interpersonal metaphors will suffice.

1.2.3.2. Ideational Metaphor

Ideational metaphor involves experiential metaphor oriented to transitivity and logical metaphor oriented to logico-semantics. For example, experiential metaphor arises when processes are lexicogrammatically expressed by nouns, whereas logical metaphor occurs when conjunctive relations between one process and another are expressed by verbs. The following diagram from Matthiessen (1995: 162) exemplifies how ideational metaphors enrich the option for realising a sequence of processes, which is congruently realised as a clause complex:



(adapted from Matthiessen 1995: 162)

Figure 1-7 Congruent and Metaphorical Realisations of Sequence

As shown in Figure 1-7, grammatical metaphor contributes to the enhancement of the meaning potential, providing multiple ways to realise the same sequence of processes. Since ideational metaphors are especially frequent in scientific/Technical discourse, they will be discussed further in the next chapter. In the next section, we will observe the same symptom in the domain of interpersonal meanings.

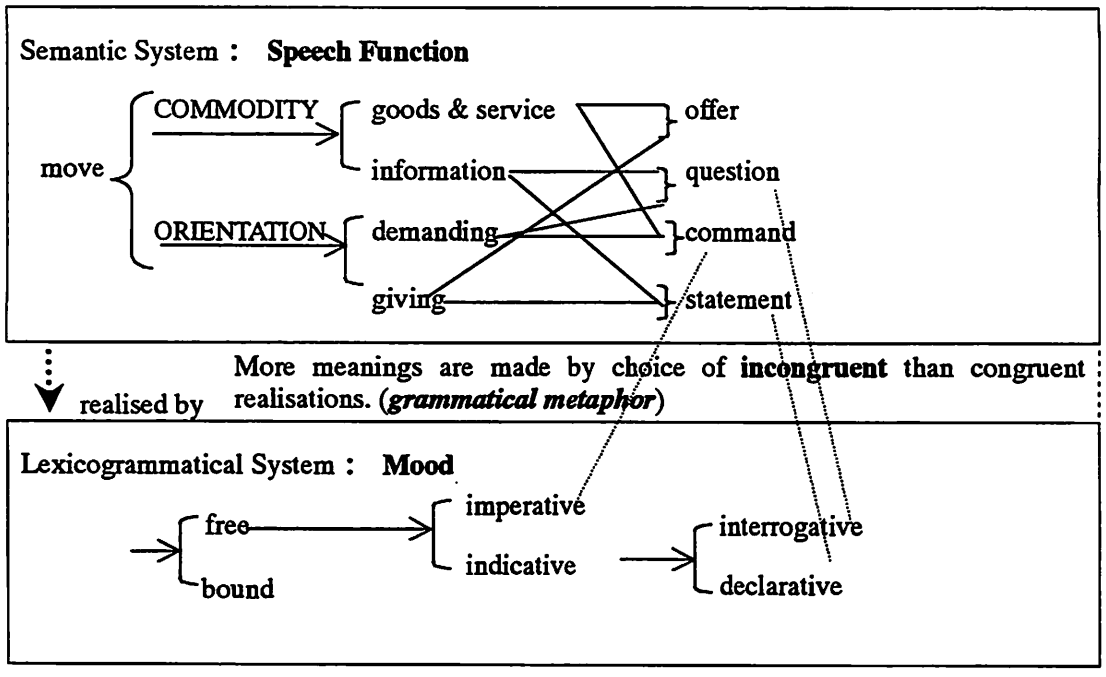
1.2.3.3. Interpersonal Metaphor

Interpersonal grammatical metaphor includes metaphors of Mood and Modality (Modalisation and Modulation). As far as Modality is concerned, assessments of probability, usuality, obligation, and inclination are congruently realised by modal elements within a clause, such as Modal Adjunct (e.g., *certainly*), Modal Finite (e.g., *must*), or the combination of the two (e.g., *must...certainly*) (Matthiessen 1995: 501).[9] When they are realised by any

[9] Martin (1992: 413) categorises Modal Adjunct as a metaphorical realisation of modality, regarding Modal Finite (Modal verb in his term) as the unique congruent realisation.

other forms like a projecting clause (e.g., *I think* ...), metaphors of modality come about.

For the purpose of this thesis, particularly for the analysis in chapter 3, the other interpersonal metaphor regarding Mood is more important. Speech Function categories, which are systematised in semantic stratum, are realised by Mood selections in lexicogrammatical stratum. Figure 1-8 presents system networks of Speech Function and Mood, together with their congruent relationships.



Note: Congruent relationships are indicated by dotted lines (⟶)

(adapted from Matthiessen 1995: 435)

Figure 1-8 Mood and Speech Function in Stratified Language System

Just as a sequence of processes can be realised by ideational patterns of various kinds, a speech function can be realised by multiple Mood options, like a command expressed by a declarative as well as an imperative (e.g., *You should pass me the salt, Pass me the salt*). However, precisely because there is a natural bond between semantic categories and the congruent realisational patterns, grammatical metaphors must have a good reason to be deployed. This is the very point I will attempt to explore in the following chapters, with an intent to distinguish Technocratic discourse from Technical discourse.

1.2.4. Context

Up to this point, the general conceptions and concepts of SFT have been discussed, with a focus solely on language system. But, the system of language is systemically related to, and organised in relation to, that of context (see Figure 1-1). Thus, in this section, we will turn our attention to context as a semiotic system, with a particular focus on three contextual

variables (shown as shaded areas in Figure 1-9): 1st-order tenor, genre, and value/ideology.

Within Systemic Functional frameworks, the definition of variables and the division of work assigned to each variable are different among researchers according to their research purposes. The diagram below elaborates on Figure 1-1 by providing the definitions given in Yamaguchi (2002)[10]:

CONTEXT

Context of Register	**2nd-order Field:** Subject matter: What are you talking about?	**2nd-order Tenor:** Speech role: - information giver – receiver - information demander – giver - goods&service demander – giver - goods&service offerer – receiver Speech attitudes	**2nd-order Mode:** Degree of writteness and spokenness spoken⟷written
Context of Situation	**1st-order Field:** What is taking place as a social interaction?	**1st-order Tenor:** What social role is interacting with what social role, for what purpose?	**1st-order Mode:** What communication channel is used for the social interaction, oral-aural or visual, or both?
Genre	A Goal-oriented (3), Staged (2), Social Process (1) (1) A social process, because members of a society interact with each other to achieve their goals. (2) Staged, because it usually takes more than one step for participants to achieve their goals. (3) Goal-oriented, because genres have evolved to get things done.		
Context of	a complex of Values & Institutions Values Values (well-established, generally accepted values) Ideologies (conflicting values, anti-established values) Metaphors (values expressed as some other well-known/familiar realities) Institutions: traditionally established patterns of behaviour		

Note: Relevant definitions are all quoted from Yamaguchi (2002).

Figure 1-9 Context as a Semiotic System

Among all the contextual variables, the shaded portion of the diagram will be discussed in turn.

[10] The reason I choose his contextual model rather than a variety of others is its clear distinction between first- and second- orderedness in context. To the best of my knowledge, the only other who clarifies the two orders within context is Matthiessen (1995: 35), though his model lacks the distinction in Mode. For other models and comparison of these, see Martin (1992: 493).

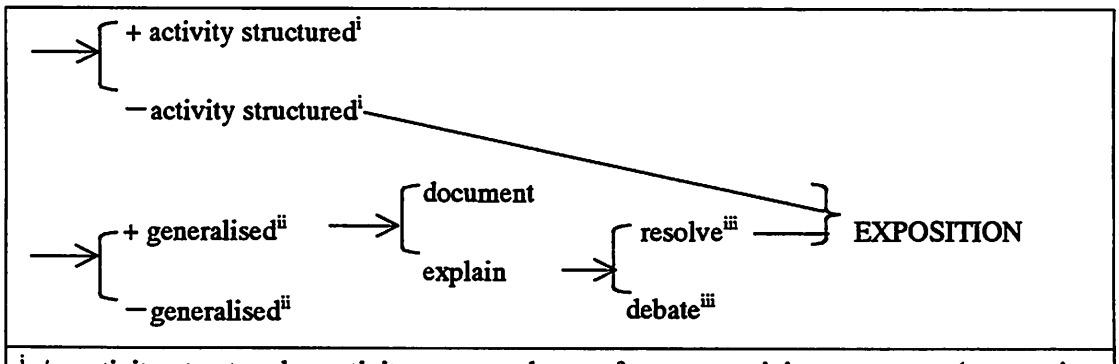
1.2.4.1. Context of Situation: 1st-order Tenor

Constituents of Context of Situation are oriented to features of material situation surrounding language, while those of Context of Register concern functions of language itself. The distinction of field, tenor, and mode shown in Figure 1-9 reflects metafunctional diversity: field is oriented to experiential metafunction, tenor is oriented to interpersonal metafunction, and mode is oriented to textual metafunction.

As mentioned in section 1.1, the definition of Technical and Technocratic discourses for this paper partly depends on their 1st-order tenor which is a component of Context of Situation. 1st-order tenor, as shown in Figure 1-9, concerns social roles of the interactants. As far as Technical and Technocratic discourses for this paper are concerned, 1st-order tenor is about writer-reader relationships. Technical discourse is written by a scientific/technical expert and addressed to equally-professional readers, while Technocratic discourse is written by an authoritative policy maker and oriented to the non-professional public. The other factor that distinguishes Technocratic discourse from a Technical one concerns the purpose of the text, which brings us to the next contextual variable, genre.

1.2.4.2. Genre

In order to assign generic classes to Technical and Technocratic discourses, let us consider the following system network:



[i]+/−activity structured: +activity structured texts focus on activity sequences (e.g., recipe, manual) whereas −ones do not (e.g., description, exposition).

[ii]+/−generalised: +generalised texts focus on generalised experiences whereas −ones focus on specific manifestations of a culture.

[iii]resolve/debate: resolve texts present only one position whereas debate texts consider more than one point of view.

(based on Martin 1992: 563)

Figure 1-10 System Network of Genre: Exposition

The features of Technical and Technocratic discourses all fall into the ones of Exposition. However, their disparity becomes visible in more delicate features. Martin (1985, 1992) further divides expository writings into analytical and hortatory ones and defines them as follows:

- Analytical exposition: oriented to stasis and outlines arguments to defend the way things are.
- Hortatory exposition: oriented to transformation/change and persuades listener/readers to undertake a particular course of action.

Technical discourse falls into the category of analytical exposition in that it outlines a scientific/technical argument, whereas Technocratic discourse is an instance of hortatory varieties in that it tries to persuade readers to accept a new action. Fuller discussion on these generic types and their lexicogrammatical choices will be presented in section 3.4.1.

1.2.4.3. Culture: Value and Ideology

The last concept to be clarified in the area of context is value/ideology. In the model shown in Figure 1-9, value and ideology are defined as mutually opposing conceptions. However, the purpose of this thesis is to capture how one particular value orientation of a writer, or his discourse community, influences lexicogrammatical choices, rather than to compare different types of value orientations or their linguistic manifestations. Therefore, in order to simplify the discussion (as we are not concerned here with the value/ideology distinction), we will call them altogether ideology.

To echo Martin (1992: 495), access to genre, register and language as semiotic resources is mediated through discourses of ethnicity, class, gender and generation. Meaning potential is not evenly distributed across a culture (any more than material resources are). Thus, writers of any kind must carefully choose semiotic resources that are comprehensible to the target audience or the interactant of the 1st-order tenor.

It is to account for the meaning potential disparity among readers that the next notion of semogenesis must be introduced.

1.2.5. Semogenesis

In earlier parts of this paper, we have mentioned the obligation of writers to adjust lexicogrammatical resources to the 1st-order tenor, in order to get the readers to understand the text. The conception of semogenesis, which is the concern in this section, provides us with a way to capture the features of 1st-order tenor.

Semogenesis refers to a semantic change or expansion in semiotic system over a particular time frame. In SFT, three types of time frames are assumed: phylogenesis, ontogenesis, and logogenesis. Their definitions are given in Figure 1-11.

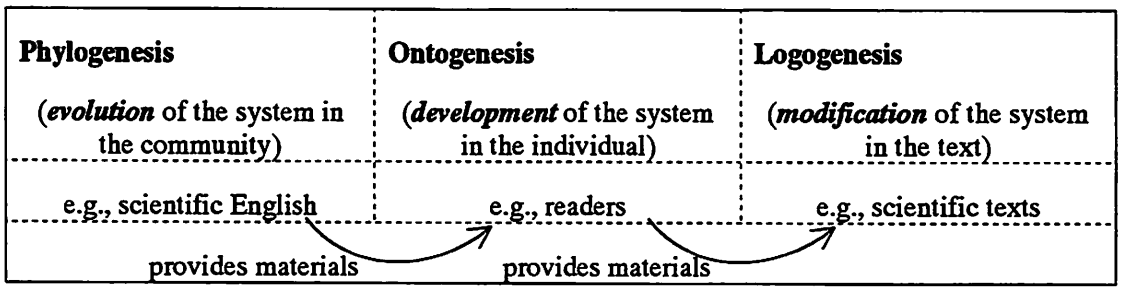


Figure 1-11 Time Frames: Phylogenesis, Ontogenesis, Logogenesis

What is at stake in this paper are the mutual relations among these time-frames, which enable us to get some ideas about the assumed knowledge of readers (i.e., the interactant of the 1st-order tenor).

In the case of scientific terminology, ontogenetically learned technical terms (i.e., terms learned by individual researchers) have to be previously phylogenetically established in the relevant discourse community. As far as readers are specialists who have ontogenetically learned the field-specific technical terms, those terms do not have to be defined logogenetically in a text; they have already been incorporated into the readers' semiotic systems. On the other hand, if we wish to get the readers to understand the meaning, who have never undergone an ontogenetic establishment of the terminology, logogenetic establishment has to be attempted. In section 3.2.1.3, we will observe the presence/absence of the logogenetic establishment of technical terms, considering if the choice is appropriate for the 1st-order tenor.

1.3. Summary

In this chapter, we have overviewed the theoretical framework of SFT in an attempt to establish the background knowledge necessary for the following chapters. Considering what we have discussed so far, deploying SFT as an analytical tool to explore political language seems useful in the following respects:

- In SFT, the architecture of language is modelled as tri-stratal: semantics, lexicogrammar, and phono-graphology. During wartime, a government pays extra attention to WHAT to mean and HOW to say it in order to convince the public and allied nations that the policy set out by that government is the most appropriate. By analysing the official documents by way of SFT, we can clarify in concrete terms HOW (= lexicogrammar) some contents (= semantics) are expressed.

- In SFT, the semiotic system of language is systemically related to, and organised in relation to, that of context, including writer/speaker's ideology. In official documents that intend to convince readers of the validity of a new policy, especially when it comes to a recommendation of war, the author has to give the appearance that his/her standpoint is neutral and objective. By using SFT as an analytical tool, we can clarify in specific terms under what kind of value orientation (= ideology), and for what purpose (= genre), particular linguistic manifestations (= lexicogrammar) are selected.

Having established the relevant background knowledge in this chapter, we can now go on to the text analysis: Technical discourse in chapter 2, and Technocratic discourse in chapter 3.

2. Technical Discourse: Lexicogrammatical Resources in Technical Discourse
2.1. Lexicogrammatical Resources for Technical Knowledge

Various attempts have been made by scholars to show specific deployment of lexicogrammatical resources for construing/constructing specialised knowledge (see Halliday and Martin 1993, Martin and Veel 1998). In contrast with meaning-making resources characteristic of young children's talk, or informal conversation among friends, language in Technical discourse is highly metaphorical and difficult to grasp. Halliday (1993) makes an observation about the origin of scientific language and points out that scientific language has evolved in a way to respond to the nature of scientific argumentation:

> This kind of metaphor is found particularly in scientific discourse, and may have evolved first of all in that context. It is already beginning to appear in the writings of the ancient Greek scientists; from them it is carried over into classical Latin and then into medieval Latin; and it has continued to develop — but to a far greater extent — in Italian, English, French, German, Russian and the other languages of Europe from the Renaissance onwards. And although it has spread across many different registers, or functional varieties, of language, in English at least the main impetus for it seems to have continued to come from the languages of science. [...] These were not arbitrary or random changes. The reason lies in the nature of scientific discourse. Newton and his successors were creating a new variety of English for a new kind of knowledge [...] . (Halliday 1993: 80)

Here is a brief summary of the features in Technical discourse that we will take into account:

(1) Within Clause: Grammatical Metaphor (→ 2.2)
  a. Nominal Realisation of Event
  b. Verbal Realisation of Cause-Effect Relation
(2) Between Clauses: Internal Logico-Semantic Relation (→ 2.3)

It may be helpful to present the wordings where these features are realised together:

happening A ***causes*** **happening B**
(*so*) **this point** ***suggests*** **happening C**
(*therefore*) **happening D** ***is proved***

Note: (1a) Nominal realisation of event **(bold)**
(1b) Verbal realisation of cause-effect relation ***(bold italic)***
(2) Internal logico-semantic relation *(italic)*

Figure 2-1 Lexicogrammatical Resources in Technical discourse

Technical discourse depends on these lexicogrammatical resources, and (1) generalises, (2) abstracts, and (3) technicalises individual experiences into universal facts applicable to all the related phenomena. I will use the terms Generalisation, Abstraction, and Technicalisation to refer to the three dimensions of construing/constructing technical knowledge. Figure 2-2 below provides the definitions and examples to illustrate each of the dimensions:

Generalisation	To construe/construct a specific social phenomenon or an experimental result as a generic fact applicable to all the components of that class. It is a semiotic process that construes what is true of a subclass as equally applicable to the superordinate typically realised by general nouns. e.g., 1 During the Renaissance **men** abandoned mediaeval ways of looking at life. 2 (That is to say) They developed new ideas about art, religion and behaviour. 3 (Because) They regarded the preceding centuries as barbaric [...].
Abstraction	To construe/construct concrete events as an abstract entity not perceivable "here and now." Two types of abstracting processes can be identified: nominalisation of a process configuration, and lexicalisation of a semiotic content. Both processes tend to take place logogenetically, in that the referent of abstracted expression can be tracked anaphorically or cataphorically. Lexicalisation encapsulates the meaning expressed in a stretch of text, labelling it with mental/verbal process nouns (e.g., *this interpretation/belief, this argument/statement*) or other nouns that have no cognate verbs (e.g., *this point/story*). e.g., 1) Nominalisation 1 The atomic nucleus absorbs and emits energy only in quanta [...]. → 2 **Each absorption** marks its transition to the state of higher energy [...]. 2) Lexicalisation 1 [...] the stronger are the claims made about constraints on the possible hypotheses the child makes about the structure of the world. → 2 **This point** brings the discussion back to the bearing of the study of [...].
Technicalisation	To construe/construct various phenomena as a scientific reality, using technical terms with field-specific meanings. When texts are intended for novice readers, they usually include ①defining and ②classifying stages for the terms. Defining is carried out in the elaborating ($a = b$), extending ($a + b$) or enhancing ($a \times b$) structures. It may precede or follow a classifying stage, where technical terms are ordered taxonomically according to the relations of Superordination (a is a kind of b) or Composition (a is a part of b). e.g., As far as the ability to carry electricity is concerned, we can place most substances into one of two groups (***CLASSIFYING***). The first group contains materials with many electrons that are free to move. These materials are called **conductors** because (=×) they readily carry or conduct electric currents (***DEFINING***).[...] The second group contains materials with very few electrons that are free to move. These materials are called **nonconductors** and (= +) are very poor conductors of electricity (***DEFINING***).

Figure 2-2 Three Dimensions of Construing/Constructing Technical Knowledge

The lexicogrammatical resources set out in Figure 2-1 have evolved precisely to meet the semantic necessity for generalisation, abstraction, and technicalisation of argumentation. In the following chapter, we will try to give a more precise account of these dimensions, when we consider the lexicogrammatical resources in Technocratic discourse. For the present, let us devote a little more space to examining the lexicogrammatical resources themselves. We will discuss intra-clausal and inter-clausal features in turn, first considering the issue of grammatical metaphor, and then internal logico-semantic relation.

2.2. Within Clause: Grammatical Metaphor

In Technical discourse, an event typically expressed by a process, complete with participants and circumstances, is frequently realised as a single entity. Likewise, a cause-effect relation between events unmarkedly expressed by a conjunction is realised by other experiential resources, most frequently by a verbal element. These are what we called nominal realisation of event and verbal realisation of cause-effect relation in the previous section as instances of grammatical metaphor.

In order to highlight the dominance of nominal realisation of event, let us consider the following passage from TEXT 3:

TEXT 3

Original Version (Metaphorically realised)

(4) *This growing public acceptance of a strong genetic determinism* (3) **with** *its hope for predictability and control* (1) **is apparently reinforced** by the *eager promises of the Human Genome Project* (2) and *an* ***attendant*** *public demand for genetic engineering and reproductive choice.*

Rewritten Version (Congruently realised)

(4) People increasingly accept a strong genetic determinism
(3) **because** they hope that the genetic determinism may allow us to predict and control (the genetic pattern of babies)
(1) **and because** the Human Genome Project is **so** promising
(2) **that** people demand genetic engineering and reproductive choice.

Note: Causal order of events (1 - 4)
Nominal realisation of events (*Italics*)
Cause-effect relations (**bold**)

Four events are nominally realised as participants, and the cause-effect relations are prepositionally, verbally, and adjectively realised as a circumstance, process, and quality. As a result, a series of events, and the relations among them, are packed into a single clause complex. The revised version of this example, where the grammatical metaphors are left out, discloses the semantic organisation buried in the original version.

As shown in the above example from TEXT 3, cause-effect relations can be realised in different semiotic spaces. Figure 2-3 exemplifies a series of metaphorical representations, as well as corresponding shifts in semantic category and rank scale.

	Shift in Semantic Category	Shift in Rank	Example: Cause-Effect Relation between (Event *a*) & (Event *x*)	
Congruent	Relator	clause complex	(*a* happened); **so** (*x* happened)	she didn't know the rules; **so** she died.
Metaphorical	Circumstance	clause	(*x* happened) **as a result of** (happening *a*)	she died **as a result of** ignorance of the rules.
	Process		(happening *a*) **caused** (happening *x*)	ignorance of the rules **caused** her death.
	Quality	nominal group	the **resultant** (happening of *x*)...	her **resultant** death from her ignorance of the rules
	Entity		the **result** (of happening *a*)...	the **result** of ignorance of the rules was her death

Note: (*a* / *x* happened) = process-centred event (happening *a* / *x*) = nominalised event

(adapted from Halliday 1998: 212)

Figure 2-3 Cause-Effect Relations between Events

Among all types of experiential resources, verbal realisation (i.e., realisation as process) of a cause-effect relation predominates. This is why we give a special attention to that realisation pattern over others. The analysis of TEXT 4 well clarifies the semiotic tendency, which is represented in Figure 2-4.

	Shift in Semantic Category	**No.**	**Example:** Cause-Effect Relation between (Event *a*) & (Event *x*)	
Congruent	Relator	2	(*a* happened); **so** (*x* happened)	
			(17)	(*a* happened) **then**, (*x* is proved)
			(28)	(*a* happened); **as a result**, (*x* happened)
Metaphorical	Circumstance	4	(*x* happened) **as a result of** (happening *a*)	
			(15)	**with** (happening *a*), (*x* happened)
			(17)	(happening *x*) was achieved **because of** (happening *a*)
			(27)	**to** achieve (happening *a*), (*x* happened)
			(29)	(*a* happened) **without** (happening *x*)
	Process	15	(happening *a*) **caused** (happening *x*)	
			(13)	(happening *a*) **generated** (happening *x*)
			(24)	(happening *a*) **contributed to** (happening *x*)
			(30)	(happening *a*) **led to** (happening *x*)
			(35)	(happening *x*) **was brought on by** (happening *a*)
			(1)	(happening *a*) **captured** (happening *x*)
			(3)	(happening *a*) **attracted** (happening *x*)
			(5)	(happening *a*) did little to **alter** (happening *x*)
			(6)	(with happening *a*) **came** (happening *x*)
			(11)	(happening *a*) **earned** (happening *x*)
			(19)	(happening *a*) **was based on** (happening *x*)
			(21)	(happening *a*) **was dependent on** (happening *x*)
			(2)	(happening *a*) **was** [meant] (happening *x*)
			(8)	(happening *a*) **meant** (happening *x*)
			(31)	(happening *a*) **meant** (happening *x*)
			(35)	(happening *x*) **following** (happening *a*)
	Quality	0	the **resultant** (happening of *x*)...	
			None	
	Entity	0	the **result** (of happening *a*)...	
			None	

Figure 2-4 Cause-Effect Relations between Events in TEXT 4

To sum up, cause-effect relations between events are most commonly realised in Technical discourse as 'happening *a* caused happening *x*' rather than '*a* happened, so *x* happened' or otherwise. Matthiessen (1995: 324) provides the list of verbs and proves that most of the major categories of expansion can be represented by verbs. The list is reformulated as Figure 2-5 below.

TYPE			example of verb serving as Process
elaborating	expository		*be, comprise, constitute, indicate, point to, reflect, represent, signal*
	exemplifying		*be, exemplify, illustrate*
extending	additive		*accompany, combine with, complement*
	alternative		*alternative with, replace, substitute for, supplant*
	adversative		*contrast with, distinguish*
enhancing	temporal		*anticipate, co-occur with, follow, greet, precede, predate*
	causal	external	*arise from, bring about, cause, lead to, produce, prove, result in*
		internal	*indicate, show, suggest* → elaborating
	conditional		*apply to, be associated with, be contingent on, condition, correlate with, depend on*
	concessive		*conflict with, contradict, contravene, preclude, prevent*
	comparative		*approximate to, compare with, differ from, resemble, stimulate*

(adopted from Matthiessen 1995: 324)

Figure 2-5 Verbs Representing Expansion Types

As shown in the diagram, both text-internal and external causal relations can be represented in the form of verbs. In section 3.2.2, we will observe how the distinction between text-internal and external relations is obscured, when causal relations are metaphorically realised by verbal elements.

In this section, we have examined the intra-clausal lexicogrammatical features, focusing on nominal realisation of event and verbal realisation of cause-effect relation. As we shall see later in chapter 3, this kind of semantic tendency is necessary for Technical discourse to introduce textual new information step by step. Now, we will turn our attention to inter-clausal features, to see the types of logico-semantic relations that move the argument forward.

2.3. Between Clauses: Internal Logico-Semantic Relation

Technical discourse is not special only in its local lexicogrammatical structures. To meet the needs of scientific argumentation, it has also evolved more global structures oriented to the text as a whole, namely discourse-semantic structures. Among the systems which contribute to the shaping of the overall text structure, we will focus on conjunctive relation, technically known as "logico-semantic relation."

In Technical discourse, internal logico-semantic relations prevail over external ones in order to unfold complex arguments toward the conclusion of a text. The logico-semantic relations in TEXT 3 are outlined in Figure 2-6 to highlight the point (conventions as in Martin 1992).

TEXT 3

(a) Historically, the first research thread leading to experimental cloning involved laboratory stimulation of development through artificial fertilization. (b) From "natural" reproduction in aspen trees or sea anemones, for example, it is a short step to carrying out some forms of cloning, (c) but there has to be an interest in intervening. (d) By the turn of the 20th century, researchers had that interest and enough knowledge about fertilization and the fundamentals of inheritance and development to begin experimenting. (e) Jacques Loeb's artificial parthenogenesis to make larval urchin eggs in the 1890s showed that fertilization is not

necessary to make larval urchins. (f) Loeb altered the water's salt content to stimulate cell division, (g) and as historian Philip Pauly has shown, produced an exciting sense of controlling or engineering life. (h) This introduced questions about whether the male is necessary, whether reproduction has to be sexual, and how far science might be able to take us through biological engineering. (i) Newspapers trumpeted the story of "creation of life" and reporters saw parallels to "immaculate conception" in the laboratory. (j) Though some invoked Frankenstein scenarios, (k) the interest remained largely positive. (l) Science might unlock the "secrets of life" (m) and in the golden progressive era of science and engineering, that seemed good.

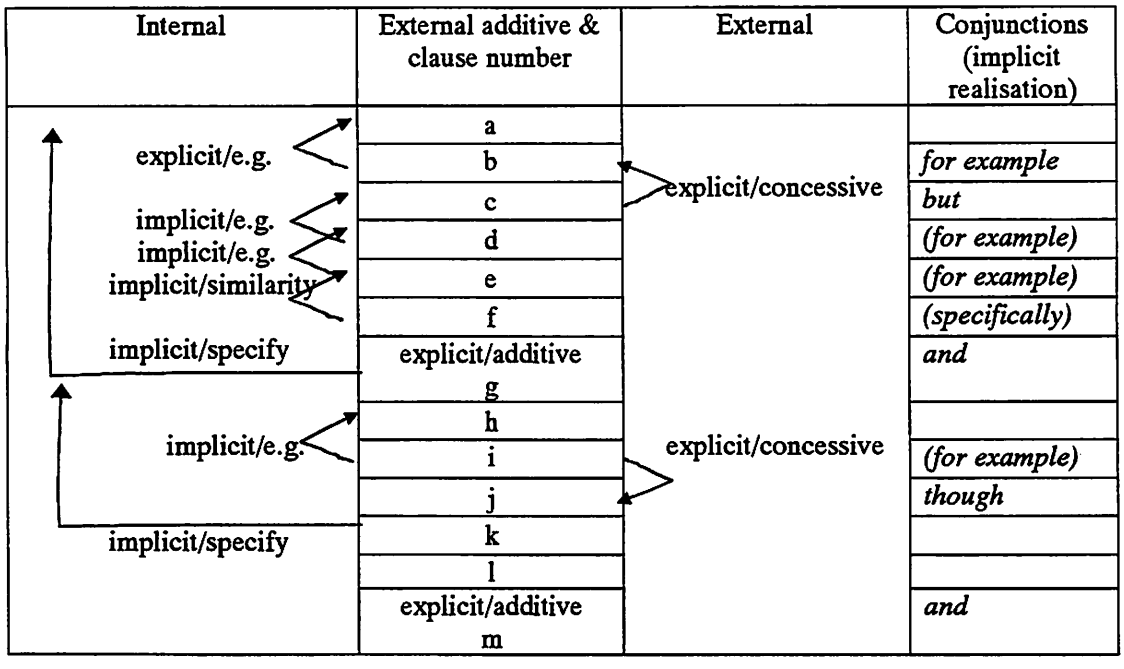


Figure 2-6 Logico-Semantic Relations in TEXT 3 (Technical discourse)

The conjunctive relations shown in the diagram above capture the type of argumentation that Technical discourse most typically deploys; for the most part it is the internal relations that move the argument forward. In the following chapter, we shall return to this point and prove that argumentation of this kind is also used in Technocratic discourse.

2.4. Summary

Let us summarise the main points that have been made in this chapter. We examined the meaning-making resources evolved in and for Technical discourse, considering the intra-clausal and inter-clausal features. Within clause, the deployment of lexicogrammatical resources is characterised by metaphorical realisations of events and cause-effect relations. To be specific, events are metaphorically realised by nominal elements, and cause-effect relations by verbal elements. Thus a cause-effect relation between events is most commonly realised as 'happening *a* caused happening *x*'. Turning now to inter-clausal features, internal logico-semantic relations are deployed to connect messages, building up the argument according to the writer's logic. As far as Technical discourse is concerned, these lexicogrammatical resources serve the interests of both writers and readers; they have evolved to generalise, abstract, and technicalise experiences very efficiently, in a way readers

can best follow the argumentation. In the next chapter, we will shift our focus away from Technical discourse on to Technocratic discourse, and explore how Technocratic discourse tries to "ventriloquate" Technical discourse.

3. Technocratic Discourse: Lexicogrammatical Resources in Technocratic Discourse

3.1. Lexicogrammatical Resources as Political Strategies

Each social subcommunity has evolved its own meaning-making resources that best serve the interests of the community. Bakhtin (qtd. in Lemke 1995: 24) uses the term "voice" to refer to the social language for a particular group. Technocrats or bureaucrats tend to deploy the voice of professional scientists originally developed for scientific/technical argumentation. In that sense, technocratic voice constructs a close relationship with technical voice in terms of its lexicogrammatical features.

In this chapter, we will first examine intra-clausal and inter-clausal lexicogrammatical resources in Technocratic discourse based on the discussion in the previous chapter: nominal realisation of event (→ 3.2.1), verbal realisation of cause-effect relation (→ 3.2.2), and internal logico-semantic relation (→ 3.3). In addition, the analysis of Chomsky (2001) will be conducted in order to clarify two points. First, Technocratic discourse construes/constructs the direction of an action or policy against "terrorism" as the only solution available, as if there were no option. By observing Chomsky, we can reveal that there are other kinds of social reality concerning "terrorism" and, therefore, other possible solutions to resolve the issue. Second, Technocratic discourse chooses metaphorical realisations of meanings to leave a lot of meanings opaque to readers. By analysing Chomsky, we can reveal that there are more congruent or concrete realisations available, if the author wishes to make the discourse comprehensible to a wider audience. And finally, we will consider the reasons for technocrats' inclination towards "ventriloquating" Technical voice, asking what types of ideological motivations work behind the scene (→ 3.4). Throughout this chapter, the discussion will be mainly restricted to the following part of TEXT 1:

TEXT 1
Increasing challenges and threats emanating from the territories of weak states and ungoverned areas.

(a) The absence of capable or responsible governments in many countries in wide areas of Asia, Africa, and the Western Hemisphere creates a fertile ground for non-state actors to engage in terrorism, acquisition of NBC weapons, illegal drug trafficking, and other illicit activities across state borders.
(b) A terrorist underworld—including such groups as al Qaeda, Hamas, Hezbollah, Islamic Jihad, and Jaish-I-Mohammed—operates in such areas.
(c) In an era of catastrophic terrorism, the United States cannot afford to ignore the anarchy that threatens a number of regions of the world.

(d) In several regions, the inability of some states to govern their societies, safeguard their military armaments, and prevent their territories from serving as sanctuary to terrorists and criminal organizations poses a threat to stability and places demands on U.S. forces.
(e) Afghanistan is but one example of the security implications for the U.S. of such weak or ungoverned areas.
(f) Conditions in some states, including some with nuclear weapons, demonstrate that threats can grow out of the weakness of governments as much as out of their strength.

3.2. Within Clause: Grammatical Metaphor

TEXT 1 makes use of various kinds of grammatical metaphors characteristic of scientific argumentation, such as nominal realisation of events, or verbal realisation of causalities. In the following sections, we will analyse these lexicogrammatical features in turn, first considering the nominal realisation of events (→ 3.2.1) and then the verbal realisation of cause-effect relations (→ 3.2.2). Features of Technical discourse will also be mentioned, in order to highlight the uniqueness of Technocratic discourse.

3.2.1. Nominal Realisation of Event

In this section, we will examine realisational patterns of events in Technocratic discourse, observing if some particular patterns are preferred over others and in what textual context (i.e., co-text). Three dimensions of construing/constructing technical knowledge previously mentioned in chapter 2 will be the basis for discussion (see Figure 2-2 for definitions and examples). From here on, the dimensions of generalisation, abstraction, and technicalisation will be considered in turn.

3.2.1.1. Generalisation

In Technical discourse, general nouns are introduced in the process of construing/constructing specific social phenomena or experimental results as generic facts. For an explanation of an individually-manifested phenomenon to hold as a scientific theory, it needs to be equally true of other members in the same category. In this process, a general noun referring to the superordinate (i.e., hyperonym) is deployed to show the universal applicability. The following excerpt (re-cited here) serves as an example:

Generalisation in Technical discourse

During the Renaissance men abandoned mediaeval ways of looking at life.
(*That is to say*) They developed new ideas about art, religion and behaviour.
(*Because*) They regarded the preceding centuries as barbaric [...].
(adapted from Eggins et al. 1993)
Note: General noun (**bold**) Internal logico-semantic relation (*italic*)

In this example, the general noun *men* serves to establish an event *mediaeval ways of looking at life were abandoned* as a historic fact that took place in the Renaissance period. Specific participants, such as *John* or *Mary*, cannnot function in the same way as the general noun *men* does: *John/Mary/John and Mary abandoned mediaeval ways of looking at life* can never be perceived as a historic fact which characterises the Renaissance. Thus, a specific instance has to be generalised in the course of semogenesis.

Technocratic discourse also uses general nouns intending for a particular effect: to construe/construct a proposed policy as universally beneficial. General nouns are deployed to indicate that a policy the U.S. government is trying to implement is in the interest of all U.S. citizens. Let us examine the following example from TEXT 1:

Generalisation in Technocratic discourse (TEXT 1)

c. In an era of catastrophic terrorism, **the United States** cannot afford to ignore the anarchy that threatens **a number of regions of the world**.

Note: U.S. citizens as generalised participant (e.g., organisation or nation) (**bold**)
Agent (double underline) Medium (broken underline)

In the above example, the generalised participant, *the United States*, has an effect to construct the present situation as a crisis for all U.S. citizens to face. The preference of a generalised participant over a specific one enables the writer to make the impression that the proposed policy is for the sake of the public in general, and not the personal interest of the government. Precisely because the generalised expression presents the readers as a member of the same organization (i.e., the United States), it also serves to create a sense of solidarity with the public.

Moreover, looking at the generalised participants from the ergative perspective gives us another insight. As discussed in section 1.2.2.1 above, a clausal pattern can be interpreted as involving two types of elements: a medium through which the process is actualized, and an agent as an external causation which brings about the process (Halliday 1994). In the example (c) above, the generalised participant, *a number of regions of the world*, by implication, *the United States*, is construed as a medium whose 'fear' is caused by the agent, *the anarchy*, i.e., enemy. Thus, in the semiotic space, the enemy is construed as causing the catastrophic situation which needs to be solved by a military intervention, whereas the U.S. is construed as just being passively thrown into the crisis. It is shown diagrammatically in Figure 3-1.

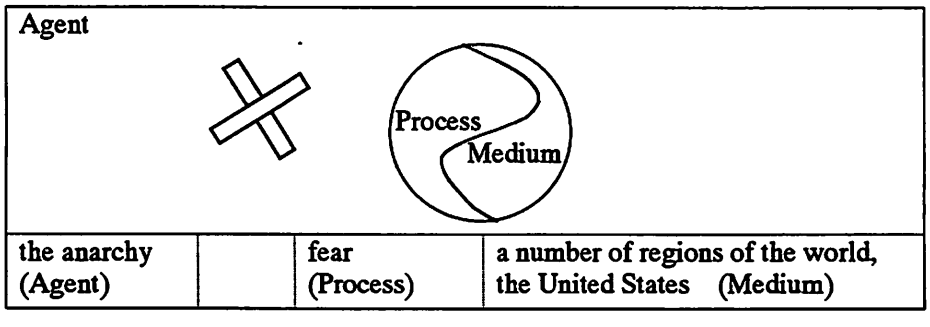


Figure 3-1 Ergative Interpretation

This kind of semioticising process stands out in the text — the U.S., who in the real world actively takes actions against the enemy, is semioticised as a passive reactor to the crisis. It is a semiotic strategy which serves to shift the responsibility away from the U.S..

This kind of hidden pattern can only be noticed and interpreted critically by initiated readers equipped with relevant background knowledge. In the following excerpt, political activist Chomsky (2001: 111) indicates that U.S. "unilateralism" persists in all its practices; only experts like him can notice that the kind of semioticising tendency found in TEXT 1 to construe the U.S. as a generalised participant and medium functions to conceal U.S. "unilateralism."

Chomsky (2001: 111)
It's worth recalling that Bush's "unilateralism" was an extention of standard practice. [...] Members of the coalition are expected to be silent and obedient supporters, not participants. The U.S. explicitly reserves to itself the right to act as it chooses, and is carefully avoiding any meaningful recourse to international institutions, as required by law.

Incidentally, it is interesting to see a related lexicogrammatical feature in Chomsky in comparison with TEXT 1. In place of generalised participants deployed in TEXT 1, a specific person, *Bush*, is chosen as a part of the participant in the subject position. As shown below, participant in a subject position is given Modal responsibility and becomes the element to be responsible for the validity of the proposition.

TEXT 1: **the United States** cannot afford to ignore the anarchy.
Chomsky: **Bush's "unilateralism"** was an extention of standard practice.

From this comparison, it becomes obvious why the choice between an individually- oriented participant and a generalised participant is made, and when a generalised participant is chosen as in TEXT 1, it is a semiotic strategy to avoid any possible blame toward a specific individual.

3.2.1.2. Abstraction

For Technical discourse, the dimension of abstraction is indispensable in the course of scientific argumentation. Abstracted expressions are deployed to reify as semiotic things the configurations of participant + process + circumstance in the previous message. The following excerpt shows the point:

Abstraction in Technical discourse

The atomic nucleus absorbs and emits energy only in quanta, or discrete units.
GIVEN/THEME NEW/RHEME

Each absorption marks **its transition to a state of higher energy**,
GIVEN/THEME NEW/RHEME

and **each emission** marks **its transition to a state of lower energy**.
GIVEN/THEME NEW/RHEME

(adapted from Halliday 1993: 81)

Note: Abstracted expression **(bold)**

Here, reified processes *absorption* or *emission*, as Given, logogenetically condense/pack what has previously been said in the form of a clause. This type of logogenetic unfolding makes it sure that the condensed meaning is interpretable from the co-text, and, at the same time, makes a great contribution toward introducing textual new information one piece at a time, based on well-founded given information.

On the other hand, Technocratic discourse tends to deploy abstracted expressions without introducing a congruent construction of the meaning. This is why it is difficult to interpret the transitivity patterns condensed in those expressions based on the co-text. This also means that an abstracted expression in Technocratic discourse is not a means to introduce textual new information step by step. Let's look at the following example:

Abstraction in Technocratic discourse (TEXT 1)

d. In several regions, **the inability of some states to govern their societies, safeguard their military armaments, and prevent their territories from serving as sanctuary to terrorists and criminal organizations** poses **a threat to stability** and places **demands** on U.S. forces.
Note: Abstracted expression **(bold)**

In this example, the abstracted expressions, such as *a threat to stability* or *demands*, do not by themselves provide a clue to understand the condensed transitivity patterns: 'WHO threatens/will threaten WHOM to be unstable in WHAT respect' or 'WHO demands/will demand U.S. forces to do WHAT', respectively. As for the latter case, the condensed pattern would practically mean 'the inability of some states (= WHO) demands U.S. forces to preemptively attack them (= WHAT)', though the pattern is hidden from the readers, thereby permitting no critical reading of the claim. It is also important to note that the abstracted expressions function as Given (as well as New), as if they were widely-accepted knowledge:

Theme/Given	Rheme/New
In several regions, **the inability of some states to govern their societies, safeguard their military armaments, and prevent their territories from serving as sanctuary to terrorists and criminal organizations**	poses **a threat to stability** and places **demands** on U.S. forces.

Abstracted expression **(bold)**

Therefore, TEXT 1 makes use of information structure and constructs the claim that the U.S. military intervention is in demand as an irrefutable fact.

The claim may be irrefutable in a semiotic space but cannot be in a real world, as suggested in the following citation from Chomsky (2001: 23):

Chomsky (2001: 23)

> [...] we know quite well how the problem should be addressed, if we want to reduce the threat rather than escalate it. When IRA bombs were set off in London, [...] efforts were made to deal with what lay behind the resort to terror. [...] Just about every crime — whether a robbery in the streets or colossal atrocities — has reasons, and commonly we find that some of them are serious and should be addressed.

As in TEXT 1, Chomsky considers how the U.S. should deal with terrorism. However, another claim is made that the U.S. should make an effort to find and address why people have to resort to terror. From his observation, it is revealed that the social-semiotic reality in TEXT 1 is not the one and only reality concerning terrorism, and the government's policy is not necessarily the most adequate solution to the current crisis.

Turning now to the lexicogrammatical features, Chomsky's description is quite concrete, leaning toward the clausal construction of events and avoiding abstracted expressions (i.e., the nominal construction of events). Then, there is the possibility of choosing abstracted expressions in order to mystify the transitivity patterns, or opting for concrete expressions in order to make things clear. Clearly, the author of TEXT 1 chooses the former.

3.2.1.3. Technicalisation

As shown in Figure 2-2, technicalisation is a process to construe/construct various phenomena as a scientific reality, using technical terms with field-specific meanings. When texts are intended for novice readers, they usually include defining and classifying stages for the terms. However, in Technical discourse intended for specialists, technical terms are introduced in the text without being defined or mutually classified. They are regarded as being already established in the readers' language systems, in the course of their ontogenetic or individual semantic development (see section 1.2.5). The following excerpt exemplifies the point:

Technicalisation in Technical discourse (TEXT 2)

Fertilization of **mammalian eggs** is followed by successive **cell divisions** and progressive differentiation, first into **the early embryo** and subsequently into all of the cell types that make up the adult animal.

Note: Technical terms (**bold**)

Phylogenetically invented and generally established in a specific academic discourse community, technical terms are exclusively possessed by the community members who are intertextually familiar with the terminology. This explains why they have to be defined or mutually categorised logogenetically in the text, when they are introduced to novice readers such as junior-secondary school students:

Technicalisation in Junior-Secondary School Textbook

As far as the ability to carry electricity is concerned, we can place most substances into one of two groups (***CLASSIFYING***). The first group contains materials with many electrons that are free to move. These materials are called **conductors** because (=×) they readily carry or conduct electric currents (***DEFINING***). [...] The second group contains materials with very few electrons that are free to move. These materials are called **nonconductors** and (=+) are very poor conductors of electricity (***DEFINING***).

(adapted from Martin 1993: 223)

Note: Technical terms (**bold**)
2 phases of Technicalisation (***bold italic***)

In this excerpt, a phenomenon once constructed with commonsense wordings is resemioticised as a specialised knowledge by deploying technical terms *conductors* and *nonconductors*. These words are logogenetically defined and classified into taxonomy, given the position of sub-classes that belong to the same superordinate (i.e., *substances*). In other words, the junior-secondary school textbook deploys the kind of meaning-making resources that are friendly to novices, in that it familiarises the readers with the field-specific technical terms before going on to any specialised discussion.

On the other hand, Technocratic discourse is reader-unfriendly, in that it not only leaves out logogenetic definition or classification of technical terms, but it deploys these terms with certain intentions, conscious or unconscious. Let's consider the following example, focusing

on the term *terrorist* or *terrorism*:

Technicalisation in Technocratic discourse (TEXT 1)

(a) The absence of capable or responsible governments in many countries in wide areas of Asia, Africa, and the Western Hemisphere creates a fertile ground for non-state actors to engage in **terrorism**, acquisition of NBC weapons, illegal drug trafficking, and other illicit activities across state borders.

(b) A **terrorist** underworld—including such groups as al Qaeda, Hamas, Hezbollah, Islamic Jihad, and Jaish-I-Mohammed—operates in such areas.

(c) In an era of catastrophic **terrorism**, the United States cannot afford to ignore the anarchy that threatens a number of regions of the world.

Note: Technical terms (**bold**)

Here, the technical term *terrorist/terrorism* is deployed to construe/construct *many countries in wide areas of Asia, Africa, and the Western Hemisphere* as enemies to fight against. The technical term carries a negative evaluation or value within itself; just by naming someone a terrorist, we can construe the person as an evil that should be extinguished.

When definitions of the terms are clarified in the course of logogenesis, as in the junior-secondary school textbook above, readers can ask if it is appropriate to call a particular group of people in question terrorists, and by implication an evil. Therefore, readers can also ask if the U.S. really should attack the countries where such groups operate. In TEXT 1, this kind of critical reading is carefully avoided by not providing the definition of technical terms to the readers.

Roland Barthes (1993), in his discussion on the official vocabulary of African affairs, makes a similar point (see section 1.1). Taking a French word *bande de hors-la-loi* 'band of outlaws' as an example, he clarifies the intended effect of its deployment: when an attack is proposed against 'outlaws', it appears to be a means to achieve peace rather than produce a cruel war. The attack is the one and only solution, since the very nature of the word 'outlaw' conjures up an image of someone who would be unwilling to negotiate. The following passage from Chomsky (2001: 16, 90) serves as a counter-example:

Chomsky (2001: 90)

> [...] the term "terrorism" is used to refer to terrorist acts committed by enemies against us or our allies. [...] Given these conventions, even the very same people and actions can quickly shift from "terrorists" to "freedom fighters" and back again.

Chomsky (2001: 16)

> [...] To call it a "war against terrorism," however, is simply more propaganda, unless the "war" really does target terrorism. But that is plainly not contemplated because Western powers could never abide by their own official definitions of the term, as in the U.S. Code or Army manuals. To do so would at once reveal that the U.S. is a leading terrorist state, as are its clients.

In the above quotations, as in TEXT 1, Chomsky talks about "a war against terrorism," the technical term *terrorism* is logogenetically defined as *terrorist acts committed by enemies against us or our allies*. On the basis of the logogenetic definition, Chomsky discusses that the U.S. itself is a leading terrorist state. This type of textual pattern ensures that readers can

follow the discussion and read the author's claim critically, asking if the U.S. really falls under the category of terrorist state. All these things make it clear that the omission of defining and classifying processes in Technocratic discourse functions as a political strategy to avoid possible objection against the construction of any state as an enemy, and thus objection against the proposal to attack the enemy.

3.2.2. Verbal Realisation of Cause-Effect Relation

In the last section, especially in the discussion of abstraction, we have shown that an event, which is typically expressed by a process configuration, is condensed into and realised by a nominal group. Consequently, verbal items are used to express a cause-effect relation between events as in 'this event *caused* that event'. As we have mentioned in section 2.2, Technical discourse has good logogenetic grounds for deploying these metaphorical expressions:

Verbal Realisation of Cause-Effect Relation in Technical discourse

The atomic nucleus absorbs and emits energy only in quanta, or discrete units.
THEME/GIVEN RHEME/NEW

Each absorption marks **its transition to a state of higher energy,**
THEME/GIVEN RHEME/NEW

and **each emission** marks **its transition to a state of lower energy.**
THEME/GIVEN RHEME/NEW

(adapted from Halliday 1993: 81)

Note: Abstracted expression (**bold**)
Verbalised cause-effect relation (rectangle)

Here, the second and third clauses consist of the nominalised events which have been previously constructed in the form of a process configuration, presenting them as the starting point of a message or the basis of new information. In order to introduce a new information part on the basis of the taken for granted part, the verb *marks* has a vital role to play. It functions to connect the two parts logically, either externally, 'happening *a* causes happening *x*', or internally, 'happening *a* proves happening *x*'. In other words, grammatical metaphor allows Technical discourse to organise information in a way that moves the argument forward step by step. Accoding to Halliday (1993: 81) these metaphorical expressions are not arbitrary or random choices, but meet the nature of scienific discourse:

> Newton and his successors were creating a new variety of English for a new kind of knowledge; a kind of knowledge in which experiments were carried out [...] The discourse had to proceed step by step, with a constant movement from 'this is what we have established so far' to 'this is what follows from it next'; and each of these two parts [...] had to be prenseted in a way that would make its status in the argument clear. The most effective way to do this, in English grammmar, is to construct the whole step as a single clause, with the two parts turned into nouns, one at the beginning and one at the end, and a verb in betweeen saying *how* the second follows from the first. (Halliday 1993: 81)

In Technocratic discourse, grammatical metaphor does not seem to be motivated by the same

logogenetic semantic pressure as in Technical discourse; it does not organise the information in ways similar to Technical discourse. As shown in section 3.2.1.2 above, neither 'happening *a*' nor 'happening *x*' has been congruently presented anywhere in the text, masking the condensed transitivity pattern. By the same token, cause-effect relations between events are metaphorically realised not for showing experiential connections but for faking them. The distinction between text-external and internal logico-semantic relations is obscured, and the writer's specification of the causality is lexicogrammatically realised as if it were a text-external or real causation. Consider the following passage:

Verbal Realisation of Cause-Effect Relation in Technocratic discourse (TEXT 1)

d. In several regions, **the inability of some states to govern their societies, safeguard their military armaments, and prevent their territories from serving as sanctuary to terrorists and criminal organizations** [poses] **a threat to stability** and [places] **demands** on U.S. forces.

☆ *the inability of some states* [cause] 1. *a threat to stability* & 2. *demands on U.S. forces*

Note: Abstracted expression **(bold)**
Verbalised cause-effect relation ([rectangle])

In (d), what is set up between *the inability of some states* and *a threat to stability* or *demands on U.S. forces* is the relationship of inferred causation rather than text-external or real causation: 'event *a* causes me to think event *x*' rather than 'event *a* causes event *x*'. However, the metaphorical realisation of causalities blurs the difference, disguising text-internal causation as text-external or real causation. By this means, the writer's inference about the causal sequences is lexicalised as an objective fact, which is hardly read in a critical way by novice readers.

Critical reading is only possible for political specialists like Chomsky:

Chomsky (2001: 32)

In Iraq, though Westerners prefer a different story, they see that U.S. policy in the past ten years has devastated the civilian society while strengthening Saddam Hussein — who, as they know, the U.S. strongly supported through his worst atrocities, including the gassing of the Kurds in 1988.

☆ *U.S. policy in the past ten years* [cause] *a threat to stability*

In this passage, Chomsky recognises different causation for the *threat to stability* other than *the inability of some states*: *U.S. policy in the past ten years*. As for the deployment of lexicogrammatical resources, verbal elements such as *devastate* or *strengthen* do metaphorically represent the causal relations, but accompany rather specific individual participants such as *Saddam Hussein*. This is why the passage by Chomsky seems easier to grasp than TEXT 1.

We have so far considered intra-clausal features, asking how and on what logogenetic grounds events and their cause-effect relations come to be lexicalised. It has been revealed that in Technocratic discourse, grammatical metaphor is deployed not for making the argument clear, but for masking transitivity patterns or logical relations. This is where Orwell's problem arises (see section 1.1). All these things make it clear that grammatical metaphor is exploited as a political strategy to manipulate social reality. The following

sentences summarise what aspects of reality are masked and for what effects:

① Experiential patterns condensed in abstracted expressions and technical terms are obscured, impeding the readers' critical interpretation against the government's observation. In this process, some states are constructed as an evil enemy to fight against. General nouns are deployed to indicate that the policy is in the interest of all U.S. citizens as well as the people in many regions of the world; they also serve to create a sense of solidarity with the readers.

②Cause-effect relations are metaphorically realised to present the writer's specification of the causality as a text-external or real causation. In this process, the defects of the argumentation are masked and the inevitability of the U.S. proposal comes to be well-grounded and foregrounded.

In the next section, we will turn our attention to the inter-clausal semantic features.

3.3. Between Clauses: Internal Logico-Semantic Relation

We have seen in section 2.3 that Technical discourse makes use of internal logico-semantic relations to interconnect messages and unfold argumentation. This type of argumentation leans toward the writer's rhetorical strategies rather than text-external or real connections between the events. Take the following excerpt from TEXT 3 as an illustration, the clauses (b), (d), and (e) elaborate the previous message, by exemplifying what has been stated in the prior clause. In this manner, the internal logico-semantic relations function to build up the rhetorical structure, leading the argument towards the conclusion:

Internal Logico-Semantic Relation in Technical discourse (TEXT 3)

exemplification (elaboration)	(a) Historically, the first research thread leading to experimental cloning involved laboratory stimulation of development through artificial fertilization. (= CONCLUSION)
exemplification (elaboration)	(b) From "natural" reproduction in aspen trees or sea anemones, for example, it is a short step to carrying out some forms of cloning,
	(c) but there has to be an interest in intervening
exemplification (elaboration)	(d) By the turn of the 20th century, researchers had that interest and enough knowledge about fertilization and the fundamentals of inheritance and development to begin experimenting.
	(e) Jacques Loeb's artificial parthenogenesis to make larval urchin eggs in the 1890s showed that fertilization is not necessary to make larval urchins.

Likewise, Technocratic discourse organises messages through text-internal relations, developing the argument in support of the "macro-proposal." Following Martin's conventions (1992), the logico-semantic relations in TEXT 1 can be diagrammatically modelled as in the following reticula. The analysed portion of the text is shown in section 3.1:

Internal	External additive & clause number	External	Conjunctions (Implicit relation)
implicit/cause	a		
implicit/e.g.	b		*(for example)*
implicit/cause	c		*(therefore)*
implicit/i.e.	d		*(in other words)*
explicit/e.g.	e		*for example*
implicit/e.g.	f		*(another example)*

Figure 3-2 Logico-Semantic Relations in TEXT 1 (Technocratic discourse)

TEXT 1 is an instance of hortatory expositioin that intends to persuade readers to accept a new policy. As presented in Figure 3-2, the validity of the conclusiton realised in clause (c) is supported by the surrounding messages. The supporting messages are interconnected through internal logico-semantic relations such as clarifying (i.e.) and exemplifying (e.g.) reformulations. The conclusion and the supporting messages combine to realise the macro-proposal (i.e., the policy) that the United States should preemptively attack the anarchistic regions. The following diagram elucidates the point:

Internal Logico-Semantic Relation in Technocratic discourse (TEXT 1)

(a) The absence of capable or responsible governments in many countries in wide areas of Asia, Africa, and the Western Hemisphere creates a fertile ground for **non-state actors** to engage in terrorism, acquisition of NBC weapons, illegal drug trafficking, and other illicit activities across state borders.

exemplification (elaboration) (b) A terrorist underworld— including such groups as al Qaeda, Hamas, Hezbollah, Islamic Jihad, and Jaish-I-Mohammed

cause (enhancement) —operates in such areas.

(c) In an era of catastrophic terrorism, the United States cannot afford to ignore the anarchy that threatens a number of regions of the world. (= CONCLUSION)

- Semantically "Proposal of Policy"
  Macro-Proposal : *the United States should preemptively attack the anarchistic regions (Iraq ?).*
- Lexicogrammatically "Statement of Facts"
  In an era of catastrophic terrorism, the United States cannot afford to ignore the anarchy that threatens a number of regions of the world. etc.

Note: Elaborated portion **(bold)** Elaborating portion (underline)

Here, the supporting propositions (a) and (b) are connected to the conclusion (c) on the basis of internal logico-semantic relations or the author's inferences and judgements. The conclusion, as well as the supporting propositions, is lexicogrammatically constructed by the declarative Mood as a statement of fact (see section 1.2.3.3 for the explanation of Mood and Speech Function). In other words, the policy is incongruently or indirectly proposed as an

inevitable consequence of the situation. This is the third textual strategy of Technocratic discourse and functions to conceal the writer's responsibility for launching a new policy.

③ A "macro-proposal" to preemptively attack an enemy is lexicogrammatically derived from propositions interconnected through internal logico-semantic relations. By this means, the proposed policy is presented as an inevitable consequence of the situation, while the argumentation is mainly based on the writer's inferences or judgements.

The discussion up to this point makes it clear that Technocratic discourse deploys intra-clausal and inter-clausal lexicogrammatical resources evolved for scientific argumentation: (1) grammatical metaphor and (2) internal logico-semantic relations. However, they are deployed to convince the readers that the policy set out by the government is the most proper.

3.4. Genre and Ideology

We have so far attempted to account for the lexicogrammatical resources in Technocratic discourse. Our account will be completed by interpreting these choices in terms of two contextual variables: genre and ideology. The interpretations of genre and ideology adopted for this paper are presented in section 1.2.4.2 and 1.2.4.3 respectively.

3.4.1. Generic Consideration

In the history of language evolution, each generic type of text has evolved meaning-making resources suitable to accomplish its own task. This is why one can predict the set of lexicogrammatical options that is consistently taken up by certain genres of texts. Of special interest here is: whether Technocratic discourse abides by the predictive pattern or not.

As Martin (1985, 1986) points out, texts that attempt to resolve particular issues incline toward "exposition" of various kinds in different modes: debates, public speeches, conferences, and the like. We have discussed above in section 1.2.4.2 that Technical discourse falls into the category of analytical exposition in that it is oriented to stasis, whereas Technocratic discourse is one instance of hortatory varieties in that it is oriented to transformation/change and tries to persuade readers to accept a new action. Hortatory expositions, as Martin (1986: 232) mentions, are a kind of macro-proposal, while analytical expositions are a kind of macro-proposition. The following lexicogrammatical resources shown in Figure 3-3 are habitually deployed in hortatory expositions and analytical expositions respectively.

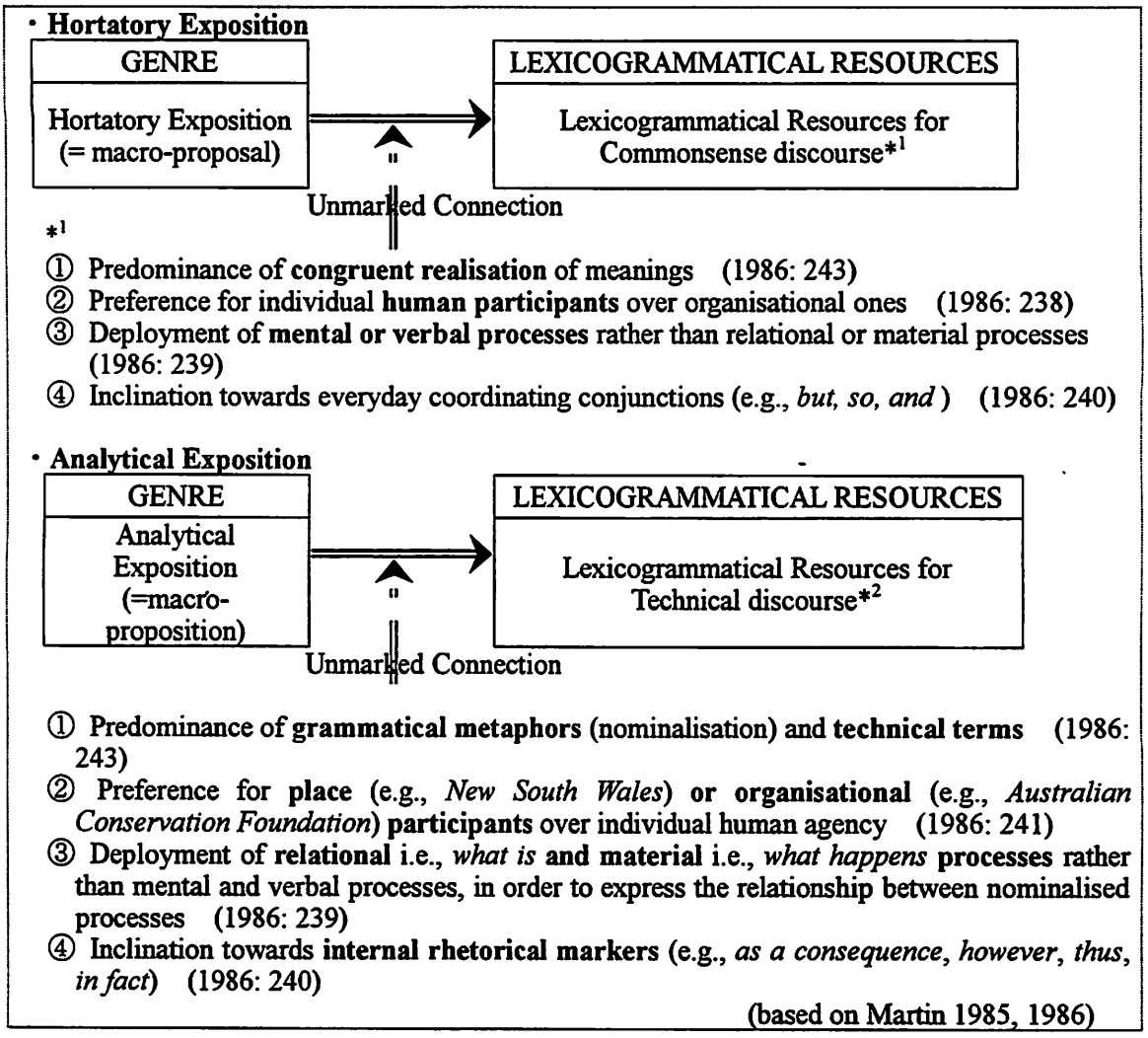


Figure 3-3 Lexicogrammatical Resources in Hortatory Exposition and Analytical Exposition

As shown in Figure 3-3, hortatory expositions that seek changes are inclined towards people and what they think or say. They intend to appeal to the readers' feelings and persuade readers by means of commonsense wordings where the use of grammatical metaphor is limited. The writer-reader relationship is a quite personal and interactive one – that of equal to equal. In contrast, analytical expositions that try to protect the status quo lean more towards nominalised things and their relations. The writer-reader relation is an impersonal one — that of an expert passing on the ready-made information to the uninformed (Martin 1985: 44).

Generically speaking, Technocratic discourse belongs to hortatory expositions. However, if we compare the lexicogrammatical features in Technocratic discourse (reformulated in Figure 3-6) with those in other hortatory expositions (summarised in Figure 3-3), we can find dissimilarities. Rather, Technocratic discourse leans more towards analytical exposition in its lexicogrammatical characteristics: ① "predominance of grammatical metaphors (e.g., nominalisation) and technical terms" is equivalent to "abstracted expressions" and "technical terms" in our analysis; ② "preference for place or organisational participants over individual human agency" is equivalent to "generalised expressions"; ③ "deployment of

relational (i.e., *what is*) and material (i.e., *what happens*) processes that express the relationship between nominalised processes" is equivalent to "verbal realisation of cause-effect relations"; ④ "inclination towards internal rhetorical markers" is equivalent to "internal logico-semantic relations." The marked relation between the genre and lexicogrammatical resources in Technocratic discourse can be schematised as follows:

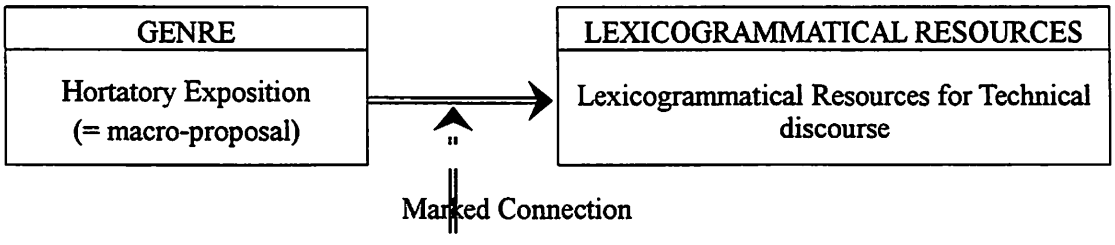


Figure 3-4 Genre and Lexicogrammatical Resources in Technocratic Discourse

Technocratic discourse can be characterised by its marked relationship of the generic type and lexicogrammatical resources, which functions to create a distance between the writer and the reader and prevent any critical interpretation against the government's observation. In the next chapter, we will consider the underlying motives for the marked lexicogrammatical choices in detail, from the perspective of ideology.

3.4.2. Ideological Motivation towards Technical Discourse

Based on the observation so far stated, this section aims to reveal the ideology that motivates technocrats or bureaucrats for using intra-clausal grammatical metaphors or inter-clausal internal logico-semantic relations. In order to clarify the motivation, we should first ask what can be gained by choosing these forms of realisations. The following passage from TEXT 1 can be used to illustrate the point:

Original " Written / Metaphorical " Version (TEXT 1)

(d) In several regions, the **inability** of some **states** to govern their **societies**, safeguard their military armaments, and prevent their territories from serving as **sanctuary** to **terrorists** and **criminal organizations** poses a threat to **stability** and places **demands** on **U.S. forces**.

(e) Afghanistan is but one example of the **security implications** for **the U.S.** of such weak or ungoverned areas.

(f) **Conditions** in some **states**, including some with nuclear weapons, demonstrate that **threats** can grow out of the **weakness** of governments as much as out of their **strength**.

Note: Nominalised event: Generalised/Abstracted/Technicalised **(bold)**
Metaphorical cause-effect relation (rectangle)

This type of written or metaphorical language can be translated into spoken or congruent language, by removing or unpacking the metaphors. This results in more intricate clause complexes, with fewer lexical items per clause. The paraphrasing is based on the following principles of congruent wordings adopted from Halliday (1993:80):

1 processes (actions, events, mental processes, relations) are expressed by verbs;
2 participants (people, animals, concrete and abstract objects that take part in processes) are expressed by nouns;
3 circumstances (time, place, manner, cause, condition) are expressed by adverbs and by prepositional phrases;
4 relations between one process and another are expressed by conjunctions.

Based on these principles, the original version can be paraphrased as follows:

Translated " Spoken / Congruent " Version (Paraphrase of TEXT 1)

(d) In several regions, some state governors cannot govern their people, safeguard their military armaments, and their territories. *Because* they are *so* unable *that* the territories are occupied by terrorists and people who commit crimes. *Therefore*, the regions become unstable, and *so*, U.S. forces are demanded to do something.

(e) *For example*, I think that the U.S. has to secure Afghanistan *because* it is weak and not governed by the government.

(f) Some states' conditions are affected unfavourably. *For example*, some states have nuclear weapons. *Therefore*, the regions are threatened *if* the government is weak. *But* the regions are also threatened *if* the government is strong.

Note: Congruent cause-effect relations (*Italic*)

The comparison of the two versions reveals a couple of distinctive features of original metaphorical version: (1) mystification of the social reality, and (2) credibility of the resolution. The first point just reformulates what we have observed throughout this chapter: grammatical metaphor mystifies the transitivity patterns condensed in nominal groups, as well as the distinction between internal and external logico-semantic relations buried in verbal groups. It is the second point that we will explore in this section.

In English, metaphorical discourse gains prestige, or perhaps it would be better to say that scientific/technical knowledge is highly valued, and, hence, the prestige of the language that goes with it. That is why the congruently translated version of TEXT 1 sounds more childish and less credible, though it has the same experiential content as the original. To quote Lemke (2002), there are "twin ideologies of scientism": (1) that scientific/technical truth is 'objective' (i.e., free from the biases of particular interests), and (2) that it is a 'special' truth, available only to those who have mastered the intricacies of scientific/technical discourse and practices that are often divergent from commonsense beliefs. We can see, based on this claim by Lemke, how people hold scientific/technical truth sacred. With this truth, and, hence, the language to construct the truth, we can present our subjective opinions as if they were something 'special', something 'objectively' necessary. And it seems to be for this reason that technocrats or bureaucrats, consciously or unconsciously, deploy the kind of scientific language which is semantically skewed. By choosing these lexicogrammatical resources, they can promote a new policy as something 'special' and 'objectively' necessary for the country. Accordingly, Figure 3-4 can be modified as follows:

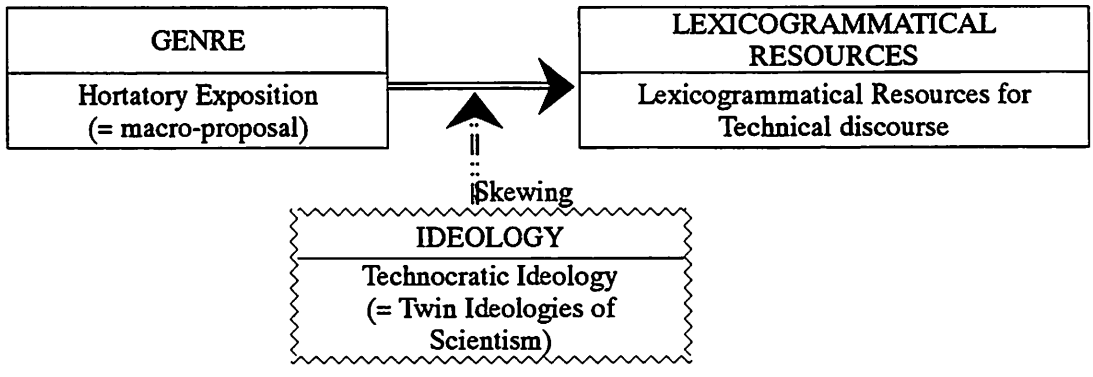


Figure 3-5 Ideology, Genre, and Lexicogrammatical Resources in Technocratic Discourse

3.5. Summary

In this chapter, we have first examined intra-clausal and inter-clausal lexicogrammatical resources in technocratic discourse based on the study in the previous chapter: nominal realisation of event, verbal realisation of cause-effect relation, and internal logico-semantic relation. The lexicogrammatical resources and their intended effects are summarised below in Figure 3-6. Subsequently, we have considered the reasons for technocrats' inclination towards scientific language, revealing that "twin ideologies of scientism" serves as a semiotic motivation.

(Kinds of Meaning-Making Resources → Intended Effects in Technocratic Discourse)

(1) Within Clause: Grammatical Metaphor

1. Nominal Realisation of Event

→ Experiential patterns condensed in abstracted expressions and technical terms are obscured, impeding the readers' critical interpretation against the government's observation. In this process, some states are constructed as an evil enemy to fight against. General nouns are deployed to indicate that the policy is in the interest of all U.S. citizens as well as the people in many regions of the world; they also serve to create a sense of solidarity with the readers.

2. Verbal Realisation of Cause-Effect Relation

→ Cause-effect relations are metaphorically realised to present the writer's specification of the causality as a text-external or real causation. In this process, the defects of the argumentation are masked and the inevitability of the U.S. proposal comes to be well-grounded and foregrounded.

(2) Between Clauses: Internal Logico-Semantic Relation

→ A "macro-proposal" to preemptively attack an enemy is lexicogrammatically derived from propositions interconnected through internal logico-semantic relations. By this means, the proposed policy is presented as an inevitable consequence of the situation, while the argumentation is mainly based on the writer's inferences or judgements.

Figure 3-6 Lexicogrammatical Resources as Political Strategies

Conclusion

In this paper, we have attempted to demonstrate "Orwell's Problem," concerning the opacity of political language, by means of the framework of Systemic Functional Theory. In order to explain the effect of political language to mystify the social reality, we started by comparing the lexicogrammatical resources in Technocratic discourse with those in Technical discourse. The comparison made it clear that the mystifying effect stems from the logogenetic nonnecessity of the meaning-making resources in Technocratic discourse.

In Technical discourse, the three textual phases of construing/constructing scientific/technical knowledge, namely generalisation, abstraction, and technicalisation, demand the deployment of intra-clausal grammatical metaphors and inter-clausal internal logico-semantic relations to effectively unfold the argument. So far as grammatical metaphor is concerned, it has been revealed that in Technocratic discourse nominalised events and verbalised cause-effect relations are utilised not for making the argument clear, but for masking the condensed experiential patterns or faking logical relations. As for inter-clausal features, the rhetorical development heavily relying on internal logico-semantic relations enables the writer to logogenetically connect propositions in support of the policy or macro-proposal based on his/her own inferences and judgment. The conclusion of the text, along with the supporting propositions, is lexicogrammatically realised by declarative Mood as a

"statement of fact." By this means, the policy is constructed as an inevitable consequence of the situation. However, by analysing Chomsky (2001), it was proved that there are more congruent or concrete realisations of meanings available, as well as different kinds of social reality concerning terrorism and, therefore, different solutions for resolving the issue. Therefore, we have good reasons for thinking that Technocratic discourse 'ventriloquates' the voice of professional scientists as a political strategy.

If there is no logogenetic motive for the lexicogrammatical resources, then what brings them into being? This was the next question we have attempted to answer. Generically speaking, Technocratic discourse belongs to hortatory exposition where macro-proposal is presented. In unmarked case, hortatory exposition is characterised by its deployment of commonsense wordings or congruent realisations. Technocratic discourse, however, leans more towards analytical exposition in its lexicogrammatical characteristics — lexicogrammatical resources for Technical discourse. This is where "twin ideologies of scientism" have a role to play. Technocratic discourse deploys scientific/technical language to disguise a policy as a 'special' and 'objective' truth like other scientific truths. To recapitulate the point, let's look at the following extract which best exemplifies the features of Technocratic discourse. This portion of text is obtained from TEXT 1:[11]

Lexicogrammatical Resources as Political Strategies in Technocratic Discourse

☆ Fourth, **defending the United States** requires **prevention and sometimes preemption.**
(Because) It is not possible to defend against **every threat,** in every place, at every conceivable time.
(Therefore) **The only defense against** is **to take the war to the enemy.**
(In other words,) **The best defense** is **a good offense.** (p.30)

- **bold** : Event as Abstracted Expression
- broken underline : the Unites States as General Noun & Medium
- rectangle : Verbalised Cause-Effect Relation
- underline : Internal Logico-Semantic Relation
- ☆ : Policy Lexicogrammatically Realised as Macro-Proposition

After the attacks on September 11, the Bush administration has made every effort to manipulate the kind of social reality which can justify "the war against terrorism." This paper tried to shed light on the role language plays in constructing the version of reality in the social semiotic space. Appendix 1 provides a summary chart that recapitulates the argument throughtout this paper. We will conclude the argument with George Orwell's remarks:

[11] In this part, the author, Defense Secretary Donald Rumsfeld, enumerates the lessons drawn from the recent U.S. military attacks in Afganistan. The extract indirectly proposes a new policy to launch a preemptive attack against the nations labelled as part of an "axis of evil."

(Orwell 1946: 362)

In our time, political speech and writing are largely the defence of the indefensible. Things like the continuance of British rule in India, the Russian purges and deportations, the dropping of the atom bombs on Japan, can indeed be defended, but only by arguments which are too brutal for most people to face, and which do not square with the professed aims of political parties. Thus political language has to consist largely of euphemism, question-begging and sheer cloudy vagueness.

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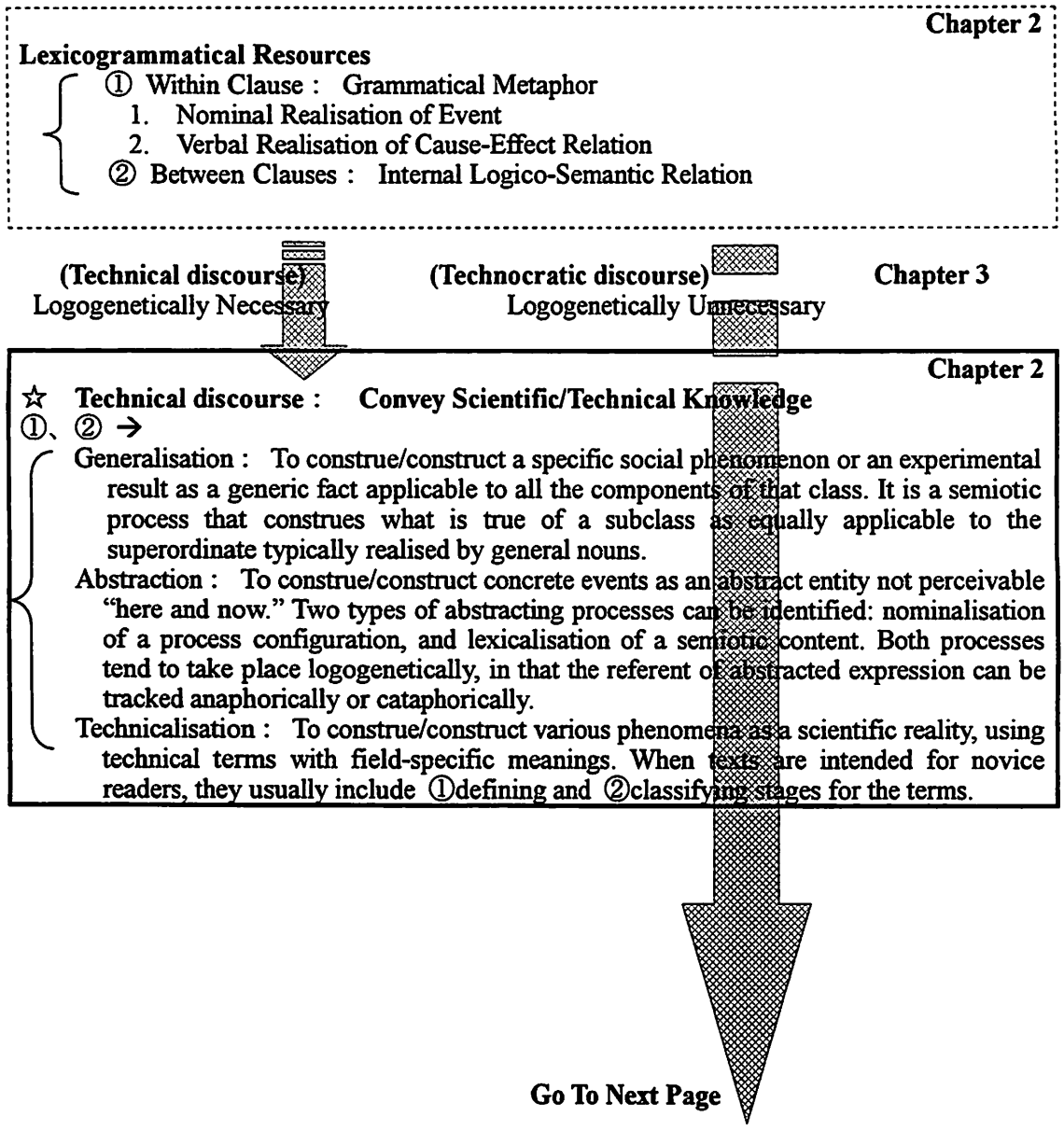
Appendices

APPENDIX 1: Summary Chart



Chapter 3

☆ **Technocratic discourse : Propose a New Policy**
(Kinds of Meaning-Making Resources → Intended Effects in Technocratic Discourse)

① 1. → Experiential patterns condensed in abstracted expressions and technical terms are obscured, impeding the readers' critical interpretation against the government's observation. In this process, some states are constructed as an evil enemy to fight against. General nouns are deployed to indicate that the policy is in the interest of all U.S. citizens as well as the people in many regions of the world; they also serve to create a sense of solidarity with the readers.

① 2. → Cause-effect relations are metaphorically realised to present the writer's specification of the causality as a text-external or real causation. In this process, the defects of the argumentation are masked and the inevitability of the U.S. proposal comes to be well-grounded and foregrounded.

② → A "macro-proposal" to preemptively attack an enemy is lexicogrammatically derived from propositions interconnected through internal logico-semantic relations. By this means, the proposed policy is presented as an inevitable consequence of the situation, while the argumentation is mainly based on the writer's inferences or judgements.

• **Generically**, Technocratic discourse is a type of Hortatory Exposition (= macro-proposal), but its lexicogrammatical resources are skewed towards those for Analytical Exposition (= macro-proposition). The skewing is motivated by the twin **Ideologies** of scientism that scientific truth is 'objective' and 'special'.

Chapter 1

Orwell's Problem
The features of political language that mystify the reality to promote a policy. They impede the readers' critical interpretation against the government's observation.

APPENDIX 2: ANALYSIS TEXT

TEXT 1: Technocratic discourse
(from Donald H. Rumsfeld. 2002. *Annual Report to the President and the Congress*: 11-14.)

The Department's senior leadership identified features and trends of the security environment that define today's geopolitical and military-technical challenges, and which highlight critical operational challenges that the nation's armed forces will need to master in the future.

Current Security Trends

Although U.S. military forces enjoy advantages in many aspects of armed conflict, the U.S. will be challenged by adversaries that possess or seek capabilities and design novel concepts to overcome those advantages. The United States cannot predict with a high degree of confidence the identity of the countries or the actors that may threaten its interests and security. But it is possible to identify the trends that will provide adversaries with capabilities and opportunities to do harm to the U.S.

Diminishing protection afforded by geographic distance. As the events of September 11 have demonstrated, the geographic position of the United States will not provide immunity from direct attack on its people, territory, or infrastructure. Enemies are finding new ways to

overcome the difficulties of geographic distance. It is clear that over time an increasing number of states have and will acquire cruise and ballistic missiles of steadily increasing range. Moreover, economic globalization and the increase in travel and trade across U.S. borders have created new vulnerabilities and opportunities for hostile states and actors to exploit and to perpetrate attacks on the U.S. homeland.

Regional Security Developments. Regional powers are developing capabilities to threaten stability in regions critical to U.S. interests. In particular, Asia is gradually emerging as a region susceptible to large-scale military competition. Along a broad arc of instability that stretches from the Middle East to Northeast Asia, there exists a volatile mix of rising and declining regional powers. The governments of some of these states are vulnerable to radical or extremist internal political forces or movements. Many of these states field large militaries and already have or possess the potential to develop or acquire weapons of mass destruction. Iraq, Iran, and North Korea are arming with long-range missiles and are seeking or acquiring nuclear, biological, and chemical (NBC) weapons. Analyses of regimes continue to support global terrorist organizations and to terrorize their own people.

Asia. Maintaining a stable balance in Asia will be both a critical and formidable task. The possibility exists that a military competitor with a substantial resource base will emerge in the region. The Asian littoral represents a particularly challenging area for operations. The distances are vast and the density of U.S. basing and en route infrastructure is lower than in other critical regions. This places a premium on securing additional access and infrastructure agreements and on developing systems capable of sustained operations at long distances with minimal theater-based support.

Middle East. The U.S. and its allies and friends will continue to depend on the energy resources of the Middle East, a region in which several states pose conventional military challenges and seek to acquire NBC weapons. Iran aggressively pursues these weapons. Iraq has worked to develop anthrax, nerve gas, and nuclear weapons for over a decade. Both states are also developing ballistic missile capabilities and expanding their military means to coerce states friendly to the U.S. and to deny U.S. military forces access to the region.

Europe. With the notable exception of the Balkans, which though not at war remains unstable, Europe is largely at peace. Central European states are becoming increasingly integrated with the West, both politically and economically. An opportunity for cooperation exists with Russia. It does not pose a large-scale conventional military threat to NATO. It shares some important security concerns with the United States, including the problem of vulnerability to attack by ballistic missiles from regional aggressors, the danger of accidental or unauthorized launches of strategic weapons, and the threat of international terrorism. Yet, at the same time, Russia pursues a number of policy objectives contrary to U.S. interests, both overt and covert.

Western Hemisphere. While the Western Hemisphere remains largely at peace, the danger exists that crises or insurgencies might spread across borders, destabilize neighboring states, and place U.S. economic and political interests at risk. U.S. homeland security cannot be divorced from that of its neighbors.

Increasing challenges and threats emanating from the territories of weak states and ungoverned areas. The absence of capable or responsible governments in many countries in wide areas of Asia, Africa, and the Western Hemisphere creates a fertile ground for non-state actors to engage in terrorism, acquisition of NBC weapons, illegal drug trafficking, and other illicit activities across state borders. A terrorist underworld— including such groups as al Qaeda, Hamas, Hezbollah, Islamic Jihad, and Jaish-I-Mohammed—operates in such areas. In an era of catastrophic terrorism, the United States cannot afford to ignore the anarchy that

threatens a number of regions of the world.

In several regions, the inability of some states to govern their societies, safeguard their military armaments, and prevent their territories from serving as sanctuary to terrorists and criminal organizations poses a threat to stability and places demands on U.S. forces. Afghanistan is but one example of the security implications for the U.S. of such weak or ungoverned areas. Conditions in some states, including some with nuclear weapons, demonstrate that threats can grow out of the weakness of governments as much as out of their strength.

Diffusion of power and military capabilities to non-state actors. September 11th demonstrates that terrorist groups possess both the motivation and capabilities to conduct devastating attacks on U.S. territory, citizens, and infrastructure. Often these groups have the support of state sponsors or enjoy sanctuary and protection of states, but some have the resources and capabilities to operate without state sponsorship. Terrorist networks and their supporters are exploiting globalization and actively seek NBC technology. There can be little doubt that terrorist organizations like al Qaeda that possessed such weapons would attempt to use them.

Increasing diversity in the sources and unpredictability of the locations of conflict. Together, these trends produce a geopolitical setting that is increasingly complex and unpredictable. Unlike the recent past, the U.S. will not be able to develop its military forces and plans primarily to confront a specific adversary in a specific geographic area. The United States could face the need to intervene in unexpected crises against opponents with a wide range of capabilities. Moreover, these interventions may take place in distant regions where urban environments, other complex terrain, and varied climatic conditions present major operational challenges.

TEXT 2: Technical discourse
(from I. Wilmut., A.E. Schnieke., J. McWhir., A.J. Kind., and K.H.S. Campbell. 1997. "Viable Offspring derived from Fetal and Adult Mammalian Cells." *Nature* 385: 810.)

Fertilization of mammalian eggs is followed by successive cell divisions and progressive differentiation, first into the early embryo and subsequently into all of the cell types that make up the adult animal. Transfer of a single nucleus at a specific stage of development, to an enucleated unfertilized egg, provided an opportunity to investigate whether cellular differentiation to that stage involved irreversible genetic modification. The first offspring to develop from a differentiated cell were born after nuclear transfer from an embryo-derived cell line that had been induced to become quiescent. Using the same procedure, we now report the birth of live lambs from three new cell populations established from adult mammary gland, fetus and embryo. The fact that a lamb was derived from an adult cell confirms that differentiation of that cell did not involve the irreversible modification of genetic maternal required for development to term. The birth of lambs from differentiated fetal and adult cells also reinforces previous speculation that by inducing donor cells to become quiescent it will be possible to obtain normal development from a wide variety of differentiated cells.

TEXT 3: Technical discourse
(from Jane Maienschein. 2001. "On Cloning: Advocating History of Biology in the Public Interest." *Journal of the History of Biology* 34: 424-431.)

The most important research threads in developmental biology leading to cloning include,

first, the discovery of artificial fertilization and the ability to stimulate development in selected cases. Second came the ability to recombine tissue through grafting and transplantation, leading naturally to the third thread, nuclear transplantation. Fourth was cell line and gene cloning. Next came recombinant DNA techniques of the 1970s. Finally, advances in reproductive technologies provide an important context within which these other advances have gained significance. Two lines of research - in development and genetics and in reproductive technology - provide the warp and woof of the modern cloning fabric.

Artificial Parthenogenesis

Historically, the first research thread leading to experimental cloning involved laboratory stimulation of development through artificial fertilization. From "natural" reproduction in aspen trees or sea anemones, for example, it is a short step to carrying out some forms of cloning, but there has to be an interest in intervening. By the turn of the 20th century, researchers had that interest and enough knowledge about fertilization and the fundamentals of inheritance and development to begin experimenting. Jacques Loeb's artificial parthenogenesis to make larval urchin eggs in the 1890s showed that fertilization is not necessary to make larval urchins. Loeb altered the water's salt content to stimulate cell division, and as historian Philip Pauly has shown, produced an exciting sense of controlling or engineering life. This introduced questions about whether the male is necessary, whether reproduction has to be sexual, and how far science might be able to take us through biological engineering. Newspapers trumpeted the story of "creation of life" and reporters saw parallels to "immaculate conception" in the laboratory. Though some invoked Frankenstein scenarios, the interest remained largely positive. Science might unlock the "secrets of life" and in the golden progressive era of science and engineering, that seemed good.

[...]

This growing public acceptance of a strong genetic determinism with its hope for predictability and control is apparently reinforced by the eager promises of Human Genome Project and an attendant public demand for genetic engineering and reproductive choice.

[...]

There is also opportunity to step forward to illuminate public discussion and media presentation of this science, to show that this is not radically new science. Nor is the cycle of reactions from yuk to tolerance to enthusiasm to reflective concern new or atypical.

TEXT 4: Technical discourse

(from Louis D. Hayes. 1992. *Introduction to Japanese Politics*. New York: Paragon House: 1-3.)

(1) **The "miracle" of Japan's postwar economic recovery, especially the penetration of international markets during the 1970s and 1980s, captured the imagination of the world.**

(2) Actually, this **was the second such period of extraordinary industrial expansion and growing technological sophistication, the first being the period of economic modernization during the last half of the nineteenth century.**

(3) In both instances, **Japan's dogged pursuit of rapid economic growth** at first **attracted little attention from the rest of the world.**

(4) Japan was considered of **such minor importance** as to pose **no significant threat to the economic interests of others.**

(5) Even **Japan's military activities in China during the 1890s and its defeat of Russia in 1905 did little to alter the prevailing view that Japan was only a regional power.**

(6) But with **the victories over Nationalist Chinese, British, French, and American forces in the 1930s and 1940s came the realization that the Japanese challenge to global strategic interests must be taken seriously.**

(7) After the war, the world returned to **the familiar pattern of international relations dominated by Western interests.**
(8) For Japan this meant **a welcome return to obscurity and time to rearrange national priorities.**
(9) "Washington's tutelary shadow was a convenient screen behind which they could reach the center of the stage without upsetting anyone."
(10) But **this convenient arrangement** could not last forever.
(11) **Their economic exploits in the 1970s and 1980s** earned the Japanese once again **the full attention of the international community.**
(12) In the late nineteenth century, when it embarked on **its manifold national development efforts,** Japan was well positioned to achieve **substantial economic growth.**
(13) As much as a century before **the restoration in 1868, the expansion of agricultural productivity** generated **capital being used for the maintenance of a social order** that had become largely functionless by the middle of the century.
(14) The role of the professional warrior (samurai) class disappeared along with the feudal system after **the restoration.**
(15) With **the coming of the unified state, financing needed to support the samurai** could be redirected into **economically productive investment.**
(16) Moreover, the samurai themselves constituted a pool of manpower, much of it educated, now available for **economic and political modernization.**
(17) "And it may be, then, that **the rapid transformation of Japanese society in the Meiji era** was in large measure achieved because of the tools, training, education, leadership and experience brought to it by members of the former feudal class."
(18) Japan was not, moreover, altogether primitive in the broad organizational sense when it began **its rapid modernization.**
(19) **The rapid political and economic development of the 1880s and 1890s** was based on **significant institutional precedents** and substantial human and financial resources.
(20) By the middle of the nineteenth century **market activities, industrial employment, and commercial ventures in Japan** had already attained **a fairly high level of sophistication.**
(21) The economic development process was encouraged by political leadership who recognized not only **the need for economic growth** but also that **such growth** was dependent on **the maintenance and strengthening of national unity.**
(22) Stimulated by government policy, commercial and financial organizations developed in the form of several large business houses.
(23) Western economic methods were accepted, including not just the technology of modern industry but also the management practices needed to run them.
(24) **Pursuit of economic modernization and national integration** contributed to **the development of vigorous nationalism in which there was a broad popular sharing of national goals.**
(25) **Japan's developmental experience** is distinguished from that of many other countries in that very early in the process, education was assigned a high priority.
(26) Learning was not **the preserve of the social elite** but was seen as a means to the end of **national growth.**
(27) To achieve this end, education became an integral part of the value system of the Japanese both individually and collectively.
(28) As a result, **new demands** were met by manpower that was forthcoming in amounts and at skill levels appropriate to sustain economic development.
(29) Japan achieved **the transition from an agricultural to an industrial economy** without **the massive social dislocation that frequently attends the process.**
(30) **The combination of private entrepreneurship and government support** led to **rapid growth in the manufacturing sector.**
(31) This meant **a corresponding decline in the economic predominance of agriculture during the latter part of the nineteenth century.**

(32) Neither a self-conscious and exploited urban proletariat nor a large disadvantaged rural peasantry was a significant element of the political universe.
(33) On the eve of World War II, **agriculture's share of gross domestic product** had fallen to 19 percent.
(34) Still, **the agricultural population, including forestry and fishing,** continued to make up 45 percent of the total number of persons employed.
(35) There was **a renewed emphasis on agriculture** following **the period of industrial decline** brought on by World War II.
(36) The number employed in **farming** increased to 53 percent of the population in 1947 but declined again soon thereafter.

JASFL Occasional Papers Volume 3 No. 1 2004

Application of Syntactic and Logico-semantic Relationships between Clauses to the Analysis of a Multimodal Text

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Abstract

In this research, the concept of syntactic and logico-semantic relationships between clauses is applied to the analysis of a multimodal text. In the application, an image and a paragraph are regarded as the constituents of a pair. This research shows especially that logico-semantic relationships seem to be effective in explaining how an image expands the meanings of a paragraph. The merit of this method is that it is appropriate in the situation where lexical relationship between two modes seems very weak. Not only syntactic and logico-semantic relationships but process types of visual representation were also analyzed. In this analysis, it is apparent that writers or editors pay attention to the functions of the visuals which deepen learners' understanding.

Introduction

In a story carried in an English textbook, it is normal to find a multimodal text which consists of verbal and visual modes. However, it has been taken for granted that teachers teach only the verbal mode without paying enough attention to visuals. Although they may have chosen a text because of photographs to decrease the burden English put on learners, it is possible to assert that there exists a phenomenon where they don't draw on them as much as they use verbal mode for information. To sum up, the subject of English at high school is to teach and to learn the verbal mode, and visuals are an additional material teachers don't regard as important. In this research, however, I analyze a multimodal text in a high school textbook and argue that images should be regarded as constituents of stages of the schematic structure with written text. Their function in the structure is not the secondary but ranks equally with the written text. Following this idea, the purpose of this research is to prove how visuals make up the schematic structure of a text. In order to interpret visuals as integral part of a stage, this research applies the concept of syntactic and logico-semantic relationships between two clauses to the relationship between visual and verbal modes. In this analysis, a pair of one image and a paragraph is regarded as a unit, just like a clause nexus which is one pair of clauses related by interdependency. Further, based on the perspective of experiential metafunction, representational structures of visuals are analyzed, and their functions are described.

Overview of the Theories

Logico-semantic Relationship of Expansion

The relationship between two clauses in a clause complex can be discussed in terms of syntactic and logico-semantic relationships. The former consists of paratactic and hypotactic relationships, and the latter means elaboration, extension, and enhancement. Halliday(1994: 218) describes the types of syntactic relationships between clauses as follows:

> Where one element modifies another, the status of the two is unequal; the modifying element is dependent on the modified. But two elements may be joined together on an equal footing, neither being dependent on the other.
> The general term for the modifying relation is HYPOTAXIS. Hypotaxis is the relation between a dependent element and its dominant, the element on which it is dependent. Contrasting with this is PARATAXIS, which is the relation between two like elements of equal status, one initiating and the other continuing.
> All 'logical' structures in language are either (a) paratactic or (b) hypotactic. The clause complex involves relationships of both kinds.

As mentioned above, the relationship can be applied to units other than clauses.

In the logico-semantic relationships of expansion, 'the secondary clause expands the primary clause by (a) elaborating, (b) extending, (c) enhancing it, either paratactically or hypotactically' (Downing and Locke, 2002: 281). Halliday (1994: 220) gives a brief definition of each category:

(1a)	Elaborating: 'i.e.'	one clause expands another by elaborating on it (or some portion of it): restating in other words, specifying in greater detail, commenting, or exemplifying.
(1b)	Extending: 'and, or'	one clause expands another by extending beyond it: adding some new element, giving an exception to it, or offering an alternative.
(1c)	Enhancing: 'so, yet, then'	one clause expands another by embellishing around it: qualifying it with some circumstantial feature of time, place, cause or condition.

Based on the above definitions, Downing and Locke (2002: 281) carry the next list:

Expansion	(i) Paratactic	(ii) Hypotactic
(a) elaboration	Tom kept quiet; he said nothing.	Tom kept quiet, which was unusual.
(b) extension	Tom kept quiet, but Ed spoke out.	Tom kept quiet, whereas Ed spoke out.
(c) enhancement	Tom was afraid, so he kept quiet.	Tom kept quiet, because he was afraid.

Visual Representational Structures and Intersemiotic Complementarity

Kress and van Leeuwen (1996) use the systemic functional linguistics in order to provide the systematic and comprehensive account of the grammar of visual design. Three metafunctions, that is, the ideational, the interpersonal and the textual ones, are utilized. In the dimension of the ideational metafunction, they draw on process types just like verbal communication. First, they divide the visual representational structures into narrative and conceptual processes. Their definitions are given below:

> When participants are connected by a vector, they are represented as doing something to or for each other. From here on we will call such vectorial patterns *narrative* and contrast them to *conceptual* patterns. Where conceptual patterns represent participants in terms of their class, structure or meaning, in other words, in terms of their generalized and more or less stable and timeless essence, narrative patterns serve to present unfolding actions and events, processes of change, transitory spatial arrangements (Kress and van Leeuwen, 1996: 52).

Narrative processes are further classified into several processes. One of them is action processes, and another is reactional processes. In action processes, it is possible to say that a doer does something. The doer is termed as an Actor and something the Actor does is called a Goal. If some boys are playing soccer in a picture, *some boys* are the Actors and *soccer* is the Goal. So an Actor is always necessary in the processes but a Goal is sometimes not included in the visual modes. In reactional processes, an Actor is doing something and a Reacter is watching his/her/its behaviour. The participant the Reacter is looking at is called the Phenomenon. Conceptual Processes are also categorized into analytical and some more processes. According to Kress and van Leeuwen (1996:89), analytical processes are defined as follows:

> *Analytical processes* relate participants in terms of a part-whole structure. They involve two kinds of participants: one *Carrier* (the whole) and any number of *Possessive Attributes* (the parts).

In their book, there is the picture of an Antarctic explorer, in which the explorer functions as 'Carrier', and whatever he has functions as 'Possessive Attributes'. They are further categorized and one of the classifications is temporal analytical processes:

> Time lines involve the temporal dimension, and this suggests narrative. Yet they are not vectorial, and rather than representing history as a gradual unfolding of events, they analyze it into successive stages with fixed and stable characteristics, stages which can then be treated as though they were things. (Kress and van Leeuwen, 1996)

On the other hand, Royce (1998) approached the relationship between visual and verbal modes from a different perspective. In his analysis, he utilized the concept of cohesion (see Halliday, 1976), finding cohesive ties represented in both of the two modes. He tried to prove that "the visual and verbal modes semantically complement each other to produce a single textual phenomenon in a relationship which can be referred to as *intersemiotic complementarity*" (Royce, 1998: 26). In the research, he drew on the ideational, interpersonal, and textual metafunctions. Royce (2002) used the same method to analyze an article about science and suggested methodologies for engaging with multimodality.

Research Questions

The purpose of this research is to analyze a multimodal text in terms of schematic structure. The visual mode has its own role in realizing a stage of schematic structure with the verbal mode. In theorizing the relationship of the two modes, we can analyze cohesive ties just as Royce (1998) did. In narratives, for example, it is not so difficult to associate that both of the two modes share common lexical items, as pictures represent them in Action processes. In some cases, however, the lexical relationship between the two modes seems to be very weak. We see a multimodal text in which two modes are not tied in a lexically strong term. Then we need another theory to connect the two modes. In that case, Halliday's (1994) concept of syntactic and logico-sementic relationships is a candidate to theorize the relationship. Centering around the concept, this research is conducted. Based on the purpose of the research, following research questions are taken up:

1. Is it possible to apply the syntactic and logico-semantic relationship between clauses to the analysis of a multimodal text?
2. What stage of schematic structure is realized by a pair of verbal and visual modes?
3. What process type can be found in each image?

The Research

Material and Procedure

In this research, one lesson of a high school English reading textbook[1], whose theme covers the dinosaur era, was utilized. The lesson consists of 4 photographs, and 5 drawings in 11 pages. The reason why I chose this story is that as the number of visual modes shows, visual communication is affluent and that the scientific story is very logical and is suitable for finding the schematic structure trends of scientific expository writing. For my analytical procedure, I classified stages of the schematic structure in the verbal mode first. In this text, each paragraph can be understood as each stage of the schematic structure. Then I tried to match each image with each stage in the written text. Moreover I tried to categorize the pairs of an image and a paragraph in terms of their syntactic and logico-semantic relationship. Further the internal structure of visual communication was analyzed based on process types.

Schematic Structure of the Written Text

As the Appendix shows, the text consists of 15 paragraphs. It is possible to assert that each paragraph functions as a stage of the schematic structure in order to reach the goal of the multimodal text. Each stage has been given a functional label, according to its purpose. Table 1 is the list analyzed in such a way.

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[1] Lesson 10 *The Day the Dinosaurs Disappeared* included in *Mainstream IIB The New English Reading Course Second Edition* published in 1993 by Zoshindo in Osaka.

Table 1 Stages of the Schematic Structure Realized by Verbal and Visual Modes

Stage	*Verbal Mode* / *Paragraph*	*Visual Mode* / *Figure*	*Function*	*Syntactic and Logico-semantic Relationship*
a	1		Identification	
b	2		Chronological Description A	
c	3	1	Chronological Description B	Paratactic Enhancement
		2		Hypotactic Elaboration
		3		Hypotactic Elaboration
		4		Hypotactic Elaboration
d	4	5	Chronological Description C	Paratactic Enhancement
e, f	5		Issue and Argument A	
g	6		Argument B	
h	7	6	Argument C	Paratactic Elaboration
i	8		Argument D	
j	9		Elaboration I on Argument D	
k	10		Elaboration II on Argument D	
l	11		Elaboration III on Argument D	
m	12		Elaboration IV on Argument D	
n	13	7	Elaboration V on Argument D	Paratactic Elaboration
		8		Paratactic Elaboration
o	14		Elaboration VI on Argument D	
p	15	9	Conclusion	Paratactic Extension

Analysis of Each Stage

Paragraph 3 and Figure 1 realize Stage c, and constitute the relationship of paratactic enhancement. Downing and Locke (2002: 291) cite the next example of circumstantial meanings expressed by the pair of enhancement with parataxis:

> **time:** *now; then*
> The lights have gone out; now we won't be able to do any more today.
> They spread the cloth on the grass and then began unpacking the picnic things.

If we connect the meanings realized by the two modes, we can say that *Mantel suggested that the tooth came from a huge, iguana-like reptile and then scientists began to restore the skeleton of an iguanodon fossil* (the underlined part is realized by the visual mode). Figure 1 shows action processes, as the researchers are restoring an iguanodon or we can say that the participants, *the researchers*, form the vector and have the role of the

Actor, and that another participant, *a dinosaur*, functions as the Goal at whom the vector is directed in the transactional structure. The action in the transactional structure has a Goal. The transactional action process is therefore analogous to the transitive verb in language (the verb that takes an object). At the same time, however, the picture contains a multitude of embedded analytical processes. For example, we can say that the dinosaur has a long tail, and a huge leg. In this case, the participant, *the dinosaur*, has the role of Carrier and the other participants, *a long tail, and a huge leg*, function as Possessive Attributes. Paragraph 3 and Figure 2 realize the stage of Chronological Description B, too, and constitute the relationship of hypotactic elaboration. Figure 3 also realizes the stage of Chronological Description B with Paragraph 3. The relationship between the visuals and the text are hypotactic elaboration. About hypotactic elaboration, Halliday (1994:227) describes:

> The pair of elaboration with hypotaxis gives the category of NON-DEFINING RELATIVE CLAUSE (also called 'non-restrictive', 'descriptive'). This functions as a kind of descriptive gloss to the primary clause, as in
>
> They decided to cancel the show, which upset everybody alike.
>
> These dependent clauses may be either finite or non-finite.

In Stage c which consists of Figures 2 and 3 and Paragraph 3, it will be possible to tell that *he named the huge, iguana-like reptile iguanodon (iguana + tooth), whose skeleton is shown here*. In this clause complex, the primary clause is used in the written text, and the secondary clause is realized in the visuals. In order to associate an iguanodon, there is such a nominal group as *a South American lizard called an iguana* in the verbal mode. The head element in the group is *a lizard*, its classifier is *South American*, and the qualifier is an *–en* (which signifies a past participle) clause, or *called an iguana*. Only with this nominal group and the following nominal group, *a huge, iguana-like reptile*, we must associate an iguanodon. The appreciative epithet, *huge*, is too subjective and too abstract. In this description, it is almost impossible to imagine what the dinosaur is like. In this term, Figures 2 and 3 compensate the disadvantage of the written text with their analytical processes, which demonstrate the details of the dinosaur. The mode linking of Paragraph 3 and Figure 4 realizes Stage c, and the relationship between the visuals and the text are hypotactic elaboration. The verbal alternative is *Mantell learned that the tooth resembled that of a South American lizard called an iguana, whose shape is like this*. Figure 4 realizes analytical processes, too.

Paragraph 4 and Figure 5 constitute Stage d. The relationship between the verbal and the visual modes can be regarded as paratactic enhancement. If the relationship is compared to a clause complex, Paragraph 4 acts as the primary clause and Figure 5 as the secondary clause. Figure 5 enhances the meaning of Paragraph 4 by reference to time, and the verbal alternative is like *the members of the group came to be known as dinosaurs and then scientists found that they ruled the earth from 240 million years ago to 65 million years ago*. In Paragraph 2, the writer uses circumstantial elements such as *more than 200 million years ago, for nearly the next 140 million years*, and *about 65 million years ago*. In the chronological table, however, not only the Mesozoic Era but also the Paleozoic Era and the Cenozoic Era are illustrated in a very compact way. In this way, Figure 5 realizes a temporal analytical process. We can understand these expressions of exact quantification in language, but it is really difficult to understand the flow of time in cognition. In this dimension of locating time, the function of visual mode exceeds that of verbal mode. Figure 5 also illustrates other living things. It is quite intriguing to pay attention to the direction the creatures are facing. Only our ancestor is facing to the right (or the future)! In the written text, there is only description about dinosaurs and the other living things are not mentioned.

Paragraph 7 and Figure 6 realize Stage h. The relationship between the two modes is

paratactic elaboration. In this paratactic elaboration, Figure 6 develops the content of the Paragraph 7 by means of an example. In a clause complex, two clauses are connected with such Conjuncts as *for example* or *for instance* (Downing and Locke, 2002: 284). In this multimodal text, the image says to us, "*for example, a plant-eating dinosaur notices that two small mammals try to steal its big egg but it is too slow to catch up with the animals*." In this stage of argument, the written text utilizes a material process, *stole*. The visual communication uses the action process, that is, two animals are carrying an egg. A plant-eating dinosaur is looking at the deed. This process belongs to the reactional process.

Paragraph 13, Figure 7 and 8 constitute Stage n. The relationship between Paragraph 13 and Figure 7 is also paratactic elaboration. The function of the image is exemplifying and it is possible to use Conjuncts such as *for example* or *for instance* to represent the function. In the verbal mode, there is a clause which says that *a giant asteroid, 10 kilometers in diameter, hit the earth*. The word, *hit*, is another example of the material process. The relationship between Paragraph 13 and Figure 8 is another example of paratactic elaboration. Figure 7 shows the scene that an asteroid is going to hit the earth and utilizes the action process. However, this image also realizes a reactional process, as dinosaurs are watching the asteroid falling on the earth. Figure 8 realizes action processes. It is snowing and dinosaurs are being killed by the low temperature.

Paragraph 15 and Figure 9 realize Stage p. Figure 9 expands Paragraph 15 by extending it paratactically. As to the relationship of extension, Martin, Matthiessen, and Painter (1997: 172) describes as follows:

> The basic meanings of the extending relation are those of addition (including the adversative relation) or variation. The extending relation combines most frequently with parataxis, being realized most typically by the conjunctions *and, nor, but* and *or*.

In this case, it is possible to describe that *because the dinosaurs disappeared, we are here, but the dinosaurs were wonderful and huge creatures as this picture of a Hainosaurus Fossil showed*. Figure 9 realizes analytical processes.

Discussion

In order to answer Research Question 1, I made a pair of an image and a paragraph. Later it turned out that each paragraph was well organized to realize each stage of schematic structure and it was not so difficult to match which image and paragraph were making a pair. This shows that this characteristic of the text is very proper for learners, because visuals help the learner to understand the content of each paragraph. When the effectiveness of syntactic relationships and logico-semantic relationships are compared, the logico-semantic relations of expansion seem to be quite applicable to the analysis of the two modes. Just as one clause expands the meaning of another, one image expands the meaning of one paragraph in this text. In this research, I took the position that a paragraph works as the primary clause in a clause nexus, but it may be possible to regard an image as the primary clause. If that had been done, the other point of view might have produced quite different results. As to the syntactic relationship, it was sometimes difficult to decide whether the relation is paratactic or hypotactic. The choice between the two types may be very ambiguous as one of the pair is visual communication. In this research, I admit that it was possible to make a sentence in either of taxis for a translation between the two modes. Here I don't mean that my method was absolute. Rather it was a kind of challenge in treating visuals. It is also important to think about cohesive ties realized in both of the visual and

verbal modes. If the relationship is very strong, the concept of cohesion applied by Royce (2002) works well in the analysis. In that meaning, Stages h and n are appropriate for the analysis based on cohesion. There are a lot of cohesive ties which refer to both of the modes. At Stages c, d, and p, however, we cannot see many cohesive ties. Especially at Stage d, we can only find a few of cohesive ties such as *reptiles*, *Dinosauria*, and *dinosaurs*. In the chronological table, it is one feature that creatures which are not mentioned in the written text are referred to. As to the names of geologic eras, only the Cretaceous period is mentioned in Paragraph 15. At Stage c, cohesive ties between Paragraph 3 and Figure 1 are *dinosaurs, tooth, bone, bury, rock, fossil, lizard, iguana, reptile*, and *iguanodon*. There are not many cohesive ties here. In Figure 1, the restoration work is drawn, but there are no words which represent the process of restoration in the written text. In this meaning this trial of applying syntactic and logico-semantic relationships seems to be effective in the case of weak lexical relationship between the two modes.

As to Research Question 2, it is prominent that at the stage of Chronological Description B, four combinations of an image and a paragraph are utilized. The first image realizes action processes but the others realize analytical processes. The written text says that an iguanodon was discovered. This situation produces the necessity that fossils are displayed in the visuals. As the restoration work is illustrated in Figure 1, it helps readers to know the process of connecting the bones for the skeleton. This stage is one of the most important stages in the development of the story because a dinosaur was found for the first time. At the stage of Chronological Description C, a chronological table is carried. This is because with the use of the table, the writer can save the explanation which clarifies the position of the reptiles in the geologic eras, while in the verbal mode, an episode on the discovery of dinosaurs is developed. The topic of this story is the dinosaurs' extinction, and it is essential to mention the preceding and the following eras as the background knowledge of the dinosaur era. As the story develops, narrative structures of the visual mode can be seen at the stages of the arguments on the dinosaurs' extinction. Especially at the stage of the meteorite theory, two pictures are employed. Of course that part is the most important in the explanation of dinosaurs' extinction. The connection of the visual and the verbal modes boosts the readers' imagination. At the same time, the existence of the visual mode makes it quite easy to read the climax of the written text.

In order to think about Research Question 3, it is useful to think about the stages of the schematic structure. In the first half, dinosaurs were found, and in the second half, theories of their extinction are described. In the first half, skeletons are given to show what a dinosaur was like. Naturally, in the photograph analytical processes are realized in a static position. In the second half, last days of dinosaurs are realized in action processes. These are the fundamental principals of process types. However, we notice some techniques which do not follow the division. In Figure 1, for example, the restoration work is demonstrated in a very compact way. The combinations of action processes and analytical processes are well realized, or viewers can understand the work and an iguanodon at the same time. Analytical processes make it possible for viewers to know the types of equipment which are employed in the work. Figure 5 realizes temporal analytical processes. These processes make it possible to describe the concept of not only space but also time effectively. Old creatures which lived in the sea look at the left, and their heads are about 30 degrees lower than the horizontal level, which means they lived in the sea. On the other hand, the eye level of land animals is horizontal. Another characteristic of this visual mode is the description of time. Old living things which died out or are precious today look left and only our ancestors look right. It will be possible that as visual representational structures, narrative structures such as action processes and conceptual structures such as analytical processes are organized well in this multimodal text.

In this research, I made a combination of an image and a paragraph to constitute a stage

of schematic structure. However, another interpretation about visuals is possible. In the interpretation, one or several images constitute stages by themselves without any connections to the verbal mode. For example, Figures 1 and 2 are interpreted as the stage of stimulation, which motivates learners to read the story. In the case of Figure 9, the role of the image is afterglow. Readers reflect on the era of dinosaurs once again after reading the story at the stage. In this interpretation, mode-switching occurs in a text, just like code-switching occurs in an identical person's speech. Even if we take either interpretation, it can be said that visuals are effectively put in the most important stages of the story.

As to the technique of drawing, it is not difficult to notice the difference on being naturalistic between Figure 6 and Figures 7 and 8. This is not the scope of this research because it belongs to the dimension of modality (see Kress and van Leeuwen, 159-180), but it can be said that Figures 7 and 8 are more naturalistic in drawing than Figure 6.

Conclusion

In this research, I tried to apply the syntactic and logico-semantic relationship between clauses to a combination of visual and verbal modes, whose units are one photograph or picture and a paragraph. In order to include visuals into stages of schematic structure, two interpretations are possible. One is to admit one or plural images constitute one stage without any verbal mode. The second is to relate one or plural pictures with verbal mode. In this research, I adopted the second interpretation. As this research demonstrates, it will be possible to apply the concept which is mainly used to signify the relationship of clauses to the two modes. Especially when the lexical relationship between two modes is very weak, the method mentioned in this research seems to be effective. In other words, it is very persuasive to carry a photograph or a picture in a text when the number of epithets or classifiers is very small, as was shown in this material. In order to utilize visuals, the perspective of logico-semantic relationships between the two modes will work. In that meaning, visual and verbal modes complement each other with their own characteristics. One of the merits of visuals is the characteristic of analytical processes. In verbal mode, it is impossible to describe a scene completely. Another merit is its concrete illustration. A phenomenon is drawn very vividly in a way of easy understanding. Another is the compactness of information transmitted in visuals. Readers can understand a rather complicated matter at a glance. To sum up, the concept of logico-semantic relationship is quite applicable to visual communication.

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Appendix

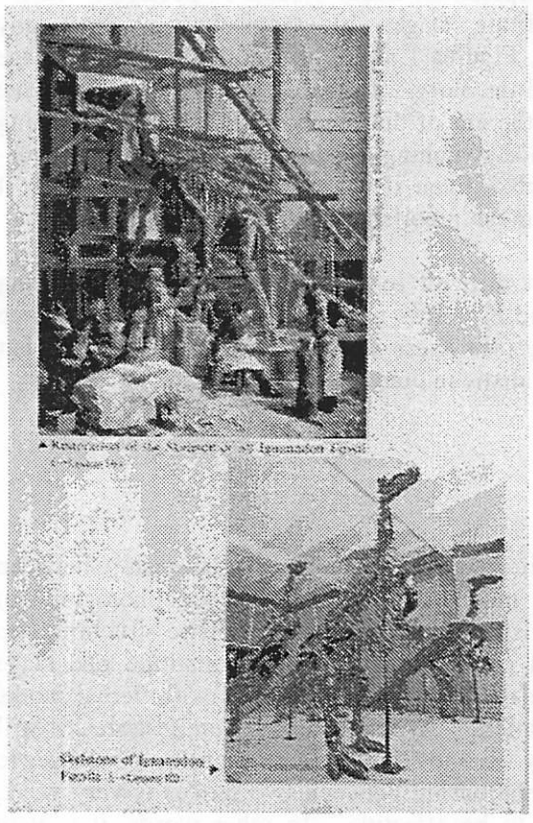

Figure 1

Figure 2

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Lesson 10 *Intensive Reading*

The Day the Dinosaurs Disappeared

—A Bold New Theory about the Mass Extinction

Dinosaur is the name of a kind of reptile that lived during the time in the earth's history called the *Mesozoic Era*. The term *dinosaur* comes from two Greek words meaning *terrible lizard*.

Paragraph 1

The first dinosaurs appeared more than 200 million years ago. For nearly the next 140 million years, they ruled the earth from swamps to open land so thoroughly that the era has become known as the *Age of Reptiles*. Then about 65 million years ago, these huge reptiles died out rather abruptly, and disappeared completely.

Paragraph2

dinosaur(s) [dáinəsɔ:(r)] extinction [ikstíŋkʃən] reptile [réptil/-tail]
swamp(s) [swɔmp(s)/swɔmp-] abruptly [əbrʌ́ptli]

dinosaur「恐竜」 1. reptile「ハチュウ類の動物」 2. Mesozoic Era [mèzəzóuik ìərə]「中世代」 2億3000万年〜6500万年前の時代。 4. lizard「トカゲ」

◇今から約6500万年前，それまで繁栄を極めていた恐竜はすべて絶滅した．また他の多くの動植物もこの時期に死に絶えてしまった．なぜこのような大絶滅が起こったのかは，古生物学の大きな謎の一つであった．しかし最近になって，この謎を解き明かす大胆な仮説が現れた……．

Answer the Questions

1. Why is it that the age in which the dinosaurs lived has come to be called the Age of Reptiles?

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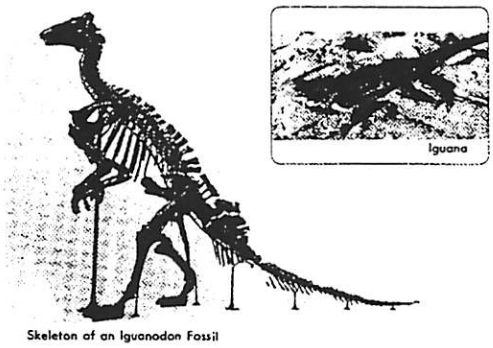
Before the 1800's, no one knew that dinosaurs had ever existed. People who found a dinosaur tooth or bone did not realize what it was. Then in 1822, the wife of an English physician named Gideon Mantell found a large tooth partly buried in a rock. She showed the tooth to her husband, who was a fossil specialist. Mantell learned that the tooth resembled that of a South American lizard called an iguana. He suggested that the tooth came from a huge, iguana-like reptile, which he named *iguanodon* (iguana + tooth).

Paragraph 3



Skeleton of an Iguanodon Fossil

Figure 4

physician [fəzíʃən] fossil [fɑ́səl/fɔ́s-] resemble(d) [rizémbl(d)]

4. **Gideon Mantell** [gídiən mǽntl] (1790–1852) 英国の地質・古生物学者.
8. **iguana** [igwɑ́:nə]「イグアナ」 熱帯アメリカ産の大トカゲ.

Figure 3

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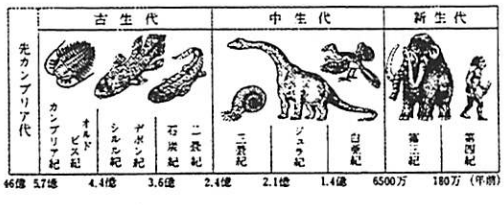

Figure 5

Within a few years, the remains of several other kinds of large, extinct reptiles had been discovered. In 1841, Sir Richard Owen, an English scientist, suggested that they belonged to a group of reptiles that were unlike any living animals. Owen called the group *Dinosauria*, and the members of the group came to be known as *dinosaurs*.

Paragraph 4

Over the years scientists have developed one theory after another to explain the sudden and complete extinction of the most spectacular animal the earth has ever known. Some Victorian scientists accepted Darwin, insisting that creatures die out because they are no longer

Paragraph 5

extinct [ikstíŋkt] spectacular [spektǽkjələ]

2. **extinct** = no longer existing 3. **Sir Richard Owen** (1804–92)「リチャード・オーエン卿」 英国の動物・古生物学者. 5. ***Dinosauria*** [dainəsɔ́:riə] -ia は学名を表す接尾語. 10. **spectacular** = unusually interesting
11. **Victorian**「ビクトリア朝時代の」 1840〜1900年のころをいう.
Darwin [dɑ́:win], Charles (1809–82) 英国の博物学者. 進化論を唱えた.

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fit to survive. This argument seemed to apply particularly well to the dinosaurs, which had grown too big, too slow, too pea-brained and too cold-blooded for their own good.

Of the many theories, one holds that alkaloid-producing plants began evolving toward the end of the dinosaur era. These plants produced poisonous chemicals, but they also tasted so bitter that most modern creatures would not chew them. Vegetarian dinosaurs were not choosy enough. So they died off. So did the meat-eaters that preyed on them.

Another theory suggests that small mammals appearing during the first half of the dinosaurs' reign stole and ate all the reptiles' eggs; the dinosaurs could not fight back because the warm-blooded thieves were too fast. This theory might account for the fact that so few dinosaur eggs have been found, but it does not explain

particularly [pətikjələli] vegetarian [vèdʒətɛ́əriən] prey(ed) [preid] mammal(s) [mǽməl(z)] reign [rein]

2. pea-brained [píːbreind]「頭脳が豆のように小さい」 *for one's own good* good = advantage *e.g.* You should drink this medicine *for your own good.*
4. alkaloid [ǽlkəlɔid]「アルカロイド」ニコチン・モルヒネ・コカインなど.
5. evolve = develop gradually 8. choosy = careful in choosing *e.g.* He is *choosy* about what he eats. 10. *prey on*「～を捕食する」 *e.g.* Eagles *prey on* small animals. 11. mammals「ホニュウ類性」

2. How did some Victorian scientists reason to explain the extinction of the dinosaurs?
3. In what way were alkaloid-producing plants different from other plants?

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how the dinosaurs were then able to exist with other mammals for so long—more than 100 million years.

Probably the most widely accepted theory involves a change in the earth's climate. Toward the end of the Cretaceous Period, the climate cooled and may have become too cold for the dinosaurs. Smaller animals could sleep during cold periods. Mammals and birds had fur or feathers for protection, and some could travel to warmer places to avoid the cold weather. In these ways, such animals could survive the cold that may eventually have killed off the dinosaurs. But what caused sharp temperature changes? Volcanic eruptions? Changes in sea

fur [fəː] protection [prətékʃən] volcanic [vɑlkǽnik/vɔl-] eruption(s) [irʌ́pʃən(z)]

4. the Cretaceous [kritéiʃəs] Period「白亜紀」1億4000万年～6500万年前の時代.
10. eventually = at last; in the end *e.g.* Through hard work, I *eventually* made myself ill. 11. *kill off* = destroy completely

4. What helped the mammals and birds to survive the cold weather that may have killed off the dinosaurs?

Paragraph 6

Paragraph 7

Figure 6

Paragraph 8

levels? Radiation from an explosion of a dying star? Scientists could not, try as they might, come up with a theory to tie the loose ends together.

A revolution began, however, with a little-known element called iridium. Very recently, a bold new theory about the mass extinction has been presented, and is gaining increasing acceptance from scientists the world over.

In the spring of 1977, American geologist Walter Alvarez was carefully cutting through rocks in central Italy, trying to test ancient sedimentation rates by testing for the concentration of certain metals along the length of a core in the rocks. One of the metals being tested for happened to be iridium; and, to his great surprise, Alvarez found a concentration of iridium in a single narrow band that was 30 times as high as the concentrations immediately below and above.

Paragraph 9

Paragraph 10

loose [luːs] iridium [iridiəm] acceptance [əkséptəns] geologist [dʒiɔ́lədʒist/-ɔ́l-] sedimentation [sèdəmentéiʃən] concentration [kɑ̀nsəntréiʃən/kɔ̀n-]

1. **radiation**「放射能」 2. **try as they might** = no matter how they might try **come up with** = think of; produce *e.g.* You'd better *come up with* a better excuse. 9. **Walter Alvarez** [wɔ́ːltə ǽlvərez] (1911-88) アメリカの地質学者. 1968年ノーベル物理学賞を受けた. 11. **sedimentation rate**「堆積率」 **test for**「～(の有無)を調べる」 *e.g.* We *tested* the rock *for* gold. 12. **concentration**「(成分・要素の)濃度」 13. **core**「雌心」 ボーリングをするとき，円筒状に採取される岩石片や鉱石片のこと.

5. By whom has a new theory about the mass extinction been recently presented?

Where could the iridium have come from? Could the sedimentation rate have been unusually high at that point? Or could it have come from some unusually rich iridium source? Meteorites are richer in iridium and certain other metals than the earth's crust is, and that section of the core was rich in the other metals as well. Alvarez suspected that a meteor had fallen, but there was no sign of any ancient crater in the region.

Later discoveries, however, showed that the iridium-rich layer occurred in widely separated places on the

Paragraph 11

Paragraph 12

Figure 7

meteorite(s) [míːtiəràit(s)] crust [krʌst] meteor [míːtiə] crater [kréitə]

4. **meteorite** = a meteor that has landed on the earth「隕石」 5. **crust** = the hard outer covering of the earth「地殻」 7. **meteor**「流星」

earth and always in rocks of the same age. And at what time did this happen? The rock from which the iridium-rich material was taken was 65 million years old —exactly the end of the Cretaceous!

Now more and more scientists believe that one day some 65 million years ago a giant asteroid, 10 kilometers in diameter, hit the earth. The heat from the impact was huge. It instantly vaporized the asteroid itself and threw billions of tons of dust—or vaporized sea-water, if the asteroid had hit the ocean—into the atmosphere. The sunlight was blocked for three to six months. The seeds and roots of plants survived but the plants themselves stopped growing, and this killed off the plant-eating dinosaurs. The meat-eating dinosaurs that fed on them also died. The darkness caused land temperatures to drop below freezing for six to twelve months. Scientists reasoned that small mammals and birds were protected from the cold by fur or feathers and survived by feeding on seeds, nuts, and dead plants. After the worldwide darkness ended, plants grew again from seeds and roots.

Paragraph 13

asteroid [ǽstərɔid] vaporize(d) [véipəraiz(d)] atmosphere [ǽtməsfiə]

6. **asteroid** 「小惑星」 8. **vaporize** = change ～ into vapor

6. What incident first led Alvarez to believe that a meteor had fallen?
7. If a giant asteroid were to hit the earth, what would happen to the asteroid itself?

Figure 8

In 1983, astronomer Carl Sagan pointed out that, in the event of a nuclear war, the explosion of as little as 10 percent of the present-day nuclear weapons would send enough matter into the stratosphere to start a winter-like night that might last long enough to put human life on the earth into serious danger—another mass extinction we certainly cannot afford.

Paragraph 14

In any case, the death of the reigning reptiles at the end of the Cretaceous brought in the *Age of Mammals*, the world as we know it. "If you ask the question, 'Why

Paragraph 15

astronomer [əstrɑ́nəmə/-rɔ́n-] stratosphere [strǽtəsfiə]

1. **Carl Sagan** [kɑ́:l séigən] (1934-) アメリカの天文・宇宙学者.
4. **stratosphere** = the outer part of the air which surrounds the earth 「成層圏」

8. What age came after the Age of Reptiles?

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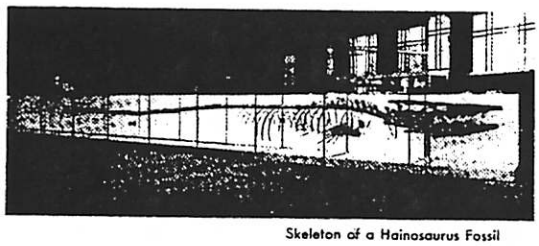
are we here?'" says a scientist, "the answer is, 'Because the dinosaurs disappeared, not because the mammals outcompeted them.'" Should the Alvarez theory be correct, the theory of natural selection will have to be called into question.



Skeleton of a Hainosaurus Fossil

Figure 9

outcompete(d) [àutkəmpíːt(id)] selection [səlékʃən]

4. natural selection「自然淘汰」

■Hainosaurus [héinəsɔ́ːrəs] 海トカゲ竜の一種.

9. If an asteroid hadn't hit the earth 65 million years ago, what do you think animal life on the earth would be like?

JASFL Occasional Papers Volume 3 No. 1 2004

An Analysis of Narrative:

Its Generic Structure and Lexicogrammatical Resources

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Abstract

This paper presents a preliminary attempt, from the perspective of Systemic Functional Theory, to explore the semantic tendency of English lexicogrammatical resources to be deployed for constructing Narrative genre and achieving the goal of 'entertaining the reader'. By analyzing a typical fairy tale, 'The Wolf and the Seven Young Kids', it has become clear that both the successive stages, 'Orientation', 'Complication', 'Evaluation', 'Resolution' and 'Coda' and the characters are ingeniously constructed by means of different formations of lexicogrammatical resources of three metafunctions: Ideational, Interpersonal and Textual. Analysis of Ideational metafunction shows that both generic stages and the main characters are constructed by the different formations of Process Types. Analysis of Textual metafunction shows that this story is primarily 'about the mother', because of allocation of macro-Thematic responsibility on the mother in Orientation. Analysis of Interpersonal metafunction shows that both Mood selection and appraisal function as the important signals to foreground the cause and causer of the crisis. In this way, the metafunctional analysis by Systemic Functional Theory effectively shows that the specific semantic tendency contributes to the construction of a fairly tale.

1. Introduction

This paper is a preliminary attempt, from the perspective of Systemic Functional Theory, to explore the semantic tendency of English lexicogrammatical resources deployed in constructing the generic staging of 'Narrative' of a typical fairy tale (Grimm's 'The Wolf and the Seven Young Kids'), its main characters and its discourse purpose to keep the reader staying within the story, namely 'entertain the reader'.

According to Systemic Functional Theory, all texts are constructed by three metafunctions: Ideational, Interpersonal and Textual. These three metafunctions give us a useful insight to explore the nature of a language. As Halliday (1994: 35) argued,

> It (the clause) is constituted not of one dimension of structure but of three, and each of the three construes a distinctive meaning. I have labeled these 'clause as message', 'clause as exchange', 'clause as representation'. In fact, the threefold pattern of meaning is not simply characteristic of the clause; these three kinds of meaning run throughout the whole language, and in a fundamental respect they

determine the way that language has evolved.

The significant point to the analysis is to show how different formations of three dimensions of lexicogrammatical resources are deployed to constitute a text.

2. Procedure

Preceding the analysis, 'Narrative Generic Structure' will be introduced to show the typicality of the analyzed text as Narrative. Then, in section 4.1- 4.3, the deployment of different lexicogrammatical resources from the three perspectives will be examined (4.1: from Ideational perspective; 4.2: Interpersonal; 4.3: Textual) to illustrate the nature of the story. Section 5 is the conclusion.

3. Text

The text analyzed here is the well-known fairy tale, 'The Wolf and the Seven Young Kids' from *The Complete Brothers Grimm Fairy Tales*; some additional texts are also used to illustrate this.

4. Analysis

Narratives usually deal with an activity sequence which presents a problem to be solved. The problem collapses one or more of the participants' usual life. By resolving it, some kind of stability returns, and so the narrative ends, from which we can sometimes get some morals. Thus, the generic structure of Narrative can be defined as follows (following Rothery and Stenglin, 1997: 244).

(Abstract) ^ (Synopsis) ^ Orientation ^ Complication ^ Evaluation ^ Resolution ^ (Coda)

'The Wolf and the Seven Young Kids' includes Orientation, Complication, Evaluation, Resolution and Coda. In Orientation the time, place and the goat's daily life are introduced. In Complication the crisis happens: the mother goat went out of her house, leaving her children, and then the wicked wolf came to her hut and ate her children. In Evaluation this incident is evaluated as a problem. In Resolution the goat saved all of her kids by cutting open the wolf's stomach. Coda, an optional stage, deals with the revenge of the goat: the death of the wolf.

Now, it can be safely said that this story is constructed as a typical Narrative generic structure. In the following sections, the deployment of different lexicogrammatical resources will be explored.

4.1 From Ideational perspective

4.1.1. Transitivity constructing generic stages

In this section, Transitivity, the main component of Ideational metafunctions, will be explored to show how the different semantic tendencies of process types contributes to the construction of generic stages. According to Halliday (1994) and Halliday and Matthiessen

(1999), our language imposes order on the flow of events, and the grammatical system by which this is achieved is called the Transitivity system. The Transitivity system construes our experience into a manageable set of Process Type: Material process construes doing and happening; Behavioural process does behaving; Mental process does seeing, feeling and thinking; Verbal process does saying; Relational process does attributing and identifying; Existential process does existing.

Table1 shows the deployment of the different process types in the story.

Table 1: Deployment of process types (number)

	Orientation	Complication	Evaluation	Resolution	Coda	total
Material	0	32	5	12	18	67
Behavioural	0	3	3	0	4	10
Mental	2	8	3	3	4	20
Verbal	0	10	2	0	2	14
Relational	1	5	5	3	1	15
Existential	1	0	0	0	0	1
total	4	58	18	18	29	127

Table 2 and Figure 1 shows that the various process types do not occur uniformly throughout the story; the semantic tendency of process types has some relation with the construction of the generic stages in which they occur. The relation will be analyzed respectively: 4.1.1.1 Orientation; 4.1.1.2 Complication; 4.1.1.3 Evaluation; 4.1.1.4 Resolution; 4.1.1.5 Coda.

Table 2: Deployment of process types (percentage)

	Orientation	Complication	Evaluation	Resolution	Coda	total
Material	0%	55%	28%	67%	62%	53%
Behavioural	0%	5%	17%	0%	14%	8%
Mental	50%	14%	17%	17%	14%	16%
Verbal	0%	17%	11%	0%	7%	11%
Relational	25%	9%	28%	17%	3%	12%
Existential	25%	0%	0%	0%	0%	*1%
total	100%	100%	100%	100%	100%	100%

*: less than 1%

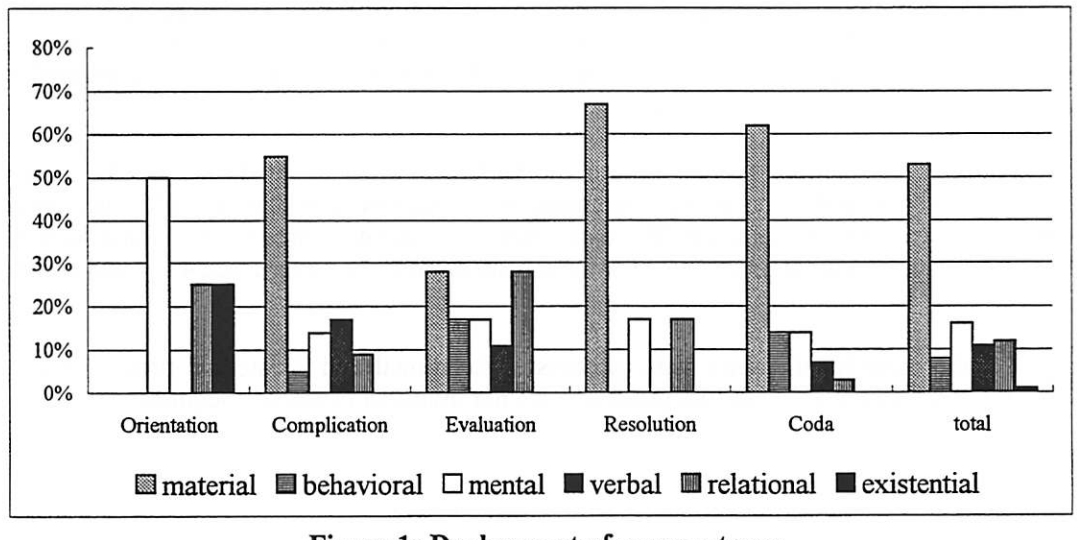


Figure 1: Deployment of process types

4.1.1.1. Orientation

According to Rothery and Stenglin (1997: 236), Orientation serves to create a context for understanding what is to follow in the subsequent stages of the genre and orient the reader to what is to follow. What Orientation typically does to establish this function is introduce the main characters, give them attribute, describe their daily life and establish a physical and temporal setting. Observe the rather short Orientation of the story:

> *There was once an old goat who had seven young ones, and she loved them as much as any mother could love her children.*

One of the main characters, an old goat, is introduced by Existential process, which is a usual tool to do this (Note that this is only one usage of Existential process in the story): see the following quotations from 'Little Red Riding-Hood' and 'Three Little Pigs.'

> *There was once a sweet little girl, who had gained the love of every one, even those who had only seen her once. (Little Red Riding-Hood)*

> *Once upon a time there were three little pigs who lived with their mother. (Three Little Pigs)*

These two stories also exploit Existential process to introduce the main characters as if they were there originally.

The goat is characterized by Mental process and Relational process (*who had seven young ones*, *she loved them*, respectively) both of which are rather static process (as for process dynamism/ activeness, see 4.1.2 and Yamaguchi's website). In addition, an unusual usage of who (this is usually used to substitute for human beings) contributes to constructing the place as not being 'here and now.'

4.1.1.2. Complication

As I mentioned earlier, Complication is characterized by an activity sequence which is usually realized by Material process; in this stage, the main characters do unusual acts which cause a problematic incident for one or more of them. In the story, the mother went out into the forest and the wolf came to the hut to eat the kids up. Therefore, this stage is characterized by Material process (55% of total process types in it). The other stages whose rate of Material process is high are Resolution and Coda; these three stages are particularly characterized by an activity sequence.

Another conspicuous process type is the Verbal. In order to satisfy his greedy appetite, the wolf talked with the young kids pretending the mother goat so that he could enter her hut where her seven children stayed. The conversation is repeated three times, which leads the high rate usage of Verbal process (as for the repeated sequence pattern, see 4.3.1 and Darnton, 2001).

On the other hand, rather static processes, Relational and Existential process are rare (9%, 0% respectively). These two processes are not involved in activity sequence.

4.1.1.3. Evaluation

Compared with other stages, the rate of Material process in Evaluation is low; that of Mental, Behavioural and Relational process is high. These processes make a contribution to making one of the main characters feel anxious about the victims and judge the crisis as a problem to be solved. See the following quotations:

> *Ah! what a scene it was for her. The house door was open. Table, chairs, and stools upset. The wash-tub broken to pieces, the counterpanes and pillows dragged from the bed.*
>
> *We can guess how the poor mother mourned an wept for her children.*

In the story, instead of the mother, the narrator judges the situation as a problem, nevertheless the stage functions as Evaluation.

4.1.1.4. Resolution

In Resolution, positive judgment to the current situation is to be done, which is followed by the real act of the main characters to solve it:

> *'Ah!' thought she, 'if he only swallowed my dear children, they must still arrive.'*
>
> *So she sent the little kid into the house for a pair of scissors, a needle, and some thread, and very quickly began to cut open the monster's stomach. ...*

The main part of this stage is the mother's act of problem solution. This is why the rate of Material process is by far the highest (67%); Resolution is characterized by the great deployment of Material process, as well as Complication.

4.1.1.5. Coda

The optional stage, Coda includes the sequel, moral and lesson lead from the story. Coda of 'The Wolf and the Seven Young Kids' include the episode of the wolf to die. This activity sequence is mainly constructed with Material process (62%), although all process types are deposited.

As we have seen, the Transitivity analysis enables us to see one aspect of how stages in Narrative are constructed through the Transitivity system. Narratives are, on the whole, characterized by an activity sequence and so mainly constructed by Material process. From the perspective of generic structure, the nature of the generic staging, which may be intuitionally recognized, is constructed by the different array of process types as we have seen. The change of the process type formation contributes to attracting the reader to the development of the story and keeping them proceeding with the story.

4.1.2. Participants

So far, we have seen the semantic tendency in process types to characterize generic stages in the story. In this section, we will see a semantic tendency in participants to show how the

tendency of various participants taken by the main characters contributes to the creation of the characters' image (for more detailed analysis, see Washitake, 2002).

Table 3 shows the numbers and rates of participants taken by the main characters.

Table 3: Participants taken by the main characters

process type	participant	The number of participation		
		the mother	the wolf	the kids
Material	Actor	12 (38%)	24 (55%)	17 (33%)
	Goal	0 (0%)	5 (11%)	6 (12%)
Behavioural	Behaviour	4 (13%)	4 (9%)	1 (2%)
	Range	0 (0%)	1 (2%)	3 (6%)
Verbal	Sayer	2 (6%)	8 (18%)	5 (10%)
	Receiver	0 (0%)	0 (0%)	2 (4%)
Mental	Senser	10 (31%)	2 (5%)	9 (18%)
	Phenomenon	0 (0%)	0 (0%)	2 (4%)
Relational	Carrier	3 (9%)	0 (0%)	4 (8%)
	Attribute	0 (0%)	0 (0%)	2 (4%)
Existential	Existent	1 (3%)	0 (0%)	0 (0%)
Total		32 (100%)	44 (100%)	51 (100%)

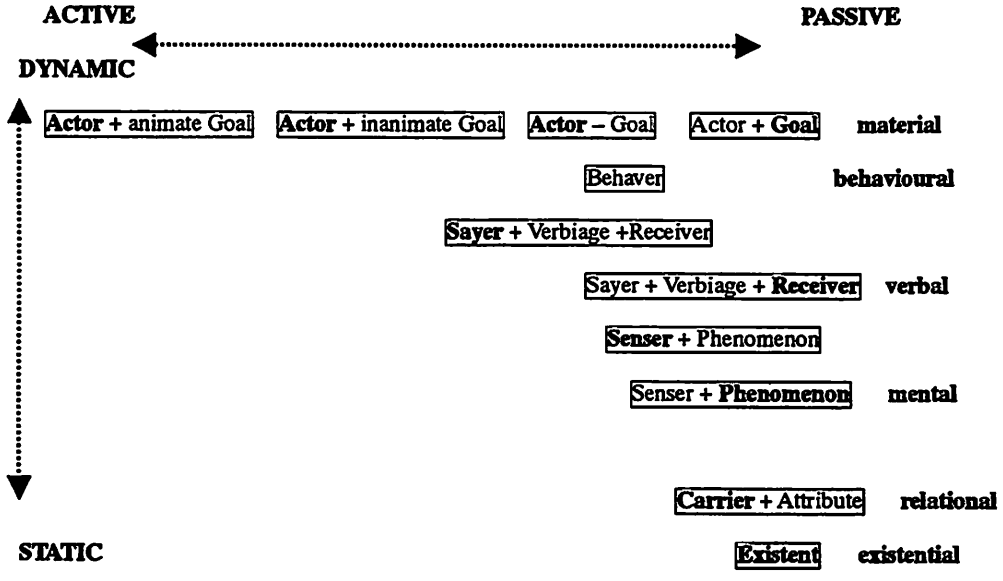


Figure 2: Cline of Process Dynamism/Activeness (adopted from Yamaguchi)

After Hasan (1985), I call such participants as Actor and Sayer '-er role'; Goal and Receiver '-ed role', and regard '-er role' as more active than '-ed role'. In addition, for the judgment of activeness among participants, I use Yamaguchi's 'Cline of Process Dynamism/ Activeness' (see Figure 2). The examination is as follows.

The mother: For her tendency to be constructed with '-er role', Actor, Behaver, Senser and less contribution to '-ed role', her images are the following: she is active and sensible and have warm heart; have a great influence on the others; is never

harmed. That is, she is construed as a gentle and strong hero.

The wolf: For his tendency to be constructed with '-er role', Actor, Behaver, Sayer and less contribution to Senser, his images are the following: he is active; cunning but not rational; has no warm heart; has great influence on the others. That is, he is construed as a cunning villain.

The kids: For their tendency to be constructed with '-ed role', Sayer and Senser and less contribution to Actor and Behaver, their images are the following: they are passive; can sense things and have feelings, but without practical power, they cannot deal with things properly; have little influence on the others. That is, they are construed as helpless victims.

From this analysis, it has been clear that different formations of process types as well as such appraisal words as 'the poor mother' or 'the wicked animal' contributes to the creation of the main characters (as for 'appraisal', see 4.3.2). They conspire, reflecting our social life and ideology, to create the character's personality.

4.2. From Textual perspective

Halliday (1994: 34) defines the Theme as follows:

> (i) The Theme functions in the structure of the CLAUSE AS A MESSAGRE. A clause has meaning as a message, a quantum of information; the Theme is the point of departure for the message. It is the element the speaker selects for 'grounding' what he is going to say.

In Narrative, most of the messages the writer/ teller is going to tell are the incidents that the main characters cause; many of the origin of the messages, the Theme of clauses are the main characters.

Daneš (1974: 106-128) argued that the typical Thematic progressions (TP) include these three patterns: see Figure 3.

(1) Simple liner TP (or TP with liner thematization of rhemes):

$T_1 \rightarrow R_1$
$\downarrow$
$T_2(=R_1) \rightarrow R_2$
$\downarrow$
$T_3(=R_2) \rightarrow R_3$

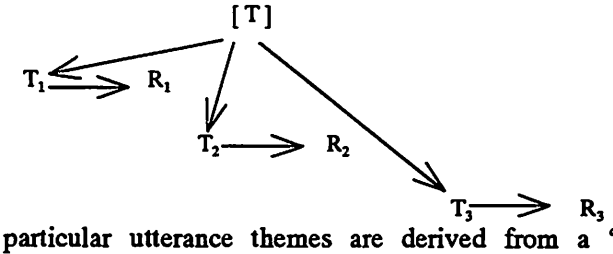
In type (1), each R becomes T of the next utterance.

(2) TP with a continuous (constant) theme:

$T_1 \rightarrow R_1$
$\downarrow$
$T_1 \rightarrow R_2$
$\downarrow$
$T_1 \rightarrow R_3$

In this type one and the same T appears in a series of utterances (to be sure, in not fully identical wording), to which different R's are linked up.

(3) TP with derived T's:



The particular utterance themes are derived from a "hypertheme" (of a paragraph, or other text section).

Figure 3: Three patterns of Thematic progression (adopted from Daneš, 1974)

Martin (1992: 437-448) expanded the idea of Daneš' hypertheme (Martin called it 'hyper-Theme') to devise macro-Theme. For him, a macro-Theme is an introductory sentence or group of sentences which predicts a set of hyper-Themes: macro-Theme is a Theme of a text; hyper-Theme, a paragraph; Theme, a clause.

As for Genre analysis, the components of texts are clause, generic stage and text rather than clause, paragraph and text. Therefore, in this paper, hyper-Theme will be used to mean the Theme of a generic stage. In the following sections, the Thematic progression will be explored on these different levels: 4.2.1, Theme in a clause (complex) will be explored; 4.2.2, each generic stage; 4.2.3, a whole text.

4.2.1. Theme of a clause

The Themes of clauses (or clause complexes) are simple. For example:

> *Then the wolf ran away ..., and (he) bought a great stick of white chalk, ... After he had eaten it, he went back to ....*
>
> (underlined words are Theme)

In this example, the same element, the wolf is successively given Theme prominent of the clauses: the Thematic progression pattern is (2).

4.2.2. Theme of a generic stage

In this section, the Thematic progression of each generic stage will be examined to show the elements to which the hyper-Thematic prominence are given and the patterns of the Thematic progression in each generic stage.

Orientation

In Orientation, most of the Theme are given to the mother and the Thematic progression pattern here is (2): clearly, the hyper-Thematic prominence is given to the mother.

Complication

In the middle of the Complication, the mother goes out of the story. This means that the mother cannot be given the Thematic responsibility; instead, the wolf is given it; Complication can be divided into two parts. In the former part, where the Thematic and hyper-Thematic prominence are given to the mother, problematic matters do not happen at all; nevertheless, it can be a part of Complication because of the mother's unusual action, going out to the forest. In the latter part, where Thematic and hyper-Thematic prominence are given to the wolf, the serious problem happens.

The two-parts structure of Complication is true of other stories. In 'The tree little pigs', for example, before the pigs build each of their house, the hyper-Thematic prominence is given to the pigs and they act unusual act to build their house. After building them, the hyper-Thematic responsibility is replaced by the wolf and the tragedy happens.

Here, it can be said that the change of the Thematic responsibility suggests the occurrence of a problematic incident.

Evaluation

Although the hyper-Thematic prominence in Evaluation is the mother, she is not the one to evaluate the situation that her children were eaten by the wolf as a problem: it is the Narrator of the story. The evaluation starts with *'Ah! what a scene it was for her'*, followed by the elaborating sentences:

> *Ah! what a scene it was for her. The house door was open. Table, chairs, and stools upset. The wash-tub broken to pieces, the counterpanes and pillows dragged from the bed.*

We can notice that the first clause is predicted by the following; the local hyper-Theme here is the first one: see Figure 4.

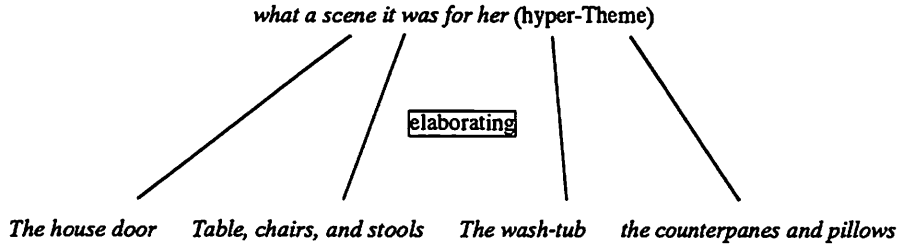


Figure 4: Theme deployment in Evaluation

Resolution & Coda

The main character that is given the hyper-Thematic prominence in these two stages is the mother; she is the main to solve the problem, to help her children, and to revenge the wolf.

4.2.3. Theme of a text

Despite the different deployment of the hyper-Thematic prominence, we can intuitionally realize that the story is about the mother, not the wolf. Why don't we regard this story as the poor wolf's failure in trying to get some food?

The notion of macro-Theme, Theme of a whole text, will give a key to the answer. In Orientation, the macro-Thematic prominence is allocated on the mother; Orientation says, 'This is a story about a mother goat', governing the rest of the story as a significant background. Orientation is the origin of the text as a message.

Now, we can notice that the hyper-Themes of the latter part of Complication and Evaluation are foregrounded in the background of the macro-Theme, the mother. In the latter part of Complication, the wolf is foregrounded as the cause of the crisis, and in Evaluation, the terrible scene is foregrounded as the crisis, both of which contribute to giving the reader the impression, 'unusual.'

4.3. From Interpersonal perspective

So far, we have seen the story 'The Wolf and the Seven Young Kids' from two perspectives, Ideational and Textual metafunctions. In this section, we will explore it from Interpersonal perspective; Mood and appraisal.

4.3.1. Mood selection

As we can realize at a glance, the most frequent choice of Mood type is Declarative: Declarative 166; Imperative 7; Interrogative 0. The majority of Declarative contributes to making this story Narrative, and the use of Imperative, although few in numbers, is likely to

make a significant contribution to foreground the cause of the crisis, in the background of Declarative.

The first imperative clause appears in the mother's calling for her children's attention to the wolf:

> *don't open the door while I am away, for if the wolf should get into our hut, the wicked deceitful creature will eat you up, even to the very hairs.*

The negative Declarative clause '*don't open the door*' is related to the tragic crisis: if the children break this ban to open the door, they are eaten up by the wolf.

As soon as the mother went out, the wolf came to her hut in which her children waited for her coming back, and called them pretending their mother.

> *'Open the door, my dear children, I have brought something nice for each of you.'*

Recognizing it is not their mother's but the wolf's voice, they answered it:

> *'We shall not open the door, you are not our mother; She has a soft and gentle voice, and your voice is rough. You are only a wolf.'*

By saying '*We shall not open the door*', they could avoid the tragedy. Then the wolf, having been detected his disguise, left the hut. Having changed his rough voice into soft one, he returned and said:

> *'Open the door for me, dear children; I am your mother, and I have something nice for each of you.'*

Same as the former statement, his statement exploits an Imperative clause '*Open the door for me, dear children*'. The children answered it adding some nasty words:

> *'No! we shall not open the door; our mother has no black feet like that; go away, you are the wolf.'*

Then, he made his legs like their mother and called for opening the door:

> *'Open the door, dear children, it is your mother this time; she has bought you something from the forest.'*

At this time, they believed him as their mother and let him enter their hut: they broke the ban '*don't open the door*'. As a result, they were eaten as the mother had said.

A ban and its neglect is the common to foreground the cause of the crisis. In 'The Red Riding Hood', for example, her mother says, '*... go straight on your road while you are out, ...*' , but she is egged on by the wolf into making a detour, resulting her tragedy. Also, in 'The Three Little Pigs', the pigs are told, '*Watch out for the big bad wolf, because he will eat you*' and '*Build your house nice and strong so that you will be safe from the wolf.*' Two of them, however, make their house not enough strong, so that the houses are broken down by the wolf and they are eaten.

In addition to the effective usage of imperative clauses, 'The wolf and the Seven Young Kids' exploits 'the repeated sequence pattern' (Darnton, 2001): the similar interaction between the wolf and the children is repeated three times (see the quotations regarding '*don't open the door*'). This makes the reader anxious about the crisis. The repeated sequence pattern, conspiring with Imperative, contributes to foregrounding the cause of the crisis.

4.3.2. Appraisal

According to Thompson and Hunston (2000: 6), the functions of appraisal (they call it 'evaluation', but I use the word 'appraisal' instead to avoid confusing with the generic stage, 'Evaluation') are:

(1) to express the speaker's or writer's opinion, and in doing so to reflect the value system of that person and their community;
(2) to construct and maintain relations between the speaker or writer and hearer or reader;
(3) to organize the discourse.

The functions are not exclusive, that is, a single instance of evaluation may well perform two or three of the functions simultaneously.

In 'The Wolf and the Seven Young Kids', the lexicogrammatical resources for appraisal such as 'the wicked animal' are sometimes found in place of the mother and the wolf. These words are used to foreground the crisis and its causer. Figure 5 is the summarized story to show the deployment of the appraisal words and its relation to the deployment of Imperative clauses.

Events	Texts	Appraisal (the wolf)	Appraisal (the mother)
The mother's going to the forest.	M: 'don't open the door while I am away, for if the wolf should get into our hut, the wicked deceitful creature will eat you up, even to the very hairs'	the wicked deceitful creature	
RSP* 1	W: 'Open the door' K: 'we shall not open the door.'		
His attempt to change his voice.			
RSP 2	W: 'Open the door' K: 'we shall not open the door'		
His attempt to change the appearance of his legs.			
RSP 3 (His eating the children)	Now went the wicked animal for the third time to the house door, and said ... W: 'Open the door' They (children) opened the door The wolf ..., gobbled them up one after the other, ...	the wicked animal	
Evaluation of the problem	We can guess how the poor mother mourned and wept for her children.		the poor mother
The mother's helping children		the monster	
The wolf's death	And this was the end of the greedy wolf.	the greedy wolf	

*Underlined clauses are Imperative
*RSP stands for the repeated sequence pattern

Figure 5: Imperative and Appraisal

Let's see Figure 5 chronologically. In going out to the forest, the mother appraises the wolf as 'wicked' and 'deceitful'. This statement gives the reader the impression that the wolf is a vice and all his deed will be wrong. At the wolf's third trial to enter the hut, he is appraised as 'the wicked animal'. This appraisal word links the former appraisal, 'the wicked deceitful creature' to make the reader think that some problematic incident may happen. As the mother comes back from the forest and sees the terrible sight, the problem is evaluated. In it, the appraisal word 'the poor mother' works to make it clear that what the wolf caused is a serious problem. While the mother is helping her children, the wolf is appraised as 'the monster', a symbol of the evil. Also he is appraised at his death as 'the greedy wolf'.

Lexicogrammatical resources for appraisal in the story work to foreground the crisis and its causer, having some value or ideology in common between the writer and the reader, as the main event of the story. Owing to the deployment of lexicogrammatical resources of Interpersonal metafunction, Imperative and appraisal, the reader can follow the plot, enjoying the thrill.

5. Conclusion

In this way, the metafunctional analysis by Systemic Functional Theory has shown that the semantic tendency seen in the deployment of lexicogrammatical resources contributes to the construction of generic staging and character depiction in a fairly tale. The text analyzed is only one; other kind of Narrative such as novels may exploit another semantic formation, though the analysis of other 'fairy tales', I believe, would produce similar results.

A story reflects our value or ideology, although in most case we are not aware of or ignore it. To explore the Narrative genre is a significant strategy to clarify the way the world is and make use of the power of language to maintain and change the world. To explore the interaction between Narrative and Context would be the further theme to study.

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Appendix: The Wolf and the Seven Young Kids

THE WOLF AND THE SEVEN YOUNG KIDS.

Orientation THERE was once an old goat who had seven young ones, and she loved them as much as any mother could love her children.

Complication One day she wished to go into the forest and get food for them, so she assembled them round her and said: 'Dear children, I am going out into the wood; don't open the door while I am away, for if the wolf should get into our hut, the wicked deceitful creature will eat you up, even to the very hairs; you may easily know him by his rough voice and his large black feet.'

'Dear, mother,' said the young kids, 'we will be very careful to keep out the wolf; you may leave us without the least anxiety.' So the old goat made herself quite comfortable and started on her way.

She had not been absent long, when there came a knock at the door, and a voice cried: 'Open the door, my dear children, I have brought something nice for each of you.'

But the young kids knew by the rough voice that it was the old wolf, and not their mother; so the eldest said: 'We shall not open the door, you are not our mother; She has a soft and gentle voice, and your voice is rough. You are only a wolf.'

Then the wolf ran away to a shop at some distance, and bought a great stick of white chalk, which he ate to make his voice soft. After he had eaten it, he went back to the goat's cottage and knocked again at the door and said, in a soft voice, which the little kids thought was their mother's: 'Open the door for me now, dear children; I am your mother, and I have something nice for each of you.'

But the wolf put his foot on the window-sill as he spoke, and looked into the room; the young kids saw it, and one of them said; 'No! we shall not open the door; our mother has no black feet like that; go away, you are the wolf.'

So the wolf went away again to a baker's, and said: 'Baker, I have crushed my foot; please to wrap it in dough, that will soon cure it.' And as soon as the baker had done this, he went off to the miller and asked him to cover his foot with flour. The miller was too frightened to refuse, so he floured the wolf's foot and sent him away. Such is the way of the world.

Now went the wicked animal for the third time to the house door, and said: 'Open the door, dear children, it is your mother this time; she has brought you something from the forest.'

'Show us your feet,' said the little kids, 'then we shall know if you really are our mother.' The wolf placed his white foot on the window, and when they all saw it was white, they believed that what he had said was all true, so they opened the door; but as soon as he entered the house they discovered that it was the wolf, and with screams of terror ran to hide themselves.

One hid under the table, another in the bed, the third in the oven, the fourth in the kitchen, the fifth in the cupboard, the sixth under the wash-tub, and the seventh in the clock-case. But the wolf found six, and, without much ceremony, gobbled them up one after the other, excepting the youngest, who was hidden in the clock-case.

After the wolf had satisfied his greedy appetite, he went out lazily and laid himself down in the green meadow under a tree and fell fast asleep.

Evaluation Not long after the old goat returned home from the forest. Ah! what a scene it was for her. The house door was open. Table, chairs, and stools

upset. The wash-tub broken to pieces, the counterpanes and pillows dragged from the bed. She sought for her children in terror, but not one could she find. At last she heard a little voice cry: 'Dear mother, here I am, shut up in the clock-case.' The old goat helped her kid out, and then listened while she described the deceitful manner in which the wolf had managed to get into the hut and eat up all her brothers and sisters. We can guess how the poor mother mourned and wept for her children. At last she went out, and the little kid followed her. As they crossed the meadow, they saw the wolf lying under a tree and snoring so loud that the ground trembled.

Resolution

The goat examined him on all sides, and saw a movement as if something were alive in his stomach. 'Ah!' thought she, 'if he only swallowed my dear children, they must still alive.' So she sent the little kid into the house for a pair of scissors, a needle, and some thread, and very quickly began to cut open the monster's stomach. She had scarcely made one cut, when a little kid stretched out his head, and then the second, and a third sprang out as she cut farther, till the whole six were safe and alive, jumping around their mother for joy; the monster in his eagerness had swallowed them whole, and they were out hurt in the least.

Coda

Then their mother said to them: 'Go and fetch me some large pebbles from the brook, that we may fill the stomach of the dreadful creature while he still sleeps.' The seven little kids started off to the brook in great haste, and brought back as many large stones as they could carry; with these they filled the stomach of the wolf; then the old goat sewed it up again so gently and quietly that the wolf neither awoke nor moved.

As soon, however, as he had had his sleep out, he awoke, and stretching out his legs, felt himself very heavy and uncomfortable, and the great stones in his stomach made him feel so thirsty that he got up and went to the brook to drink. As he trotted along the stones rattled and knocked one against the other against his sides in a most strange manner. When he cried out:

'What a rattle and rumble!
They cannot be bones
Of these nice little kids,
For they feel just like stones.'

But when he came to the brook and stopped over to drink, the weight of the stones in his stomach overbalanced him, so that he fell in and was drowned.

The little kids and their mother ran over towards the brook when they heard the splash and saw what happened. Then they danced round their mother for joy, crying out: 'The wolf is dead! The wolf is dead!' And this was the end of the greedy wolf.

JASFL Occasional Papers Volume 3 No. 1 2004

選択体系機能言語学に基づく日本語テクスト理解システムの実装

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1. はじめに

我々は、日常的な言語を使ってさまざまな情報処理を行う日常言語コンピューティングと呼ばれる新しいパラダイムを提案し、その実現を目指して研究を進めている（岩爪他、2003）。日常言語コンピューティングシステムを構成する主要な構成要素として、言語テクストの意味の理解および生成に用いられるセミオティックベース（Semiotic Base）と呼ばれる言語資源がある（伊藤他、2001；伊藤他、2003）。セミオティックベースは、選択体系機能言語学（systemic functional linguistics、以下、SFL）で提唱されている言語モデルに基づいて設計された言語に関する知識のデータベースであり、言語を表記のレベルから状況のレベルまで包括的に扱うことを可能としている。

テクスト生成システムの基礎としてSFLを採用した研究(Matthiessen and Bateman、1991；Fawcett 他、1993）は今まで多くなされてきた一方で、テクスト理解システムの研究は比較的少ない。SFL の枠組みを部分的に利用した理解システム（Winograd、1972；O'Donoghue、1994）や、SFL の記述を HPSG など他の文法記述体系に変換するアプローチ（Kasper、1988；Bateman 他、1992）は存在するものの、それらのシステムにおいて、SFL の理論的特長が充分に活用されているとはいえないのが現状である。例外的に、WAG システミックパーザ（O'Donnell、1994）は、SFL の言語モデルに基づいて記述された言語資源を直接使うテクスト解析を追及しており、我々は、彼のアイデアに基づき、それを発展させることによって、日本語テクスト理解アルゴリズムを設計した。

今回、我々はセミオティックベースのプロトタイプとそれを使った日本語テクスト理解・生成アルゴリズムの実装を行い、さらにその応用として日常言語によってワープロなどのソフトウェアを操作できるアプリケーションシステムを実現した（杉本他、2003）。本稿では、テクスト理解アルゴリズムとそれに関わる言語資源に焦点を絞って説明したい。始めに、セミオティックベースの構造とそこに含まれる言語資源について述べる。次に、セミオティックベースを参照することによってどのようにテクスト理解が進んでいくのかを具体例を挙げて説明する。最後に、今後の課題について述べる。

2. セミオティックベース

セミオティックベースは、表 1 に示すように、４つの主要コンポーネントと２つの補助コンポーネントから成る。

[表 1] セミオティックベースの構造

<table>
<tr><td rowspan="6">主要コンポーネント</td><td rowspan="3">コンテクストベース (CB)</td><td>状況ベース</td></tr>
<tr><td>ステージベース</td></tr>
<tr><td>概念辞書 (CR)</td></tr>
<tr><td colspan="2">意味ベース (MB)</td></tr>
<tr><td colspan="2">語彙文法ベース (WB)</td></tr>
<tr><td colspan="2">表現ベース (EB)</td></tr>
<tr><td rowspan="3">補助コンポーネント</td><td rowspan="2">電子化辞書</td><td>汎用辞書 (GD)</td></tr>
<tr><td>状況特化辞書</td></tr>
<tr><td colspan="2">コーパスベース</td></tr>
</table>

セミオティックベースは、SFL で提唱されている、言語体系を記述する際の指針に則って設計されている。その指針の 1 つが、状況と言語の体系を層的に捉える点である（stratification）。これに合わせて、セミオティックベースの主要コンポーネントは、コンテクストベース (Context Base)、意味ベース (Meaning Base)、語彙文法ベース (Wording Base)、表現ベース (Expression Base) となっている。

コンテクストベースには、言葉がやりとりされる状況を分類するための特徴の体系と、状況タイプ毎にそこでやりとりされる言葉の意味的な特徴に関する記述が納められている。コンテクストベースは、状況ベース (Situation Base)、ステージベース (Stage Base)、概念辞書 (Concept Repository) という 3 つのコンポーネントから構成されている。状況ベースには、言葉がやりとりされる状況のタイプとそれを分類するためのフィールド、テナー、モードの特徴の体系が入っている[1]。ステージベースには、状況タイプ毎にそこでのやりとりの進行のパターン (generic structure potential) と言葉の特徴に関する記述が納められている。概念辞書には、概念がフレーム形式で定義されており、その概念に関連する SFL で定義されている意味・語彙文法特徴とロールと EDR 概念識別子 (concept identifier) も書かれている。表 2 は、概念辞書のレコードの例である。

[表 2] 概念辞書レコードの例

見出し概念名		writing	
概念区分		class	
EDR概念識別子		0fe07c	
MB意味特徴		fg-creative	
WB語彙文法特徴		creative	
上位概念名		domain-action	
	スロット名	*スロット値タイプ*	*SFLロール*
1	agent	agent	Actor
2	object	document	Goal
3	instrument	word-processor	Means

概念辞書のレコードは状況タイプ毎に用意されており、この点で、EDR 概念辞書の概

[1] 状況ベースの詳細と検討課題については、高橋他 (2002) を参照のこと。

念体系が状況に依存しない、より汎用的なタクソノミーとして設計されているのとは異なる。

意味ベースには、言葉の意味特徴の体系と、特定の状況下で当該の意味特徴を具現するための語彙文法的な手段に関する制約が納められている。具体的には、観念構成的意味に関してはHalliday and Matthiessen (1999) のIdeation Base、対人的意味に関しては Halliday (1994) ; Matthiessen (1995) の SPEECH FUNCTION、テクスト形成的意味に関しては Mann 他 (1992) の rhetorical structure theory を基に、それぞれ日本語の文法に合うように修正・追加されたものが含まれており、これ以外の意味的な資源については現在含まれていない。

語彙文法ベースには、言葉の語彙的、文法的な特徴の体系と、特定の状況下で当該の語彙文法特徴を具現するための表現的な手段に関する制約が納められている。基本的にTeruya (1998)を参考にしているが、形態素ランクや語ランクについては、後述する形態素解析において ChaSen を利用していることから、ChaSen の品詞体系に準じて資源を構築し、群ランクや節ランクについては、係り受け解析において CaboCha を利用していることから、CaboCha で定義されている文節の区切りに合うように資源を構築するなど、処理の利便性を考慮に入れて、語彙文法的な資源を構築している。

表現ベースは、現在は音声には対応しておらず、文字に関する特徴が納められており、句読法や、当該の語彙項目をどの表記体系（漢字、仮名、英数字など）で具現するか、文字列をどのように画面表示するかを HTML などで指定する際に利用することに主眼が置かれている。

主要コンポーネント内のこれらの言語資源は、コンテクストベースのコンテンツの一部を除いて全て選択体系網と具現規則の形で記述されており、ある特徴を選択することで、同じベース内または異なるベースにある他のシステムへの入力としたり、特定の言語構造を形成したりするために使われる。使用している具現オペレータは、insert、conflate、order、preselect、partition で、特殊なものとして、ChaSen の品詞体系と語彙文法特徴との対応を示す correspond、システム内のデフォルトの選択肢を指定する default-choice を設けた。

上述の４つの主要コンポーネントに加えて、セミオティックベースはタグ付きコーパスと電子化辞書を備えている。コーパスには、テクストに対してコンテクストベース，意味ベース、語彙文法ベース、表現ベース、電子化辞書を参照してタグ付けした結果が入っており、実体化（instantiation）の観点から言うと、他の資源が可能性（potential）であるのに対して、実体（instance）として位置付けることができる。辞書については、汎用辞書（General Dictionary）と状況特化辞書（Situation-specific Dictionary）の２種類用意した。これらは、記述の粒度（delicacy）の観点から言うと、言語の 3 ベースに収められている資源があまり詳細でなく文法的（less delicate, grammatical）なものであるのに対して、より詳細で語彙的（more delicate, lexical）な資源としてみなすことができる。両者共に、見出しとなっている語彙項目に関する通常の辞書情報に加えて、SFL で定義されている意味・語彙文法特徴とロールと EDR 概念識別子と概念関係子（concept relation label）が書かれている。意味・語彙文法特徴に関しては、見出しとなっている単語そのものを特徴付けるものだけではなく、その単語を含む上位ランクの要素（群や節）の特徴も書かれている場合がある。両者の違いは、状況特化辞書には、見出し項目が使われる状況に関する情報や見出し項目がその状況下で使われた場合にのみ観察される言語的な特徴が含まれているが、汎用辞書にはそのような情報が入っていないことである。そのため、実際の処理では、汎用辞書は主に、処理すべきテクストの状況が分かっていない、または該当する状況タイプが見つからなかった場合に利用され、状況特化辞書は状況が判明しているときに利用される、という具合に使い分けがなされている。表 3 は汎用辞書のレコードの例である。

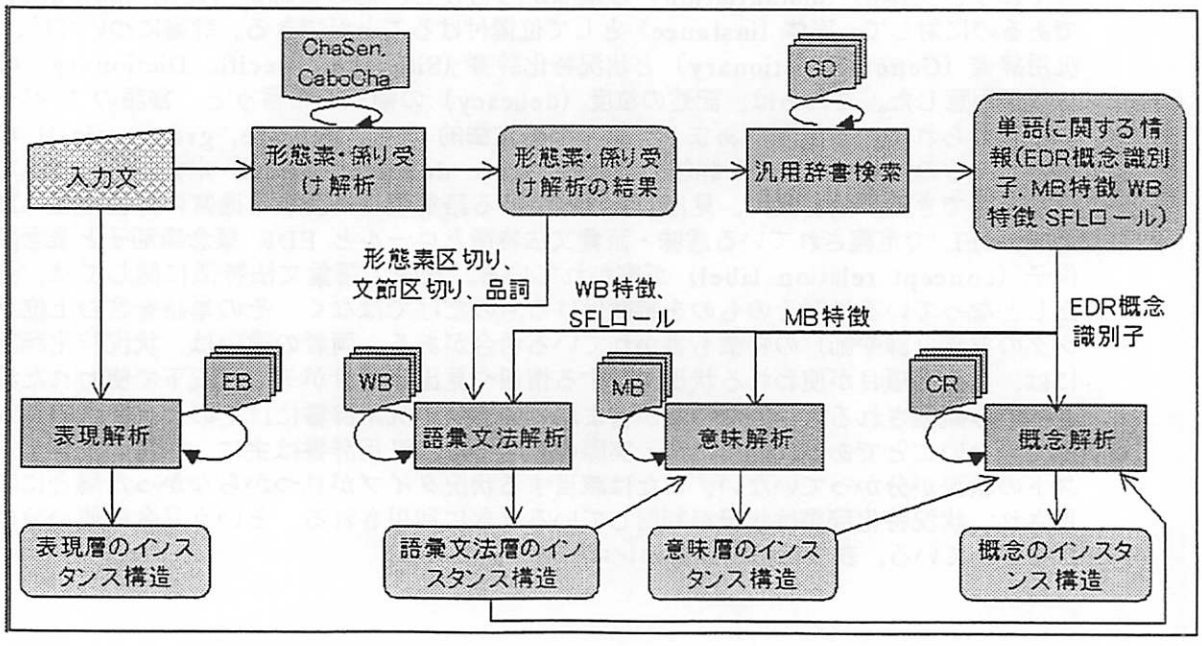
[表3] 汎用辞書レコードの例

見出し語		書く
カナ		カク
EDR品詞		JVE (i.e., 動詞)
EDR概念識別子		0fe07c
MB 意味特徴		fg-creative
WB語彙文法特徴		creative&lg-concrete or creative&lg-abstract
見出し語のSFLロール		Event
	EDR概念関係子	*子ユニットのSFLロール*
1	agent	Actor&Agent
2	object	Goal&Medium
3	instrument	Means

3. テクスト理解アルゴリズム

セミオティックベースを使ったテクスト理解処理とは、与えられた文のインスタンス構造、すなわち依存関係を表した構造と意味的・語彙文法的・表現的な特徴、および概念的な構造の表現を抽出するというものである。ここで、インスタンス構造とは、ユニットというノードを持つ木構造で、ユニットは選択体系網のルートから当該の特徴までの選択パスと、それ以外に処理中に使われる情報（例えば、汎用辞書レコードから得られた単語の情報）を含んでいるものと考える。また、ユニットの子ノードには、それぞれ親ユニットに対する関係を表すSFLロール(Actorなど､grammatical function labelのこと）が割り当てられるものとする。

図1は、セミオティックベースを使ったテクスト理解処理の流れを示している。



[図1] テクスト理解の流れ

[表 4] テクスト理解処理結果の例

前処理	形態素・係り受け解析		私	は	クリスマス	会	の	招待	状	を	書き	たい	。
			0 3D		1 3D			2 3D			3 -1O		
	GD検索	CID	0e7e95, 2dc301	2621d5	3ceda8		2621d5	0e3e07		2621d5	0e910d, 0e910f	2621c8	-
		CRL	agent		scene			object			-		-
表現解析	sentence		eb-graphology-base sentence										
	comma-unit		Head										Tail
			eb-graphology-base comma-unit										full-stop
	letter		Head	2	3-7	8	9	10-11	12	13	14-15	Tail	-
			j-characters...	j-characters...	j-characters...	j-characters...	j-characters...	j-characters...	j-characters...	j-characters...	j-characters...	j-characters...	-
語彙文法解析	clause simplex rank		clause clause-simplex major-clause independent-clause non-conjunct cls-neutral no-circumstance material mat-doing creative lg-concrete effective thematic-agent-subject operative-voice thematic relative-theme unmarked-theme explicit-topical-theme free cls-positive cls-hon-default cls-informal sbj-explicit md-interactant md-non-addressee md-speaker non-addressee-option non-indicative cls-optative unkeyed ...										-
	group complex rank		-		Goal/ Medium/ Complement/ Rheme1						-		-
			-		ngrp-complex ngrp-projection ngrp-hypotactic ngrp-matter...						-		-
	group simplex rank		Actor/ Agent/ Subject/ TopicalTheme		Qualifier/ Modifier1			Thing/ Head1			Process/ Predicator/ Rheme2		-
			ngrp-simplex specific determinative nominal-head thematic-ngrp personal pronominal ngrp-participant-head general-theme-marker speaker ngrp-part-ga non-qualified ...		ngrp-simplex non-specific nominal ngrp-abstract non-thematic-ngrp ngrp-qualifier noun-qualifier non-qualified ...			ngrp-simplex non-thematic-ngrp nominal-head non-specific ngrp-participant-head nominal ngrp-part-o ngrp-concrete qualified ...			vgrp-simplex zgrp-positive temporal non-past modal modulation rediness-inclination optative option-tai non-causative active-voice ...		-
	word simplex rank		Thing/ Head1	Thematic-marker/ Nominal-marker/ Modifier1	Thing/ Head1		Binder/ Modifier1	Thing/ Head1		Nominal-marker/ Modifier1	Event/ Head1	Tense/ Modality/ Modifier1	-
			pronoun-ippan ...	j-kakari-zyoshi kakari-wa ...	common-noun-ippan hasei-go suffixation ...		j-zyoshi-rentai-ka ...	common-noun-ippan hasei-go suffixation ...		j-case-marker case-o ...	lexical-verb ...	auxiliary-verb aux-tai ...	-
	morpheme rank		1	1	Head1	Modifier1	1	Head1	Modifier1	1	1	1	-
			base ...	base ...	base ...	suffix ...	base ...	base ...	suffix ...	base ...	base ...	base ...	-
意味解析	figure/move		pb-figure fg-non-projected fg-doing-to-with fg-creative agentive move-simplex mb-goods-and-services command mb-demanding initiating ...										
	sequence		-		Goal/ Medium						-		-
			-		sq-element sq-unequal sq-projection sq-location ...						-		-
	element		Actor/ Agent		Qualifier/ Modifier1			Thing/ Head1			Process		-
			ph-participant simple-thing mb-conscious ...		ph-participant macro-thing ...			ph-participant simple-thing mb-non-conscious mb-material-object...			pb-process...		-
概念解析			want-action{speaker = user, hearer = system, content = writing{agent = user, object = invitation-letter{purpose=Christmas-party{}}}										

このセクションでは、表 4 に示したような例文に対するインスタンス構造を得るまでの処理を、図に示した段階毎に説明する

3.1. 前処理

まず、ChaSen、CaboCha（工藤と松本、2002）を使って、与えられた文の形態素・係り受け解析を行う。次に汎用辞書の検索を行うと、入力文中の単語が同定され、該当

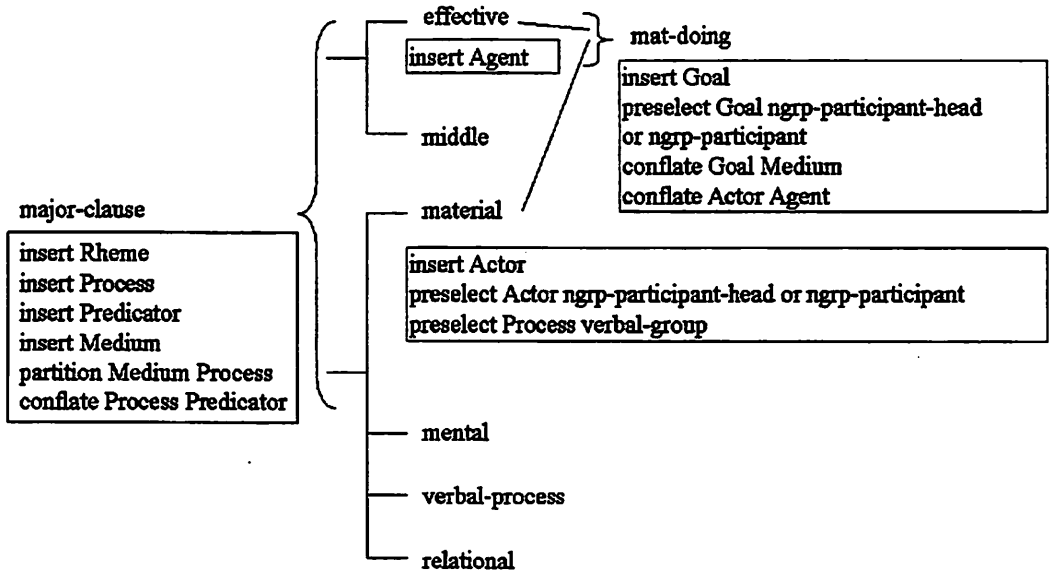
する汎用辞書レコードから単語の意味・語彙文法的特徴やロール構造に関する情報が抽出される。さらに、EDR 日本語動詞パターン副辞書、日本語共起辞書、概念辞書を参照することによって、係り受け関係にある文節の各ペアに対して、EDR 概念関係子が割り当てられる。単語の意味の曖昧性はこの時点で解消されるものもある。最後に、汎用辞書レコードの内の対応表を参照することによって、各文節に対して、先ほど求めたEDR 概念関係子から SFL ロールの候補が割り当てられる。例えば、EDR 日本語動詞パターン副辞書内の動詞「書く」に関する情報を参照することによって、3番目の文節「招待状を」には EDR 概念識別子 object が割り当てられるので、対応表から、この文節には Goal と Medium という SFL ロールが与えられる。

3.2. 表現解析

表現ベースを参照して、与えられた文の表現層のインスタンス構造、すなわち、文字や句読法に関する特徴と構造を求める。表現解析は、その他の処理とは独立して行われ、現在のシステムでは、句読点に基づいて文の区切りを同定することしか行っていないので、詳細は省略する。

3.3. 語彙文法解析

ここでは、前処理の結果と語彙文法ベースを使って、語彙文法層のインスタンス構造を求める。我々は、O'Donnell (1994) のアイデアをベースにして、処理効率の問題に対処するために部分構造（partial-structure）というデータ構造とボトムアップ・チャート・パージングを用いている。部分構造には結合ユニットと順序ユニットの２種類あり、親ユニットの選択パスとその親ユニットが取りうる子ユニットの特徴選択パス、ロール、子ユニット間の生起順序などが規定されている。結合ユニットは、親ユニットと子ユニットの可能な組み合わせを表したもので、語彙文法ベース内にある insert, conflate, preselect という具現オペレータを含んだ具現規則を組み合わせることによってコンパイルされる。図 2 に、語彙文法ベースの語彙文法層の選択体系網と具現規則の一部とそこからコンパイルされる部分構造を挙げておく。



link_Actor_1

```
(:and wb clause clause-simplex major-clause
effective material mat-doing)
```

Actor/Agent

```
(:and wb group-phrase groups nominal-group
  (:or (:and ngrp-simplex nominal-head
         ngrp-participant-head)
       (:and ngrp-complex ngrp-hypotactic
         ngrp-participant)))
```

link_Actor_2

```
(:and wb clause clause-simplex major-clause material)
```

Actor

```
(:and wb group-phrase groups nominal-group
  (:or (:and ngrp-simplex nominal-head
         ngrp-participant-head)
       (:and ngrp-complex ngrp-hypotactic
         ngrp-participant)))
```

link_Goal_3

```
(:and wb clause clause-simplex major-clause
  effective material mat-doing)
```

Goal/Medium

```
(:and wb group-phrase groups nominal-group
  (:or (:and ngrp-simplex nominal-head
         ngrp-participant-head)
       (:and ngrp-complex ngrp-hypotactic
         ngrp-participant)))
```

link_Process_4

```
(:and wb clause clause-simplex major-clause)
```

Process/Predicator

```
(:and wb group-phrase groups verbal-group)
```

order_Medium#Process_5

```
(:and wb clause clause-simplex major-clause)
```

Medium#Process/Predicator

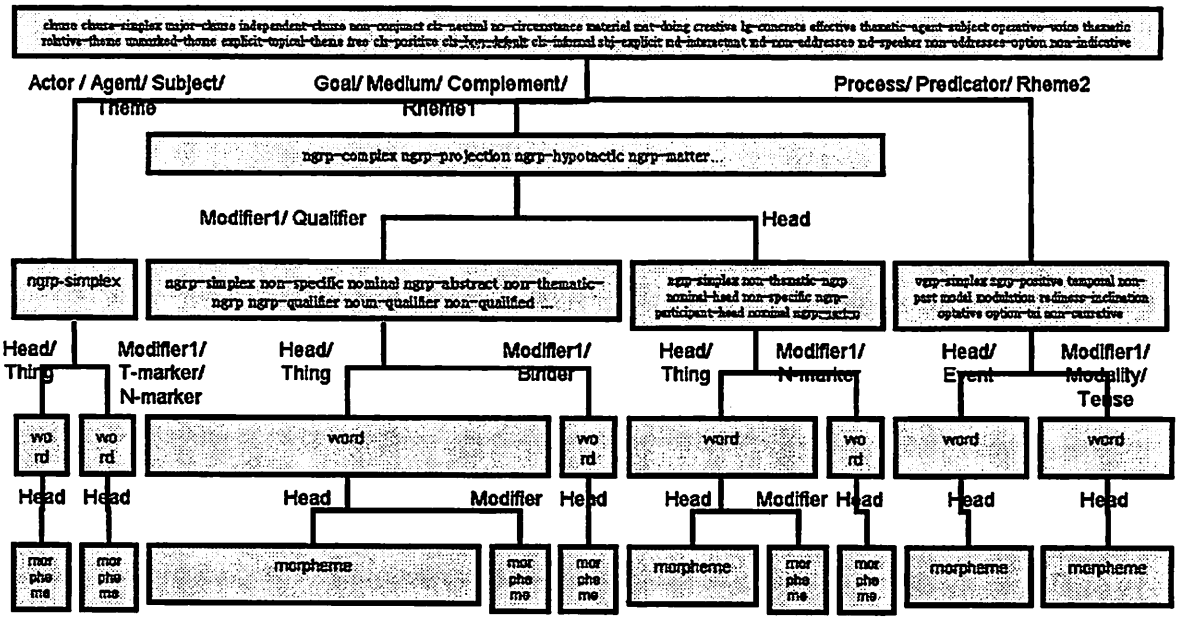
[図2] 選択体系網・具体的規制とそこから抽出される部分構造の例

図 2 の例で説明すると、link-Process-4 という結合ユニットは、verbal-group という特徴をもつユニットは material という特徴をもつユニットの構成要素となることができ、親ユニットに対する子ユニットのロールは Process と Predicator である、ということを表現している。

順序ユニットは、複数の子ユニットが文中で生起する時の順序関係を指定したもので、insert, conflate, order, partition という具現オペレータを含んだ具現規則を組み合わせることによってコンパイルされる。図 2 にある order_Medium# Process_5 という順序ユニットは、major-clause という特徴をもつ親ユニットは、Medium というロー

ルを持つ子ユニットと Process/ Predicator というロールを持つ子ユニットを取り、この順序でユニットが並ぶが、必ずしも隣接してなくても（つまり、他のユニットが間に入っても）よい、ということを表現している。

処理については、大きく 2 段階に分かれる。まず語彙文法ベース内の選択体系網を参照しながら、前処理の結果として得られた各単語の語彙文法特徴を選択体系網上に位置付け、その特徴に至るまでの選択の道筋を計算する。次にあらかじめコンパイルしておいた部分構造のリストから、パスに含まれる特徴と同じものを含んでいる部分構造を選び出し、パスやロールの単一化を繰り返すことによって、形態素ランクから節ランクの構造まで、ボトムアップ式に作り上げていく。そうすることによって、図 3 のような木構造が得られる。



[図 3] 語彙文法層のインスタンス構造の例

図中の四角はユニットを表し、四角と四角のあいだに引いてある線はユニットの親子関係を表し、そこに添えられている文字はロールを表している。四角の中に書かれているのはそのユニットの特徴選択パスであるが、紙面の都合上、主だった特徴だけを挙げている[2]。

3.4. 意味解析

ここでは、前処理、語彙文法解析の結果と意味ベースを使って、element ランクから、figure, move ランクを経て、rhetorical unit ランクまでの意味層のインスタンス構造を求める。

語彙文法解析の結果を意味解析に送るために、語彙文法ユニットと意味ユニットの間の関係を宣言的に表現する層間結合ユニット（図 4）を導入し、それを語彙文法層のイ

[2] 見た目は異なるが、表 4 の語彙文法解析と書かれた欄とこの図 3 は同じインスタンス構造を表している。

ンスタンス構造から意味層のユニットを生成するために用いる。

```
wblink_1
(:and mb grammatical-semantics non-rhetorical-unit
exchange move-simplex role-assigning initiating
mb-demanding mb-goods-and-services command)
        |
(:and wb clause clause-simplex major-clause free
non-indicative cls-optative md-interactant
md-non-addressee non-addressee-option)
```

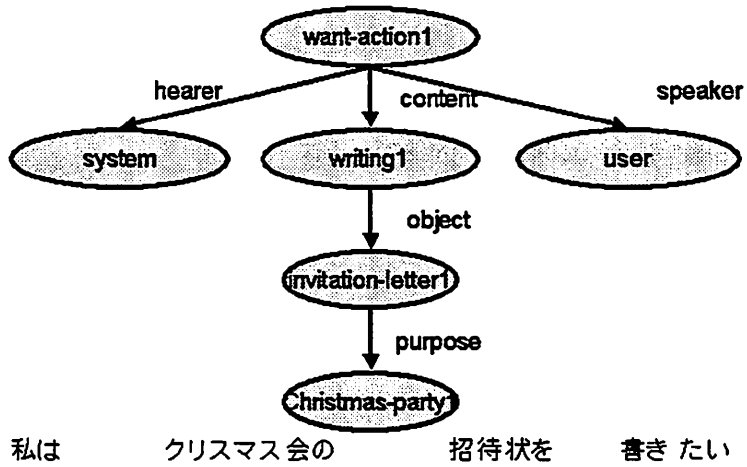
[図 4] 意味ベースの層間結合ユニットの例

このようにして生成された意味層のユニット間の親子関係を構築していく際のアルゴリズムは、上で説明した、語彙文法解析のアルゴリズムと基本的に同じで、意味ベース内の具現規則からコンパイルされた結合ユニットを使ってelementランクからrhetorical unitランクに向けてボトムアップ式に構築していく。意味層では順序ユニットは使用しない。

O'Donnell (1994) と比較した場合の改良点として、我々は、インスタンス構造に情報を追加したり、不適切な解釈を排除したりするために、チャートパージングの過程で随時前処理の結果を取り込んで利用している。もう1つの改良点は、co-selection constraints とデフォルトの特徴選択を処理できるようにするために、特徴の前向き連鎖推論も用いていることである。

3.5. 概念解析

前処理、語彙文法解析、意味解析の結果と概念辞書を使って、与えられた文の概念内容を表現するインスタンス概念フレームを生成する。図 5 は例文のインスタンス概念フレームを表している[3]。



[図 5] 概念のインスタンス構造の例

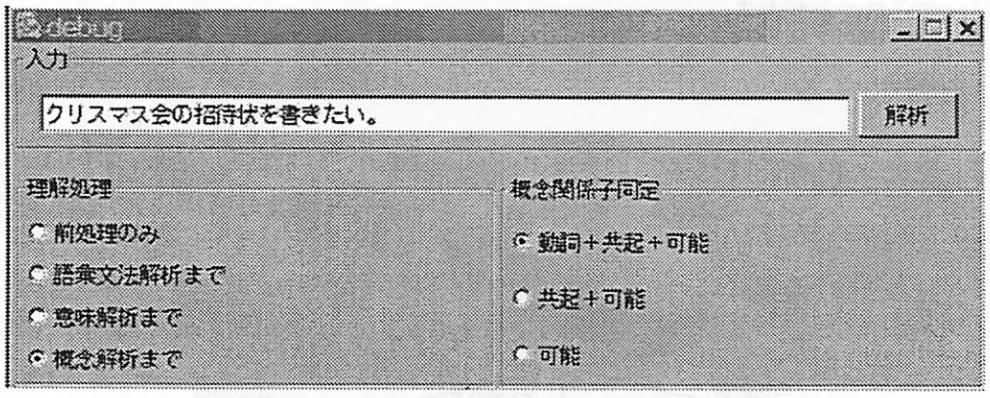
[3] 見た目は異なるが、表 4 の概念解析と書かれた欄とこの図 5 は同じインスタンス構造を表している。

インスタンス概念のスロットは他のインスタンス概念で埋められており、それらのほとんどは入力文のいずれかのユニットに対応している。スロットのフィラーに関するタイプ制約については、概念辞書の状況に特化した概念体系だけでなく、一般的な概念に関するより豊富な情報を備えたEDRの概念体系も参照して、チェックされる。

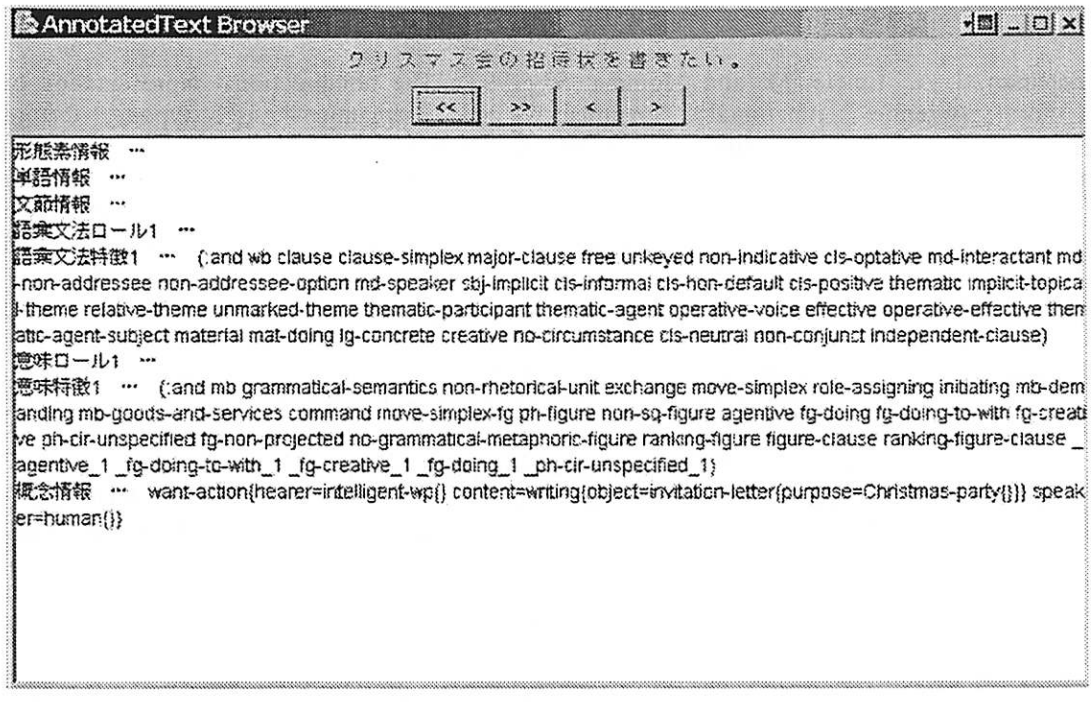
現在のシステムでは、状況層については概念解析のみで、発話の状況の同定や更新は行っていないので、テクスト理解処理はここで終わりとなる。ここまでで得られた前処理結果、表現層、語彙文法層、意味層、概念のインスタンス構造が、この後に続く、対話のプランニングやテクスト生成に利用される。

4. まとめ

本稿では、セミオティックベースを使った日本語テクスト理解システムについて説明した。ここで説明したセミオティックベースとテクスト理解アルゴリズムは Java で実装されており、分析結果は XML タグによって注釈を付けられた（アノテートされた）テクストとして出力される。実装したシステムは、図 6、図 7 に示したように、解析したい文を入力する画面と解析した結果を表示する画面を持ち、解析時に参照する資源や解析の段階を指定したり、どの範囲の解析結果を表示するかを選択したり出来るようになっている。



[図 6] テクスト理解システムの入力インターフェイス



[図 7] テクスト理解システムの出力インターフェイス

現在のセミオティックベースは、約 700 個の選択体系、約 1600 個の選択肢、約 1100 個の具現規則と、約 130 個の概念辞書レコード、約 70 個の汎用辞書レコードを備えている。「私はクリスマス会の招待状を書きたい。」のように、group complex を扱えるだけでなく、節の必須要素の省略や Circumstance のような非必須要素を含む節の解析にも対応している。省略と Circumstance を含む節「文字をもう少し強調したい。」の解析結果を付録に挙げておくので、こちらも参照されたい。

我々は、SFL をベースとした資源と処理に、SFL に特化していない自然言語処理ツールの結果を統合することによって、O'Donnell (1994) のアイデアを拡張し、日本語テクストの解析を可能にした。テクスト理解システム設計の基礎として SFL を採用することによって、従来の自然言語処理で扱われてきたよりも広い視点で言語分析を行うことができる。また、既存のパーザーや電子化辞書を SFL ベースの資源と組み合わせることによって、開発コストの削減や標準的な分析精度の維持も期待できる。

最後に、今回実装したシステムの問題点を挙げておく。１つは、汎用辞書にあらかじめ登録されていない単語を含む文については、語彙文法解析や意味解析時の初期入力が不十分なため、前処理以降については部分的な解析しかできないことである。語彙文法・意味解析については、SFL で言うところの、ランクシフトや文法的比喩に関する資源が構築途中であるため、連体修飾表現を含む入力文については適切なインスタンス構造が出力できないことがある。それから、現時点では具現規則から部分構造をコンパイルする作業を人手で行っているため、解析処理に利用できていない語彙文法ベースや意味ベースの資源がたくさんあるので、コンパイルの自動化を早急に行った上で、我々が構築した資源の適用範囲を評価したい。また、セミオティックベースの資源を最大限に活用して、入力文の言語的な特徴の分布からコンテクストのパラメータを推定するアルゴリズムについては、現在構想中である。これらは今後の課題としたい。

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付録：「文字をもう少し強調したい。」の解析結果

前処理の結果

文節情報 ID = bunsetsu_8
　　単語情報 ID = lWord_12
　　単語辞書レコードの候補 1 = 文字（モジ）概念識別子 = 1f5057 品詞 = JN1
　　　　形態素情報 ID = morph_1
　　　　出現形 = 文字
　　　　読み = モジ
　　　　品詞 = 名詞-一般
　　単語情報 ID = lWord_11
　　単語辞書レコードの候補 1 = を（ヲ）概念識別子 = 2621d5 品詞 = JJO
　　　　形態素情報 ID = morph_2
　　　　出現形 = を
　　　　読み = ヲ
　　　　品詞 = 助詞-格助詞-一般
係り先 = bunsetsu_16 概念関係子の候補 = [object, scene]

文節情報 ID = bunsetsu_13
　　単語情報 ID = lWord_15
　　単語辞書レコードの候補 1 = もう少し（モウスコシ）概念識別子 = 0e4c48 品詞 = JD1
　　　　形態素情報 ID = morph_3
　　　　出現形 = もう少し
　　　　読み = モウスコシ
　　　　品詞 = 副詞-助詞類接続
係り先 = bunsetsu_16 概念関係子の候補 = [goal, cause]

文節情報 ID = bunsetsu_16
　　単語情報 ID = lWord_21
　　単語辞書レコードの候補 1 = 強調する（キョウチョウスル）概念識別子 = 3ceb76 品詞 = JSA
　　単語辞書レコードの候補 2 = 強調する（キョウチョウスル）概念識別子 = 3ceb76 品詞 = JSA
　　単語辞書レコードの候補 3 = 強調する（キョウチョウスル）概念識別子 = 3ceb76 品詞 = JSA
　　　　形態素情報 ID = morph_4
　　　　出現形 = 強調
　　　　読み = キョウチョウ
　　　　品詞 = 名詞-サ変接続
　　　　形態素情報 ID = morph_5
　　　　出現形 = し
　　　　読み = シ
　　　　品詞 = 動詞-自立
　　単語情報 ID = lWord_20
　　単語辞書レコードの候補 1 = たい（タイ）概念識別子 = 2621c8 品詞 = JJD
　　　　形態素情報 ID = morph_6
　　　　出現形 = たい
　　　　読み = タイ
　　　　品詞 = 助動詞
係り先 = なし

表現解析の結果

```
ユニットID =
選択パス =(:and eb-graphology-base whole-text-dialogue)
[Head, Tail, 1] =
        ユニットID = lUnit_38
        選択パス =(:and eb-graphology-base section-turn)
        [Head, Tail, 1] =
                ユニットID = lUnit_36
                選択パス =(:and eb-graphology-base sentence)
                [Head, 1] =
                        ユニットID = lUnit_35
                        選択パス =(:and eb-graphology-base comma-unit)
                        [Head, 1] =
                                ユニットID = lUnit_22
                                選択パス = (:and eb-graphology-base letter-graph j-
characters)
                        [2] =
                                ユニットID = lUnit_23
                                選択パス = (:and eb-graphology-base letter-graph j-
characters)
                        [3] =
                                ユニットID = lUnit_24
                                選択パス = (:and eb-graphology-base letter-graph j-
characters)
                        [4] =
                                ユニットID = lUnit_25
                                選択パス = (:and eb-graphology-base letter-graph j-
characters)
                        [5] =
                                ユニットID = lUnit_26
                                選択パス = (:and eb-graphology-base letter-graph j-
characters)
                        [6] =
                                ユニットID = lUnit_27
                                選択パス = (:and eb-graphology-base letter-graph j-
characters)
                        [7] =
                                ユニットID = lUnit_28
                                選択パス = (:and eb-graphology-base letter-graph j-
characters)
                        [8] =
                                ユニットID = lUnit_29
                                選択パス = (:and eb-graphology-base letter-graph j-
characters)
                        [9] =
                                ユニットID = lUnit_30
                                選択パス = (:and eb-graphology-base letter-graph j-
characters)
                        [10] =
```

ユニットID = lUnit_31
選択パス = (:and eb-graphology-base letter-graph j-characters)
[11] =
ユニットID = lUnit_32
選択パス = (:and eb-graphology-base letter-graph j-characters)
[Tail, 12] =
ユニットID = lUnit_33
選択パス = (:and eb-graphology-base letter-graph j-characters)
[Tail, 2] =
ユニットID = lUnit_34
選択パス = (:and eb-graphology-base letter-graph non-j-characters full-stop)

語彙文法解析の結果

ユニットID = lUnit_927
選択パス = (:and wb clause clause-simplex major-clause free unkeyed non-indicative cls-optative md-interactant md-non-addressee non-addressee-option md-speaker sbj-implicit cls-informal cls-hon-default cls-positive thematic implicit-topical-theme relative-theme unmarked-theme thematic-participant thematic-agent operative-voice effective operative-effective thematic-agent-subject material mat-doing lg-concrete despositive mat-elaborating mat-alteration resultative-incorporated-verb resultative-sahen cir-specified cir-expansion cir-enhancement cir-manner cir-quality no-cir-secondary cls-neutral non-conjunct independent-clause)
[Medium, Rheme1, Complement, Goal] =
ユニットID = lUnit_1026
選択パス = (:and wb group-phrase groups nominal-group non-deictic non-epithized non-classified non-qualified ngrp-simplex nominal-head ngrp-participant-head ngrp-part-o noun-head non-named-individual nominal ngrp-concrete ngrp-neutral non-thematic-ngrpnon-post-quantified ngrp-full _ngrp-part-o_1)
[Head, Alpha, Thing] =
ユニットID = lUnit_1037
選択パス = (:and wb word word-simplex tanzyun-go nominals noun common-noun common-noun-ippan wrd-neutral wrd-full wrd-informal wrd-hon-default)
[1] =
ユニットID = lUnit_1038
選択パス = (:and wb morpheme base mrp-neutral mrp-full mrp-informal mrp-hon-default)
単語辞書レコード = 文字（モジ）概念識別子 = 1f5057 品詞 = JN1
[Modifier, Nominal-marker, Beta] =
ユニットID = lUnit_1035
選択パス = (:and wb word word-simplex tanzyun-go nominals j-nominal-marker j-case-marker case-o wrd-neutral wrd-full wrd-informal wrd-hon-default)
[1] =
ユニットID = lUnit_1036
選択パス = (:and wb morpheme base mrp-neutral mrp-full mrp-informal mrp-hon-default)

単語辞書レコード = を（ヲ）概念識別子 =2621d5 品詞 =JJO
[Adjunct1, Rheme2, Quality1] =
ユニットID = lUnit_1044
選択パス = (:and wb group-phrase groups adverbial-group advgrp-simplex advgrp-circumstance advgrp-cir-no-particle)
[Head, Alpha] =
ユニットID = lUnit_1047
選択パス = (:and wb word word-simplex tanzyun-go adverbials adverb wrd-neutral wrd-full wrd-informal wrd-hon-default _adverb_2)
[1] =
ユニットID = lUnit_1048
選択パス = (:and wb morpheme base mrp-neutral mrp-full mrp-informal mrp-hon-default)
単語辞書レコード = もう少し（モウスコシ）概念識別子 =0e4c48 品詞 = JD1
[Process, Rheme3, Attribute, Predicator] =
ユニットID = lUnit_1049
選択パス = (:and wb group-phrase groups verbal-group vgrp-simplex complex-event zyukugoo-event sahen-event vgrp-full vgrp-neutral active-voice non-causative non-causative-active modal no-secondary modulation rediness-inclination optative option-tai temporal no-secondary-tense non-past other-aux-coexist zgrp-informal zgrp-hon-default zgrp-positive _modal_1 _no-secondary_2)
[Head, Alpha, Event] =
ユニットID = lUnit_1074
選択パス = (:and wb word word-complex wrd-expansion wrd-hypotactic zyukugoo-go sahen-plus-suru)
単語辞書レコード = 強調する（キョウチョウスル）概念識別子 = 3ceb76 品詞 = JSA
[Beta, Modifier1] =
ユニットID = lUnit_1081
選択パス = (:and wb word word-simplex tanzyun-go nominals noun common-noun common-sahen-setuzoku-noun wrd-neutral wrd-full wrd-informal wrd-hon-default)
[1] =
ユニットID = lUnit_1082
選択パス = (:and wb morpheme base mrp-neutral mrp-full mrp-informal mrp-hon-default)
[Alpha, Head1] =
ユニットID = lUnit_1077
選択パス = (:and wb word word-simplex tanzyun-go verbals lexical-verb non-phrasal lex-verb wrd-neutral wrd-full wrd-informal wrd-hon-default)
[1] =
ユニットID = lUnit_1078
選択パス = (:and wb morpheme base mrp-neutral mrp-full mrp-informal mrp-hon-default)
[Modifier, Tense1, Beta, Modality1] =
ユニットID = lUnit_1083
選択パス = (:and wb word word-simplex tanzyun-go verbals auxiliary-verb non-copula non-bound-vrb/ adj aux-tai wrd-neutral wrd-full wrd-informal wrd-hon-default)
[1] =

ユニットID = lUnit_1084
選択パス = (:and wb morpheme base mrp-neutral mrp-full mrp-informal mrp-hon-default)
単語辞書レコード = たい（タイ）概念識別子 = 2621c8 品詞 = JJD

意味解析の結果

ユニットID = lUnit_1904
選択パス = (:and mb grammatical-semantics non-rhetorical-unit exchange move-simplex role-assigning initiating mb-demanding mb-goods-and-services command move-simplex-fg ph-figure non-sq-figure agentive fg-doing fg-doing-to-with fg-despositive fg-elaborating fg-alteration ph-cir-specified circumstances-of-expansion ph-cir-enhancing ph-cir-manner ph-cir-quality fg-non-projected no-grammatical-metaphoric-figure ranking-figure figure-clause ranking-figure-clause _agentive_1 _fg-doing-to-with_1 _fg-despositive_1 _fg-elaborating_1 _fg-alteration_1 _fg-doing_1 _ph-cir-specified_1 _circumstances-of-expansion_1 _ph-cir-enhancing_1 _ph-cir-manner_1 _ph-cir-quality_1)
[Medium, Goal] =
ユニットID = lUnit_1908
選択パス = (:and mb grammatical-semantics non-rhetorical-unit non-exchange element-only ph-element non-sq-element ph-participant el-simple el-thing simple-thing mb-non-conscious ph-material mb-material-object no-grammatical-metaphoric-element ranking-element element-group-phrase element-ngrp _mb-material-object_1 _el-thing_1)
[Quality] =
ユニットID = lUnit_1906
選択パス = (:and mb grammatical-semantics non-rhetorical-unit non-exchange element-only ph-element non-sq-element ph-circumstance simple-circumstance ph-advgrp-cir no-grammatical-metaphoric-element ranking-element element-group-phrase element-adverbialgrp)
[Process] =
ユニットID = lUnit_1907
選択パス = (:and mb grammatical-semantics non-rhetorical-unit non-exchange element-only ph-element non-sq-element ph-process ph-positive ph-modal ph-non-phasal ph-tense ph-non-past no-grammatical-metaphoric-element ranking-element element-group-phrase element-vgrp _ph-process_1 _ph-modal_1 _ph-non-phasal_1 _ph-tense_1 _ph-non-past_1)

概念解析の結果

インスタンス概念ID = want-action_1970
hearer =
インスタンス概念ID = intelligent-wp1
content =
インスタンス概念ID = emphasizing_1969
object =
インスタンス概念ID = font_1966
degree =
インスタンス概念ID = degree_1968
speaker =
インスタンス概念ID = user

Implementation of a Japanese Text Understanding System Based on Systemic Functional Linguistics

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We have implemented a Japanese text processing system, combining the existing parser and dictionary with the linguistic resources that we developed based on systemic functional linguistics. In this paper, we explain the text understanding algorithm of our system that utilizes the various linguistic resources in the Semiotic Base. First, we describe the structure of the SB and the linguistic resources stored in it. Then, we depict the text understanding algorithm using the SB. The process starts with morphological and dependency analyses by the non-SFL-based existing parser, followed by looking up the dictionary to enrich the input for SFL-based analysis. After mapping the pre-processing results onto systemic features, the path identification of selected features and unification based on O'Donnell are conducted with reference to the linguistic resource represented in the system networks. Consequently, we obtain graphological, lexicogrammatical, semantic and conceptual annotations of a given text.
The current version of the SB has approximately 700 systems, 1600 features, 1100 realization statements, 130 records in CR, and 70 records in GD. The system can analyze a nominal group complex, a clause where obligatory unit (e.g., Subject) is elliptical, and a clause that contains optional unit (e.g., Circumstance).

JASFL Occasional Papers Volume 3 No. 1 2004

タスク解決に関する対話における修辞構造を用いたステージの規定

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1. 研究の背景

選択体系機能言語学（Systemic Functional Linguistics、以下 SFL）の考えに従うと、テクストはコンテクストのありようを具現している。テクストには、テクストを構成する文の意味・語彙文法的特徴と、テクスト自体の展開の仕方という二つの側面とが考えられる。SFL では、テクストはインタラクションの目標に応じて一定の段階（ステージ）を経て展開するものとされ、その際のテクストの展開はジャンル構造(Generic Structure Potential、以下 GSP)として分析の対象となる（Martin1992; 山口 1999; 鷲嶽 2002）。

テクストの展開に関しては、他にテクストの構成要素が相互にどのような意味的依存関係をとり持つかという視点からの分析も存在する。このような分析として代表的なのは、修辞構造理論（Rhetorical Structure Theory 以下 RST, Mann and Thompson 1988; Mann et al 1992）である。

Matthiessen(1995:47)において、GSP はコンテクスト層、RST は意味層に属するものとみなされ、GSP と RST との相補関係が指摘されている。

> これら二つのアプローチ(GSP と RST：引用者)は相補的である。GSP は所与の状況タイプの中でテクスト構造のどのレパートリーが使用可能かを示すためにデザインされている。……これに対して、RST は高度に一般化された修辞関係をもって作動しており、……多様な使用域にわたって適用可能なのである。（引用者訳）

さらに、Matthiessen は両者の分業関係についてさらに研究が必要なことを述べた上で、次のように続ける。

> 注意しなくてはならないのは、ある種の使用域においてはこの二つのテクスト構造がかなり精密に統合できるということである。例えば、インストラクションのテクストではある特定のジャンル構造という観点から包括的に構成されるが、このジャンル構造の諸要素は修辞関係という観点から構成されるという具合である。（引用者訳）

以上から、GSP を用いて状況の観点からトップダウンにテクストの構造を指定し、逆に RST を用いてその構成要素同士の意味的関係を探ることによってボトムアップにテクストの構造を解明することが期待される。しかるに、ステージ認定においてどのように修辞構造を用いるかについては、まだ考察の余地がある。本稿では、具体的にテクストのジャンル構造と修辞構造を検証することによって、各ステージ間およびステージ内部における修辞関係を考察する。

本稿の構成は次の通りである。まず、分析の対象となるテクストのサンプルを例示し

た上で、例示されたテクストに具現されるコンテクストについて説明する。次に、サンプルテクストのジャンル構造を提示する。その後、サンプルテクストの修辞構造を分析し、ステージとの関連を検討する。

2. 分析の対象とコンテクスト

本節では、分析の対象となるテクストのサンプルとコンテクストについて説明し、コンテクストのどの要素がどのようにテクストに具現されているかについても述べる。

まず、サンプルテクストを提示した上で、テクストを取り巻くコンテクストについて、活動領域（field）、役割関係（tenor）、伝達様式（mode）の観点から説明し、その後、テクストの展開に関して、コンテクストのどの部分が重要な役割を担っているかについて述べる。

2.1 テクスト

本稿で分析するテクストタイプのサンプルを以下に挙げる[1]。

（テクスト 1）
ユーザー（以下 U）1　　あとなんか例えば「十時より」っていう、その「より」って字が、「時」って字のその右下に小さくあるんですけど
2　　それはどういうふうにやれば
インストラクター（以下 I）3 はい、それではその小さくしたい文字を選んでいただきます
4　　そうしましたら選んだ状態で右クリックしてください
5　　選んだ状態で反転した状態で右クリックして
6　　フォントを選びます
U7　　反転できないんですけど
8　　なんか枠の中にあるからできないのかわかんないんですけど
I9　　えっとできないことはないんですけれども
10　　かなり長く黒いのが反転されると思うんですけれども
U11　　ああできましたはい
I12　　わかりましたか
13　　でフォント選んでいただきますと
14　　えっとさきほど影付きでチェックしましたけれども
15　　えっといちばん左端に下付きという文字があります
U16　　はい下付きです
I17　　でそちらのほうチェックしていただいて
18　　ＯＫしてください
U19　　できました

このテクストは「コンピュータの初心者ユーザーとインストラクターとの間の、音声によるワープロソフトを使ったタスクの解決手順に関する質疑応答」を記録したものである。ユーザーは見本を提示され、それに従ってワープロソフトを利用して回覧版を作成する。解決方法の不明なタスクがある際、インストラクターにタスクの解決方法を尋

[1] 本稿で使用するテクストは、筆者の所属先で 2001 年 6 月に収録した、ワープロの操作方法に関する初心者ユーザーとクライアント秘書との間の質疑応答を収録した対話である。なお、本稿では、分析の目的にあわせてフィラーや言い直し部分に成型を加えた。

ねる。インストラクターはユーザーの問い合わせ内容からタスク解決方法を推測し、その手順をユーザーに提示する。

なお、ユーザーとインストラクターは同じ部屋にいるが、双方は間仕切りで隔離されているので、双方は互いに対面せず、音声によってのみ交信を行う。双方は画面を共有しないので、インストラクターはユーザーの問い合わせ内容から作業内容を推測する。

2.2 活動領域、役割関係、伝達様式[2]

本項では、テクストに具現されるコンテクストについて、活動領域、役割関係、伝達様式という観点から説明し、どの要素がテクストの形成に関して重要になっているかを検討する。

SFLにおいて、コンテクストは活動領域(field)、役割関係(tenor)、伝達様式(mode)の三つの項の組み合わせとして記述される。これらの項は、それぞれ「どのようなインタラクションが行われているのか」「どのような参与者がインタラクションを行っているのか」「どのような媒体を使ってインタラクションを行っているのか」という観点から記述される。ここで、活動領域は「コンピュータ操作に関する質疑応答」、役割関係は「初心者ユーザーとインストラクター」、伝達様式は「視覚情報を伴わない音声によるテクスト構成的伝達」と記述することができる。

活動領域は、さらに活動範囲(sphere of action)、活動(action)、目標(goal)の三つの要素に細分化できる。活動範囲は、インタラクションの話題を構成する。この場合、ワープロソフトの操作方法である。活動は、言語的活動と物理的活動に分かれるが、言語的活動としては「質疑応答」、物理的活動としては「コンピュータの操作」が存在する。目標は、「ユーザーのタスク解決」である。

このうち、活動範囲はインタラクションの話題として具現され、本テクストの場合には、操作方法・操作の対象を表す語彙・特に経験構成的要素に活動範囲のありようが反映される。また、物理活動は実際の操作のタイミングに反映されるが、テクストそのものには反映されない。言語活動はユーザーの質問に対してインストラクターが回答するという談話の基本的な展開に反映されている。目標は、ユーザーの質問に対してインストラクターが順を追って回答するというテクスト全体の構造に反映される[3]。

役割関係は、相互作用者の役割(agentive role)、社会的階層性(social hierarchy)、社会的距離(social distance)と細分化できる。相互作用者の役割は、コンピュータの初心者ユーザーと専門的知識を有するインストラクターである。ユーザーの質問に対してインストラクターが応答するという談話の基本構造は、相互作用者間のこの社会的関係を大きな契機とする。社会的階層性とは、相互作用者同士の社会的上位ー下位関係をさす。この場合には、ユーザーがインストラクターより上位に立つ。社会的距離とは、相互作用者同士の親疎の程度を示す。通常、ユーザーとインストラクターは互いに知り合いではないので、距離は最大に近くなる。したがって、双方の発話は丁寧体が使用される。

伝達様式は、テクスト構成上の言語の役割(role of language)、媒体の性質(medium)、伝達手段(channel)に細分化される。相互作用者は電話のみを使ってインタラクションが行われる。したがって、相互に伝達手段は音声を用いた言語のみであり、テクスト構成において言語は構成的な役割を果たす[4]。また、言語は話し言葉が使用されている。

---

[2] 本稿におけるコンテクストの扱いについては、Butt(2002), Hasan(1999), 高橋他（2002）を参照。

[3] 後で分析する修辞関係も、ゴールに反映される。つまり、このインタラクションの目的がユーザーのタスク解決であるため、ユーザーの質問全体がインストラクターの回答に対してSolutionhoodの関係が付与される。

[4] ただし、モニターを見る形式をとっており、ユーザーの状況をインストラクターが再現したり、インストラクターの指示をユーザーがモニターで再構成したりしているので、完全に

媒体としては、視覚媒体と聴覚媒体とがあるが、視覚媒体は存在せず、聴覚媒体のみ存在する。

2.3 本節のまとめ

以上、本節では、対象となるテクストのサンプル（テクスト 1）を示した上で、そのコンテクストについて検討し、コンテクストのどの要素がテクストの展開に重要な役割を担っているかについて述べた。以上のコンテクストの各要素において、テクストの展開に主要な役割を果たすのは、活動領域では目標と言語的活動、役割関係では相互作用者の役割である。

3. ジャンル構造

本節では、テクスト 1 を構成するステージを提示し、ステージ間相互の連関を述べた上で、ジャンル構造を提示する。また、必要に応じて類似のテクストも取り上げる。

この種のテクストは大きく分けて、ユーザーによる質問部分（1,2）とインストラクターに対する回答部分（3〜18）、ユーザーのタスク解決の宣言（19）に分けることができる。

ユーザーによる質問部分は、さらに、ユーザーがタスク解決の必要に迫られている背景を説明する部分と、具体的にタスクを表明する部分とに分けることができる。それぞれ、状況の説明, 問題点の提示と呼ぶことにする。

まず、状況の説明の部分では、ユーザーが現在直面しているタスクの背景を説明する。この時点で、サポーターは、解決すべきタスクの同定はしていない。次の問題点の提示に至って、ユーザーは具体的なタスクを表明（宣言）し、インストラクターはこれによってユーザーがどのようなタスクを解決しなければならないか、同定することができる。

（テクスト 2）
U1 何か最初の一行目と二行目が中央揃えで、
2 三行目も中央揃えになっちゃうと
3 なんか真ん中になっちゃって、
4 左に行かなくなっちゃうけど

この例の場合、1，2 においてユーザーの現状が紹介されており、3，4 で具体的な問題点が指摘されている。インストラクターの立場に立つと、具体的にユーザーがどのようなタスクを解決しなければならないか、1，2 だけでは不明であり、3，4 で具体的に「中央揃えの解除」というタスクが同定される。

また、このタスクの場合、与えられた見本と同様のものを作成することが求められている。したがって、状況の説明では、見本の状態を説明する場合も存在する。次の例では 1 が状況の説明にあたる。

（テクスト 3）
U1 なんか例えば「十時より」っていうその「より」って字が、「時」って字のその右下に小さくあるんですけど
2 それはどういう風にやれば

さらに、場合によっては、状況の説明が存在せず、ユーザーが問題点を提示する場合

構成的というわけではない。指示表現が利用できる場合がある。

もある。

(テクスト4)
U1 あ、これ字体変えたいんですけど
I2 えっとその変えたい箇所の文字なり文字列なりを選択していただきまして

次に、回答部分に関して説明する。通常、この種のコンピュータを使ったタスク解決は、複数の操作手順を経て完了にいたる。例えば、テクスト1の場合、「文字列を選択する→[フォント]メニューを選択する→[下付き]をチェックする→[OK]をクリックする」という段階を経て、タスクが完了する。したがって、回答部分はタスク遂行に必要な段階の数に応じて複数の段階に分けることができる。また、回答部分は複数の解決ステップによって構成されているものとする。テクスト 1 では 3, 4, 5〜12, 13〜18 がそれぞれ解決ステップを構成する。このステージには、解決方法の提示というステージを付与する。

また、回答部分に関して、ユーザーが疑問点をインストラクターに質問し、インストラクターがそれに回答する部分がある。テクスト 1 の場合、6 で提示された操作に対して、7〜8 でユーザーがタスク遂行に失敗したことが宣言される。以下、9〜10 でインストラクターがユーザーの質問に回答し、11〜12 でインストラクターの当初の指示通りに操作がなされたことが示されている。ここでは、回答部分のそれぞれのタスクを構成する個々の操作方法の不明点などが話題になる。この部分に関しては、トラブルシューティングというステージを付与する。テクスト 1 の場合には、7~12 がこれに相当する。

タスク解決の宣言は、ユーザーが問題解決のためのタスクを解決し、目標に到達したことを宣言するステージである。ただし、タスクの成功は必ずしも明示的に宣言されるわけではないので、このステージが常に存在するとは限らない。

以上から、ジャンル構造は次のようになる。

(状況の説明 ^) 問題点の説明 ^ {解決方法の提示(<トラブルシューティング>)}* (^ タスク解決の宣言) [5]

以上、本節ではいくつかのテクストサンプルを利用しつつ、ステージとジャンル構造を提示し、その特徴について述べた。

4. 修辞構造

本節では、RST について概説した後で、テクスト1の修辞構造を分析することによって、コンピュータの操作方法を話題とした質疑応答のテクストの修辞関係を検討する。

4.1 修辞構造の概略

RST は、テクストの構成要素同士の意味的依存関係と階層性とを記述して、テクストの構造を記述する理論である。この理論のもとでは、テクストはその構成要素同士の意味的依存関係が構造化される。RST ではこの依存関係を修辞関係と呼ぶ。Mann and Thompson(1988)は、この修辞関係を約 20 種類に分類している。ただし、RST 自体は、必要に応じて任意の修辞関係を定義することも許容している。

RST では、テクスト中の任意の単位をスパンと呼び、複数のスパンは、意味的依存

[5] GSP の表記は Matthiessen(1995: 53-54)を参照。

関係を有するものとされる。このスパンとその間に結ばれる関係とが、修辞構造の一単位（ユニット）を形成する。このとき、単一のユニットにおけるスパンの間には意味的主従関係がある。単一のスパンに他の（残りの）スパンが意味的に依存するという関係が生じている。RST では意味的に主要なスパンを中核部（Nucleus）、従属するスパンを衛星部（Satellite）と呼ぶ。本稿では最小のスパンを節とする。また、修辞関係には、このような主従関係をもつものの他に、複数のスパンが並立する場合もある。この場合はそれぞれのスパンを中核部とみなし、多重核（Multinuclarity）と呼ばれる。また、ユニット同士でも修辞関係をもち、さらに上位のユニットを構成する。つまり、RST はテクスト間の意味的階層性を措定している。

RST で付与される修辞関係の定義は、制約と効果との二つの要素により構成される。制約は、中核部、衛星部、およびそれらの組み合わせに与えられ、効果については、書き手がその関係を使うことで生み出そうとしていると思われる効果、および効果の在り処（locus）が記述される。このとき、効果の在り処は、スパン全体に及ぶことも考えられるし、中核部あるいは衛星部のいずれか一方に限定されることもありうる。

4.2 テクスト 1 の修辞構造分析

テクスト 1 に示されているインタラクションの目標は、ユーザーがワープロソフトを使って文字列を下付き文字に変換することである。従って、テクスト全体の中核部は、ユーザーがタスク解決手順を提示している 3〜18 までの部分である。また、この部分はユーザーからの質問に対する回答部分なので、質問部分を構成する 1，2 は 3〜18 に対して Solutionhood の関係になる。

Solutionhood の関係に関しては、次のような定義が与えられている[6]。

> S に対する制約：問題を提示する。
> N+S の組み合わせに対する制約：N において呈示された状況が S で述べられた問題の解決になっている。
> 効果：読み手は N で提示された状況を S で提示された問題に対する解決と認識する。
> 効果の在り処：N と S

さらに、ユーザーは回答に対して、タスクが遂行されたことを 19 で宣言している。これは、ユーザーがインストラクターの指示に従って操作した結果、成功したことを宣言している。ただし、操作の結果はユーザーが意図した結果とはいえない。ユーザーは指示通りの操作をして本当にタスクが遂行されるかどうかはわからないからである。そこで、この部分には Non-Volitional Result の関係を与える。Non-Volitional Result に関しては、次のような定義付けがなされている。

> S に対する制約：S で示される状況は意図的ではない行為である。
> N+S の組み合わせ： N は S で提示された状況を起こした状況を提示する。つまり、N-S 関係を表す上で N の提示は書き手の目的にとって S の提示より中心的である。
> 効果：読み手は N で提示された状況が S で提示された状況を引き起こしえたことを認識する。
> 効果の在り処：N と S

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[6] 以下、修辞関係の定義は Mann and Thompson (1988)による。以下、修辞関係の定義において、N(ucleus)は中核部、S(atellite)は衛星部を指す。

次に、1 と 2 の関係であるが、質問部分は2であり、2 の質問に対してその背景を説明しているのが 1 である。この説明によって、インストラクターはユーザーが現在何を行っているのかが理解でき、タスクの特定が容易になると考えられる。そこで、1に対しては2の Background を付与する。なお、Background の定義は以下のとおりである。

N への制約：読み手は S を読んだあとになって N を十分に理解する。
N+S の組み合わせに対する制約：S によって読み手は N における要素を把しやすくなる。
効果：読み手は N を把握しやすくなる。
効果の在り処：N

すでに述べたように、具体的に 3～17 に関しては、タスク解決の方法を示している。一般にこの種のコンピュータを使った問題解決は、いくつかの段階を踏んで行われるものである。このテクストの場合には、三つの段階があり、それぞれの段階において具体的な操作方法が提示されている。それぞれの段階は、順番が決まっており、入れ替えが不可能である。従って、それぞれの段階に応じて Sequence が付与される。このテクストの場合、3, 4, 5～12, 13～18 と四つの Sequence に分かれる。なお、Sequence については、次のような定義づけがなされている。

N への制約：多重核
核の組み合わせの制約：それぞれの部分で説明されている状況の間の継起的な関係が核において説明されている。
効果：読み手は中核部間の継起的関係を認識する。
効果の在り処：中核部

次に、5～12 と 13～18 の Sequence の二つの部分を分析する。
まず、5～12 は、三つ目の手順を説明している部分である。5～6 に関しては、一つ前のステップ（文字を選択した状態で右クリックする）が完了したら次のステップ（メニューから「フォント」を選択する）に進むように、ユーザーに指示している部分である。この場合、具体的な操作方法を提示している 6 が中核部であり、5 が衛星部になる。5 の部分は、「フォント」を選択できるための条件を説明している部分なので、Condition を付与する。なお、Condition の定義は以下のとおりである。

S への制約：（S の状況コンテクストに関して）S は仮定的であるか、未来のことか、あるいは具現されていない状況を提示する。
N+S の組み合わせへの制約：N で表現されている状況の具現は S で提示されている状況の具現に依存する。
効果：読み手は N で表現されている状況の具現のされ方が S で具現されている状況の具現にどのように依存しているかを認識する。
効果の在り処：N と S

7～12 に関しては、6 の操作までで問題が生じたことによるトラブルシューティングである。この部分を見ると、7～8 のユーザーへの質問に対して 9～10 でインストラクターが応答し、11～12 でトラブルシューティングが完了したことが明確になる。まず、7～8は 9～10 に対する Solutionhood であり、11～12 は 9～10 への Evaluation を形成する。Evaluation の定義は以下のとおりである。

N+S に対する制約：S は N における状況について、読み手が N で表現された状況をどのくらい肯定的に考えているかということと関連付ける。

効果： S で表現された状況によって N で表現された状況が査定されていることと、そのことによって付与される価値とを読み手が認識する。
効果の在り処：N と S

ユーザーの問い合わせの内容は、文字列を選択しても文字列が反転しない、ということである。これは 7 の部分に提示されている。8 は 7 で述べられている状況をさらに詳しく述べているので、7 に対する Elaboration の関係と考えられる。Elaboration の定義は次のとおりである。

N+S の組み合わせに対する制約：N で提示されていたり、推論によって N に到達可能だったりする状況、または話題にかかわる何らかの要素に関して追加的な詳細を以下にリストアップされた方法で S が提示する。下のリストにおいて、N がいずれかの最初のメンバーである場合には、S は二番目のものになる。

1 集合：成員／2 抽象：具体／3 全体：部分
4 過程：段階／5 対象：属性／6 一般：個別

効果：読み手は S で提示された状況によって N の追加的な詳細が与えられていると認識する。R は詳細の与えられている話題の要素を同定する。
効果の在り処：N と S

それに対するインストラクターの回答が 9～10 である。インストラクターの回答の趣旨は、文字列が選択されればその文字列が反転されるので反転できないはずがない、ということである。ユーザーにとっては文字列が反転されることが重要であり、インストラクターの回答の中心は、反転できるはずである旨を告げる 9 であり、反転される際の画面の様子を述べる 10 は 9 に対して Elaboration の関係と考える。

11 と 12 は、問題が解決したことを示す部分である。これは、7～8 で示される問題が、9～10 を経て解決されたことを示す。したがって、9～10 に対して Evaluation の関係を示すことになると考えることができる。

以上の分析で、7～12 の間では、9 を中心として修辞関係が構成されているということがわかった。9 の実質的な内容は、10 の「かなり長く黒いのが反転されると思うんですけれども」で補足的に説明されている。よって、この部分と 5～6 との関係は、「選んだ状態で右クリックしてフォントを選ぶ（選択された文字列のフォントを変換するという操作）」と、「長く黒いのが反転される（文字列が選択されている状態のディスプレイ上での表現）」との意味的関係ということになる。そこで両者の意味的関係をみると、7～12 では「文字列が選択された状態でフォントを決定する」という 5～6 の情報を基に「文字列が選択された状態」についてディスプレイ上ではどう表現されるかについての情報を追加しているということがわかる。よって、7～12 は 5～6 に対して Elaboration の関係を持っていることがわかる。

13～18 に関して考える。この段階では、「フォント」のダイアログボックスが現れたあとの操作方法を提示している。具体的な操作方法は、ダイアログボックス中の「下付き文字」をチェックした上で「OK」ボタンをクリックする、という方法である。したがって、17 と 18 が中核部を構成する。また、17 と 18 は、一連の操作を表し、入れ替え不可能なので、Sequence を構成する。

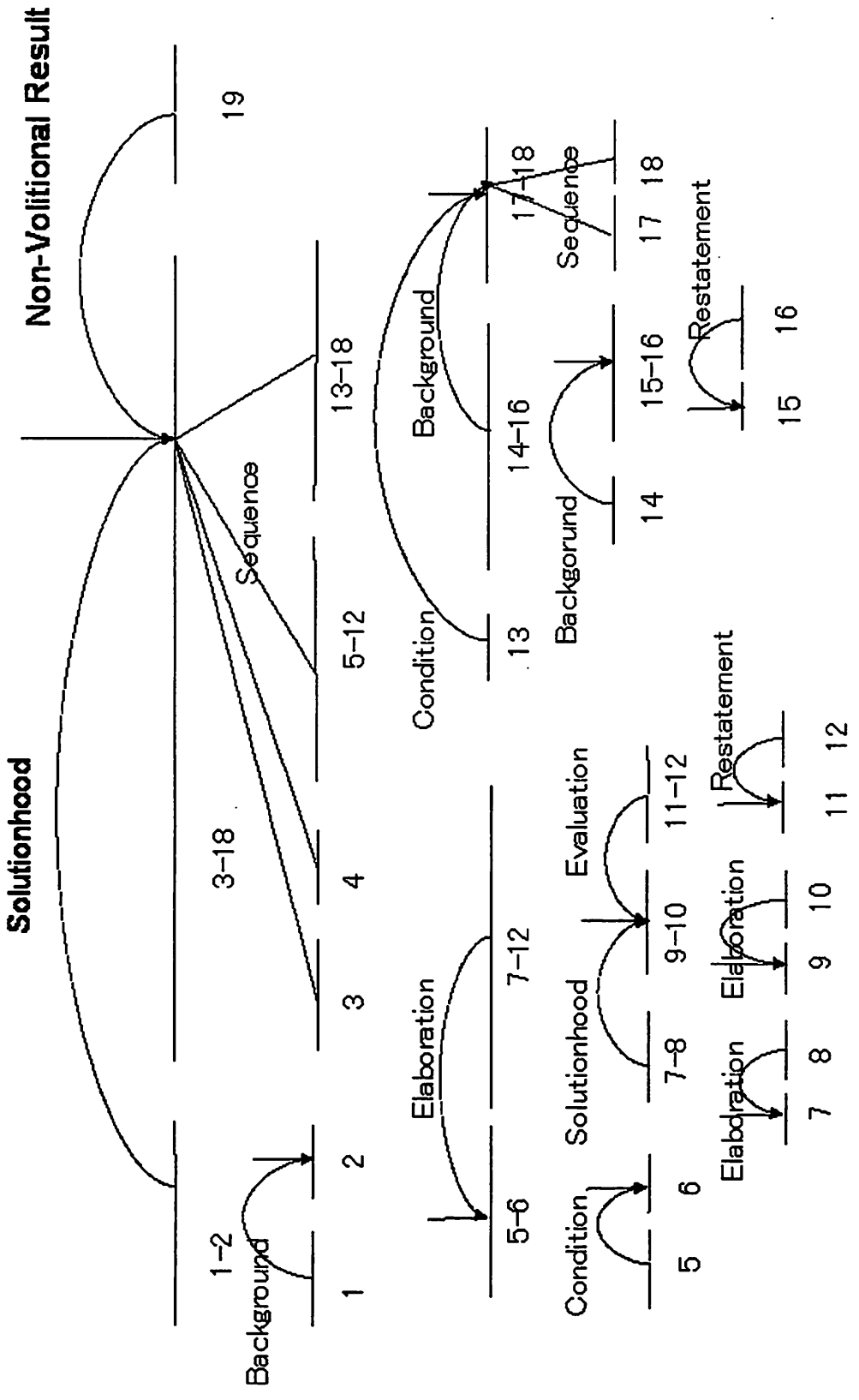
13 から 16 までを見る。13 は、前のステップの操作が終了した後でフォントの確定の作業が行われるという条件を示したものである。また、14～16 にかけては、下付き文字のチェックボックスの位置を説明している。この説明によってチェックを入れる位置が明確になり、操作が容易になることが期待される。よって、13 は 17～18 に対して Condition の関係にあり、14～16 は、17～18 に対して Background の関係にある。

14〜16 については、ダイアログボックスの下付き文字の位置が提示され、それに対してユーザーが 16 で確認する。下付き文字の位置そのものは、15 で示されるが、14 では以前に同様の操作で影付き文字の処理を行ったことが示される。また、影付き文字の処理と下付き文字の処理の方法が基本的に同様であることもユーザーに示され、これによってユーザーにとっては下付き文字の処理が容易になることが期待される。よって、14 は 15 に対して Background の関係にあると考えることができる。

4.3 本節のまとめ

以上、本節ではテクスト 1 の修辞構造を分析することによって、テクストの構成要素が相互にとり持つ意味的連関という観点からテクストの全体的な構造を検討した。

全体の分析を図示すると、以下のようになる。



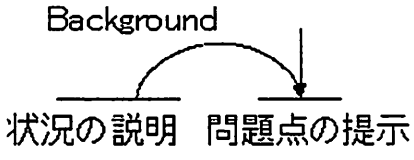
[図 1]テクスト 1 の修辞構造

5. 修辞構造とジャンル構造

以上のジャンル構造と修辞構造の分析から、ステージ間がどのような修辞関係で結ばれているかを検討し、また、ステージ内部の修辞構造についても言及する。

5.1 状況の説明と問題点の提示との関係

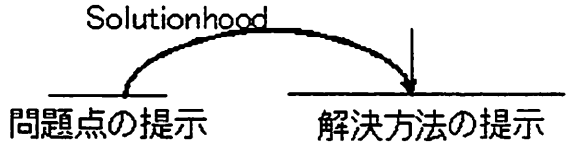
状況の説明は、状況の中でインストラクターに対して現在のタスクの状況を説明するステージである。これによって、インストラクターはユーザーが現在どのような状況におかれているか把握でき、次のステージ（問題点の提示）で解決すべきタスクを同定することが容易になると考えることができる。したがって、状況の説明が問題点の提示に対して Background の関係にある。



[図 2]状況の説明と問題点の提示との関係

5.2 問題点の提示と解決方法の提示との関係

このテクストの基本構造は、ユーザーの質問に対してインストラクターが回答するというものである。質問部分は状況の説明と問題点の提示で構成され、修辞構造を分析すると、すでに述べたように問題点の提示が中核部を形成する。そして、解決方法の提示は質問部分の回答を構成している。したがって、問題点の提示は解決方法の提示に対して Solutionhood の関係にある。



[図 3]問題点の提示と解決方法の提示との修辞関係

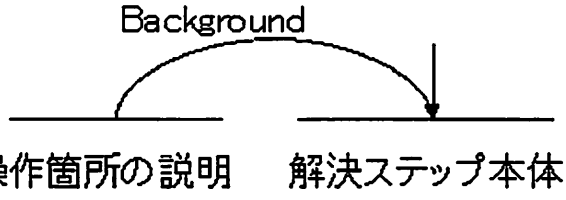
5.3 解決ステップの内部構造

解決ステップの内部構造は概ね 3 種類ある。一つ目は、単純に操作方法を指示するだけのもの、二つ目は、操作の背景を指示してから具体的な操作の説明をするもの、三つ目は、内部にトラブルシューティングステージを持つものである。

一つ目については単に操作方法を提示するだけのものなので説明しない。二つ目に付いては、テクスト 1 においては 13～18 が相当するが、Background の衛星部の部分（テクスト 1 では 13～16 に相当）は、さらに Background の修辞ユニットを構成している場合が多い。テクスト 5 もその例である。

（テクスト５）
U1　センタリングはどうやるんですか
I2　文字列を選んでいただきまして、
3　で、さきほどフォントの種類変更したかと思うんですけれども
4　その列のほうずっと右側のほうにいきますと
5　横線がこう並んだアイコンが三つあると思うんですね
6　その一番真ん中を押していただくと
7　これ中央揃えという機能になります
U8　できました

このテクストの場合、解決ステップ 1 は 2 のみで、3～７が解決ステップ 2 を形成している。解決ステップ 2 の中で６が最も重要な部分であるが、3～5 は操作する箇所の説明を行い、これによってユーザーはワープロソフトのどの箇所を操作すればよいかが把握できる。このとき、テクスト上では、2～5 は 6 に対して Background の修辞関係を形成している。さらに、3～5 の内部をみると、3 でインストラクターは過去にユーザーが行った操作を説明し、ユーザー自身の過去の操作履歴と現在の操作とをリンクさせることによってユーザーの理解が容易になるようにしている。つまり、4～5 に対して 3 が Background の修辞関係を形成している。このように、Background の衛星部を形成しているスパンの内部に Background の修辞ユニットが含まれている場合がある。



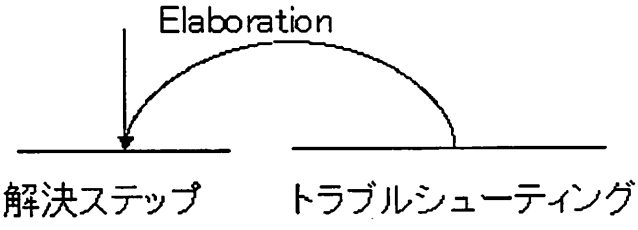
[図 4]解決ステップの内部構造：操作箇所の説明が入る場合

三つ目のトラブルシューティングを含んだステージについて説明する。

（テクスト６）
I7　そちらのほうを適当なフォントに変更していただきます。
U8　その変更するところどこでしたっけ。
I9　えっとメニューバーの一つ二つ下にアイコンバーがあると思うんですけど
10　今そちらのほうに、MS 明朝と表示されているボックスがあるでしょうか。
11　確認できますでしょうか
U12　いや、確認できません
13　ああ、はい
I14　ありますか
15　その右端に、下三角の矢印があるんですけれども
16　はい、わかります

すでに述べたとおり、トラブルシューティング部分は、直前の操作において問題点が生じたときに、追加的にインストラクターが情報を与える部分である。テクスト６では、インストラクターの指示（７）で操作箇所のわからなかったユーザーが８のように操作箇所の確認の質問をすることによって、トラブルシューティングのステージに入る。こ

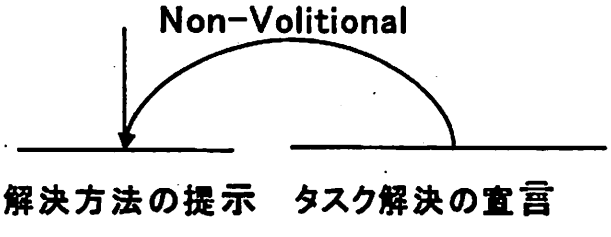
のステージで重要な部分は、ユーザーからの求めに応じて、前の部分でインストラクターが指示した操作方法について補足的な情報を加えてユーザーが問題を解決することである。テクスト 6 では 9〜11 がこれに相当する。したがって、この場合には、トラブルシューティングのステージ自体は直前の解決ステップ本体部分に対して Elaboration の関係をとる。また、ユーザーからの要求に応じてインストラクターが説明を加えるという構造をとるので、基本的には Solutionhood の修辞関係を内部構造にもつことになる。



[図 5]解決ステップの内部構造：トラブルシューティングを含む場合

5.4 解決方法の提示とタスク解決の宣言との関係

タスク解決の宣言は、インストラクターの操作指示通りの操作が成功し、目標に到達したことをユーザーが宣言するものである。このとき、解決方法の提示とタスク遂行宣言とは、原因ー結果の関係になっている。ただし、ユーザーはインストラクターの指示に従って操作をしたものであって、操作そのものはユーザーの意図によって行われたものとはいいがたい。したがって、タスク解決の宣言は解決方法の提示に対して Non-Volitional Result の関係にあると考えるのが適当である。



[図 6]解決方法の提示とタスク解決の宣言

6. まとめと課題

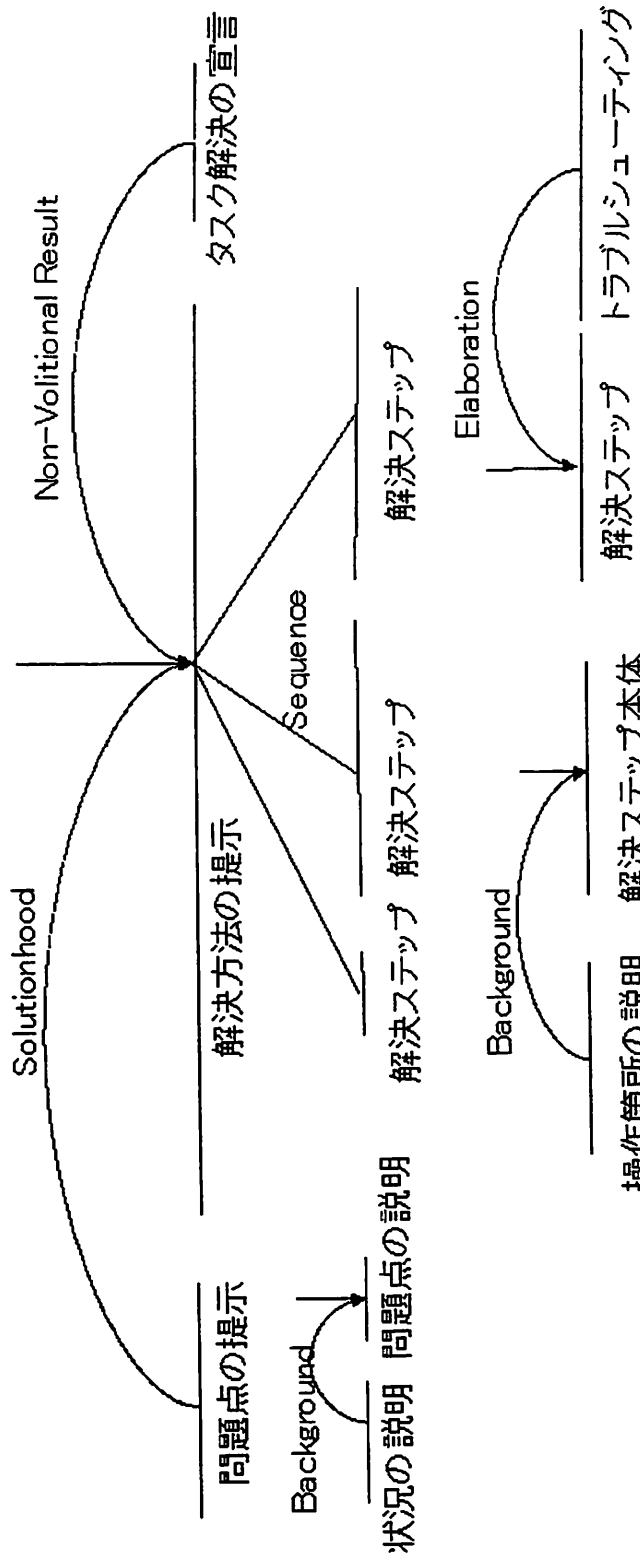
以上、本稿では、初心者ユーザーとインストラクター間のワープロ使用に関する話題を取り扱った模擬対話のジャンル構造と修辞構造を検討し、両者を対照することによって、個々のステージの内部とステージ間の関係とを修辞構造によって規定し、修辞構造を基準にジャンル構造を規定する方法を考察した。

具体的に明らかになったことは以下のとおりである。

- 問題点の提示は解決方法の提示に対して Solutionhood の関係をとる。
- 状況の説明は問題点の提示に対して Background の関係をとる。

- 解決方法の提示は問題解決の手順の段階に従って複数の Sequence で構成される（このとき、個々のスパンを解決ステップとする)。
- 個々の解決ステップの内部構造には、単純に操作方法を指示するだけのもの、操作の背景を指示してから具体的な操作の説明をするもの、内部にトラブルシューティングを持つものの三種類がある。
- タスク解決の宣言は解決方法の提示に対して Non-Volitional Result の関係をとる。

修辞構造とジャンル構造との対応を図 7 のように提示する。



[図 7]修辞構造とジャンル構造との対応

以上から、タスク解決に関する対話の修辞構造がステージ分類の基準となりうること、およびRSTとGSPとの相補性の一端を提示できたものと考える。

なお、本稿では対話を対象として修辞構造を扱ったが、修辞構造の分析の対象はこれまでほとんどが独話で、RSTを対話に応用した例はほとんど見当たらない。Mann et al(1992: 68)でも、「RSTはこれまで対話には実際のところ関連付けられていない。言語の諸機能を十分に包含するためには、書き言葉の独話を越えて対話や多人数での会話（multilogue）まで拡張されなければならない」と述べている。その中で数少ない例外はTaboada(2001: Chapter 6)である。

Taboadaは、電話による会議のアポイントメントの模擬対話を対象として、Mann and Thompson（1988）をそのまま踏襲して対話の修辞構造を分析している。このとき、個々のターン毎(turn-by-turn)の分析と会話全体として（conversation-as-a-whole）の分析と、二種類の分析を独立に行っている。これによって、Taboadaは会話における二人の話者のインタラクションの産物という側面（conversation-as-a-whole）と、二人の話者のそれぞれの対話のプロセスという側面（turn-by-turn）とを解明しようとしている。

本稿では、ジャンル構造という、テクスト全体との連関で修辞構造を検討することを意図しているので、個々のターンでどのような修辞構造が構成されているかという視点には立っていない。つまり、純粋にconversation-as-a-wholeという観点からのみ分析を行っている。ただし、個々のターンの修辞構造を分析することは、自然言語処理におけるテクスト・プランニングという観点からも非常に興味深い問題なので、今後の課題としたい。

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The Definition of Stages Using Rhetorical Structure in Dialogue on Task Solutions

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In this paper we investigated rhetorical relations between stages, as well as those inside of stages, of the dialogues in a given context by examining both the generic structure and the rhetorical structure.
Firstly we showed an example of the texts we are concerned with and analysed the context of situation in order to show that the goal of the text and the social relationship between the interactants affect the development of the dialogue.
Secondly we analysed the generic structure of the example text. According to this analysis this example text consists of the stages of "Explanation of the situation", "Explanation of the problem", "Demonstration of the solution" and "Declaration of solution" and this kind of dialogue has the following generic structure potential:

(Explanation of the situation ^) Explanation of the problem ^ {Demonstration of the solution (<Troubleshooting>)}* (^ Declaration of solution)

Finally, after analysing the rhetorical structure of this kind of texts, we investigated the relationship between the rhetorical structure and the stages. What we found in this investigation as a result is as follows:

"Explanation of the problem" is the Solutionhood satellite of "Demonstration of the Solutionhood".
"Explanation of the situation" is the Background satellite of the "Explanation of the problem".
"Demonstration of the solution" consists of several Sequences. (In this case each span can be regarded as a step of the solution.)
There are three types of the internal structure of each sequence of "Demonstration of solution": one is the stage in which the instructor simple indicates the way of problem solving, one is in which instructor explains the operation after showing the background of the operation and the other has the sub-stage of troubleshooting within the stage.
"Declaration of solution" is the Non-Volitional Result satellite of "Demonstration of the solution".

JASFL Occasional Papers Volume 3 No. 1 2004

外国為替記事のドメインのモデル化一機能的分析

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1. はじめに

本稿[1]は、現代日本語のレジスター（register（言語《使用域》）を選択体系機能言語学的視点[2]から、質的・量的に考察し、えられた結果をもちいることで、レジスター研究の文法的分析のし方に示唆をあたえようとするものである。ここでいう《レジスター》とは、「言語の機能的多様性」（マティスン、1993)、「言語の使用における多様性」（ハリデー、1978）のことで、ここではそのレジスターが現象するドメインを外国為替記事にもとめ、インターネット新聞記事からなるコーパスを日本語の文法体系、とくに経験（構成）的文法体系のなかの［過程型］体系[3]（テルヤ、1998、近日刊行、動詞のタイプについては、言語学研究会、1983、寺村、1982 を参照）にもとづいて文法解析し、解析の結果をもとに「外国為替」というある特定のレジスターにおける日本語の文法的特徴をあきらかにするものである。

この研究は、レジスターを試験的にではあるが、「言語的に」考察したものである。ここで「言語」に強調をおいたのは、対象となるドメインが言語テクストだけではなく、グラフ情報などのようなマルチモーダルな情報をふくんでいるからである。言語外の情報についてはここではふれないが（グラフと言語の意味的相互変換性については、マティスン他、1998 を参照)、言語外の情報がすべて言語に依存している、つまり言語によって意味的価値をえるということをかんがえると、言語の文法的解析がそれらになげかける意味あいはおおきい。コーパスは、このばあいサイズがちいさいが、このドメインに現象するテクストは形式化がすすんでいるため、文法的特徴をひきだすには、それで十分であるだろう。コーパスは、ドメインを量的に観察するのに不可欠で、量的な観察は、言語体系のどの部分が特定のドメイン（あるいはコンテクスト）において、いちじ

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[1] この論文は、1999 年 11 月に東京工業大学で開催された日本機能学会で、クリスチャン・マティスンが代行で発表した英語の論文を、日本語になおし、さらに加筆したもの。同年、「Modelling of financial domain and automatic report generation」という名称の研究として、Australian Research Council の研究補助をえて、現実化したものでもある。

[2] 「(選択）体系機能言語理論」における専門用語の日本語訳は、基本的に「意味のコンピューティング：これまでの経験とこれからの展望」（ハリデー、2002、翻訳、照屋）にしたがったが、ハリデーの翻訳、筧（1991）と、山口・筧（2001）が貴重な資料となった。前者と後者の用語が異なるばあい、前者のあとに（）にいれて後者を参照した。原本となるハリデーの英語での論文（2002a）は、1995 年にブリスベンで開催された PACLING で発表されたもので、その後、中国語訳担当の呉（2002b）と日本語訳担当の筆者が、ハリデーとマティスンをかこむかたちで、数日におよぶ協議検討の結果、中日翻訳をおこなった。用語が異なるのにはいろいろ理由があるが，たとえば，日本語文法の記述にもちいられる用語が，英語のそれとは異なるばあいもあり，日本語文法の記述では，英語の「節」というカテゴリーではなく，「文」というカテゴリーがもちいられている。

[3] 用語の、言語体系全体における素性をはっきりさせるため、記号をもちいて、識別した。各体系の名称は［過程形］、文法機能の名称は〈過程〉、そして、意味機能カテゴリーは《姿》のように表記のし方をかえた。《文法層》のような理論用語も意味表記のし方にしたがった。その他、[[ ]] はうめこみ文を、<< >>は投射文をしめす。

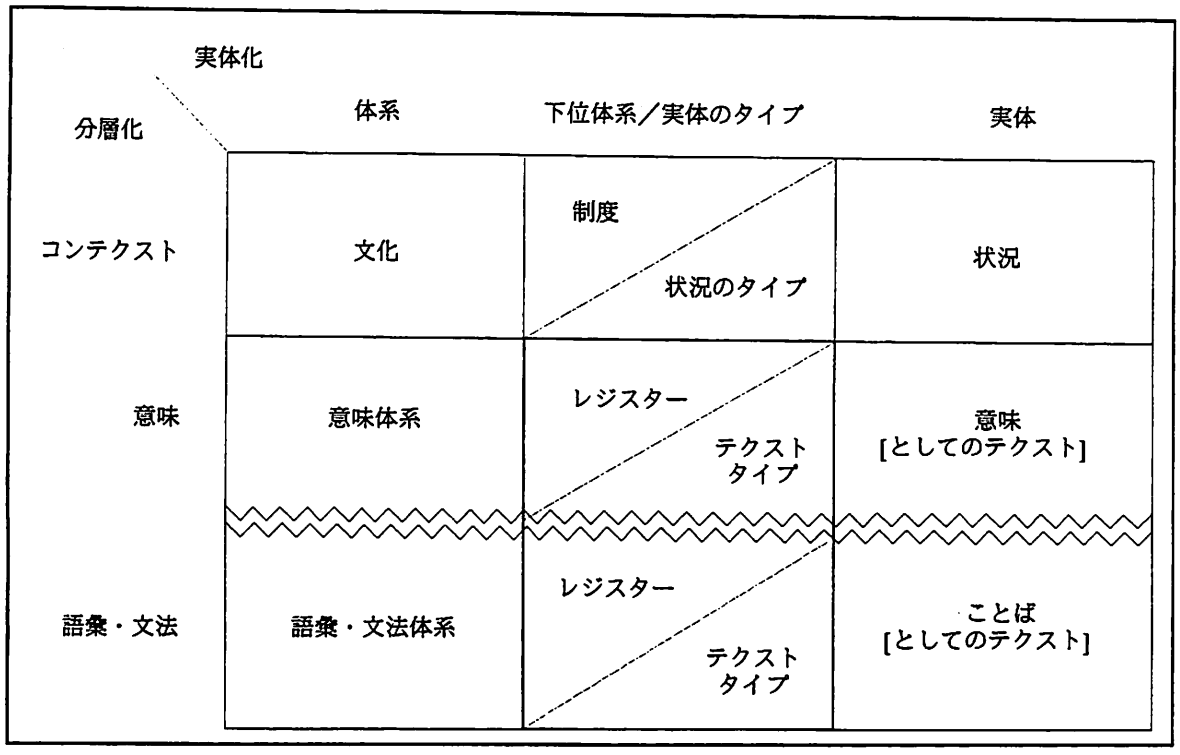
るしく実体化する instantiate のかを逆にあきらかにしてくれる。ここでは、量的な文法的観察の背景における意味づくり（意義化）とその背景についても考察をおこなう。

以上のような観点から、論文はつぎのように構成されている。

まず、レジスターを言語のメトリック（実体化 instantiation と分層化 stratification のつくる弾性のある意味空間のこと。ハリデー、2000）に位置づけ、レジスターと言語体系全体との相対関係をしめしたのち、「外国為替」の文法を《上から》、つまり意味的に観察する。そこでは、相似するテクストのまとまりとしてのテクストタイプとして外国為替記事をとらえることで、とりあげるレジスターの基底となる意味を、仮定的にではあるが、考察する。そのあと、今度はレジスターを質的に語彙・文法的観点からとらえなおし、経験（構成）的文法体系の中心となる［過程型］体系とてらしあわせながら、どのような過程が量的に実現されているのかを観察する。このような質的かつ量的観察は、ある特定のレジスターの文法的プロフィールをあらわにするのをたすけるが、同時にいくつかの疑問をなげかける。そこで、視点を「文」から下級の「群／句」へとうつし、疑問点へのこたえをその階級（階層）rank で展開する文法にもとめる。その後、全体をまとめる。

2. テクストタイプ／下位体系としてのレジスター

ここでいうレジスターとは、先にかいたように、言語の機能的多様性、あるいは言語の使用における多様性のことをさしている（ハリデー、1978、ハリデーとハッサン、1985、マティスン、1993）。レジスターを、意味層、文法層のように個別の独立した分層（階層）stratum として理論化し、その意味内容が言語によって実現化（具現化）されるという立場にたつマーティン 1985 とは異なる（理論的相違点については、マティスン、1993、ハッサン、1995 を参照）。つまり、ここでのレジスターとは、意味や語彙文法という分層のような言語の部分をなすものではなく、言語が実体化した結果もたらす多様性のことをさしているのである。このことは、まず下図にあるような「言語のマトリックス」（ハリデー、2002／1995）にレジスターを位置づけることによって、あきらかにすることができる。



[図 1] 実体化／分層化のマトリックス（ハリデー、2000）

ここでいう言語のマトリックスとは、《分層化（階層化）stratification》と《実体化 instantiation》が交差してつくりだす、このばあい 9 つのセルからなるマトリックスのことをさす（ここでは言語の表現面を割愛し、コンテクストを明示した）。

ここでいう《分層化》とは、幼児の原始言語が大人の言語へ発達していく段階で、それまでは《表現》と《意味》が一対一の対立でしかなかったところに、《文法》がその間に挿入されるような形で純粋に抽象的に発達し、言語全体がその文法を接触面としながら、3 つの層に分割されていく過程をさしている（ハリデー、1978）。さらに、その結果もたらされた《(音声および書記表現をふくむ) 表現》と《文法（正確には語彙・文法)》、そして《意味》という、実現関係（実現する一実現されるという関係）によって相互依存関係にあるそれらのひとつひとつの層のことを、ここでは《分層》あるいはたんに《層》とよんでいる[4]。

さらに、《実体化》とは、「観察者の位置における変移をモデル化したクライン」（ハリデー、2000 : 30）のことで、一方に言語体系 system が位置し、そのクラインのもう一方に言語の実体 instance[5]が位置する、言語の変移の過程を、体系と実体の両観点からとらえたものである。

このような言語マトリックスのつくりだす枠組内の左側の列のすべて、つまり《文化》《意味》《文法》は潜在的なもので、ネットワークとしてその体系をあらわにすることができる意義資源であり、逆に、右側の列のすべては、すでに実体化されたもので、特

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[4] 一般に stratification は「階層」という日本語訳があたえられているが、ここでいう stratum は、たとえば、社会階層のような階層的な意味あいをもつ体系とはちがい、階層的意味あいがないことから、ハリデーの指示をえて、《分層》という造語をあたえた。ちなみに中国語では、stratification は《層次化》、stratum は《層次》とよばれている（呉、 2000)。

[5] ハリデーによると（個人談話)，ここでいう instance とは、無形で、たとえば「実例」のように、なにかに形をあてはめ、例示するというような有形的な意味あいはない。そういった意味で、《実体》とよぶ。

定の状況や意味、そして言葉（いいまわし）をさしている。体系と実体の中間に位置しながら、その両者の側面からの特徴づけをうけるのが、ここでいうレジスターで、具体的には、レジスターは、体系の側からながめると、下位体系として、そして実体の側からながめると、相似するテクストのまとまり（あるいはクラスター）、つまりテクストタイプとして、その価値をえることになる。

本稿では、レジスターを語彙・文法的に観察することが目的であるため、観察視点を言語マトリックスの、語彙・文法層の中間点に位置づけ、研究対象をとらえる。そうすることによって、研究対象となるレジスターの範疇を体系と実体の両側面からとらえることが可能となるからである。さらに具体的にいえば、収集した外国為替の記事（つまり実体）を、手もとにある日本語の文法体系、とくに経験（構成）的文法体系の一部である［過程型］体系にもとづいて分析をおこない、どのような下位体系がここでいうレジスターに実体化しているのかを質的にながめると同時に、質的分析結果の量的側面を考慮にいれながら、外国為替記事の文法的プロフィール化を試験的にはかるものである。

よって以下では、体系の側からのレジスター観察が展開されることになる。それは、部分的にではあるが、日本語文法の体系的記述化がすすみ、それをもとにした「体系にもとづいた研究」が可能であるからである。仮にそうでないばあい、レジスターを実体の側から観察し、外国為替記事と一般によばれるテクストのクラスターを、具体的な実体のタイプ、たとえば使用される語彙のタイプなどにもとづいて分析をおこない、その分析結果をもとに他のテクストタイプとの相違点をあきらかにするような「実体にもとづいた研究」も可能ではある。しかし、実体にのみもとづいた研究結果は、局所的なものでしかなく、言語体系のもつ意味の潜在性のどの部分がある特定のレジスターにおいて文法的実現化をせまられているのか、というようなことをあきらかにすることはできない。さらに、以下の研究は、言語のメタ機能的観点からいえば、観念（構成）的機能のなかの経験（構成）的機能の研究に傾注しているため、全体像を、つまりそのレジスターの意味空間をまるごととらえているとはいえないであろう。しかし、はなし手ときき手が相互依存的にダイナミックにつくりだす「談話」とは異なり、為替記事は、対人機能的な色彩がうすく、よって対人機能的意味のバリエーションがちいさいため、情報を提供するというテクストにになわされた意義的役割から、対人文法的には、文のムードは〈ものがたり文（叙述文）〉に傾注しているということをのべておけば、それで十分である。テクストの結束性についてはここではふれない。

3. テクストのタイプ

為替レポートのレジスターを研究するばあい、先にしめしたように《レジスター》を「相似した《テクスト》のクラスター」として理論的にとらえると（ハリデー、1995）、《実体》と《体系》という両極をもったクラインの《実体》の側からまず全体をながめることが可能となってくる。

ここでいう「為替レポート」とはテクストタイプのひとつで、このばあい、それは、それを内包する形で存在する、それよりおおきなテクストのタイプ、つまりインターネットビジネスニュースの一部として現象する。インターネットのサイトに読者の便宜上もちいられているカテゴリーは、1999 年の時点において、(1) 政治・経済、(2) マーケット、(3) IT ニュース、(4) 産業・流通、(5) 自動車、(6) 店頭 (7) 社会・スポーツの 7 つで、為替レポート（正確には、円相場レポート）は、株式相場レポートとともに (2) として分類されている。ここにあげた分類は、慣習的なもので、言語分析の知見にもとづいたものではない。しかし、言語学的にいえば、それらのカテゴリーがあつかう「主題」のいかんによってえられたものであることから、《活動領域》（ハリデーとハッサン、1985/1991）に傾注した分類のし方だといえるだろう。もちろん、ここで「マーケット」の下位タイプとされる為替（レポート）と株式相場（レポート）は、主題という観点のみからではなく、実際には経済的相互依存関係にあることから、密接な

関係をもった領域であるといえるであろう。

こういったことから、テキストの「主題」とは、新聞記事のレジスターにおいて重要な意味変数であるととらえることができるだろう。すると、ここでいう「主題」という一般概念を、《相似するテクストのまとまり》として定義されるレジスターの意味カテゴリーとしての《主題》として言語学的にみなおし、そうすることによって、問題となるドメイン解明の手がかりとすることが可能となる。このような視点から、「外国為替レポート」といういいまわしを、研究対象であるレジスターを観念的に意義づけるカテゴリーとしてとらえ、以下に、調査の対象であるドメインを意味的に観察し、いくつか推測をたててみることにしよう。

ここでいう「外国為替レポート」という（テキストタイプとしての）カテゴリーは、形態論的にはまず「外国為替」と「レポート」というふたつの単語があわさってできた名詞群で、文法的には〈修飾部[6]〉である「外国為替」と、〈主要部／もの〉である「レポート」とに分析できるものである。さらに意味的には、前者が《過程》、そして後者が《意義抽象物》という意味要素から構成されている（要素の意味的タイプについては、ハリデー&マティスン、2000 を参照）。ここで定義づけをになわされた名詞群「外国為替」は、経験的機能の観点からは、つぎのように分析される。

	外国	為替
意味論的	状況	過程

語彙・文法的	名詞群	
	修飾部	主要部
	場所：空間	物質的：すること：やりもらい

例 1 「外国為替」の意味・文法的分析

「外国為替」という名詞群は、分析にしめしたように、意味的には《状況＋過程》として、そして語彙・文法的には〈空間的位置＋物質過程〉として実現している。意味と文法の実現化の関係からいうと、このばあい《状況》は〈空間的位置〉によって、そして《過程》は〈物質過程〉によって実現されている。〈物質過程〉としての「為替」は、語彙的には「交わす」が名詞化したもので、日本語の［過程型］とよばれる文法体系によると（テルヤ、1998、近日刊行）、〈すること〉をあらわす物質過程の下位タイプで、たとえば「子どもにおこづかいをやる」の例のように〈やり・もらい〉としてさらに分析をうけるものである。つまり、名詞化された「交わす」という過程が、《参与者》（あるいは状況的な文法機能をもつ参与者）である「あげ手」や「もらい手」をまきこむ過程タイプで、ここでは意味の分化をうけず、「あげ」と「もらい」の両方の過程を包括している。いいかえると、新聞記事というテクストタイプの下位タイプである外国為替のテクストを経験機能的側面からみたばあい、主要なモチーフはやりもらいの過程となり、為替相場における〈対象〉（このばあい円）のやりもらいの過程が、〈し手（行為者）〉と〈うけ手（受領者）〉をまきこみながら展開していく過程を表現したものであるといえるだろう。

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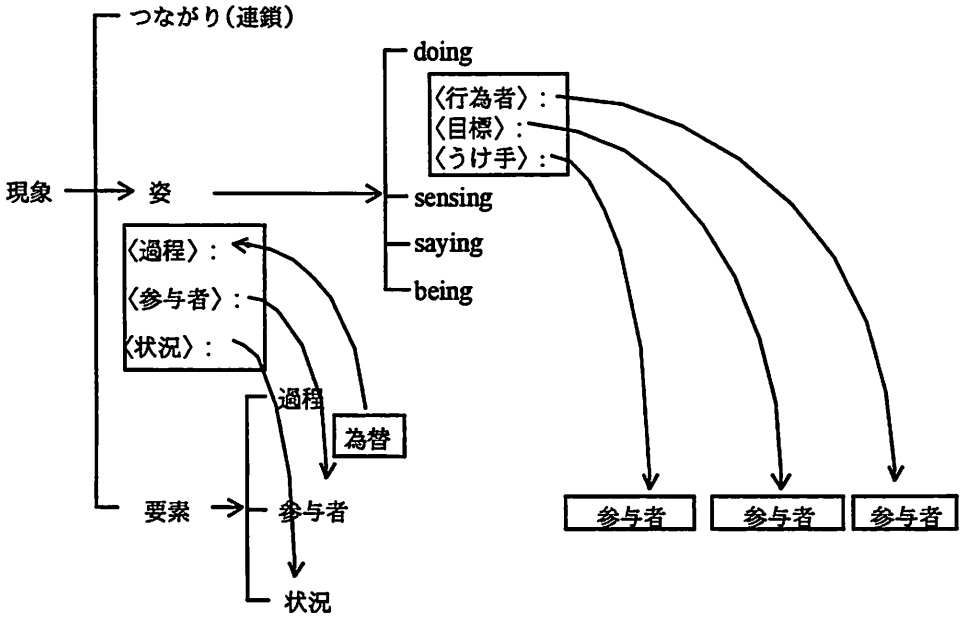
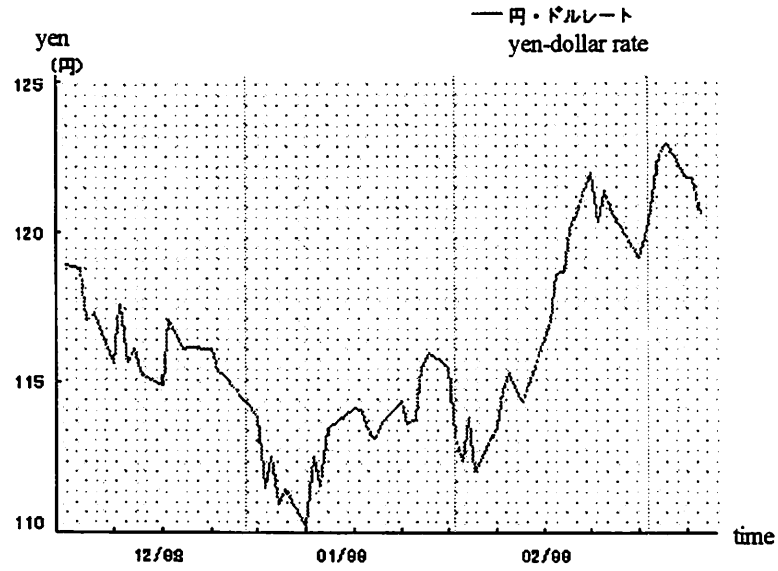
[6] 日本語のばあい、後部からの修飾がないため、英語の記述に必要な〈前修飾部〉と〈後修飾部〉という区別だては必要ない。

図 2 は、このようなことを、ハリデー&マティスン（2000）の提案する、経験的意味カテゴリーとしての《現象 phenomenon》の表記のし方にもとづき、分析をおこなったもので、三段階の複雑性をもつそのカテゴリー、つまり、《要素 element》とそれによって構成される《姿 figure》、いくつかの《姿》が相互依存関係によってあわさってできる《つながり sequence》について、前者ふたつの観点から変数を文法的に解体したものである。そこには、《要素》としての「為替（かわし）」が、〈すること〉をあらわす物質過程の下位タイプである〈あげもらい〉として《姿》を意味的に実現するということ、そして、その〈あげもらい〉を実現するための《要素》として「為替」が《過程》を実現しながら、その《過程》をひきおこす他の 3 つの《要素》によって意味構成されていることをものがたっている。それが時空のなかに展開される《過程》であることは、以下の図 3 にしめしたように、「為替」の動向がグラフの変移として表現されることにあきらかである。ここでいう《参与者》とは、先に考察したように、あげ手である〈し手〉、あげもらいの〈対象〉、そしてもらい手である〈うけ手〉である。「あげる」という〈過程〉は、「あげる人」「あげるもの」「うけとる人」がなくてはなりたたないことからもわかるように、それらは「為替」という《過程》に固有のものである。



[図 2] 為替の意味論的《姿》



[図 3] 円・ドルレートの変化をあらわしたグラフの例 (www.nikkei.co.jp)

このような意味記述からわかることは、「為替」という《過程》には、すくなくとも3 つの固有の《参与者》が意味的に参与しているということであり、よってそれと同時に、レジスター研究においては、それらが文法的にどのように表現をうけながら、テクストタイプあるいは下位体系のまとまりをつくりだしているのかということに観察の焦点をあてることで、《為替》の文法をあきらかにしなければならないという示唆でもある。以下に、テキスト例とその分析例をあげ、つづいて《為替》の文法を具体的に考察していく。

(テクスト例とその分析)

東京円、119円50銭近辺で推移

円相場は119円50銭近辺で推移している。14時現在では前日比１円５銭円高・ドル安の１ドル＝119円47―49銭で推移している。午前中は一時119円88銭まで上げ幅が縮小したものの、午後に入って円の下値は堅いとみた銀行が円買いに動いた。
日経平均株価の上げ幅が後場に入って一時300円を超えたことも円買い・ドル売りを誘った。ただ、「119円30―40銭近辺には利食いの円売り・ドル買いも見られ上値は重い」（大手銀行）との声も聞かれた。

最終更新時刻： 99/03/11 15:33

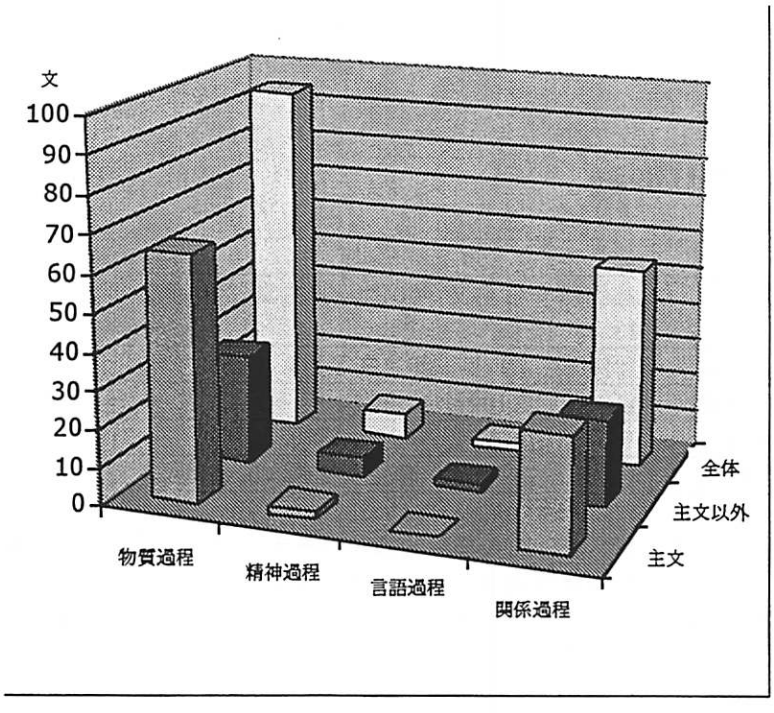
文	例文〈経験的機能〉	過程型
1	〈し手：〉東京円、〈状況：空間的位置：〉119円50銭近辺で〈過程：〉推移	物質過程：おこること：変更
2	〈し手：〉円相場は〈状況：空間的位置：〉119円50銭近辺で〈過程：〉推移している。	物質過程：おこること：変更
3	〈状況：時間的位置〉14時現在では〈状況：比較〉前日比〈状況：様態〉１円５銭円高・ドル安の１ドル＝119円47—49銭で〈過程：〉推移している。	物質過程：おこること：変更
4-1	〈状況：空間的範囲〉午前中は〈状況：頻度〉一時〈状況：空間的範囲：〉119円88銭まで〈し手：〉上げ幅が〈過程：〉縮小したものの、	物質過程：おこること：変更
4-2	〈状況：時間的位置：〉午後に入って〈し手：〉[[<<円の下値は堅いと>>みた]]銀行が〈状況：目的〉円買いに〈過程：〉動いた。	物質過程：おこること：ふるまい
4-3	[[<<〈体現者：〉円の下値は〈属性：〉堅いと>>〈過程：〉みた]]	精神活動：認識
5	〈し手：〉[[日経平均株価の上げ幅が後場に入って一時300円を超えた]]ことも〈対象：〉円買い・ドル売りを〈過程：〉誘った。	物質活動：すること：創造：過程
5-1	[[〈し手：〉日経平均株価の上げ幅が〈時間：〉後場に入って〈状況：頻度〉一時〈範囲：〉300円を〈過程：〉超えた]]	物質過程：おこること：うごき
6	ただ、〈存在物：〉<<「119円30—40銭近辺には利食いの円売り・ドル買いも見られ上値は重い」（大手銀行）と>>の声も〈過程：〉聞かれた。	関係過程：存在：無生物の存在
6-1	<<「〈状況：空間的位置〉119円30—40銭近辺には〈存在物：〉利食いの円売り・ドル買いも〈過程：〉見られ	関係過程：存在：無生物の存在
6-2	〈体現者：〉上値は〈過程：〉重い」（〈いい手：〉大手銀行）と>>	関係過程：内包関係：記述的

4. マイクロな視点から下位体系へ

はじめに外国為替記事を体系の側から概観する。まず、テクスト例を分析し、回帰的な文法パターンをあきらかしにしたうえで、それらの文法パターンを［過程型］体系内の経験的カテゴリーと、それらを実現する《要素》の意味タイプを参考にしながら、分析をおこなう。そうすることで、レジスターを、下位体系が実体化をうける実体化の頻度、あるいは蓋然性の観点から特徴づけることが可能となってくる。

4.1 語彙・文法：文の階級において

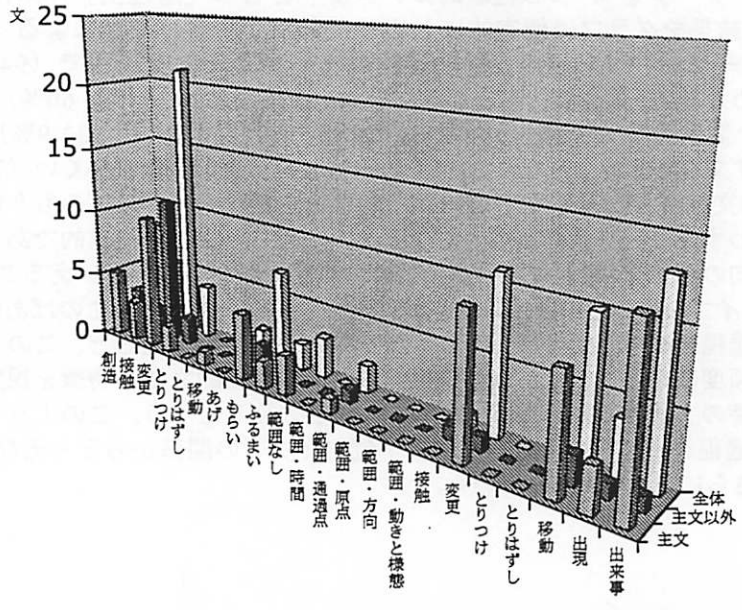
下記の図 4 は、データを 4 つの経験的カテゴリーをもつ［過程型］体系にもとづいておこなった分析結果をグラフに便宜的にしめしたものである。これによると、外国為替記事のレジスターにおいて頻度がたかい過程のタイプは、物質過程で（94 例、うち主文が 65 例、うめこみ文、投影文、階層下降文をふくむ非主文が 29 例、60%）、それにつづいておおいのが、関係過程（53 例、うち主文が 29 例、非主文が 23 例、33.9%）である。精神過程をあらわす文もあるが、先の 2 つにくらべると、頻度がかなりひくい（7 例、うち主文が 3 例、非主文が 4 例、4.4%）。日本語における主要な過程タイプのもうひとつである言語過程をあらわす文は、2 例あるが、このばあいうめこみ文で、従属的である（この点については、群／句の節でくわしくのべる）。このおおざっぱな分析からいえることは、［過程型］の 4 つのタイプの実体化には、頻度差が存在するということで、このばあい、物質→関係→精神→言語過程の順で、頻度がちいさくなっていく。いいかえると、このグラフは、過程型の実体化の頻度にもとづいて、為替のレジスターの経験的文法の特徴を視覚化したもので、つまり、為替の文法の概観をえがきだしているといえるだろう。このような概観をもとに、それぞれの過程タイプを、それら独自の下位タイプとの関係からとらえなおし、 以下に文法的特徴をさらにあきらかにしていく。



[図 4] 外国為替記事における［過程型］

4.1.1 物質過程

物質過程とは、物と物の接触、変更、移動、やりもらいなどを表現する過程を実現する文のことで、下位タイプによって《参与者》の数、そして意味実現上、必須要素となる《状況》のタイプなどさまざまだが、それが〈おこる〉タイプであれ、〈する〉タイプであれ、その経験的むすびつきのなかに、つねに〈し手〉をしたがえるタイプの文のことである。物質過程の実体化の頻度がたかいタイプは、頻度の高い順にあげると、つぎのようになる（図５を参照)。



[図 5] 物質過程とその下位タイプの頻度

下位タイプ	量とタイプ
すること：変更	21例、うち主文が10例、非主文[7]が11例、13.5%
おこること: 出来事	13例、主文12例、非主文１例、8。3%、
おこること：変更	11例、主文10例、非主文１例、７%、
すること：創造	８例、主文５例、非主文３例、5。1%、
おこること：移動	10例、 主文８例、非主文２例、6。4%

これらからわかることは、このレジスターでの経験的意味のモチーフが、円相場に関係のある、あるいは影響をあたえる、為替交換の場面での《変化の過程》をとらえていることである。ここでは、為替交換の場面でつぎつぎに展開される変化は、物質過程のまとまりとして表現をうけ、その過程は、たとえば銀行ディーラーなどのような過程の〈起動者〉であ

[7] ここでいう「非主文」は，先にかいたように，うめこみ文，投影文などのような下位階級文をふくむ。

る〈し手〉をまきこむものも（表 1 参照）、まきこまないものも（表 2 参照）ある。はじめに指摘しておいたように、外国為替記事の中心となる経験的モチーフは、為替市場での為替交換の（結果としておこる）《過程》であり、図 3 にあるように、それは円相場と時間という 2 つのX軸とY軸をもつグラフとして通常形式化をうける。ここでいう経験的モチーフ《変化の過程》とは、具体的には文法カテゴリーのことで、文法的には「円高」や「円売り」などのような動作性のあわせ名詞によって実現されている。この文法現象は、《文法的比喩》（ハリデー、1989／1993、山口と筧、538-579）で、物質過程に特有のものではない。あとでみるように、《文法的比喩》は、すべての過程タイプにまで浸透している文法現象である。ここでは、下位タイプのいくつかについて簡単にふれる。

物質過程の下位タイプである《変更》の過程（たとえば「拡大する」）は、〈対象〉の状態に変化をもたらす過程をあらわしている。〈対象〉の状態の変化のし方は、表 1 にあるようにさまざまだが、意味的にいうと、ここでいう《変更》にはすくなくとも〈対象〉の 2 つの局面が内在している。つまり、(1) 変化をうける前の状態、および (2) 変化の結果もたらされるあたらしい状態の 2 つである。ここでいう《変化》とは、物質変更を実現する文において、過程の展開によって変更をうける〈対象〉の、過程の展開前後のふたつの状態の変移関係を意味的にとらえたものである。このような物質的変移関係は、「A が B になる」という《起動》を表現する関係過程のタイプに意味的に相似している。文法的には、この《起動》をあらわす関係過程のタイプは、ここでいう物質過程の下位タイプである〈すること：変更〉とほぼおなじ実体化の頻度をもってもいる（この点は、関係過程の項でふれる）。

[表 1] 変更をあらわす物質的過程（すること）の例

し手／起動者	〈 対象／媒体〉	〈過程〉
円相場は 日経平均株価が	下げ幅を	拡大する 縮小する 広げる
銀行ディーラーは	ドル買い持ちを	増やす
投機筋など	ドルの持ち高を	膨らませる
—	円高を	牽制する
(円相場は)	損切りの円売りを	巻き込む

[表 2] 変更をあらわす物質的過程（おこること）の例

し手	過程：おこること：変更
円相場は	推移する 続伸する
上げ幅が	縮小する
銀行ディーラーのドル買い持ちポジションが	
ドル買いが	膨らむ
円の下げ幅が	拡大する

物質過程の下位タイプである〈創造〉は、創造や生産の過程、つまり《ものをつくりだす過程》を表現する。そして、その過程の展開の結果としてつくりだされるものは、文のなかで〈対象〉として実現する。このばあい〈対象〉は、それを実現する要素のタイプによって、2つの意味タイプにカテゴリー化することができる。

(1) 具体物、あるいは抽象物(たとえば、「家をつくる」の「家」や「人格を形成する」の「人格」)、
(2) 過程　(「テニスをする」の「テニス」、「キスをする」の「キス」など)

為替のレジスターでつくりだされるものは上記の(2)のタイプで、文法的に比喩・加工され、名詞化された過程である。たとえば、「円買いをさそう」の「円買い」や「介入を実施する」の「介入」がそうである。よって、ここでの中核構成〈対象〉＋〈過程〉をさらに下位分析すると、〈対象〉の部分が過程の名詞化によって実現されているため、意味的には《過程 x》＋《過程 y》となる。《過程 x》は、表1にあるように、動詞性の名詞によって実現されている。為替のレジスターでは、為替交換がなりたつのに最低限必要な2つの過程「売る」と「買う」を中心に、「売り」や「買い」をふくむ複合名詞が、たとえば「円売り介入」のように、単語の階級において単独で経験的意味のまとまりを内包しながら、〈対象／媒体〉を実現している。こうして文法化がすすみ、文法的比喩というメカニズムによってさらに意味の内包化がすすむ(意味の内包化については、マティスン、2002：2. 1 節、バット、1988、ボーム、1985 を参照)。つまり、このようにして複合名詞が専門用語として機能するようになるのである。べつのいい方をすると、このような文法化によって、専門知識の構築化が、科学や商業などの専門分野でそれぞれ展開・発展をつづける(ハリデー&マーティン、1993)。

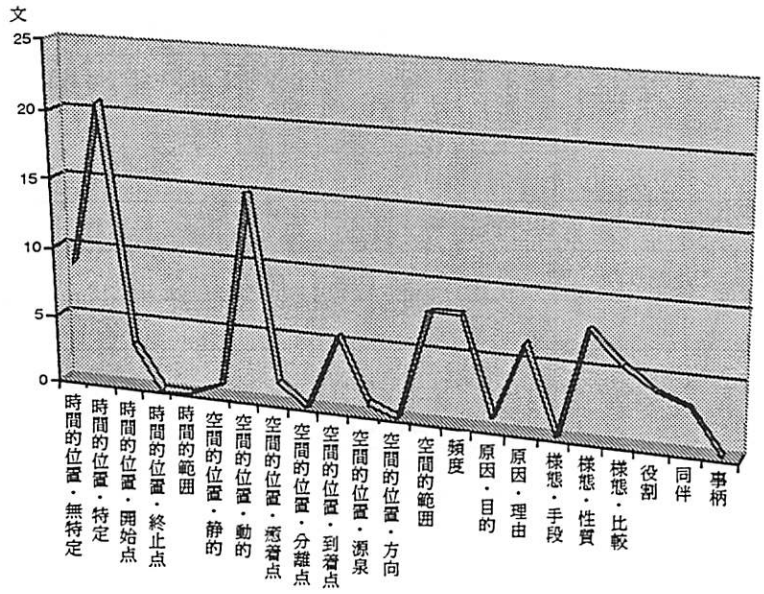
[表 3] 物質的過程の下位タイプ〈創造〉の例

〈し手〉	〈対象〉	〈過程〉
うわさが伝わったことも	円買いを	誘う
見方が	円売りを	
日経平均株価が	円買い・ドル売りを	
日銀は	円売り介入を	実施する

つぎのタイプは、〈し手〉がある場所からある場所へとうごく過程、つまり《移動》を実現するタイプをさす。データによると、このむすびつきの〈し手〉は「円」と「円相場」にかぎられており、意味的には《参与者》と《状況》との合成体によって実現されている。このタイプでは、いずれかの語彙的特徴をもつ〈し手〉が《移動》の過程を経過する。移動経過をあらわす〈過程〉は、表 4 にあるように「上昇する」「下落する」「反落する」の3つのタイプの動作に限らている。

このことはつぎのことを示唆している。つまり、円(相場)の動向が、円の値をしめす縦軸と時間の経過をしめす横軸とによって規定された2次元空間上、つまりグラフ(図 3 参照)で捨象されるのをうけ、その規定空間上での〈し手〉の動きが、「あがる」「さがる」「あがって、さがる」の 3 つの移動のいずれかとして、言語表現をうけることである(「さがって、あがる」と「反騰する」もあるが、デーてにはでてこない)。実際、「円は一時 116 円台に下落した」(例 2)のように、経過の過程が展開される状況をあらわす〈空間的位置〉は、円レートをしめす要素(「116 円台に」)によって実現されている。グラフにおいて縦軸をしめる円の値は、《高さ》と《低さ》という幅をもった意

味概念によって規定され、その規定によって、その縦軸は、〈し手〉が移動する空間的位置の集合体として、展開する為替の動向をそこにうつしだしている（図 6 を参照）。[8]



[図 6] 状況の頻度

[表 4] 物質的過程：おこること: 移動

〈し手／媒体〉	〈過程〉
円が	上昇する
	下落する
円相場は	上昇する
	下落する
	反落する

円は	一時	116円台に	下落した
〈し手〉	〈時間的位置〉	〈空間的位置 〉	〈過程：おこること：移動〉

例 2 移動をあらわす物質過程と、時空的位置

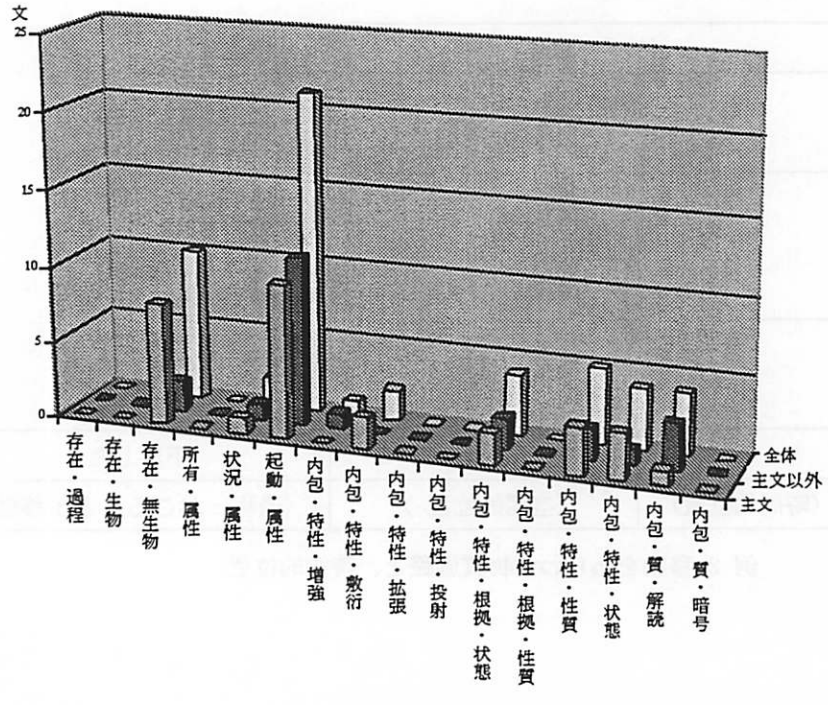
[8] 存在文と知覚文との意味的な近縁性については，スペイン語を例に、マティスン（1999）に詳細がまとめられている。

[表 5] 物質過程：おこること：出来事

〈し手〉	〈同伴〉	〈過程：出来事〉
ドル買いが		先行（する）
円売が		
ドル売りが		
円高が		進む
手じまい売りが		続く
取引が		交錯する
円相場は	円買い・ドル売りと	もみあう
	ドル買い戻しと	

4.1.2 関係的過程

外国為替記事のレジスターにおいて、物質過程についで頻度がたかい過程タイプは、ものや人やことをあらわす要素 2 つの間に存在する関係をうつしだす関係過程である。ここでいう関係過程とは、2 つの個別の事物の間に存在する関係を表現するタイプで、《同定》（「彼がその人だ」）や《記述》（「彼はおもしろい人だ」）だけではなく、日本語のばあい、《存在》（「猫がいる」）も、関係過程によって実現をうける。



[図 7] 関係過程をあらわす文の頻度

ここで、関係過程の頻出頻度が比較的たかいことの言語的理由づけとしては、２つの要素の関係（つまり《参与者》と《参与者》あるいは《参与者》と《状況》との関係）をあらわす関係過程をもちいることによって、(1) たとえば「取引は活発だ」のように、動作名詞としてもの化した《過程》が〈体現者〉をうめ、そうすることで、その《過程》が、〈属性〉として機能するもう一方の要素（このばあい「活発だ」）によって、特徴づけられるようになること、さらに (2)「119 円 30-40 銭近辺には利食いの円売り・ドル買いもみられ」の例ように、2 つの座標軸によって規定された空間に《参与者》（「利食いの円売り・ドル買いも」）を位置づけることができるということなどが考えられる。関係過程の下位タイプの頻度は、〈起動：属性〉(13．5%、21 例、10-11)が一番たかく、ついで〈無生物の存在〉(6.4%、10 例、8-11）となる。

関係過程の下位タイプである存在過程は、人やものや出来事の《存在》をあらわす。為替のレジスターにおいて《存在》をあらわす過程がもたらす文法的効果は、《ものごとの客体化》である。つまり、通常、動詞によって実現される〈過程〉や、文によって実現される過程のまとまり《姿》を、既存のもの、つまり〈存在物（存在者）〉として文法的にとりあつかうことをそれは可能にする。さらに、このように文法的に客体化された過程は、計量可能なものとして文のなかにあらわれる。日本語において、《存在》は量的なもので、計量の対象となる。存在の計量化は、「ない」「おおい」「すくない」のように、さまざまな形容詞によって実現されている（宮島、1972)。

存在過程の使用によってもたらされるこのような文法的客体化は、言語過程と精神過程の背景化をひきおこす。ここでいう文法的背景化には、(1) 名詞化と (2) 動詞のうけみ化、という 2 つの文法的メカニズムがからんでいる。ここでは、(2) をとりあげ、(1) については、名詞化についての節で考察する。

ところで、表 6 にあるように、知覚動詞のいくつかは、ここでは関係過程として分析した。これらの知覚動詞（「きかれる」「みられる」）がすべてうけみ形であることの理由を、〈感じ手〉を背景におしやることによって、情報源をぼかすことであるととらえることも可能である（山口＆筧、2001：677 参照)。事実、うけみによってもたらされるテクスト（構成）的効果はそうであるが、知覚動詞の文法化は、そのような間接的効果にとどまらず、知覚動詞の存在動詞への移行、つまり、動詞のタイプの変移と関係している。

知覚動詞の存在動詞へのこの移行は、つぎの 2 点から簡単にあきらかにすることができる。まず、(1) 近縁性においてで、先の知覚動詞を無生物の存在をあらわす一般動詞「ある」におきかえても、両者の意味的近縁性から文に意味的な変化は生じず、そして (2) 復元の可能性の観点からいうと、このばあい、たとえば、それらの知覚動詞が文字どおり精神活動をあらわすととらえ、非明示である〈感じ手〉を一人称単数、複数のいずれかで復元すると、意味的に不自然な文にしかならない。つまり、このことは、うけみ化した知覚動詞が、このばあい存在動詞と同義であること、そして、精神的過程の〈媒介〉として、その文中での存在が義務的である〈感じ手〉の文中への復元の可能性がないことから、動詞のタイプの移行をうかがうことができる。つまり、為替のレジスターにおいて、〈過程〉を実現する知覚動詞のうけみ化がもたらすものは、為替の動向の観察者である〈感じ手〉の背景化という文およびテキストレベルでの影響をこえ、動詞の意味タイプの変更にまでおよんでいるのである。

[表 6] 存在：無生物の存在

存在物／媒体	過程
夏休み入りも 場面も	ある
見方も	ある 多い
政策変更は	なく
関係過程として機能する知覚動詞をもつ文	
（投射文ーとの ）声も	聞かれる
円売り・ドル買いも	見られる
大きな動きは	見られない
新規材料は	みあたらない

[表 7] 関係：起動によってもたらされる属性

体現者	属性	過程：起動
銀行ディーラーは	動きづらく	なる
日経平均株価は	材料には 大幅高と	なる
加重平均金利は	ゼロ水準と	なる
円相場は	1ドル＝122円32-35銭と	なる
円買いが	優勢と	なる
予算の規模が	15兆円程度に	なる

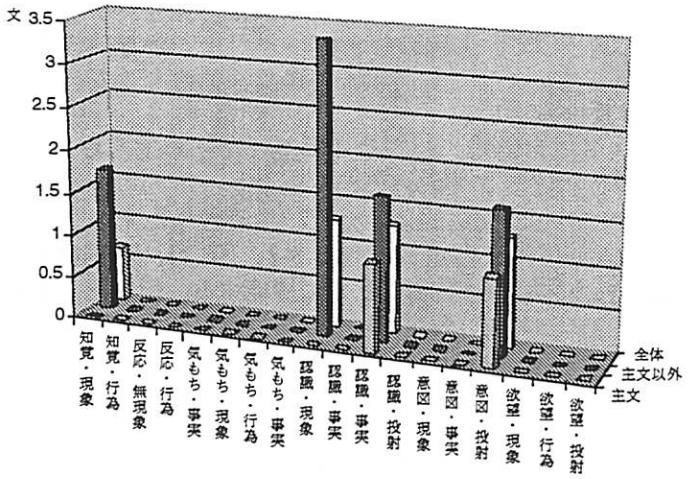
[表 8] 関係過程：内包的根拠をもつ、もたない属性（状態）

体現者／媒体	根拠／ 作用域	属性／過程
取り引きは		活発だ 閑散だった
ドルが		不足する
円相場は		下げ渋る
	材料に	乏しい

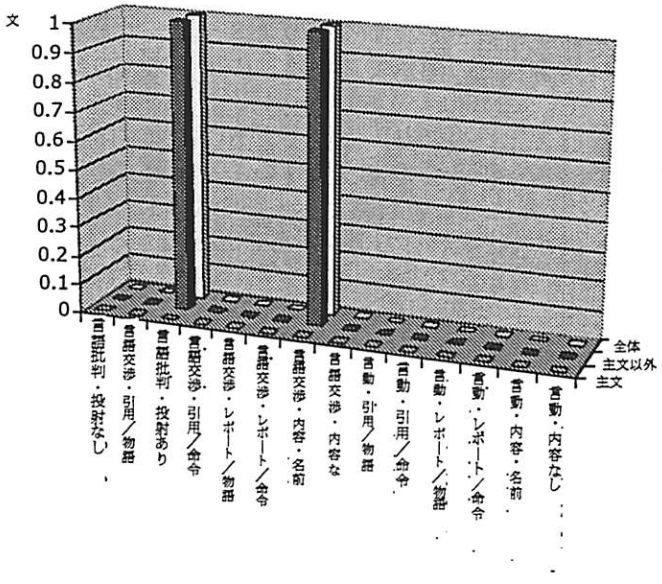
5 精神的過程と言語的過程

為替交換のレジスターにおいて、精神過程と言語過程は、図 8 と図 9 にしめしたように、ともに頻度がひくい。しかし、この事実は、人間の精神活動や言語活動そのもの

が為替の交換の過程と無関係であることを意味しているのではない。実際、予想や期待などの精神活動や、予測や評価などの言語活動が為替の観測に必然的にともなうことは、VIP の発言などが為替の動向におおきな影響をもたらすことからもあきらかである（小林、1995）。しかし、文レベルでの分析についていえば、そうではない。では、このばあい、為替交換にかかわる人間の精神活動や言語活動は、どのように言語化されているのであろうか。この点をあきらかにするためには、観察者としての視点をかえ、言語現象、つまり実体を異なる角度からとらえる必要がある。このばあい、文レベルの分析をおぎなうために、文を《上から（つまり意味の側面から）》そして《下から（つまり語彙・文法、とくに《群》や《句》の側面から）》観察しなければならない。そうすることで、過程のタイプとそれらの頻度との文法的全体像がうきぼりになってくる。



[図 8] 精神過程とその頻出頻度



[図 9] 言語過程とその頻出頻度

まず、観察の視点を文の階級 rank から下位階級である群／句へとおろし、言語現象を《下から》文をながめることにしよう。そうすることによって、異なる階級にになわされた文法的役割を明白にすることができるだけでなく、究極的には、細密度をもつ文法としての語彙（ハッサン、1987）へと研究をおしすすめることが可能となってくる。

5.1 語彙・文法：群／句の階級

言語過程と精神過程がもつ、他の２つの主要な過程タイプと異なる文法的性質は、それらが過程の結果としてもたらす発言やアイデアを投射することができるという、その文法的潜在性にある。つまり、これらふたつの過程タイプは、発言やアイデアを、「と」によってマークされた投射文[9]として、過程のむすびつき内部にとりいれながら、になわされた文法的役割を実体化していく。ここでは、この文法的潜在性を手がかりに、言語過程と精神過程の文法的背景化を論じる。

外国為替市場のコンテクストにおいて、政府や日本銀行などのような VIP による報道は、それが発言であろうが、アイデアであろうが、為替レートの動向をにぎる貴重な情報となる（小林、1995）。しかし、文法的にいえば、投射されたそのような発言やアイデアはすべて、うめこみ文として下級化 downranked され（例 3）、名詞群の〈主要部〉をいいあらためたり、定義したりする〈修飾部〉として機能する。便宜上、下級化され、名詞群にうめこまれる投射文をまとめて、暫定的に《うめこみ投射文》とよんでおこう。

ここで、うめこみ投射文によっていいあらためられる名詞群は、意味的には《意義抽象物》であり、たとえば「声」「見方」「観測」などのように、言語過程や精神過程と意味的に相似している（英語については、ハリデー、1994：263-264、日本語版、409-412 を参照）。つまり、投射された発言やアイデアを下級化し、文以下の階級でとりあうことによって、〈いい手〉あるいは〈感じ手〉を情報源や典拠としてとりあつかうことが可能となり（例 4 を参照）、うめこみ投射文のあとに補足したり、あるいは逆に省略することによって、推測が不可能な情報とすることも可能となる。

このようにして、うめこみ投射文をともなった名詞群は、たとえば、〈存在物〉として、「《うめこみ投射文：発言》との声もきかれた」（例 3）のように、意味・文法的に《参与者》という文の機能的立場がとれるようになる。さらに、たとえば、「《うめこみ投射文：発言》との味方がおおい」（例 4）のように、計量も可能となる。あるいは、〈おこること〉をあらわす物質的過程を表現する文の《参与者》である〈し手〉として、たとえば「「《うめこみ文：発言》との声がでている」のように、自然発生的な過程として表現をうける。

こうして《名詞群に投射文をうめこむ》という文法のメカニズムは、現実の出来事の表現に多様性をあたえる。さらに、このようにうめこみ投射文をともなう名詞群は、たとえば「《うめこみ投射文：発言》との観測から～」のように（例 6）、物質過程が生ずる〈原因：理由〉をあらわす《状況》をも実現することができるようになる。

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[9] 伝統的な文法論でいう「引用文」とおなじ。理論的には，既存のものを「引用する」というよりも，言語的／精神的過程によって，現実の断片として文中にあらたに「うつしだされる」発言やアイデアであることから，「投射（文）」の方がより適切である。

…上値は	重い」	(大手銀行) との	声も	聞かれた。
〈存在／媒介〉：名詞群				〈過程〉：存在
修飾部			主要部	
投射文 (発言)		(〈いい手〉)		
〈体現者〉	〈属性〉			

例 3 関係・存在文における発言としてのうめこみ文

「円を	大きく	売り込む	材料には	なっていない」	(三菱信託銀行資金為替部) との見方が	多い。
〈存在者／媒体〉：無生物の存在：名詞群						〈過程〉
修飾部：投射されたアイデア					主要部：意義抽象物	
〈属性〉				〈過程〉		

例 4 関係・存在文における発言としてのうめこみ文

市場参加者からは	「(もし	午後も	介入が	実施されたのなら)	効果的なタイミング	だった」	(邦銀) との	声が	出ている。
〈源泉〉	〈し手／媒体〉								〈過程〉：出現
	修飾部： 投射文						〈いい手〉	主要部	
〈いい手〉	〈話の内容〉								〈過程〉

例 5 出現をあらわす関係過程と、うめこまれた発言

午前は	「中値決済で	ドルが	不足する」との	観測から	円売りが	先行。
時間的位置	原因：理由：下級化された文をふくむ名詞群				し手	過程
	修飾部：投射文			主要部		
	原因	体現者	属性			

例 6 物質文における状況〈原因：理由〉としてのうめこみ文

先に説明したうめこみ投射文ほど一般的ではないが、名詞群としてはたらくうめこみ文の〈感じ手／媒介〉が名詞群への展開（名詞群への拡充）によって抽出され、表面化するばあいもある。たとえば、例 7 のようなばあい、投射された文と投射する過程全体がすべて下級化され、それによって〈限定詞〉としてその名詞群全体の〈主要部〉である〈感じ手〉を限定し、意味規定するようになる。このような名詞修飾による文の名詞化は、経験的機能の観点からいうと、たとえば、先の例のばあい 2 つの表現をうけて実

現する。つまりこのばあい、意味限定のし方は、例にあるように〈感じ手〉にまつわるものであったり、あるいは「[[銀行が<<堅いと>>みた]]円の下値は」のように、投射文中の《参与者》(「円の下値は」) であったりする。このように、名詞群内部における要素の置換は、《参与者》の数に比例して、多様性をます。

午後に	入って	[[<<円の下値は	堅いと>>	みた]]	銀行が	円買いに	動いた。
時間的位置		し手／媒体				状況：目的	過程
属性	過程	投射文：アイデア		投射する過程	感じ手		

例 7 精神的投射文全体が文法的置換によって名詞化している例

5.2 名詞化

先にのべたように、外国為替のレポートにおける過程は、名詞として実現される傾向がある。すでに指摘した、過程を名詞化すること、つまり文法的比喩によってえられる文法的影響は、もの化されることによって、《参与者》や《状況》という文法的機能を、もの化された過程が実現できるようになるということにある。しかしデータによると、その他の名詞化もみられる。このばあい、名詞群が拡充するのをたすけるというタイプである。ここでは簡単に例をしめすにとどめる。

論文の最初でふれておいたことだが、意義的観点からかんがえると、どのような過程も〈媒体〉なしには生じないという点において、過程内部にそれをもたらすもの（つまり〈媒体〉）として、すくなくとも《参与者》をひとつ潜在的に内包している。過程の、このような意義的特徴は、日本語においては、名詞化のメカニズムにも浸透しており、とくに〈主要部〉が名詞化された過程であるばあい、以下でみるように名詞拡張が顕著にあらわれる。

一般的にいって、日本語における〈過程〉は、文末にあらわれ、英語のような言語とはちがい、後方からの名詞修飾はおこらない。いい方をかえると、下記の例８にあるように、過程を〈主要部〉とする名詞拡充のばあい、後方からの修飾がおこらないことから、その拡充のし方が、もっともプロトタイプ的である経験的構成体としての文のくみあわせ、つまり中核となる｛〈起動者〉｝〈+媒体〉+ 〈過程〉の構造にふつう類似していることである。

日本語における名詞は、マークされないばあいは助詞をともなわずに（はだか格として）あらわれる（鈴木 1972、大槻 1987）としても、かき言葉のばあい、通常ガ、ヲやニなどのような助詞をともなってあらわれる。しかし、名詞拡充によって、文が名詞群内部にとりいれられるばあい、文の要素としての名詞（群）は助詞によるマークをうけないこともある。そのばあい、明示的な、あるいは「顕在する」文法によって、たとえば〈起動者〉をともなう文の〈媒体〉がふつう「ヲ」によってマークされることで、経験的構成体の意味構造が明示されるのではなく、非明示な、あるいは「潜在的な」文法、つまりこのばあい、中核をなす文の機能的構成要素の物理的順序が、助詞をともなわない名詞（群）が実現する機能を意味的に限定する（例 9 を参照。単語レベルでの単語のあわせ方（複合語化）は、教科研 1988 に系統的に記述されている)。

午前は	日銀の	断続的な	円	売り	ドル	買い	介入を	受け
	名詞群							
	修飾部						主要部	
	し手	頻度	過程					
			修飾部		修飾部		主要部	
			過程		過程			
			対象	過程	対象	過程		

例8 名詞化された過程を主要部にもつ複合的な名詞群

1円5銭	円	高	ドル	安の	1ドル＝119円47-49銭
名詞群					
修飾部					主要部
名詞	名詞	形容詞的	名詞	形容詞的	名詞群
質	体現者	属性	体現者	属性	

例9 複合的な名詞群

名詞化された過程（動作性名詞）		
名詞群の起動的なまとまり	例	名詞群の他動的なまとまり
〈過程〉	売買：売＋買	〈過程〉 ＋〈過程〉
〈作用域〉＋〈過程〉	円買い：円＋買い ドル売り：ドル＋売り 円買い戻し：円＋買い戻し 現物取引：現物＋取引	〈対象〉 ＋〈過程〉
	中値決済：中値＋決済	〈対象〉 ＋〈過程〉
〈作用域〉＋〈過程〉 〈作用域〉：〈作用域〉＋〈過程〉	円売り介入：（円＋売り）＋介入 ドル買い介入：（ドル＋買い）＋介入 円売り注文：（円＋売り）＋注文	〈対象〉 ＋〈過程〉 〈対象〉：〈対象〉 ＋〈過程〉
〈作用域〉＋〈過程〉 〈作用域〉：〈媒体〉＋〈過程 〉	ドル不足観測：（ドル＋不足）＋観測	〈現象〉＋〈過程〉 〈現象〉：〈体現者〉＋〈属性〉

名詞群：抽象空間		
名詞群の起動的まとまり	例	名詞群の他動的まとまり
〈過程〉 ＋〈範囲〉	上げ幅（上げ＋幅） 下げ幅（下げ＋幅）	〈過程〉 ＋〈対象〉

[図 9] 名詞化された過程と経験文法的分析

6. 結論

この論文は、ニュース記事（情報）、とくに外国為替レポート（ニュース）をひとつのまとまったレジスターとしてとらえ、質的、量的文法的観点からながめた結果をのべたものである。ここでは、経験機能的観点から、とくに［他動性］体系のうちの［過程型］を対称としながら、まずレポートを言語による産物ととらえ、さらに、その言語的、

つまり意義的産物であるいくつかの実体（このばあいテキスト）がもたらす多様なふるまいが、テキストの語彙文法的タイプ（テキストタイプ）として実現していることを、体系的に、つまり質的に、そして実体的に、つまり量的にしめした。

はじめに、関連するテクストを総称する「外国為替レポート」をまえおきとして、意味・文法的に観察し、そのレジスターの主要なモチーフを《過程》ととらえた。そして、その《過程》にまきこまれる《参与者》や《状況》の文法的特徴をあきらかにし、外国為替という《過程》の実体化における文法的バリエーションを明示することが、このばあい重要であることをしめした。

ここでは、外国為替の文法を経験的カテゴリー、とくに［過程型］の観点からながめ、研究の対象となるレジスターの主要な経験的モチーフが物質過程であり、そしてそれにつづく過程タイプが関係過程であることをあきらかにした。これに対して、言語過程と精神過程をあらわす文は頻出頻度がひくいが、それが文法的に動機づけられていることを、動詞の名詞化と文法的比喩との関係で指摘した。

主要なカテゴリーである物質過程の下位タイプのうち、外国為替市場の変化の動向をとらえた〈変更〉をあらわすタイプが、一番頻出頻度がたかい。ここでおもしろいのは、その変化の動向の文法化のし方で、このばあい、変化を経過するもの、それ自体も過程ではあるが、その過程は、文法的比喩によって《もの化》されたものであった。この《もの化》された過程は、そうなることによって、文中での《参与者》の地位を獲得するようになり、外国為替市場のダイナミックな表現をさらに可能にする。つまり、文法的比喩による《過程のもの化》（形態論的には、述語動詞の連用形への変化によってもたらされる〈過程〉の名詞化）は、ある出来事によって、べつの出来事がもたらされるという、出来事間の因果関係の表現を可能にする。第 4.2 でのべたように、過程の名詞化は、名詞群拡充という文法メカニズムによってひきおこされ、それによって、名詞化された過程内部に《参与者》や《状況》をとりいれることを可能にする。

つまり、名詞化とは、外国為替レポートというレジスターの、文の階級における文法的特徴のひとつといえるであろう。この論文では、名詞化をさらに文と群との関係、つまり語彙文法層内部の関係（理論的には《内的分層間》intrastratal（ハリデー&マティスン、2000：288））の観点からとらえ、とくに言語過程および精神過程の背景化と、投射文を〈限定詞〉として下級化し、それを名詞群にうめこむタイプの名詞化との関係についてのべた。この種の名詞群拡充は、投射された発言やアイデアを客体化（もの化）することで、グラフに描写された為替レートの動向がそうであるように、円相場と時間というふたつの軸によって規定された意味的抽象空間に、それを位置づけることができるようになるものである。

本稿では、外国為替というレジスターを、言語メトリックスの中心に位置づけ、それを［過程型］体系をつかって、「体系の側」から、そしてレポートという実体をつかうことで、「テクストの側」からアプローチし、文、群／句、そして語のそれぞれの階級において再起する文法パターンを観察した。ここでさらに重要となってくるのは、文が名詞群の一部として機能する例にみられるような「下級化による意味の内包化」という文法機能が、為替のレジスターを独自なものにしていることであり、さらに、そのような顕在・潜在的な意味・文法関係が動機づけとなって、特定の新聞記事が外国為替のニュースレポートとして言語的に現象していることである。

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The Domain Modelling of Foreign Exchange Reports: a Functional Analysis

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Based on the description of the general system of the grammar of modern Japanese, the paper explores a particular register, namely, foreign exchange reports. This is a text-based and a system-based registerial study. The study is text-based in that it investigates samples of the reports computationally using concordancing software and brings out favorite patterns of instances identified in the samples. These patterns of instances are then analysed systemically in terms of relevant lexicogrammatical systems such as TRANSITIVTY, PROJECTION/ EXPANSION. This will make it possible to examine these instances against the background of the general potential of the lexicogrammar represented as a system network, and thus enable us to profile the register-specific lexicogrammatical patterns as a variant within the overall lexicogrammatical potential. In this way, the paper shows how a register can be modelled as recurrent selections instantiating the systemic potential of lexicogrammar. One of the prominent grammatical phenomena that can be observed in the register domain of foreign exchange reports is the nominalization of processes, and of projected locutions and ideas. Therefore, the paper will also explore the "enfolding meaning" that is brought into being through nominalization, in particular, the grammatical mechanism called nominal group expansion.

JASFL Occasional Papers

Volume 1 Number 1 Autumn 1998

Articles（論文）

JASFL Occasional Papers

Volume 2 Number 1 Autumn 2001

Articles（論文）