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On the Cognitive Effects of wa and ga in the Discourse Frame Space

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Abstract

The present paper analyzed the cognitive effects of the Japanese postpositions wa and ga in terms of the frame changes in the perceived discourse space of the hearer's. Their intricate roles concealed in the simple appearances have long attracted researchers. By using the the knowledge frame system as a neutral descriptive device, we could demonstrate that the contrast facilitation and inhibition are the basic roles of wa and ga, respectively, upon which interesting modifications are possible: hesitative wa and unequivocal ga. It was also noted that the exclusive effect of ga was subject to conditional modulation. The part-whole restriction placed on the relationship between the frame and the slot made it possible to both intensively and extensively investigate the cognitive effects of the particles, in the unmarked and marked expressions, in light of a wide range of contextual factors. Concerning the popular belief about the Given-New distinction in conjunction with wa and ga, we pointed out that the notion has little relevance as the demarcation of the particles. The point of departure lies in the conceptualization of information. Further inquiries are strongly desired to confirm our findings over different relations between frames and slots, on the one hand, and more complex sentence structures, on the other, which necessarily involve particles other those permitted in the present work.

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On the Cognitive Effects of *wa* and *ga* in the Discourse Frame Space

1. Introduction

Researchers have long tried to explicate the roles of postpositions *wa* and *ga* in the Japanese language. The first systematic analysis by Rodriguez (1604-08) dates back to the early 17th century. Ambiguity still remains about their roles in terms of presenting Theme-Topic or Given-New information. The distinction of their contrastive-restrictive use adds to the complexity of the issue. As is well known, around the second half of the 19th century the three different notions of the Subject came to be termed as (Halliday, 1985):

the logical Subject meant to be a doer of the action;

the grammatical Subject meat that of which something is predicated; and

the psychological Subject meant that which is the concern of the message.

In order to separate the third notion from the others, the concept of the Theme was introduced by Mathesius (1975), the founder of the functional sentence perspective. The rest of the sentence is called the Rheme. This does not mean that the Theme-Rheme has been consistently used among the proponents of the functional sentence perspective. For instance, Dik (1980, 1981) postulates a scheme of the Theme-Predication-Tail, while preserving the terms Topic and Focus for the pragmatic function internal to a Predication. Halliday (1985) discerns the Theme-Rheme structure in the contextual meaning of a clause and use 'topic' for the first ideational element embedded in a Theme. (Actually he calls 'topic' topical Theme.) Chafe (1976), in contrast, considers the Theme redundant, since it's function is sufficiently covered by the Topic. Confusion grows when one finds another use of the Theme-Rheme in terms of the Given-New information in Kuno's (1973a) works on *wa* and *ga* (see also Vachek, 1975). Kuno (1972) retains the term Topic to refer to the psychological Subject. Both Kuno (1972, 1973a, 1973b) and Chafe (1970, 1976) identify *wa* as a marker for the Given information, whereas Li and Thompson (1976) regards it as a Topic marker. To Halliday (1985), the Given

and the New are conveyed by the intonational contour beside the clause structure, i.e., Given-New are different functions from Theme-Rheme. The present state of knowledge is indeed a chaos. What we need is a neutral descriptive scheme that serves as a common basis for the further inquiries. This is the inception of our frame-based interpretations.

Notions similar to Theme or Topic recurrently appear in literature on *wa* and *ga* since the work of Rodriguez (1604-08) as pointed out by Onoue (1977) in his historical review of literature. Nonetheless, controversies still continue today, chiefly due to the disputes concerning the relevance of the grammatical Subject in Japanese, and to the introduction of the New-Old (or Given-New) distinction in conjunction with Theme-Rheme. Kuno's (1972, 1973a, 1973b) extensive work is particularly responsible for the latter. On the belief, accredited due to Firbas, that the Prague school interprets the Theme-Rheme in terms of the Old-New information, Kuno (1972, 1973a, 1973b) argues that the Theme provoking use of *wa* conveys Old information, whereas *ga* as a Subject marker always carries New information. To our regret, he does not elaborate on the concept of Theme or information. Strangely, Firbas (1966) himself denies the necessity of the connection between the Theme and Old (or Known in his own terminology) information. The essential features of the Theme-Rheme, Firbas posits, ought to be analyzed by the communication dynamism (CD). As is discussed above, the Prague school is not really united. For instance, Dik (1981) considers the Given-New notions dispensable, since they are covered by the pragmatic functions Topic-Focus assigned to constituents of the predication, while the Theme-Tail are assigned to the left- and right-dislocated external constituents of the predication.

The term *information* has undeniable appeal both within and outside of the scientific community. Accordingly, one should take great care in its use, especially, as an explanatory concept. In this regard, the explanation found in the aforementioned studies tend to be substantive and incremental, lacking a functional view. That is, a piece of information is Given (or Old) if it has been stated before or present in memory. (Actually, few presented clear definition of the Givenness.) And, the New information is something to be attached to the Given state. This incremental view, nonetheless, fails to account for decremental changes in the state of knowledge in discourse. Suppose that a couple is thinking of inviting their friends to

a weekend party. If the husband finds that there are too many guests, he may suggest his wife to eliminate several of them from the list. Since these names were already known to both, one can argue, as many proponents of the Given-New distinction would do, that the mentioned names constitute the 'Given information'. But, one should realize, at the same time, the 'Given' produced a New, but decremental, change in the mind of the hearer. Or, should we regard the new list as an 'Old' one, because it is simply a sublist of the old one? Inoue (1979) explains that the Old-New distinction concerns the presence or absence of a referred item in the perceived mind of the hearer by the speaker and that the New one is more informative than the old one. Here the substantive criterion is confounded by the effect. It is not difficult to show a counter example to this: Compare the change caused by eliminating more than half of the names with that caused by adding a new name. Apparently, the 'Given information' is more informative to the extent the it is judged by the degree of change. What went wrong?

Mathesius (1975), the founder of the functional perspective of grammar, discerned the Theme-Rheme and the Rheme-Theme structures in regular two-elements statements, and called the former objective order, since the speaker starts with what is already known to the hearer and adds something new to it. But he acknowledge the occurrence of the latter, called subjective order, when the speaker feels it pertinent. Though we are not able to identify who first started, it gained popularity among students of the functional perspective to use the terms Given (or Old) and New as synonymous with the Theme and Rheme. As is obvious from the above discussion, the new distinction is insufficient for describing the effect of the communication. To make it worse, it became almost custom to use Given-New as quantifiers of the term information particularly in the discussion of *wa* and *ga* (e.g., Mikami, 1963; Kuno, 1972: Ohno, 1987; Kitahara, 1981; Yasui, 1976). By doing so, one confines the rich notion of information within the Given-New distinction. What we propose here, in short, is to free the notion of information from substantive base and use it in much wider perspective.

Whether written or spoken, words or phrases are symbols that are connected to meanings in terms of external referents or internal images. Information is metaphorically said to flow from the former entities to the latter. It is, in this narrow sense, the notion to understand the

relations between or among patterned entities. In a broader sense, information embraces the triplet of patterned entities and their relations: <sign (the superclass of symbol and signal), meaning(s), relationships>. With this relational view of information, one gains deep insight into the phenomena at various stages of evolution (Yoshida, 1990).

Suffice it to say here that the present paper investigates the roles of *wa* and *ga* with respect to the changes in the cognitive states resulting from statements containing the particles. Where communication affecting knowledge is concerned, such effects should be representable by the changes in the knowledge frames, the notion proposed by Minsky (1975). Any statement conveys information but its informativeness differs in terms of the changes in the frames, although it is not our present interest to define or measure the degree of informativeness.

2. Frame-Based Interpretations

2.1 Frame Space in Discourse

In order to have a quick grasp, let us first see a set of the popular examples:

(2.1) *Zou-wa hana-ga nagai.* (Elephants have a long nose/trunk.)

(2.2) *Zou-no hana-wa nagai.* (The nose/trunk of an elephant is long.)

(2.3) *Zou-no hana-ga nagai.* (It is the nose/trunk of an elephant that is long.)

It is not easy to translate these sentences into equivalent English without losing pragmatic and semantic subtlety. The difficulty also lies in the concepts of *hana* and trunk, since the latter already contains the length and the shape as the distinguishing properties, whereas the former is a generic word applicable to the organ of smell and breathing air of humans and other animals. The expression "nose/trunk" was chosen as a compromise between a direct and a conventional translations. Those put in parentheses are based on the suggestions by a bilingual journalist. In some linguistic articles (2.1) is translated as

Concerning (or Speaking of) elephants, their nose/trunk is long.

to emphasize the Theme-presenting role of *wa*. According to the Theme-followed-by-proposition theory (Dik, 1980, 1981; Masuoka, 1987), "their nose/trunk is long" is the proposition

that is held true within the domain defined by the Theme. This approach inevitably encounters a problem in translating (2.2), since *nagai* (long), an adjective-predicate, does not form a proposition by itself. We believe, instead, that each of these sentences as a whole reflects an underlying proposition. Topic-prominency of Japanese and Subject-prominency of English (Li and Thompson, 1976) will probably account for the difficulty in translation between the two languages. Translation similar to (2.1) and (2.2) is also suggested by Chafe (1976).

Insert Figures 2.1a, b about here

Notice that (2.1)-(2.3) all stem from the conception about an elephant (*zou*) and its nose/trunk (*hana*) that is long (*nagai*). This constitutes a part of the general knowledge about an elephant as shown in Figure 2.1a in terms of a knowledge frame (see Minsky, 1975). The frame name, elephant (*zou*), makes it distinguishable from other frames. The 'is_a' slot relates the frame to its super-class, mammal, and, also, describes its status within the biological hierarchy. While the 'is_a' slot specifies the external relationships, the 'body' slot pertains to the internal structure of the elephant. Subslots, often called facets, are necessary to detail the knowledge about the parts of the body. The properties of the parts are describable in terms of size, weight, shape and so forth. The number and kind of the slots as well as facets are determined, to a large extent, by the capacity of a knowledge holder and situational factors. Perhaps, Figure 2.1a is too formal for the everyday use where a simpler one like Figure 2.1b suffices. Usefulness of the frame-based approach to processing linguistic materials can be seen in the work of Rosenberg's (1980) and others' collected in Metzing (1980), even though it is not all-purpose. Further stimulus to the present approach comes from Chafe's (1976) assertion that a Topic sets a spatial, temporal, or individual framework within which the main predication holds.

Insert Table 2.1 about here

Upon close examination, most examples studied in connection with *wa* and *ga* turn out to be expressive in one of the forms listed in Table 2.1. The words accompanying the frame name,

slot and its value are limited to *wa*, *ga* and *no* in the table to avoid complexity. It will be shown later that the word order in the actual utterance depends largely on the situational factors. Suffice it to say here that the principal role of *wa* is to facilitate contrast at the level of the antecedent noun or noun phrase, be it denoting a frame, slot or slot-value. When it specifies a frame, the information of its slots and their values are provided by the rest of the sentence or even by the subsequent sentence(s). The long range effect of *wa* is emphasized by Mikami (1963, 1972, 1981). Perhaps we should add the repeated use of *wa* and *ga*, such as A-*wa* B-*wa* C or A-*ga* B-*ga* C, to the table to be more complete. However, we will make only occasional notes on them in order to keep the discussion within a reasonable scope.

As shown in Figure 2.2, there are usually more than one active frames in a discourse space that can be effectively arranged into different layers by, for instance, special phrases or emphasis. Within each layer, frames gather in the central, semi-central and peripheral clusters as a result of intentional or unintentional dynamism of communication.

In view of the past studies, it seems preferable to employ the term Topic at the frame level, reserving the Theme for broader use, i.e., frame clusters, layers and even the discourse space itself. Suppose a school teacher tries to teach students about different classes of animals in some detail by saying:

> "Let's talk about various classes and subclasses of animals today, first mammals, followed by birds, reptiles and fish. Among mammals, human beings are of prime importance. Anthropologists classify humans into several races...."

The first sentence in effect creates four layers of animal frames in the discourse space of the hearer in order of the mentioned classes, setting the Theme of the top layer as mammals. The second and the third sentences help prepare human beings as the central Theme of the top layer under which several frames will be opened up to receive information about races. Therefore, the names of the races, to be subsequently supplied, will become the Topics under the central Theme. The number of layers and frames in each cluster usually depends on the intention as well as the attention span of the speaker and the ability of the hearer.

2.2 Assumptions

The following assumptions are necessary to keep the discussion concise. First, the discourse involves verbal communication between two participants, i.e., a speaker and a hearer, who are normally intelligent and well-intentioned in compliance with the Grice's (1975) conversational maxims. Hence, all the utterance is straightforward devoid of irony or untruthfulness. In a daily, face-to-face situation, perhaps both verbal and nonverbal cues from the hearer supply information for evaluating the perceived structure. However, for the sake of simplicity, we will restrict the present discussion to the verbal communication.

Second, without direct access to the internal state of the hearer, the speaker should construct the perceived space in his own mind and manage it along with his own for the effective communication. In order to avoid cumbersomeness, only the perceived space will be explained in the present analysis.

Third, people are flexible enough to adjust the layout of the frames in the space and the internal structure of the frames to the ongoing demands in the discourse. Hence, a large frame may become simplified as the discourse progresses or vice versa. Also, a frame can be activated from a long term memory, newly created, or even deleted either from the discourse space or from memory. Such changes are affected by the exchanged information and neuro--pysiological factors including fatigue. It must be noted that the information accrues not only from the actual utterance but from presumed or implied knowledge. In this vein, contrast--facilitatory and contrast-inhibitory potency of *wa* and *ga* can be effectively used to make the discourse enjoyable. For instance, (2.1) helps stimulate attention to similar frames (between-frame contrast), while (2.2) tends to facilitate between-slots contrast within the elephant frame. Additional extra-linguistic sources of information are intuitive inferences such as presupposition and psychological entailment, on the one hand, and word association stemming form semantic networks or phonetic similarities, on the other.

Finally, when a frame is mentioned with a slot and its value in a Japanese sentence, they naturally appear in this order. (2.1)-(2.3) are examples of the unmarked order. One may recall that linguistic literature usually cites no criterion for the unmarkedness of a statement,

forcing the readers to comply with the implicit intuition of the author(s). Even though our assumption may not be agreeable to all or require modifications in future, it certainly is better to be explicit about the criterion than not.

2.3 Simple Frame Notation

A frame consists of a frame-name, slots and slot-values. If necessary, slots are further divided into subslots called facets. Hence, the most basic and complete frame is composed of a frame name(A), a slot(B) and its value(C) which will be simply expressed as:

<A, B(C)>

There are cases in which an opened frame lacks slots and/or slot values. It remains incomplete until the appropriate information is provided. An incomplete frame will be expressed as <A> if only the name is available, or as <A, B> if a slot is not associated with value(s).

The above notation can be easily extended to a general frame with multiple slots and slot values by listing them as

<A, $B_1(C_{11},C_{12},...)$, $B_2(C_{21},...)$, ...>

For instance,

<elephant, is_a(mammal), ..., nose/trunk(long, ...), ...>

is a short-hand notation of the frame in Figure 2.1b. Since there is no need to express the content of the entire frame in a single sentence, the speaker selects the relevant slot(s) and the value(s) relevant to the ongoing need. Suppose that he tries to inform the hearer about an elephant with respect to the length of its nose/trunk, he can state either (2.1), (2.1) or (2.3) depending on the intended effect on the hearer's frame space. As explained in the previous section, these are the unmarked expressions in Japanese corresponding to the selection. To put it in a general term, the selection of <<A, B_i, C_{ij}>> has the following unmarked verbal expressions:

(2.4) A-*wa* B_i-*ga* C_{ij};

(2.5) A-*no* B_i-*wa* C_{ij}; and,

(2.6) A-*no* B_i-*ga* C_{ij}.

Fortunately, subscripts are not necessary for the ensuing discussion.

In daily occasions, omission of slot-names is not infrequent, if felt taken for granted. For instance, in

Zou-wa ookii. (Elephants are big.)

the slot "body(-size)" is omitted. Such practice is still in compliance with the Grice's (1975) conversational maxims. We sometimes encounter with the inversed, marked expressions such as

Hana-ga nagai-no-wa zou-da (B-*ga* C-*no-wa* A-*da*)

Nagai-no-wa zou-no hana-da (C-*no-wa* A-*no* B-*da*)

Omission of the slot name also occurs in these unmarked forms (see Figure 2.2). Since the situational factors for the unmarked expressions differ from those for the marked ones, they will be analyzed in the separate chapters.

3. Illustration of the Cognitive Effects: unmarked expressions

In this and the next chapters we will illustrate how *wa* and *ga* exercise their effects in the unmarked and marked forms, focusing on Type I expressions in Table 2.1 in which slot B is in a part-whole relationship with frame A.

3.1 Preliminary Remarks

The underlying premise is that the participants of the discourse is intelligenet enough to process generic knowledge about elephants and other objects expressible in the frame form as dipicted Figure 2.1a, b or <elephant, is_a(mammal), ..., nose/trunk(long), ...>. In accordance with the situational demands, the speaker retrieves relevant frames from the his memory. After placing them in his discourse space, he attempts to transfer the entire frames or some parts of them to the hearer's space. Due to the spontaneous nature of human communication, the speaker need not refer to all the items he plans to convey, but can virtually achieve the purpose by stimulating the hearer's semantic or other kinds of networks. When it is felt necessary, however, the speaker tries to suppress such stimulation. As explained below, contrast facilitation and inhibition are the basic roles of *wa* and *ga*, respectively. For the effective

communication, the speaker should monitor the hearer's discourse space which is not directly observable. Instead, the speaker usually constructs the perceived hearer's space beside his own. With this qualification in mind, we will refer solely to this perceived space throughout our discussion in order to avoid confusion and cumbersomeness.

Statements in discourse are exchanged in various contexts such as explanations, confirmation, corrections, question-and-answer and so forth. The appropriateness or effectiveness of a statement depends on a given context, and to a certain extent, on the presence of visual, olfactory or other perceptual cues. However, it is impractical to exhaust all possible combinations of these factors in our discussion. On the belief that theory is to be judged by the soundness of argument and richness of implications, we will be rather selective about the contexts and other factors in the hope that readers easily grasp the central points.

Now, let us illustrate the cognitive effects of *wa* and *ga* in terms of the changes in the discourse space resulting from the unmarked expressions (2.1)-(2.3). Suppose that the speaker plans to explain about several species of the mammals like elephants, giraffes, horses and lions by stating

> "Today I am going to talk about elephants, giraffes, horses, lions and some other mammals. ..."

This in effect sets the central Theme of the top layer to contain mammal frames of elephants, giraffes and other animals as shown in Figure 3.1a. As stated in the previous chapter, the topmost Theme frame describes what the cluster is about. In this arrangement, perhaps the 'is_a' slot in each individual Topic frame is redundant, since it is already summarized in the Theme frame. Hence, the redundant slot will be omitted from animal frames hereinafter.

The above statement supposedly informs the hearer that distinctive features of the animals will be described subsequently. This expectation is incorporated in the Theme frame as the slot requirements. If the hearer is intelligent enough, he is able to recall that mammals are vertebrate, and share basic traits such as body-parts and means of reproduction. Readers might as well consider that these Topic frame names are Given in the conventional sense, though the notion of Givenness has little significance as the demarcation between *wa* and *ga* in the

the present analysis. We will see below how the unmarked expressions (2.1)-(2.3) will work differently in filling the Topic frames with distinctive slots and values. As briefly mentioned in Section 2.2, *wa* and *ga* are dual in the contrastive effects: While *wa* facilitates a contrast at the level of the antecendent noun phrase, whereas *ga* does the opposite.

Insert Figures 3.1a,b about here

3.2 Between-Frame and Within-Frame Contrast

When (2.1) is received, *wa* attached to the frame name *zou* stimulates between-frame comparisons. The hearer expects similar statements to follow so that he can fill the remaining Topic frames with appropriate slots and their values. With sufficient knowledge and time, the hearer performs comparisons spontaneously, activating related frames from his/her own knowledge base and add them to the central Theme if appropriate. As a matter of courtesy in the sense of the Grice's maxims, the speaker cautiously makes further reference to the slots of the same or similar kinds with the one mentioned in (2.1), unless specially noted otherwise. This similarity principle also applies the slot values. After (2.1), one ordinarily anticipates to hear about slots pertaining to body-parts that are to be filled with values of length, size or shapes.

What is particular about *ga* in (2.1) is that its inhibitory effect of *ga* restricts the number of slots in each animal frame to one. That is, the attention of the hearer is now directed to the single most distinctive feature of an animal, rather than several ones. The change is reflected in the slot requirement depicted in the topmost Theme frame (see Figure 3.1b). This within--frame exclusiveness ought to be lenient in practice, because there are animals whose most distinguishing features are hard to single out. A horse is a good example for which the exclusiveness weakens to allow for a set of features. Perhaps many native speakers would argue that the long face is usually considered as its distinctive feature in the Japanese culture. It is acceptable, in our view, only in the metaphorical use inreference to the foolish look of someone, it is rather a minor feature about a horse per se.

There is another possibility that the within-frame exclusiveness mentioned above is unob-

served, since people are basically free to maintain their discourse space in a way they choose. Once (2.1) has called attention of the hearer to the nose/trunk of animals, there is no mandatory reason not for keeping the slot in a frame of an animal even if its distinctiveness accrues from something else. By doing so, one can cope with the change of contexts easily. Such 'temporary inappropriateness' may be indicated by masking such slot values like '*' in Figure 3.1b. These masked values can be specified later if needed.

The context considered above is rather broad in that any property could be mentioned as long as it makes an animal distinctive. Hence, it is possible that (2.1) resulted from somewhat extensive search and tests of slots/values. Alternatively, we may conjecture a value-restricted context in which the speaker attempts or is required to identify the slots that are long. In this case, the condition described in the Theme frame must be altered accordingly: SLOT(long). (A word spelled all in upper case is a variable to be instantiated.) It is this type of value--restricted search that makes (2.1) equivalent to an English expression such as

As far as elephants are concerned, they have a long nose/trunk.

"Concerning elephants, ..." and "As to elephants, ..." are also popular among proponents of the Theme-provoking effect of *wa*. In our view, the translation is appropriate only in this or similarly restricted context(s). Here, again, *ga* in (2.1) exerts the restrictive influence within each frame. If the speaker is not certain about the size of other parts of the elephant, he can repeat *wa* as in *"Zou-wa hana-wa nagai"*. However, the statement must be accompanied by the special tone and pause around *wa* as a sign of his awareness of the incompleteness of his answer. Let us call this use of the particle the hesitative *wa*.

Insert Figures 3.2a, b about here

3.3 Duality Exhibited in Separate Expressions

The dual roles of *wa* and *ga* explains the differences between (2.2) and (2.3) in terms of both within- and between-frame contrast. Before we discuss them, a short note about the particle *no* seems of interest. Despite its simple appearance, it signifies various relationships like 'of' in English. Of major importance is the indication of a part-whole relationship between

the mediated nouns or noun phrases (e.g., *zou-no hana*), a location (*tsukue-no ue*; on the desk), direction (*Tokyo-no nishi*; on or to the west of Tokyo), ownership (*watashi-no hon*; my book), an experiencer (*zou-no tanjou*; the birth of an elephant) and so forth, though, strictly speaking, the part-whole relation is reversed: i.e., whole-*no*-part in contrast to part-of-whole. Another interesting meaning will be introduced in the next chapter on the marked expressions. It goes without saying that identification of a role is to be achieved in practice by the general knowledge about the mediated nouns or noun phrases. Let us first examine the differences between (2.2) and (2.3) with respect to the within-frame contrast (see Figures 3.2a, b).

3.3.1 *Within-frame effects of (2.2) and (2.3)*

In light of the slot requirement, described in the Theme frame, (2.2) informs the hearer that the 'nose/trunk(long)' is a most notable feature about an elephant, implying other possibilities by *wa* like the shape and the size of the tusk, ears, body, food habitat and so forth. The implications may be either later clarified by the speaker or left to the imagination of the hearer (Figure 3.2a-i). The more specific the context is, the narrower the range of plausible implications will be. Like the case for (2.1), for instance, when a particular dimension of the slot value is at issue, i.e., length, comparisons of other slots prompted by *wa* in (2.2) will be so constrained (Figure 3.2a-ii). Of these comparisons, only the latter, dimension-restricted type, has relevance to (2.3). This and other kinds of constraints on search are presumably documented in the Theme frame of the cluster.

The inhibitory effect of *ga* in (2.3) leaves, in principle, only the nose/trunk slot in the elephant frame (Figure 3.2b-i) with the stated value, i.e., long. However, in practice, the effect tends to be moderate, permitting other slots to remain with their values nullified as long as the length of parts is concerned (marked by '_' in Figure 3.2b-ii). In other words, further considerations of these slots, if they arise, are permissible only in the dimensions other than length. It must be noted that there is no such dimensional restriction on the temporary masking of slot values mentioned in connection with (2.1). If the speaker intends to avoid the moderate effect to result, he must state (2.3) with particular tonic patterns such as stress, intonation and pause as well as non-verbal cues.

Insert Figures 3.3a, b about here

3.3.2 *Between-frame effects of (2.2) and (2.3)*

Next, we turn to the between-frame effects of (2.2) and (2.3). The former, due to *wa*, stimulates inspection of notable features of other animals, virtually with no conditions on the values of the slots and their dimensions. It may happen that reference to the length in (2.2) exerts a priming effect in guiding the inspection process, but deviation from it will be barely considered as a violation of expectation. The effect of (2.3) is quite contrary: it is exclusive not only about the frame to be selected under the Theme, but about the slot and its value allowed in it. That is, when the effect is complete or strong, <elephant, nose/trunk(long)> is the only legitimate frame under the Theme (Figure 3.3b-i). Two things must be noted here. First, the inhibitory effect of *ga* in (2.3) is usually less than perfect. Therefore, there are chances for the other frames and slots to remain in the central cluster on condition that the values of these slots are nullified with respect to length (Figure 3.3b-ii). As explained earlier, nullification is effective only in the dimension referred to in a given statement. It must be clear by now that the so-called exhaustive listing role of *ga* (e.g., Kuno, 1972, 1973a,b; Kuroda, 1964) is limited to the strong effect of the present analysis that eliminates slots or frames other than the one explicitly mentioned. Second, (2.3) is the most likely response to the specific inquiry about the identification of the part of the animals that is truly long. Interestingly, (2.2) is also possible in this context, but the speaker is lacks confidence about the appropriateness of his answer. Hence, it must be stated with the hesitative *wa*.

Before closing this chapter, we should make a brief note on the short forms of (2.1) and (2.2), or (2.3), "*Zou-wa* (or *ga*) *nagai*," in which the slot name "nose/trunk" is omitted owing to the speaker's expectation that the hearer can fill it. All the effects of *wa* and *ga* discussed above apply to the short forms as well. Hence, no particular discussion will be made on the short forms in the next chapter on the marked expressions.

4. Illustration of the Cognitive Effects: marked expressions

As briefly explained in Chapter 2, we regard a Japanese sentence as unmarked if a frame name (A), a slot name (B) and its value (C) appear in the expression in this order. An expression in any other order is treated as marked. We will designate three basic marked forms by the first element to appear in the actual utterance; forms A, B and C. Concerning the Type I. in Table 2.1, an example of the marked form A is

"A-*de* C-*no*-{*wa, ga*} B"

where terms in braces are used alternately. However, inclusion of the particle *de* or any word besides *wa*, *ga* and *no* in analysis will result in an awfully lengthy paper. It is our hope that the restriction on the words, accompanying frame, slot and its value, to *wa*, *ga* and *no* helps clarify the central points. For this reason, the marked form A is not included in the table.

Before we move to the discussion of the marked expressions, let us make a brief note about the interesting roles of the word *no*. In addition to the roles referred to in section 3.3, linking a noun (phrase) to an adjective is an important postpositional use in specifying the attribute of an object: *hana-no shiroi zou* (an elephant whose trunk is white). The similar word linkage appears in (3.2) and (3.3) below in which the phrase "*hana-no nagai*" is immediately followed by *no-wa* and *no-ga*, respectively. The underscored *no* is comparable to the pronominal "one" in English, though some prefer to classify it as a quasi-noun. Simple as it is in appearance, the word is so rich in meaning that its full explication will require more than an entire book. For the discussion below, however, these brief remarks will suffice.

4.1 Form B

There are four variants of form B:

(4.1) *Hana-wa zou-ga nagai*;

(4.2) *Hana-no nagai-no-wa zou-da*;

(4.3) *Hana-no nagai-no-ga zou-da*;

(4.4) *Hana-ga nagai-no-wa zou-da.*

Among others, the most plausible context consists of a speaker and a hearer who are watching different kinds of animals before them. The observed objects need not be real. For example,

toys, photographs, sketches or even icons on a computer screen serve the purpose. The underlying premise is that the slot-oriented information processing is relatively hard to perform in the absence of concrete objects in comparison to the frame-oriented one in the unmarked expressions. Notice that the latter is, in principle, suitable for processing the generic knowledge. The same holds for the slot-value-oriented identification tasks discussed in the next section.

Inclusion of the perception of external objects in our discussion makes it necessary to modify our figurative presentation scheme which has been chracter-based so far. In accordance with the illustrative purpose of the present chapter, we will simply show a set of new elements by circles, along with the frame clusters, for the representations of perceived objects. A link between an element and a frame will be shown by an arrow-headed line. Perhaps, it will be formally more appropriate to set a special slot in the frame for the link. However, simplicity is preferred to complexity at present.

Now suppose the speaker is motivated to compare the parts of the animals with respect to, for instance, size, length or shape. Then, (4.1) informs the hearer that, concerning the nose, the elephants have a particularly long one. On account of the contrast prohibitive effect of *ga, zou* (elephant) is understood to be the sole animal to be referred to in connection with *hana* (nose/trunk). The contrast promotive *wa*, on the other hand, leads the hearer to expect further statements about a different part of the objects before him. For instance,

Kubi-wa kirin-ga nagai. (Concerning a neck, giraffes have a long one.)

Although (2.1) and (4.1) share the same syntactical structure, the moderate effect of *ga* hardly occurs in the latter. There is little possibility or expectation that further mentioning follows (4.1) about the selected slot unless the current theme changes. It is hoped that the assertion will be empirically validated under some strict experimental conditions to demonstrate the difference in the prohibitive strength of *ga* in the frame- and slot-oriented statements. We believe that the part-whole relations between the preceding nouns plays an important role.

As a final note about (4.1), we should point out the irrelevance of the Given-New or Old--New notions associated with *wa* and *ga*. (4.1) is equally effective whether terms *zou* and

hana were both present in the hearer's discourse space or not. The effectiveness is unaffected even when neither of them are out of the space. If the speaker feels that the words are not retrievable from the hearer's memory or the objects are not yet noticed by the hearer, he can show the referents of the words. Or, the hearer can ask the speaker to do so.

Insert Figures 4.1 and 4.2 about here

The statements (4.2) and (4.3) provide further demonstration of the subtle, but unnegligible differences between *wa* and *ga* which will be most succinctly illustrated in the quesion--answer contexts. On the one hand, (4.2) is likely to be uttered when the speaker is asked to identify the different objects by name and he chooses to point up his remarks by the easily noticeable parts. "What are they?" or "Could you tell me the names of these animals?" are the typical interrogative sentences. That is, the objects are in the perceptual space of the questioner, but they are not yet linked to any entity in his discourse space. Usually contrast stimulating *wa* tends to make the hearer anticipate further statements to continue on the remaining objects, unless it is accompanied by a hesitating intonation and pause, i.e., the hesitative *wa*.

Insert Figures 4.3 and 4.4 about here

On the other hand, (4.3) is pertinent to a question like "Which is an elephant?" or "How can I find an elephant?" That is, (4.3) helps the hearer connect the word "*zou* (elephant)" already present in his discourse space to the perceived external, actual objects. The contrast inhibitory *ga* leaves an impression, in effect, that the long nose/trunk is the very, unequivocal trait of the elephants. This effect of *ga* will be enhanced, though the context slightly differs, by its repeated use: *Hana-ga nagai-no-ga zou-da.* The statement reflects the speaker's firm belief that an object lacking such a trait, by accident or any other cause, does not deserve the name.

Insert Figures 4.5 and 4.6 about here

It is of interest to note that (4.2) also occurs as a response to a specific request for the name of the object(s) with the long nose/trunk. Alternatively, the speaker can state (4.4), but this does not mean the two are totally equivalent. For the sake of simplicity, let us denote the present inquiry by <<FRAME, nose/trunk(long) ?>>, where the word in the upper case is a variable to be instantiated. Similarly, the one discussed earlier in connection with (4.2) is expressed as <<FRAME, SLOT(VALUE) ?>>. Apparently, this demands more information than the other one. To this, (4.4) is less likely to be given as compared with (4.2). The limited applicability of (4.4) probably stems from the restrictive nature of *ga*. Even if it is used in the earlier context, it tends to confine the range of the subsequent statement or expectation within *hana* (nose/trunk), whereas contrast-neutral *no* of (4.2) places no such restriction.

4.2 Form C

Like the form B, we can discern two variants of the unmarked form C depending on whether the frame name A immediately follows the slot value C or not. Among those listed below, (4.5) and (4.6) belong to the former, while (4.7) and (4.8) to the latter. The differences between these variants become apparent in the question-answer context. Needless to say, the question can be an imaginary one in the mind of the speaker owing to his keen perception of the information desired by the hearer. For simplicity, we will assume again that various kinds of animals are present at the discourse scene.

(4.5) *Nagai-no-wa zou-no hana-da.*

(4.6) *Nagai-no-ga zou-no hana-da.*

(4.7) *Nagai hana-wa zou-da.*

(4.8) *Nagai hana-ga zou-da.*

Roughly speaking, (4.5) and (4.6) inform the name of the long object, while (4.7) and (4.8) identify the owner of the long object.

To most native speakers (4.5) and (4.6) both probably appear unnatural at first sight on account of the necessary connection between the slot and its value in their general background knowledge about the elephants. The unnaturalness, however, lessens when the objects are

highly sophisticated iconic figures, pieces of a jigsaw puzzle or pieces of fossils. The value of the nose/trunk slot in these cases need not correspond to that associated with the real elephants. Therefore, even in the dimension of length, C can take any value beside "long." In other words, the descriptions are individuated, or instance-oriented, whereas the aforementioned examples in forms A and B are principally class-oriented. Nevertheless, this should not be taken to mean that they are not suitable for the individuated descriptions. Similarly, the use of (4.5) and (4.6) are not restricted to the instance descriptions as will be explained shortly. But let us first explain them in the present context.

Insert Figures 4.5, and 4.6 about here

Statement (4.5) is likely to arise when the speaker is motivated to tell the hearer the name of the objects before them by the noticeable features (Figure 4.5). The contrast promotive *wa* of (4.5) reflects the willingness of the speaker to make reference to other objects as well. As has been repeatedly mentioned, however, the speaker can indicate his lack of assuredness and, thus, evade the expectation of further remarks by the hesitative *wa*. The same applies to (4.7). Though both (4.5) and (4.6) involve comparisons of multiple objects, the latter is appropriate when the attention of the speaker is directed specifically to the nose/trunk of an elephant possibly prompted by a question like "Which is the nose/trunk of an elephant?" In other words, his task is to link the frame-slot to an external object by mentioning the slot value. If the effect of exclusion is strong (Figure 4.6), the identification task ends at this point.

It is not our intention to leave an impression that (4.5) and (4.6) would occur only in the presence of external objects. Actually, both may be uttered even without such objects in different contexts. First, (4.5) is a relevant response to the request for comparing parts of the animals with respect to length. Such comparisons need not require external objects, provided that the participants of the discourse share the same imaginative faculty. As is clear from previous discussions, the contrast promotive *wa* makes the hearer to expect further statements to follow with regard to the slot values in the same dimension (e.g., short) or related ones (e.g., big, small and so forth). And, the expectation will be somewhat suppressed, if (4.5) is

accompanied by a hesitative tone, particularly around *wa*. A careful reader may recall that the similar effect was noted earlier about (2.3). This poses a stimulating question as to the interaction between the particles, *w*a and *g*a, and the form of *t*he statements. Notice the exclusiveness is implied in the above explanation. That is, the nose/trunk is the sole long item in the mind of the to the speaker. However, the exclusiveness tends to be more moderate than (2.3) according to our observations. In addition, if a statement given in the form of A-*no* B-*ga* C, e.g., (2.3), is felt wrong, the speaker can state (4.5) to correct it. But the reverse is hardly acceptable. The asymmetry deserves closer investigation in future.

Second, suppose the attention of the speaker and the speaker is directed to the distinctive attribute of some parts of an elephant. Then, the contrast prohibitive *ga* of (4.6) helps the speaker express his belief about the unequivocal property of the nose/trunk of an elephant, i.e., being long. It is so essential to him that an item lacking the trait is unthinkable or unacceptable as an elephant's nose/trunk. The similar effect was noted earlier in connection with (4.3) in which the very trait of an elephant as a whole was described by first mentioning its part and the value. The difference between (4.3) and (4.6) lies, hence, in the level of attention, i.e., a part or a whole.

Insert Figures 4.7 and 4.8 about here

Our final examples (4.7) and (4.8) are both instance-oriented like the first interpretations of (4.5) and (4.6). To make the point clear, it seems better to change the slot value from that generally applicable at the class level, nagai (long), to mo*re in*stance specific one. That is, adopt an idiosyncratic value in place of one common to almost all the instances of a class. Alternatively, we can replace the slot to a more general one shared by many other animals, like kiba (a tusk):

(4.7') *Nagai kiba*-wa *zou-(no)-da.*

(4.8') *Nagai kiba-ga zou-(no)-da.*

Suppose that there are tusks of various length, color and shapes, along with other objects, lying at the scene of the discourse, and that the speaker is asked to which animals they belong.

Then, (4.7') informs the owner of a long tusk (or tusks), *wa* indicating the continuation of the identification process (Figure 4.7). As has been repeatedly noted, such indication may be avoided by the hesitative *wa*, if he lacks assuredness of his knowledge or for other reasons. In practice, a short form with pronominal *no*

(4.7") *Nagai no-wa zou-(no)-da.*

is perhaps natural as compared to (4.7') if that the scene consists solely of tusks or the attention of the parties are exclusively focused on them among others. The same holds for (4.8') which will arise as a response to a question like "Which one belongs to an elephant?" or "Which tusk belongs to an elephant?". Hence, the task of the speaker, in the former question <<elephant, SLOT(VALUE)?>>, is to link an external object to the elephant frame, filling the slot and its value, while the slot is already clear in the latter (Figure 4.8). Similarly, (4.7') is an attempt to fill a slot name and its value along with a frame name, linking with an external object. However, in a special case, as noted above, the slot is obvious from the context.

5. Discussion

Even with all this elaboration, we have explored only a small portion of the problems associated with *wa* and *ga* among other interesting properties of the Japanese language. Our assertions must be interpreted conditionally, since there are numerous possibilities of contexts pertinent to the sentences analyzed. Also, *wa* and *ga* may exert roles unexplained in the present work, when other particles are allowed to precede these, e.g., *to*, *ni* and *de*. Nevertheless, it is our modest hope a) that the tenet of our argument applies, at least, to the relationships <whole, part(attribute)>, and b) that the frame system is a powerful device to represent cognitive effects of communication. The work by Ikeda (1989) is another attempt to explain the cognitive roles of *wa* and *ga*. He posits that *Wa* presents to the hearer a domain of object(s), a part of his world model, while *ga* calls attention to the particular element(s) or aspect(s) of the object(s). This is in good harmony with our basic tenet as long as unmarked expressions are concerned. The discrepancy concerning the unmarked statements deserve further investigation. It could have arisen from the way in which we organized the frames and their

clusters to reflect stable patterns of knowledge about objects. It is tempting to conceive an embedded frame structure from which a person can unfold multiple frames when necessary like the knowledge of a specialist. Similarly, it is of interest to develop a representational scheme to deal with statement about scenes with both spatial and temporal aspects. Obviously much to be done with the present simple version of frame representation. This is part of the reasons why Table 2.1 does not contain scene descriptions.

Confusion about the analysis of *wa* and *ga* is partly due to the lack of neutral descriptive device (e.g., frames as adopted here), and also to the unfortunate misinheritance, if misunderstanding sounds too critical, of the Mathesius' original idea about the Theme and Rheme, (that are known and new to the hearer, respectively), among students of the functional grammar: Their belief about the Theme-Rheme order was one-sided, and linkage of information to the the concepts Given and New narrowed the scope of analysis. We have shown that much wider range of effects can be examined by dissociating the concept of information from the Given-New distinction. We also repeatedly indicated the lack of necessary connection of *wa* and *ga* to the Given-New. Some would argue against this, quoting somewhat popular 'evidence' of how children's stories usually start: *Mukashi-mukashi arutokoro-ni ojii-san-to obah-san-ga sunde-imashita* (Once upon a time, there lived an old man and a women in a place). They say that *ga* mark the characters as New. But it should be realized that children soon learn typical characters appearing in the stories they hear and acquire a 'story grammar' (e.g., Mandler, Johnson, 1977; Thorndyke, 1978) which contains a node or a category for the main characters. In the present terminology, children process a story according an acquired story frame structure which contains the slot of the main character(s). The starting phrase quoted above informs children the values to fill the slot in an exclusive manner. Here the exclusiveness in fulfilling the hearer's expectation is the key factor, but not newness. We can present similar counter-evidence against the popular belief about *ga* as a marker of the New in, for instance, *Dare-ga mita-no-ka* (Who saw it?), *Nani-ga attano-ka* (What happened?). However, due to the limit of space, the discussion of this use must be left to another paper.

In lieu of summary, let us emphasize that the present approach helped to clarify the principal roles of *wa* and *ga*, i.e., contrast facilitation and inhibition, respectively. In practice, the

speaker can modify their effects: Hesitative use of *wa* is a way to avoid expectation of the hearer for more information. Concerning the contrast inhibition, the speaker can modulate the effect to keep the hearer's discourse space ready for further comments or changes of the Theme. It goes without saying that ensuing statements under this moderate effect must comply with the restrictions discussed in the text, e.g., dimensions of the permissible slots. The restrictive nature of *ga* makes possible interesting use of the marked expressions: The speaker can point out the very, unequivocal trait of an object, be it a slot or a slot-value. This interesting application of *ga* as well as the modulation of the effects of *wa* and *ga* were scarcely noted in the previous studies.

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Table 2.1 Four major types for expressing the selected frame contents

Type I: Slot B is a part of frame A

examples

part-whole relationship: <<*zou, hana(nagai)*>> <<elephant, trunk(long)>>

<<*zou, mimi(ookii)*>> <<elephant, ear(large)>>

unmarked order

full form	'A B C'	"A-*wa* B-*ga* C", "A-*no* B-{*wa, ga*} C"
short form	'A ϕ C'	"A-{*wa, ga*} C"

marked order

full form B	'B A C'	"B-*wa* A-*ga* C"
	'B C A'	"B-*ga* C-*no-wa* A", "B-*no* C-*no*-{*wa, ga*} A"
full form C	'C A B'	"C-*no*-{*wa, ga*} A--*no* B"
	'C B A'	"C B-{*wa, ga*} A"
short form	'C ϕ A'	"C-*no*-{*wa, ga*} A"

Type II: Slot B pertains to the class relationship or capability of A

examples

class relationship: <<*zou, ichi-rei(honyuu-rui)*>> <<elephant, instance-of(mammal)>>

capacity: <<*kare, tokui(tenisu)*>> <<he, competence(tennis)>>

<<*Hiroshima, honba(kaki)*>> <<Hiroshima, home(oyster)>>

unmarked order

full form	'A C B'	"A-{*wa, ga*} C-*no* B"
short form	'A ϕ C'	"A-{*wa, ga*} C"

marked order

full form C	'C A B'	"C-*wa* A-*ga* B"
	'C B A'	"C-*no* B-*wa* A"
short form	'C ϕ A'	"C-*wa* A"

(Table 2.1 continues)

(Table 2.1 continues)

Type III: Slot B pertains to mental or physical states of A in relation to C

examples

mental state: <<*Kare, suki*(*tenisu*)>> <<he, like(tennis)>>

physical state: <<*kare, motsu*(*kaban*)>> <<he, carry(bag)>>

unmarked order

full form	'A C B'	"A-*wa* C-*ga* B", "A-*ga* C-*wo* B"
short form	'A ϕ C'	"A-{*wa, ga*} C"

marked order

full form C	'C A B'	"C-*wa* A-*ga* B"
full form	'C B A'	"C-*ga* B-*no-wa* A"
short form	'C ϕ A'	"C-*wa* A"

Type IV: Slot B pertains to the administartive status of A

examples

administrative status: <<*Tokyo, shuto*(*Nihon*)>> <<Tokyo, capital_of(Japan)>>

unmarked order

full form	'A C B'	"A-{*wa, ga*} B-no C"
short form	'A ϕ B'	"A-{*wa, ga*} B"
	'A C ϕ'	"A-{*wa, ga*} C"

marked order

full form	'C A B'	"C-*wa* A-*ga* B"
	'C B A'	"C-*no* B-{*wa, ga*} A"
short form B	'B A'	"B-*wa* A"
short form C	'C A'	"C-{*wa, ga*} A"

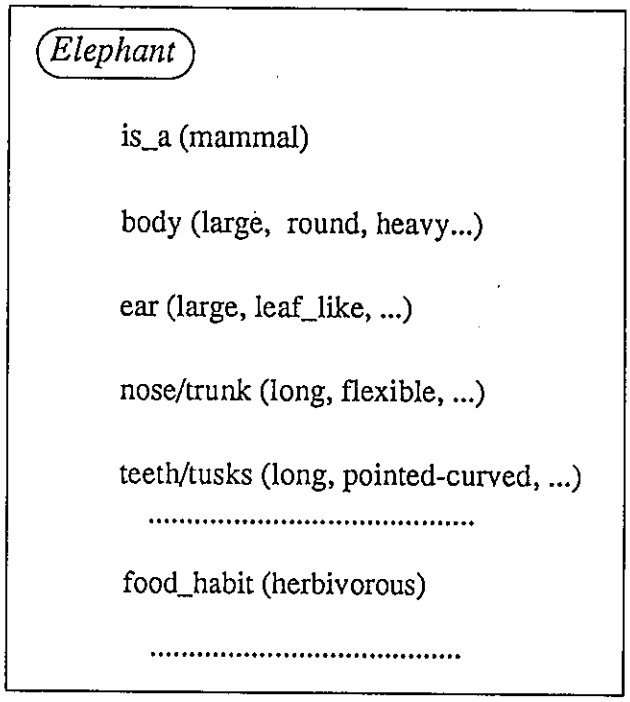


Figure 2.1b A simplified elephant frame

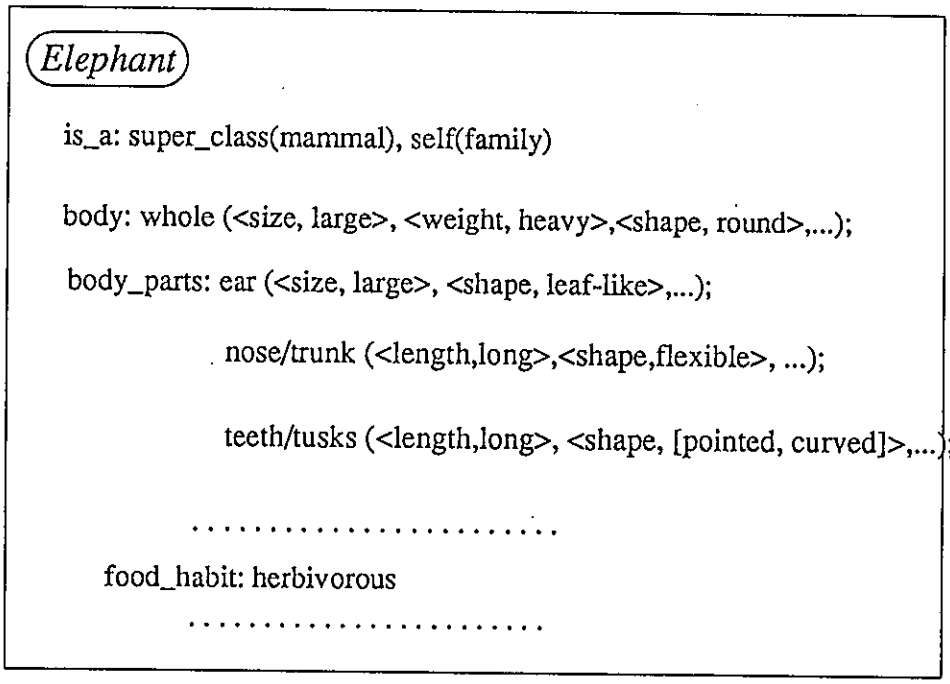


Figure 2.1a An example of the elephant frame

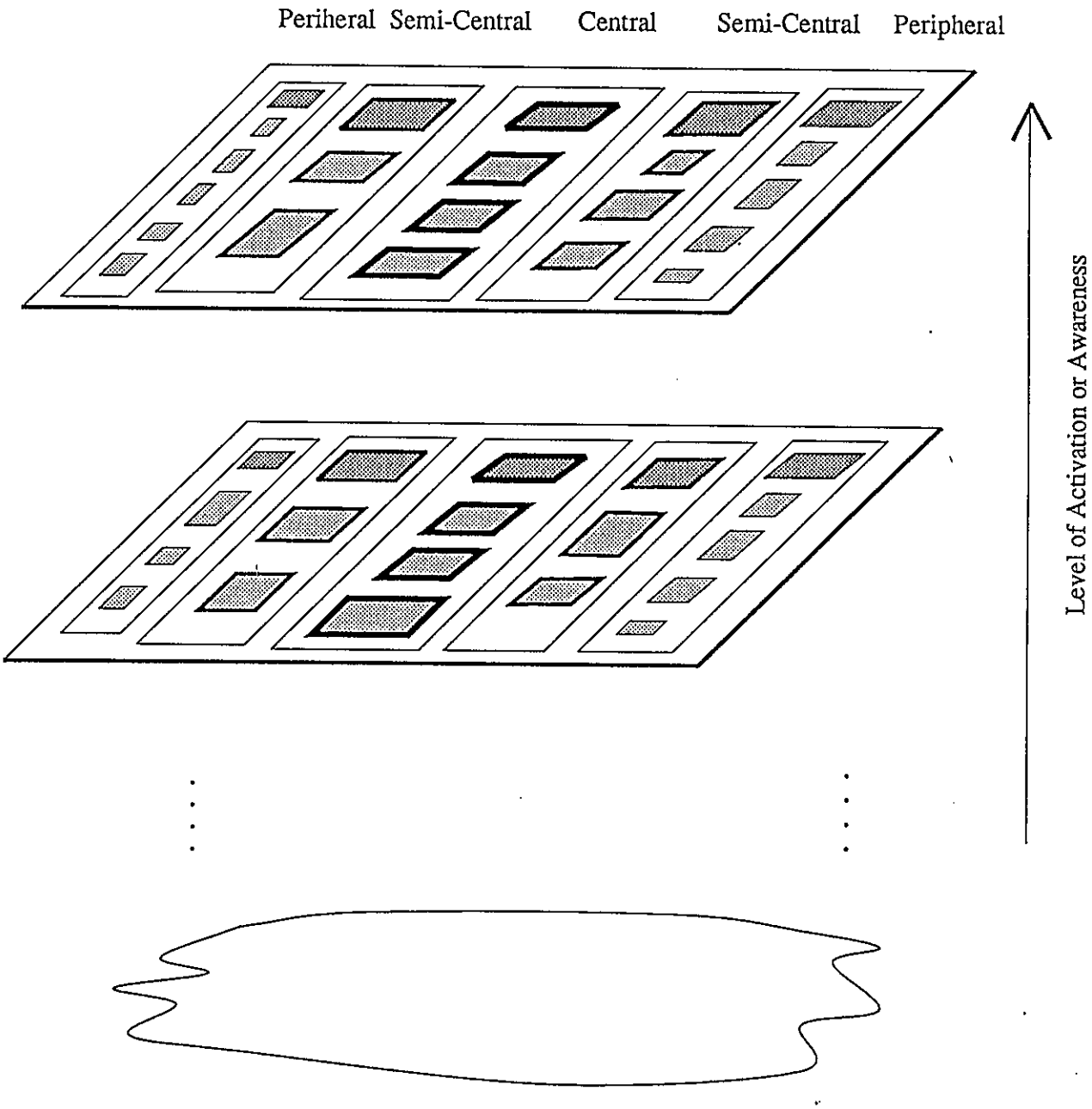


Figure 2.2 Frames in Discourse Space

Note: Information about the cluster is contained in its topmost frame.

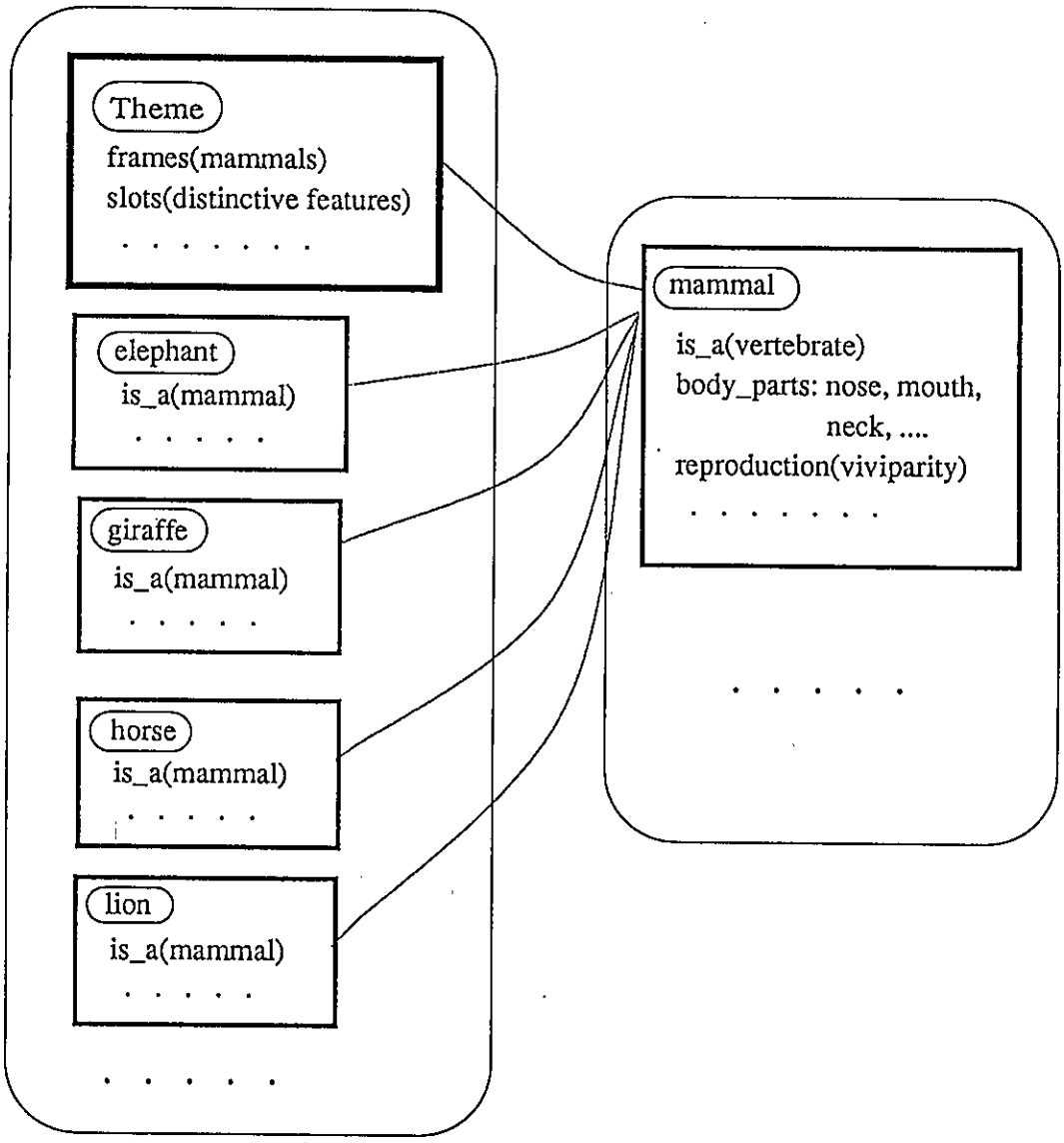


Figure 3.1a Topics introduced under the central Theme and the related mammal frame

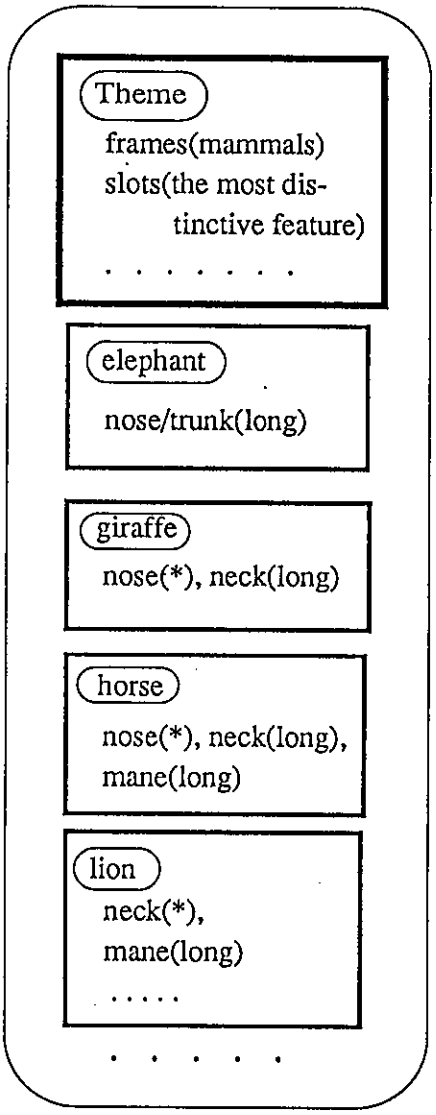


Figure 3.1b Frames resulting from (2.1)

Note: Is_a slots are omitted for simplicity.

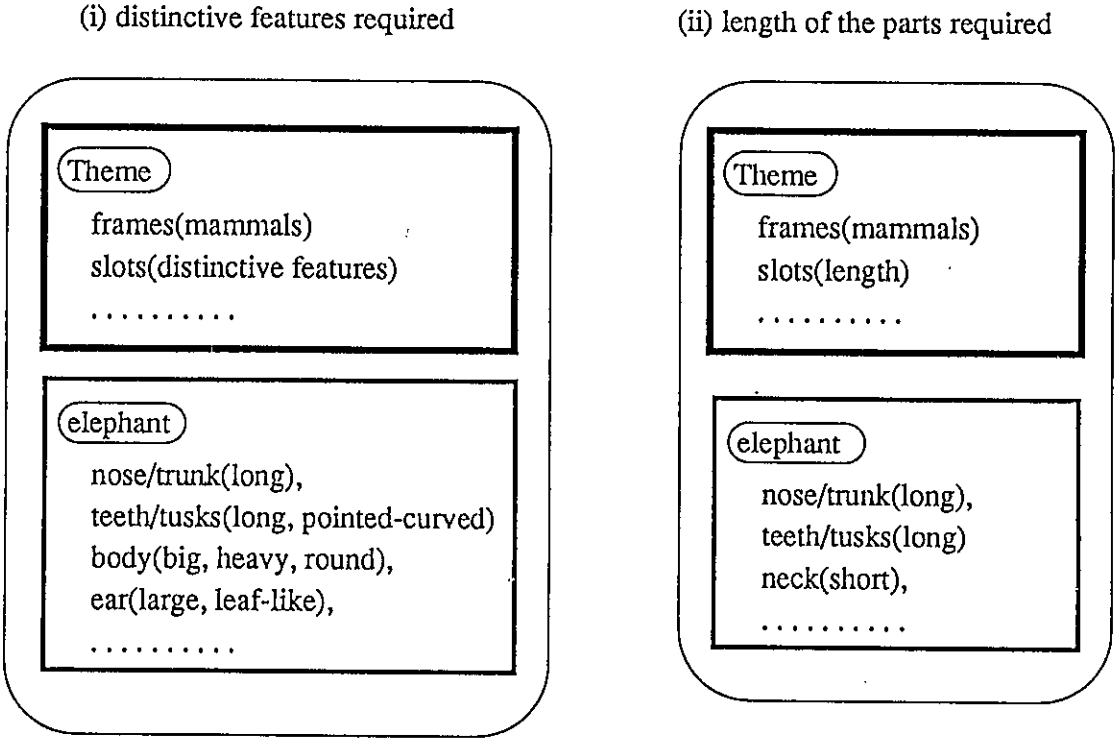
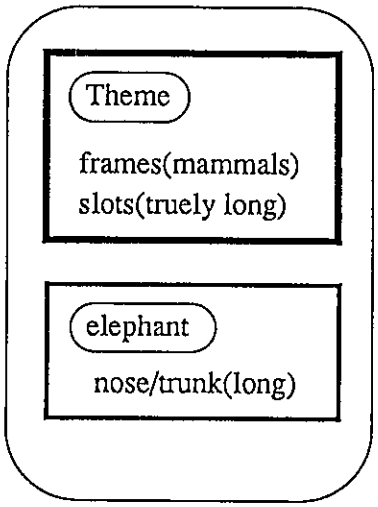


Figure 3.2a Within-Frame Contrast due to (2.2)

(i) strong restriction



(ii) moderate restriction

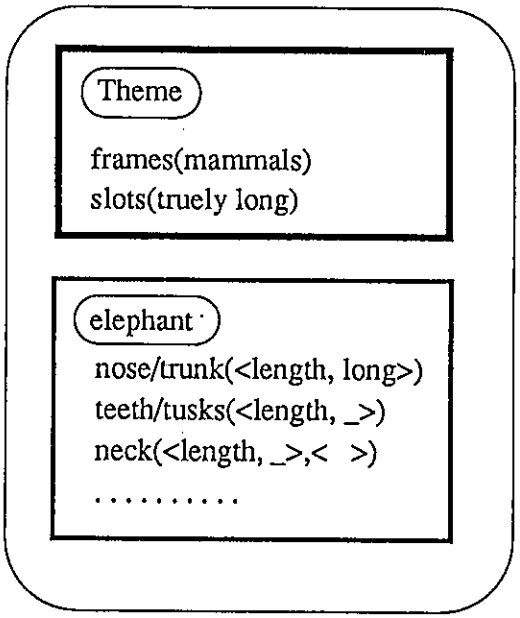


Figure 3.2b Within-Frame Contrast due to (2.3)

Note: _ denotes a nullfied value.

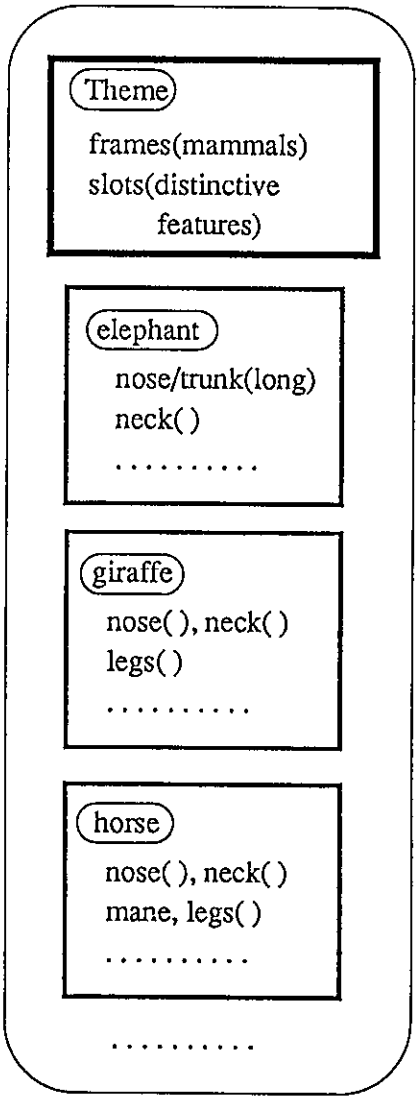


Figure 3.3a Contrast of Frames due to (2.2)

Note: ( ) indicates that values are to be filled.

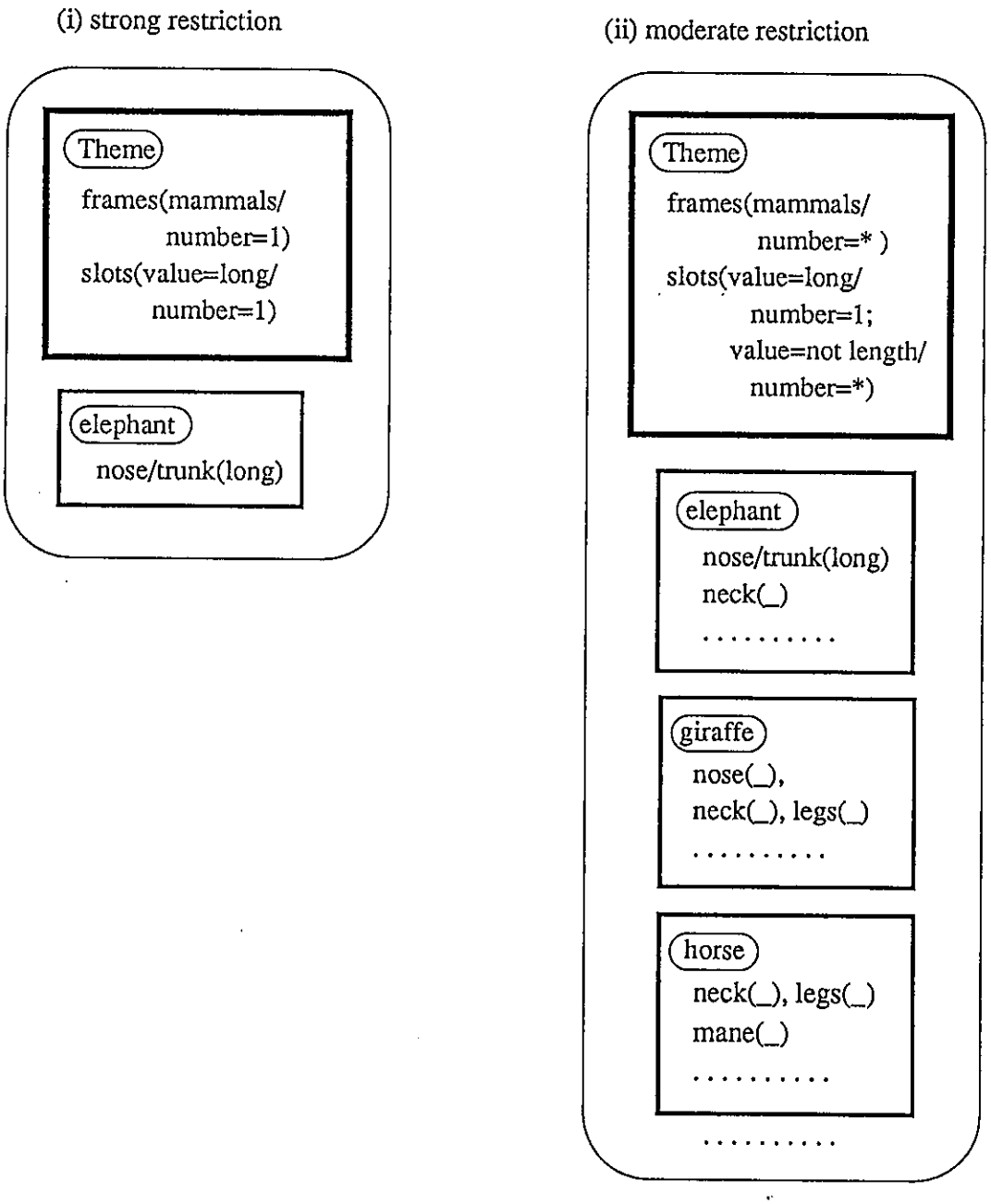


Figure 3.3b Contrast of Frames due to (2.3)

Note: _ indicates a nullified value.

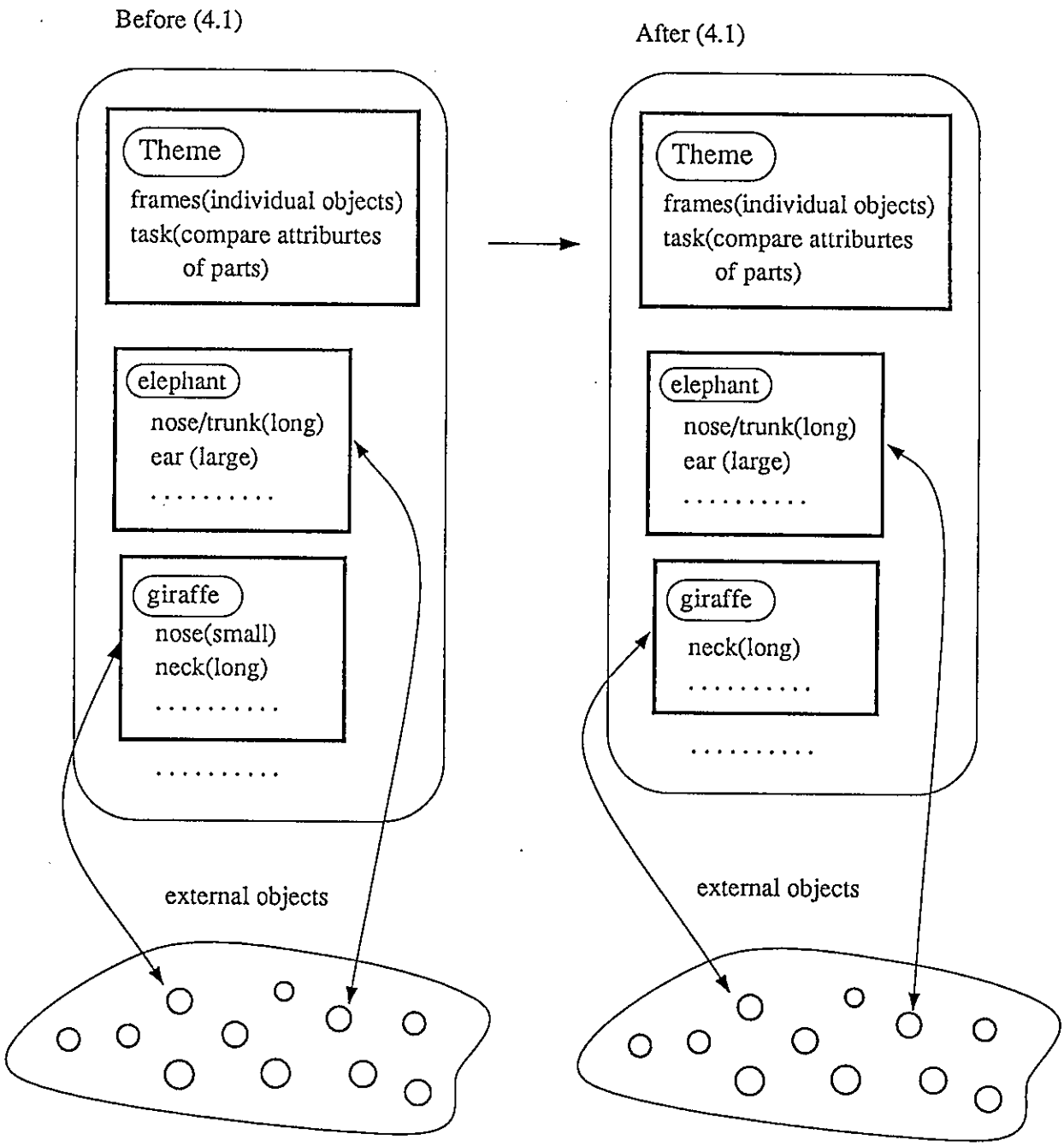


Figure 4.1 Changes in the Contrasted Frames due to (4.1)

[Note] The nose slot of the giraffe has been removed.

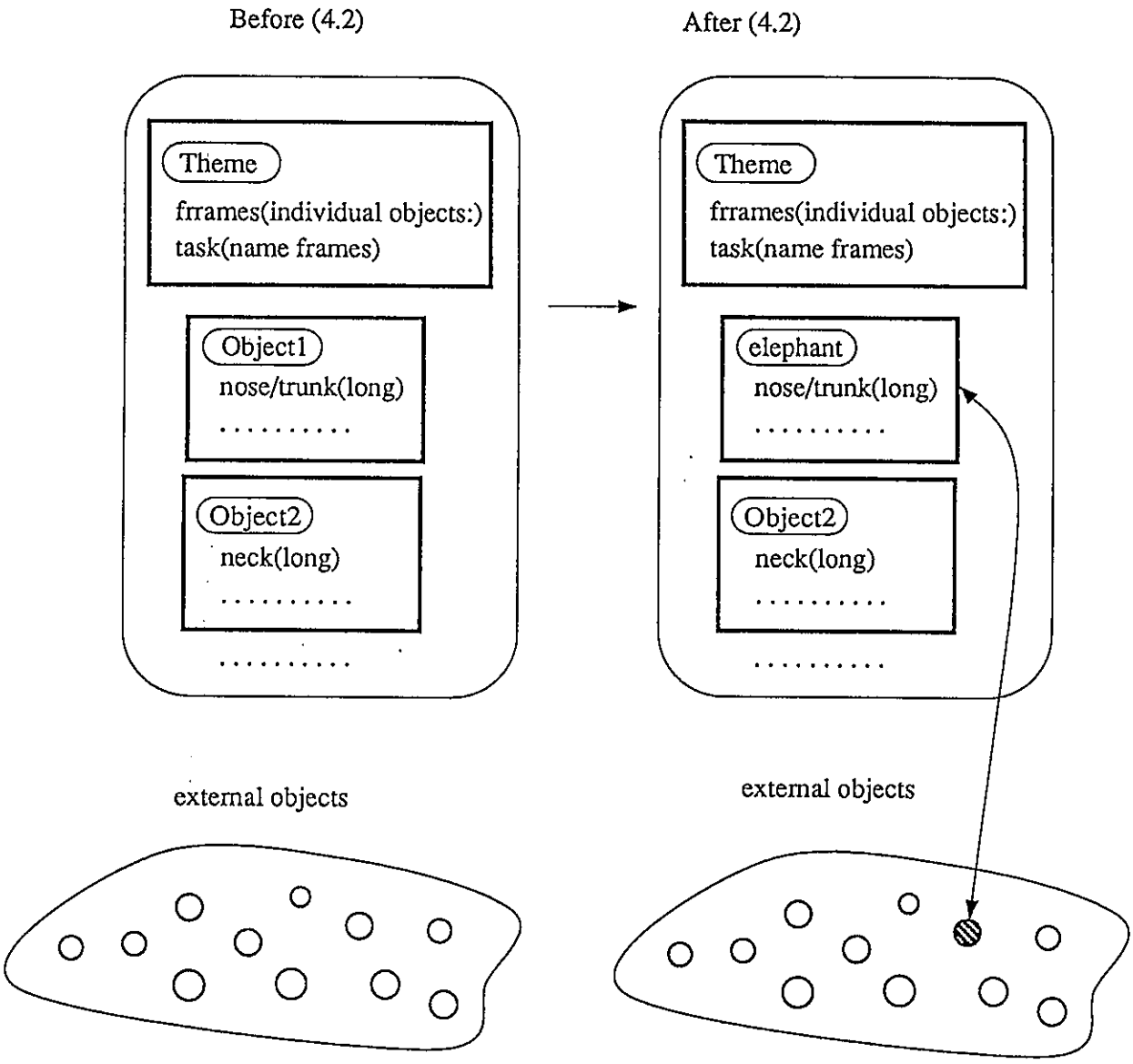


Figure 4.2 Changes in the Contrasted Frames due to (4.2)

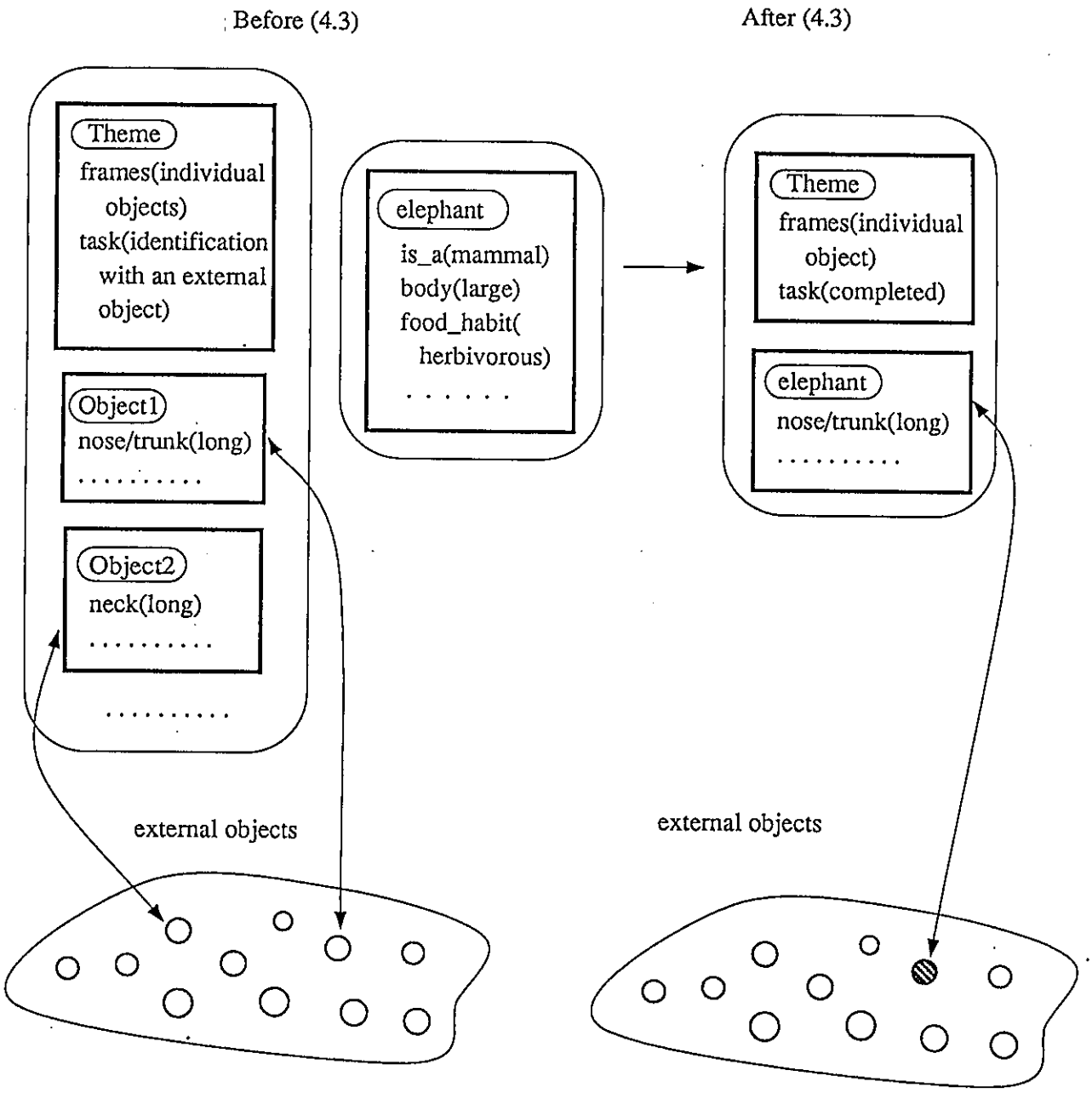


Figure 4.3 Changes in the Contrasted Frames due to (4.3)

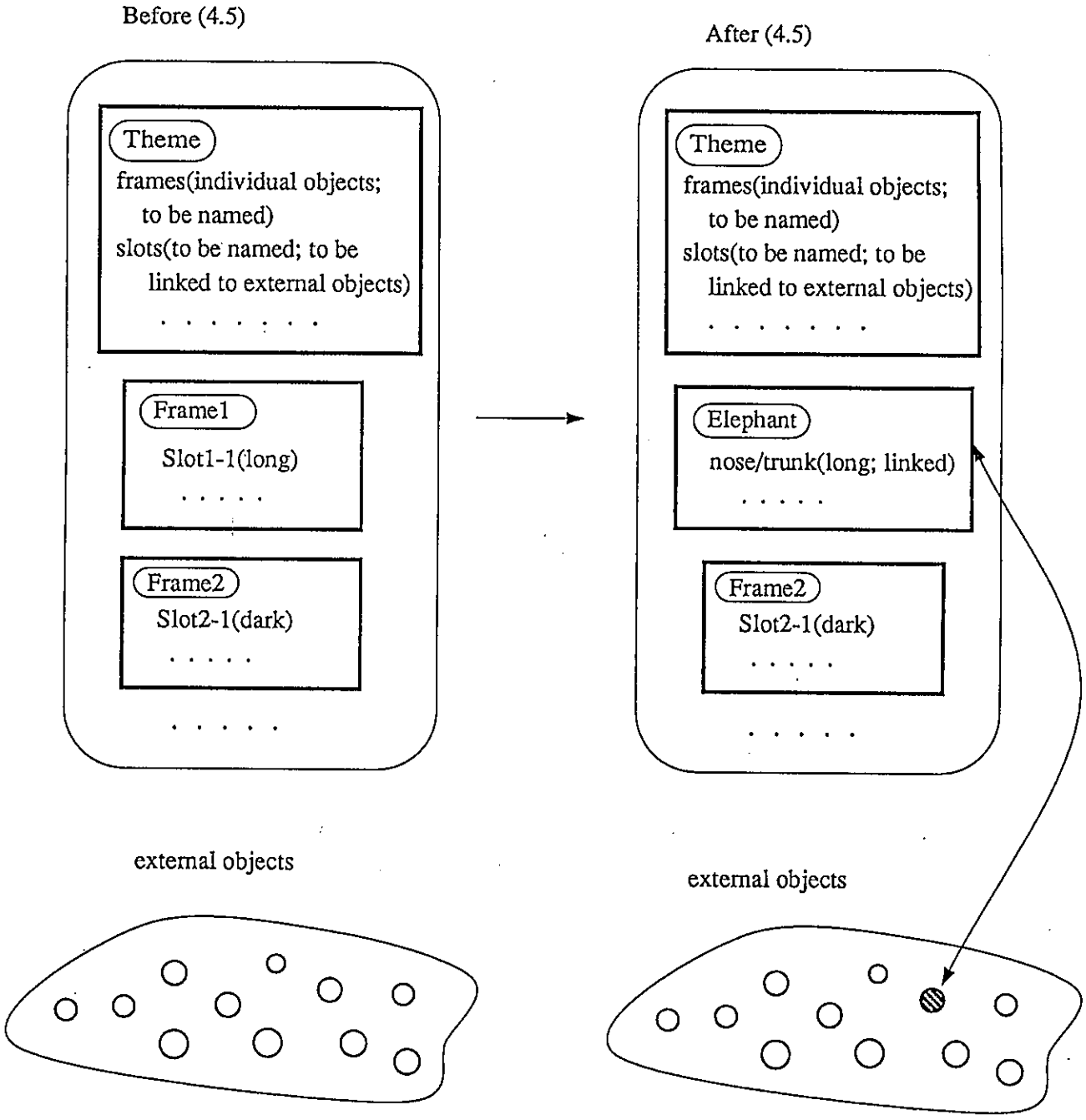


Figure 4.5 Frame changes dut to (4.5)

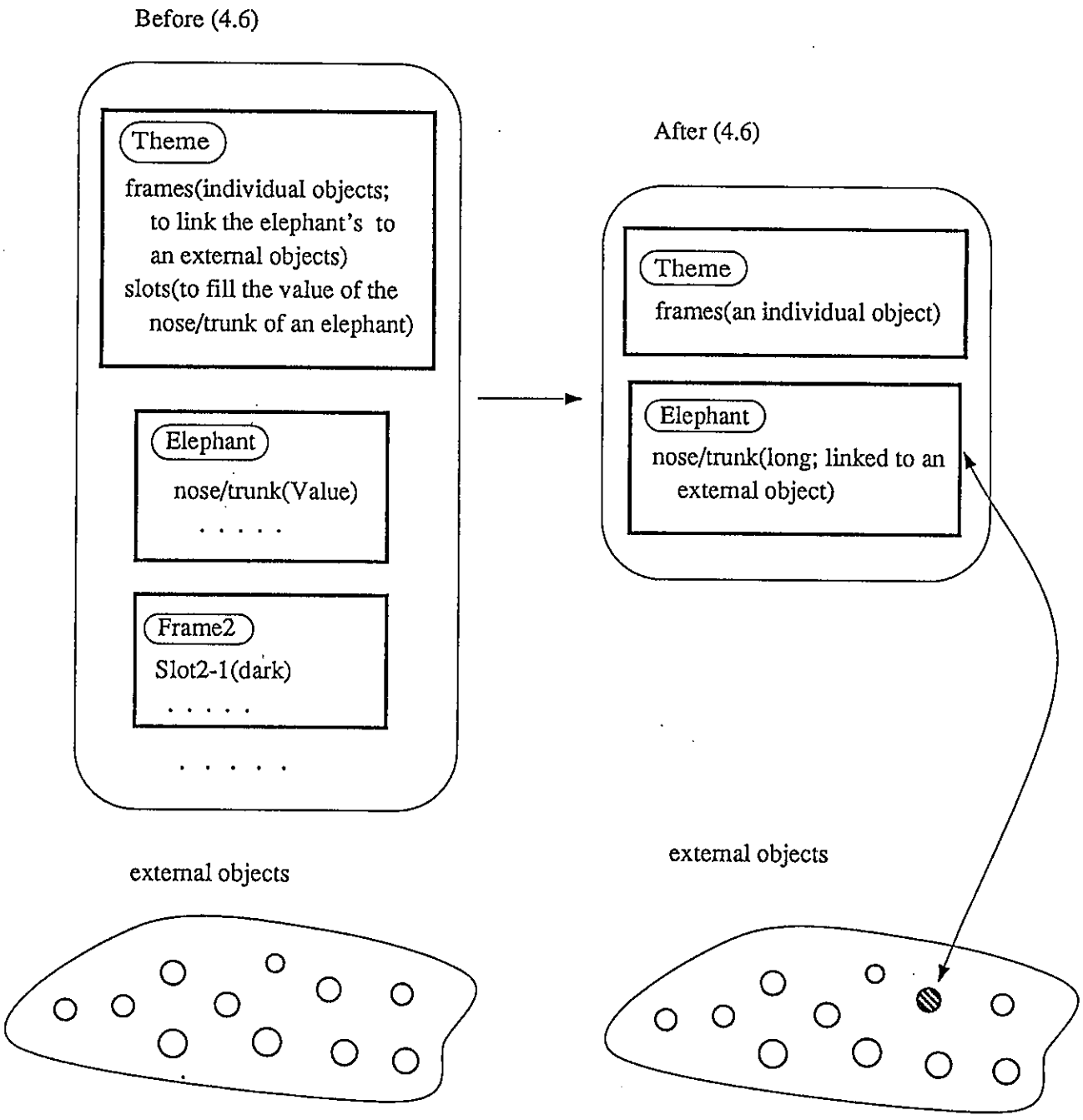


Figure 4.6 Frame changes due to (4.6)

Nagai-no-ga Zou-no Hana-da

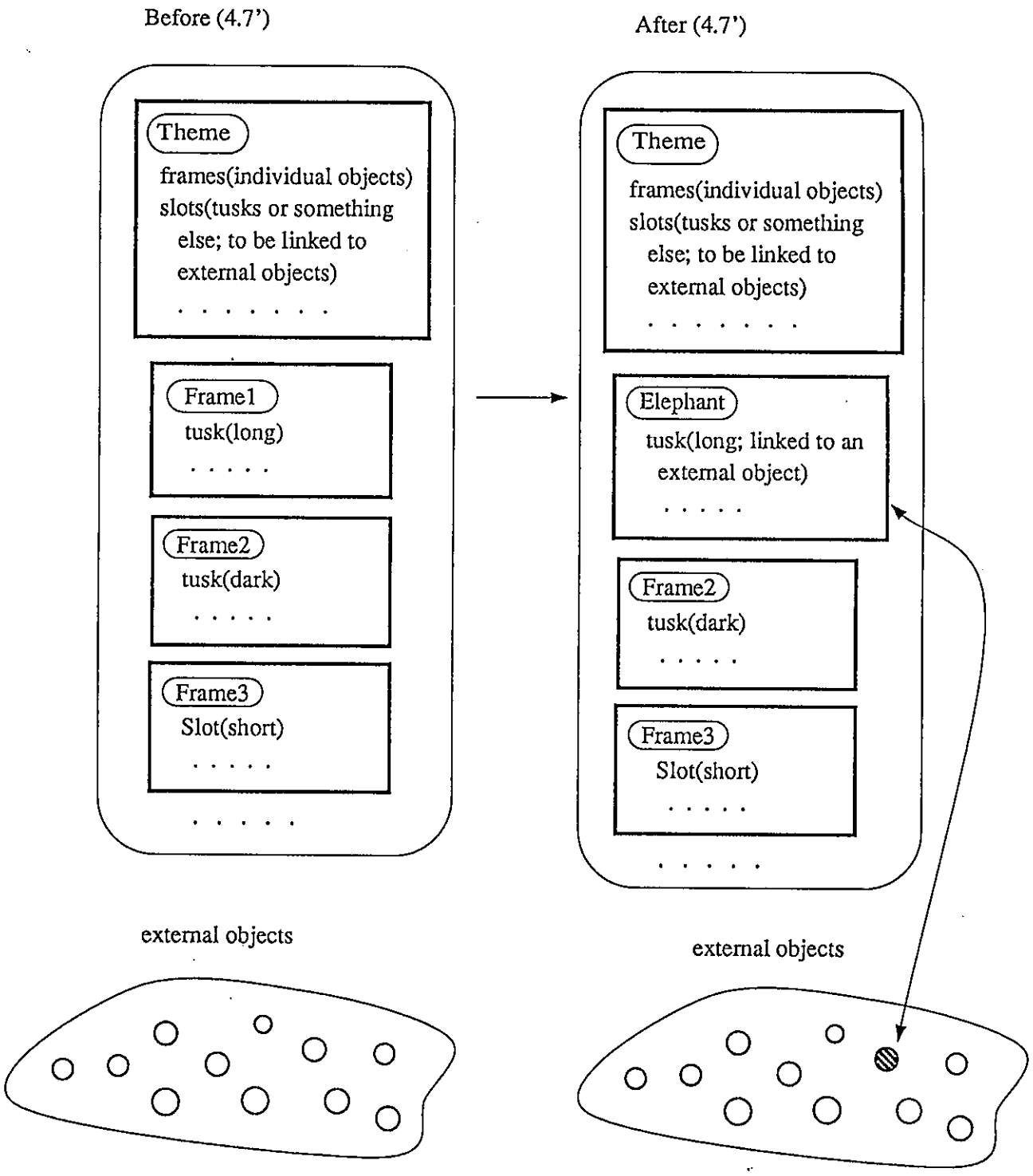


Figure 4.7 Effects of (4.7')

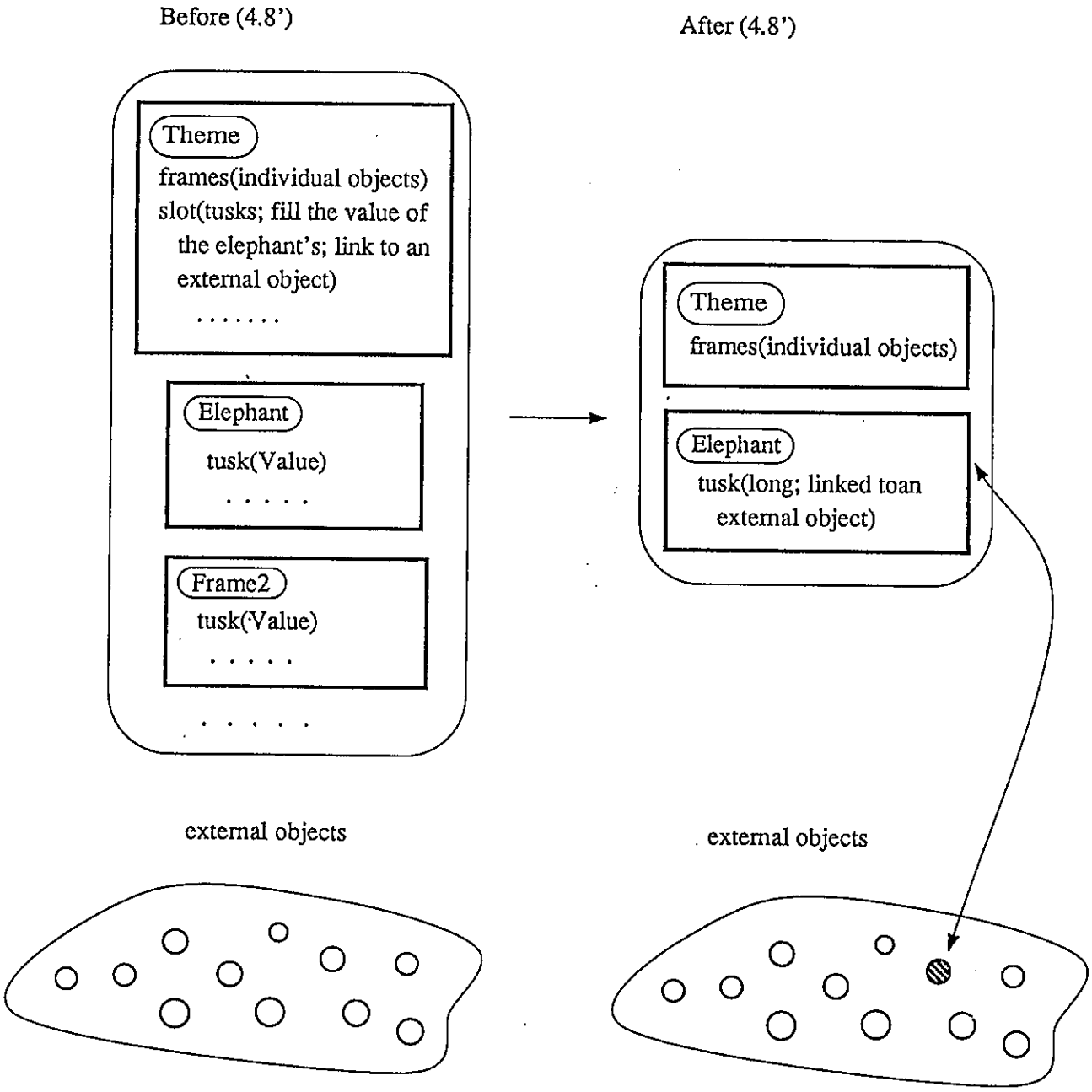


Figure 4.8 Effects of (4.8')