ON THE VERB-FORMING PREFIX *UN-*

SHIGEYASU SAWADA

Takaoka College of Law

This paper offers a lexico-semantic analysis of the relationship between the verb-forming prefix *un-* and its base verb with the help of some notations proposed in Conceptual Semantics. It is shown how we can capture and represent the function of the prefix *un-* at the level of conceptual structure. By investigating recurrent patterns and restrictions on syntactic frames into which various classes of *un-*-prefixed verbs enter, we propose a certain rule responsible for specifying an effect on the conceptual structure of the base verb. A plausible explanation will also be given to the relationship between ordinary *un-*-prefixed verbs and denominal *un-*-prefixed verbs at the conceptual structure level.*

1. Introduction

In this article we draw attention to a narrow yet intriguing area of the relation of an affix to its base, centering around the nature of the verb-forming prefix *un-*. The fundamental assumptions on which we are based here are that the lexical entry of a predicate head has a certain form of lexico-semantic structure such that it reflects the syntactic behavior of arguments that the head takes, and that the addition of the prefix *un-*, or probably any derivational affix for that matter, can affect the lexico-semantic structure in a systematic way, yielding a new but related structure for the prefixed predicate.

Given these assumptions, we will explore two questions: what lexical items does the prefix *un-* attach to? and what effect does *un-* have on their lexico-semantic structure? Specifically, the first question concerns explicit specification of the lexico-semantic structure that is

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congruent with the effect of the prefix *un-* and the second, with the corresponding alteration process on it.

The lexico-semantic structure supposedly cannot be factored out just by peeking inside the word semantics. The goal can best be achieved by investigating the behavior of syntactic argument realizations of a given predicate. Thus our method depends to a large extent on the analysis of the patterns and restrictions of the syntactic frame in which the *un-*prefixed verb and its base are able to occur, which will be pursued within the framework of Conceptual Semantics proposed and continuously elaborated by Jackendoff's serial works.¹

The class of lexical items that can take *un-* as a verb-forming prefix appears to be divided into two distinct categories: one which derives a new verb by combining with a verb, as shown in *unbind*, *unwrap*, and *unfold*; and the other which converts a certain class of nouns into verbs with specifiable variation in meaning, as in *unleash*, *unmask*, and *unknot*. This paper also attempts to clarify the relationship between these two seemingly distinct yet related derivation processes, providing a possible account for how they are integrated at a level of conceptual structure.

The organization of the article is as follows: Section 2 discusses the lexical properties of verbs compatible with *un-* within the area of our interest. In section 3 we represent the properties in terms of Conceptual Semantics and argue that the relevant change in meaning concomitant with *un-*prefixation can be stated as a rule that alters part of the conceptual structure of the base verb in a specific way. In section 4, we classify the range of verbs compatible with *un-* into several types, showing that the rule to be proposed in section 3 provides a fairly good explanation of the behavior of their argument structures. Section 5 digresses slightly in considering the cognitive nature of the function of the prefix *un-*. Finally section 6 deals with the cases of denominal *un-*prefixed verbs and puts forward a plausible explanation of their derivation in the conceptual component.

2. Lexical properties of verbs that can take *un-*

To begin with, notice that the prefix *un-* is sensitive to the lexical meaning of the base, not the form itself. This is illustrated in the

¹ See Jackendoff (1983, 1987b, 1990), among others.

following sentences:

- (1) a. He rolled a scroll.
- b. He rolled a barrel.
- (2) a. He unrolled a scroll.
- b. *He unrolled a barrel.

As shown by the contrast in (2), the sense of *roll* described in (1a) is compatible with the prefix *un-*, whereas that in (1b) cannot be. Thus, under the present assumption, the immediate question arises as to what lexical structure can be associated with the addition of *un-*.

There is a clear difference in meaning between (1a) and (1b). The sentence (1a) indicates that he changed the shape of a scroll; (1b) means that he moved a barrel somewhere or turned it around an axis without implying any change of its shape. That is, *roll* in (1a) is characterized as a verb of change of state, while *roll* in (1b) belongs to the category of verbs of spatial movement. In fact, it has been argued that the prefix *un-* has the effect of reversing a result state entailed by the base verb, not an action itself.² This suggests that verbs compatible with *un-* must include the sense of a result state in their lexical structure.

There is some syntactic evidence for this. First, most, if not all, verbs that are allowed to combine with *un-* are easily associated with the particle *up*, conveying the sense of the lexically implied change of state being completed, as illustrated in (3).

- (3) a. He rolled up a rug.
- b. He folded up a large map
- c. He bent up a metal plate

Secondly, some of these verbs can be used in the frame V NP AP, as given in (4), where AP serves as a resultative predicate.³

- (4) a. He folded his jacket small.
- b. He rolled a piece of paper thin.

² See Marchand (1969) and Horn (1988).

³ As noted in Carrier and Randall (1992), acceptability judgments of resultatives vary across speakers. I asked three informants about these sentences. One of them, Californian, said these sound too redundant to be accepted. The second informant (from Nevada) found them to be barely acceptable. The third one (from Ohio) said that although both (4a) and (4b) sound awkward, (4a) sounds much better if an adjective is comparative, and that *roll thin* sounds more natural in the sense of 'make dough thin'.

While there have been a number of discussions on these predicates, there has been a fairly established consensus that the result phrase like this must be the argument of the predicate itself.⁴

In Conceptual Semantics, a conceptual constituent does not always correspond to a syntactic constituent, but if the syntactic argument is not linked to some position in conceptual structure, it fails to be licensed. Thus a syntactic argument, if it serves as a meaningful expression, must find its appropriate position in conceptual structure. Therefore, it can be argued that verbs compatible with *un-* have an appropriate position for a result sense in their conceptual structure. This could be borne out by the syntactic inhibition on co-occurrence of particles and resultative adjectives, as shown in (5).

- (5) a. *He folded up his jacket small.
b. *He rolled up the newspaper thin.

The inhibition can be easily accounted for if we assume that they are to be linked to the same position in conceptual structure.⁵

An important thing to notice here is that there are few verbs in the range of *un-*prefixed verbs which are capable of taking a resultative adjective. But this fact, it seems, does not suggest their incompatibility with resultative adjectives. Rather the reason for this incompatibility could be ascribed to the fact that there only exists a comparably limited stock of adjectives expressing a possible physical state that can be naturally entailed by a verbal action. Predicative adjectives seem to constitute a fairly rigid closed-class category, so it is likely that there is no suitable adjective expressing a certain physical state. Thus verbs like *bend* and *twist* do not take any resultative adjective. However, syntactically constructed expressions are not so constrained. Actually, verbs qualified for *un-*prefixation can be rather freely associated with a resulting state if it is expressed in a prepositional form, just as given in (6).

- (6) a. He folded a piece of paper into a craft crane.
b. He bent the iron rod into a hoop.
c. He twisted the wire into a human shape.

From these examples we see that those verbs which do not take a

⁴ Notice that the class of resultative adjectives at issue here is a very limited one, i.e., those that a predicate head lexically implies. For classification of resultatives, see Sato (1987), Yamada (1987) and Jackendoff (1990: 226-227).

⁵ In Keyser and Roeper (1992), this fact is explained in a different guise.

resultative adjective are actually semantically consistent with an argument that expresses a physical result state.

Turning to the discussion of *un-*, one of the remarkable syntactic properties of *un-*prefixed verbs is that even if the base verb can take particles or resultative adjectives, it does not allow them to occur when combined with *un-*, as shown in (7).⁶

- (7) a. *He unfolded his jacket small.
- b. *He unfolded up a large map.

The same kind of blocking is also found in the construction with a resultative PP, as given in (8).

- (8) a. *He unfolded a piece of paper into a craft crane.
- b. *He unbent an iron rod into a hoop.
- c. *He untwisted the wire into a human shape.

As indicated by the preposition, the PPs apparently should express the result state into which the object argument enters, but in fact they are not allowed.

It is important to notice here that the *from* phrase is also disallowed.

- (9) a. *He unfolded the piece of paper from a craft crane.
- b. *He unbent the iron rod from a hoop.
- c. *He untwisted the wire from a human shape.

The ungrammaticality seen in (8) and (9) brings to light the presupposition that the object argument of an *un-*prefixed verb must be in a state that is lexically specified by its base verb. In (9a), for example, the object argument is construed as being already in a state described as “folded”. Thus we do not say **unfold a flat piece of paper*. This lexical presupposition is a reflection of the fact that the initial state is assimilated with the specification of an object argument. Generally speaking, in most change-of-state verbs, the expression of a Source argument, or the initial state, cannot be licensed, as shown in (10).⁷

⁶ As argued in Carlson and Roeper (1980), it is generally the case that prefixes cannot occur with particles and resultative predicates. However, this is not necessarily due to syntactic restriction.

⁷ Notice that the acceptability in (10) is not improved even if the *into* phrase is explicit, as shown in (i).

- (i) a. *He folded the origami from a crane into a box.
- b. *He twisted the wire from a bird shape into a fish.

When we recognize “change” in some process, there must be an entity which is recognized as remaining “unchanged”; otherwise we could never perceive any change. Therefore, the recognition of change requires three entities: the initial

- (10) a. *He folded a map from a flat piece of paper.
 b. *He bent an iron rod from a straight bar.

In the cases of *un*-prefixed verbs, the same restriction can be expected to hold if we assume that *un*-prefixation does not change the nature of base verbs, which I believe is quite reasonable. Therefore we have an explanation for the inhibition of the *from* phrase in (9).

We thus incorporate this observation into our analysis by assuming that *un*-prefixation does not change the nature of verbs, nor create a completely new verb, but constructs the conceptual structure of an *un*-prefixed verb from that of the base verb. Given this assumption, we can correctly predict that the *into* phrase in (8) also cannot be licensed by the *un*-prefixed verb, because an *un*-prefixed verb does not create a Goal argument of its own in conceptual structure. This also relates to the fact that we do not have structures like **unfold a map large*. The resultative adjective here is clearly taken to be a Goal argument, which is not created in the conceptual structure of an *un*-prefixed verb.

To summarize, we have seen a few lexical properties of verbs that can combine with *un-*, taking change-of-state verbs as illustration: (1) they include a result state as part of their lexical structure; (2) if combined with *un-*, they do not allow any expressions of result sense such as the particle *up* or resultative adjectives; and (3) the lexical structure of an *un*-prefixed verb should be constructed from that of the base verb. With this much in mind, let us go into the discussion of how they are to be formulated within the framework of Conceptual Semantics.

state, the final state, and the unchanged entity. With this in mind, we can say that in most change-of-state verbs, the unchanged entity must be realized as being assimilated with the initial state, occurring in the object position. In other words, the initial state is lexically presupposed in those verbs. Interestingly enough, this is not observed in general verbs of shifting like *change* and *convert*, as in *change/turn him from a prince into a frog*.

A quite similar pattern is also found in spatial movement verbs. Consider the following sentences.

- (ii) a. John put the book into the bag.
 b. *John put the book out of the bag.
 (iii) a. *John took the book into the bag.
 b. John took the book out of the bag.

In this case, the location of the subject is lexically presupposed as a Source argument in *put*, and as a Goal argument in *take*, respectively. See Talmy (1985: 71-72). But in more general verbs like *move* or *carry*, it is possible to say *move something from one place to another*.

In Jackendoff (1990: 113), the impossibility of *untouch* is mentioned. He says he cannot decide whether it is an accidental gap or not. According to the account in our present analysis, however, it could be a principled gap, because the base verb *touch* certainly does not include a result state in any sense.

designated as RT-state.⁹

- (12) [INCH [BE_{Ident} ([X], [IN ([_{RT-state} Y)])]]]

Clearly, the structure is not fully representative of the conceptual structure of an RT verb. Throughout the discussion, however, our attention will be confined to the relevant parts in conceptual structure. Thus we do not take into consideration the CAUSE function and, furthermore, another layer called Action tier where the Actor-Patient relation is captured. I think this skeleton structure will work well in the present discussion because the prefix *un-* does not seem to have any significant effect on such higher elaborate structures.

The position Y in (12) is posited for a conceptual position of the result sense. It will provide an immediate account for the incompatibility of the particle *up* with a resultative adjective shown in (5) if we assume they both have to occupy the position Y in order to be licensed. Then, can it be plausibly maintained that the argument in PP in (6) is also linked to this position? Notice that the PP is headed by *into*, which appears to suggest that GO is involved in conceptual structure. Consider the sentences in (13), where *into NP* occurs with a resultative adjective:

- (13) a. He folded his jacket small into a square shape.
b. He rolled the newspaper thin into a stick form.

These sound rather redundant to most native speakers, but slightly better than (5), though the judgment is delicate.¹⁰ I believe that the awkwardness or redundancy felt in (13) has to have a direct reflection in the conceptual structure. These facts seem to lead us to the idea that the verbs in question should include the conceptual function GO in some way or another, in addition to (12).

To describe the idea, let us make use of the composite conceptual structure for an RT verb, as given in (14).

- (14) (a) [INCH [BE_{Ident} ([X], [IN ([_{RT-state} Y)])]]]
(b) [GO_{Ident} ([X], [TO ([IN ([Z])])])]

⁹ RT verbs are by definition subsumed under the set of accomplishments in the sense of Vendler (1972). Notice that if the specification of RT state is not annotated in (12), the structure itself is almost the same as that of an inchoative verb, as in *turn red*. As will be shown later in the discussion, however, the concept of RT state turns out to be more than just a specification of the reversible result state of inchoative verbs.

¹⁰ Goldberg (1991) makes a similar point, though in a different context.

The structure (14b) is glossed as 'go into a state,' which, as it stands, will crash with (14a) if Y and Z are distinct at the conceptual structure level. So I have some hesitation to say both of them should be independently included in the conceptual structure of an RT verb. Rather, it seems that either (a) or (b) comes to be selected according to the syntactic frame in which a predicate enters. Thus I propose, though a little bit against Jackendoff's spirit, that in conceptual structure they be arranged on a horizontal plane, not in a vertical layer. This is typographically indicated by the left-hand brace.¹¹

This proposal may be justified if we take into consideration English speakers' intuition that the low acceptability in (13) is due to too much redundancy, not meaninglessness or contradiction. To put it differently, when they hear such a sentence, they are forced to construe it as if they were looking at the same picture from two distinct vantage points, which surely leads to the feeling of redundancy.

Now let us consider the conceptual structure of *un*-prefixed verbs. Recall that it is best characterized as being constructed from the conceptual structure of the base verb. To accommodate this fact, we propose a rule called the *Un*- Rule, which specifies the way the prefix *un*- affects the conceptual structure of its target verb only in relevant respects, yielding the conceptual structure of an *un*-prefixed verb.

The basic semantic function of *un*- will be postulated as signifying the releasing of an object from a lexically specified RT state. The rule thus can be roughly stated as in (15).

(15) The *Un*- Rule

Insert NOT into the second argument of the Event function
i.e., INCH-BE or GO, of an RT verb.

The application of (15) to (14) yields the following structure:

- (16) $\left\{ \begin{array}{l} \text{(a) } [\text{INCH } [\text{BE}_{\text{Ident}} ([X], [\text{NOT IN } ([\text{RT-state } Y])])]] \\ \text{(b) } [\text{GO}_{\text{Ident}} ([X], [\text{NOT TO } ([\text{IN}([Z])])])]] \end{array} \right\}$

What matters here is that when NOT is introduced here by the *Un*-

¹¹ The discussion on ambiguity between INCH-BE and GO is found in Jackendoff (1990: 114, 170).

The composite structure (14) would give an explanation to a link of a pure change-of-state verb to (i).

(i) She folded her jacket into a box.

In (i), the change of form must be temporally concurrent with the spatial action of getting her jacket into a box.

Rule, it blocks the linking of its inner argument to a syntactic position, as noted before. How is it to be accounted for? Recall that the positions Y and Z in (16) are posited for a result state for its base verb. Their status does not change even if *un-* is combined with it, since, as argued before, *un-*prefixation does not create any new conceptual position. Therefore, the positions Y and Z never correspond to a result state for an *un-*prefixed verb itself. Moreover, if we assume that the introduction of NOT in (16) shifts the interpretation of the second argument position from a Goal argument of the base verb to a Source argument of its prefixed verb, the positions are still not open to any syntactic expression, because the initial state is not licensed for the *un-*prefixed verb, as pointed out in section 2. Therefore, in either case, the addition of *un-* causes the positions Y and Z to be closed at the conceptual structure level.

4. Classification of verbs that can take *un-*

Though the discussion above is primarily concerned with change-of-state verbs, it should be noted that the RT verbs are not limited solely to this group. This section offers a rough classification of other RT verbs, while at the same time examining the scope of application of the *Un-* Rule. For explanatory convenience, we classify a variety of RT verbs into 6 groups. Each subsection has one typical instance as its section name.

4.1. *Bind-type*

Let us begin with a fairly large class of the RT verbs, verbs of bondage. To take *bind* as an example, it basically means “to put a movable thing into a state where it can not move any longer by *binding* some part of it”. This basic sense is illustrated in (17a). An additional characteristic of this type is that it may take the locational argument where the object is to be deprived of freedom, as shown in (17b).

- (17) a. He bound the prisoner (with a rope).
- b. He bound the prisoner to the post (with a rope).

Note that the instrumental argument is understood to be optional in both cases. What conceptual structures should be involved in verbs of binding? The process of binding implies that the deprivation of freedom of movement gradually proceeds up to the point beyond which

it can go no further in any felicitous sense.¹² Therefore, (17a) and (17b) share the sense of 'come to be in an RT state'.

What difference is there between (17a) and (17b)? It is clear that (17b) has an extra meaning: the sense of attachment. The PP serves as a Place argument to which the prisoner is attached. The attaching of a mobile object to a fixed location entails the conceptually concurrent reading that the object is to be bound. Following the line of the discussion on attachment verbs in Jackendoff (1990), we simply schematize this reading as 'come to be at a place' in our analysis.

With these points in mind, the conceptual structure of *bind* could be assumed to include at least three structures shown in (18).

- (18) (i) [INCH [BE_{Ident} ([PRISONER], [IN ([RT-state])])]]
- (ii) [INCH [BE ([PRISONER], [AT ([POST])])]]
- (iii) [GO ([ROPE], [TO ([AROUND ([PRISONER])])])]

Note that the function of the instrument is captured only at a thematic level, avoiding specification of the actual manner in which it is implemented.¹³

If we comply with the niceties of Jackendoff's formulation, these three must be interrelated in a systematic way so as to yield the full layout of the conceptual structure for *bind*, but in this article we do not go into such combinatorial relations.¹⁴ Yet, keeping to our concern, let us assume a certain hierarchical relationship among the three lines represented in (18). That is, line (i), which is called the *result portion* for reference, represents the basic conceptual structure of *bind*. When *bind* is used in a syntactic frame like (17b), line (ii), called the *placement portion*, is somehow conceptually related to the basic line (i). Most probably, the appearance of the PP as a target of attachment extends the basic conceptual structure of *bind* so that the locational argument may be licensed. Let us call this process the *Locational Extension*. In contrast, line (iii), called the *instrument portion*, is to be conceptually activated only when an instrumental phrase occurs with *bind*.

Consider how we can characterize *unbind*. We have the following

¹² Thus, we cannot bind an object that is inherently incapable of moving, as in **bind the post*.

¹³ To specify the actual manner would require the theory of vision. See Jackendoff (1987b) for the related discussion.

¹⁴ See Jackendoff (1990) and Levin and Rapoport (1988).

paradigm of *unbind*:

- (19) a. He unbound the prisoner.
 b. He unbound the prisoner from the post.
 c. *He unbound the prisoner of a rope.

What is of much interest here is that *unbind* cannot occur with any form of instrumental argument, as seen in (19c).

Under the present assumption, the *Un-* Rule applies to (18i-ii), yielding the following structures:¹⁵

- (20) (i) [INCH [BE_{Ident} ([PRISONER], [NOT IN
 ([RT-state]))]]]
 (ii) [INCH [BE ([PRISONER], [NOT AT ([POST])])]]]

(20i) stands for (19a), while the combination of (20i) and (20ii) stands for (19b), provided that NOT AT corresponds to *from*.¹⁶ As mentioned above, the inner argument headed by NOT TO in (16b) cannot be linked to any syntactic constituent, but here in (20ii) the argument headed by NOT AT is obviously linked. The reason is that the function INCH-BE in (20ii) is not designated as identificational. This indicates that the blocking on linking is only observed in the identificational semantic field. This will be borne out by the following contrast:

- (21) a. The farmer bound the reaped wheat into sheaves.
 b. *The farmer unbound the reaped wheat from sheaves.

The sense of *bind* described in (21a) is that of a change-of-state verb discussed in section 3. Therefore, (21b) is impossible. It is thus important to differentiate (19b) from (21b).

Turning to the issue of (19c), it suggests that the *Un-* Rule cannot apply to the instrument portion (18iii). The reason is, I believe, that the locational argument differs in its semantic as well as syntactic status from the instrumental argument. The former is an obligatory argument in the event of attachment. The instrumental phrase, on the

¹⁵ Jackendoff (1990: 167) gives a conceptual structure to some *un-*verbs like *uncover*, *unmask*, *unglue*. He proposes to insert the conceptual predicate like AT-END-OF [FROM] into the second argument position of INCH-BE, as illustrated in (i).

(i) [INCH [BE ([Y], [AT-END-OF [FROM [AT [Z]]]])]]]

This structure does not seem to be contradictory to our formulation. But his formulation is just an analysis of the 'taking away from' pattern. As will be shown, the *Un-*Rule proposed here covers a wider range of *un-*prefixed verbs. Yet it is important to notice that Jackendoff's idea and that of the *Un-*Rule both stipulate that *un-*prefixation affects only the second argument of a conceptual predicate.

¹⁶ See Gruber (1965) on the decomposition of the preposition *from*.

other hand, may be an essential participant in the binding action, but optional in the sense that it does not affect the meaning. It would be quite plausible to assume that the prefix *un-* affects the obligatory part of the meaning, but not the optional one. Then we stipulate that the *Un-* Rule affects only the obligatory arguments.¹⁷

Now we demonstrate that there is an alternate syntactic frame for *bind*, which is illustrated in (22).

- (22) a. He bound a rope around the prisoner.
b. *He bound a rope.

To compare (22a) to (17a), we see that the instrument has been raised to the object argument, with *the prisoner* demoted to the PP, serving as a Place around which an instrument moves. As (22b) shows, the Place is obligatory in the intended sense.

In accordance with the syntactic alternation, we assume that the conceptual structure for (22a) can be represented as (23), where the instrument portion has been raised to the first layer, thereby causing *a rope* and *the prisoner* to be obligatory.

- (23) (i) [GO ([ROPE], [TO ([AROUND ([PRISONER])])])]
(ii) [INCH [BE_{Ident} ([PRISONER], [IN ([RT-state])])]]

Since the instrument portion headed by GO is raised in (23), this construction is hereafter referred to as the *GO-raising alternant*.¹⁸

The application of the *Un-* Rule forms the structure given in (24), where NOT is inserted into the Path function of the obligatory element as well as into the RT state position.

- (24) (i) [GO ([ROPE], [NOT TO ([AROUND ([PRISONER])])])]
(ii) [INCH [BE_{Ident} ([PRISONER], [NOT IN ([RT-state])])]]

Notice that under the stipulation that the *Un-* Rule applies to the obligatory arguments, NOT can be inserted into the instrument portion in (24), since its status has already shifted. The complex conceptual structure (24) will correspond to (25).

- (25) He unbound a rope from around the prisoner.

Note here that the English preposition *from* cannot express the meaning NOT TO AROUND, which shows up as *from around*.

¹⁷ This suggests the possibility of localizing the effect of *un-* in syntactic structure.

¹⁸ The nature of the GO-raising alternant can be explained in an extensive analysis of the syntactic alternation that shifts an instrument argument to the object position with the consequence of demoting the original object to the PP.

In summary, we have seen that the *Un-* Rule can give the proper treatment of *un-* prefixed verbs in the case of binding verbs and, furthermore, that the domain of its application is limited to the obligatory arguments.

4.2. *Close-type*

The second group is verbs of closing. In the case of closing verbs, there is a selectional restriction on the argument in the object position: it must be conceptualized as an entity that comes to be in an RT state in its own right without any help from an external participant. So closing verbs are conceptually linked to binding verbs. But, unlike the binding verb, the closing verb cannot undergo the Locational Extension because of its ability to close on itself. It is impossible to say **close the lid to the box*/**clench one's hand to the post*. We can just say *(un)close the box*, or *(un)clench one's hand*. Putting aside this characteristic, the closing verb can be thought of as a subclass of the binding verbs.

The selectional restriction explains why verbs of this type cannot show a GO-raising alternant. Thus, we say *lock the door with a key*, but never say **lock a key in the door*.

4.3. *Wrap-type*

The third group is verbs of wrapping. When we wrap a thing, it gradually goes out of our sight, and finally it reaches the point beyond which no further wrapping can take place. This means that the result state of wrapping can also be regarded as an RT state.

The relevant paradigm of *wrap* is as follows:

- (26) a. She wrapped the vase.
 b. She wrapped the vase with soft paper.
 c. She wrapped the vase in soft paper.

The lexical meaning of *wrap* does not contain the removal of freedom, but just the covering of a surface, so it does not extend to the verb of attachment. However, as shown in (26c), it extends to another syntactic frame, in which the material for wrapping is accompanied by *in*.

The option of (26c) can be ascribed to the fact that the material for wrapping may be conceptualized in two ways: in (26b) it is recognized as an instrument of the same kind as in binding verbs, whereas in (26c), it is taken to be a place in which the object comes to be. This two-fold conceptualization is characteristic of this type.

Since the result portion is shared in both cases, the conceptual structure for *wrap* could be represented as the following:

- (27) (i) [INCH [BE_{Ident} ([VASE], [IN ([RT-state]))]]]
 (iia) [INCH [BE ([VASE], [IN ([SOFT PAPER])])]]
 (iib) [GO ([SOFT PAPER], [TO ([AROUND
 ([VASE])])])]]

The choice of (iia) and (iib) depends on the syntactic frame in which *wrap* occurs. The combination of (i) and (iia) stands for (26c), while that of (i) and (iib) stands for (26b).

It is worth noting here that (27iia) can be regarded as a counterpart of the Locational Extension in binding verbs. Thus, when the *Un-Rule* applies to (27), NOT can be inserted into (iia), but not into (iib), under our assumption. Then we get the following sentences:

- (28) a. She unwrapped the vase from the soft paper.
 b. *She unwrapped the vase of the soft paper.

As shown in (28a), the contrast between *bind* and *wrap* with respect to the choice of prepositions comes to be neutralized in *un*-prefixation.

Just like binding verbs, there is also a GO-raising alternant form in this group, which is illustrated in (29).

- (29) a. She wrapped a scarf around her neck.
 b. She unwrapped a scarf from around her neck.

(from Ito (1991: 61))

Just as in the case of binding verbs, we do not say *she wrapped a scarf* in the intended sense. Therefore the pattern found in (29) can be accounted for in the same way as in binding verbs.¹⁹

¹⁹ In Jackendoff (1990: 167), he illustrates the following sentences.

- (i) a. He uncovered the field (*with the tarpaulin).
 b. *He uncovered the field of a/the tarpaulin.

We get this contrast because the verb *cover* is a member of the wrap-type verb.

In Jackendoff (1990: 160), the following contrast is also noted.

- (ii) a. Bill covered the ground with a tarpaulin.
 b. *Bill covered a tarpaulin on the ground.

Compared with the verb *wrap*, the lexical sense of *cover* is more strongly associated with result rather than action. Perhaps this property of *cover* is resistant to the GO-raising alternant for a yet unknown reason. So if the preposition is changed, the acceptability improves, as shown in (iii).

- (iii) a. ?Mary covered a blanket over her child.
 b. ?Mary uncovered a blanket from her child.

The sentences in (iii) are both marginal anyway, but (iiia) sounds discernibly better than (iib). Thus, the sentence (iiib) can be acceptable to such an extent.

4.4. *Dress-type*

The action of wrapping is covering one thing with another. This action will easily shift in meaning to the action of dressing people in clothes. So it is quite reasonable that verbs of dressing people fall into the RT verb group.

There is a selectional restriction on the object argument in this type, just like in closing verbs: the argument must be a person who dresses or is dressed. Consider the following sentences:

- (30) a. She dressed her child in/with a formal suit.
 b. She undressed her child.
 c. *She undressed her child from a formal suit.

The sentence (30c), when forced to be interpreted, could convey an image where her child was taken away from the formal suit. This image will go against a normal reading of undressing, since we usually take clothes away from people, not conversely.²⁰

The selectional restriction explains the fact that this type does not have a GO-raising alternant form, as shown in (31).

- (31) a. *She dressed a formal suit on her child.
 b. *She undressed a formal suit from her child.

Another characteristic of dressing verbs is that they can be used in reflexive constructions (i.e., dress/undress oneself). Since dressing verbs are a subtype of verbs of wrapping, the supertype can also be used in the sense of dressing people, as in *She wrapped herself in a fur coat*. This pattern shows a natural link between wrapping and dressing.

4.5. *Pack-type*

The action of wrapping is to cause a visually recognized object to be covered with a sheet-like material, causing it to be contained in it. When we reverse this conceptualization, the action could well be construed as a process of putting a thing into a container. This in turn

²⁰ Thus, the reason for **undress NP from NP* is due to the idiosyncratic property. Notice that in normal cases the syntactic frame '*un-V+NP+from NP*' is allowed only when the base verb is sensitive to the Locational Extension. Ito (1991) noted that *unfreeze/unlock/unlearn/unsettle NP from NP* are all prohibited. These are certainly not verbs that show the Locational Extension. The verb *settle*, for example, does not mean 'fixing to some place'.

- (i) a. He settled a camera on the tripod.
 b. *He settled a camera to the tripod.

suggests that verbs of this type enter into our RT verbs.

Let us take the verb *pack* as an illustration. It is well known that this type can undergo a syntactic alternation called the *spray/load* alternation, which is shown in the pair (32b) and (32c).²¹

- (32) a. He packed the trunk.
 b. He packed the trunk with his books.
 c. He packed his books in(to) the trunk.
 d. He packed his books.

There are two differences that are not seen in other RT verbs. One difference is that unlike in other RT verbs, (32d) is allowed. A possible explanation could be that (32d) should not be related to (32c), but to *He packed his books (into a big, square shape)*, where *pack* is used as a change-of-state verb. Therefore we have a different source that leads to the structure (32d).

The other difference is that when *un-* is attached to *pack*, the structure (33a) is more or less acceptable.

- (33) a. He unpacked the trunk of his books.
 b. He unpacked his books from the trunk.

This fact seems to suggest that the *with* phrase in (32b) differs from those of other RT verbs.

In the cases of binding and wrapping verbs, the *with* phrase is if anything optional, but in packing verbs it is obligatory in meaning in order to convey the material to be packed.²² Therefore, as the *Un-Rule* applies to the obligatory elements in syntax, it can insert NOT into an appropriate position, making the PP in (33a) licensed.

4.6. Weave-type

The groups discussed so far appear to be closely related in meaning. The last group, verbs of creation, has shifted in meaning to a qualitatively different dimension. Therefore it may be a bit controversial

²¹ See Levin (1993) for various syntactic alternations.

²² There is an interesting semantic restriction on the object of *with*, as illustrated in the following contrast.

- (i) *He packed the trunk with his book.
 (ii) He packed his book into the trunk.

This restriction is not found in the object of *with* in binding and wrapping verbs. Actually, this restriction seems to differentiate the *spray/load* alternation from the mere locative alternation.

to allocate it to the same level. But creating or making something could possibly be taken as an action of causing it to be in an RT-state, because the activity must have a certain end point beyond which no more creating is conceivable. Furthermore, we can reverse any creating by virtue of destroying.

Consider the following sentences:

- (34) a. She wove a garland (from flowers).
 b. She unwove a garland (*from flowers).

Since the creation verb is clearly a syntactic inverse of the change-of-state verb, we assume that the conceptual structure for (34a) will be represented as (35), based to some degree on the discussion for change-of-state verbs.

- (35) {(a) [INCH [BE ([_{Form} GARLAND], [IN ([_{RT-state}]))]]]
 (b) [GO_{Ident} ([FLOWERS], [TO ([IN ([GARLAND])])])]

The specification *Form* in (35a) indicates that the form of a garland comes to be in an RT state, though it may be a bit tricky.

The *Un-* Rule can apply to (35a), but cannot apply to the structure (35b), because *from flowers* is not licensed in an *un-*prefixed verb of creation, as seen in (34b).

Notice here that the PP in (34a) describes materials for weaving, which means that they may be conceptualized as some sort of instrument.²³ Thus it can be argued that the suppression of materials in (34b) is related to the fact that the *Un-* Rule cannot affect the instrument portion.

We have so far illustrated various RT verbs. The most important thing to notice here is that the *Un-* Rule, simple as it may look, can provide a fairly good explanation for recurrent patterns and restrictions of syntactic realizations of RT verbs.²⁴

²³ There is, however, a slight difference in meaning between (i) and (ii).

(i) She wove a garland from flowers.
 (ii) She wove a garland with flowers.

In (i) the garland is virtually 100% made of flowers, whereas (ii) implies some other materials involved.

Basically, the *with* phrase seems to convey selective materials. Dixon (1991: 111) noted that in *bake*, a verb of creation, the *with* phrase is used to refer to a list of ingredients, as in *bake a cake with flour, sugar, milk, eggs, butter and vanilla essence*.

²⁴ There is still another class of *un-*prefixation, such as *unlearn* and *unlive*, which has a very small membership. We do not discuss these forms, because they have little to do with the thematic sense.

5. Contrast between marked states and unmarked states

The classification in the previous section might not exhaust the whole class of RT verbs. We could make finer distinctions on the basis of more idiosyncratic peculiarities. As noted repeatedly, however, each type mentioned in section 4 seems to be interrelated with the others in lexical meaning. This intuition suggests the possibility of integration at a higher level. Now let us digress a bit from the main discussion and look at the whole picture from a different point of view.

The concept of an RT state seems to be closely related to the way we recognize states. As we see an entity in an RT state, we have recognized it as having already undergone some action. The state that does not accompany such recognition can be taken to be a “natural” state that can exist itself, since it is not conceptually associated with any previous action. To put it differently, the state in which a thing is free, unrestrained, and uncovered would be considered to be natural or unmarked, while the one where a thing is fixed, not movable, and hidden is possibly understood as being unnatural or marked.

The marked state is conceptually salient, and therefore the expression of getting into such a state is highly likely to be lexicalized. In other words, the change of state from unmarked to marked can stand alone as an independent lexical item, but the reverse direction is not sufficient to be expressed as a distinct word. It thus follows that a prefix is added to a parent verb, expressing the reverse of the change of state denoted by the base verb. The *un*-prefixation process would be reinterpreted as such.

This idea gives us an explanation for the distributional nature of *undo*. This neutral *un*-prefixed verb, in whatever context it might be, cannot be construed as meaning the change of state from unmarked to marked in the sense of our discussion. Consider the following sentences:

- (36) a. *John released the slave_i (from the post), and then Bill undid him_i.
 b. *John opened the window, but Bill undid it because he felt a bit chilly.
 c. *The child broke the Lego house, but his father undid it.

This fact suggests that the meaning of *undo* is not just “to reverse the action”. It has a specific lexical bias.²⁵

²⁵ The asymmetry of this kind with respect to *un*-prefixation is noted in Kageyama (1980) and Horn (1988).

There are also some verbs that do not change their meaning in any relevant way even if they combine with *un-*. For example, the verbs *loosen* and *unloosen* do not have any significant difference, as illustrated in (37).

- (37) a. He loosened the horse from the post.
b. He unloosened the horse from the post.

Here we can assume that since *loosen* means the change of state from marked to unmarked, the *Un-* Rule has applied vacuously to its conceptual structure. This kind of verb is not so common, but we come across such examples as *ravel/unravel*, *rip/unrip*, *draw/undraw*, in dictionaries.²⁶

6. Nouns that take *un-*

Now let us discuss the relation of *un-* to nouns briefly. As suggested at the outset, the prefix *un-* can be combined with certain classes of nouns. However, there seem to be lexical restrictions on the combination. For example, why are there no words like *unpencil*, *ungun* and *unwall* in English? In this section we will see what classes of nouns are compatible with *un-*.

6.1. Nouns of instrument

It is possible to claim that most nouns which can be converted into a verb prefixed with *un-* fall into the class of nouns of instrument. What we call “instrument” here is a coverall term for implements with which some purposeful action is performed. An instrument usually refers to a thing that has been artificially created and constructed with the intention of implementing some conceptually salient action. We do not call natural objects an instrument in this sense, even though we happen to use them as an instrument for doing something, say, hitting nails with a stone. In other words, the concept of an instrument is so interwoven with an action related to it that it can conceptually evoke the action. An instrument tends to be engaged in such an action that affects a physical object. Therefore the instrumental noun can be frequently used to denote the transitive action associated with the

²⁶ The sense is much more limited in the case of *un-*prefixed verbs. *Undraw a curtain*, for example, only means ‘open a curtain’.

proper use of the instrument.²⁷ The form *chain*, for example, can be used either as a noun referring to the instrument with which one binds some movable object or as a verb denoting the same action. What we want to argue with respect to *un*-prefixation is that when the action conceptually evoked by an instrument noun falls into the range of meanings discussed in section 4, then *un*- can combine with that form.

Let us see how this situation can be captured in our terms. Consider the contrast in (38) with an instrument noun as a verb.

- (38) a. He leashed the dog to the post.
b. He unleashed the dog from the post.

The contrast in meaning found in (38) is quite similar to that in *bind* and *unbind*. The difference is that in (38) the instrument used for binding is lexicalized as a verb. So we could represent the conceptual structure of (38a) as (39), based on the conceptual structure for binding verbs.

- (39) (i) [GO ([LEASH], [TO ([AROUND ([DOG])])])]
(ii) [INCH [BE ([DOG], [IN ([RT-state])])]]
(iii) [INCH [BE ([DOG], [AT ([POST])])]]

Note in (39) that the instrument portion has been raised to the first layer, functioning as the basic component of the action. This is natural, since the lexical item *leash* is used as a verb in (38a), serving as an obligatory participant in the event. Accordingly, the result and the placement portions are degraded.

Applying the *Un*- Rule to (39), we have the conceptual structure for (38b), which is given in (40).

- (40) (i) [GO ([LEASH], [NOT TO ([AROUND ([DOG])])])]
(ii) [INCH [BE_{Ident} ([DOG], [NOT IN ([RT-state])])]]
(iii) [INCH [BE ([DOG], [NOT AT ([POST])])]]

What is of much interest here is that NOT can be inserted into (i), the instrument portion. This is because the portion has shifted its status from optional to obligatory in accordance with the conversion into a verb. Furthermore, since the instrument has been lexically incorporated into a verb form, there is no GO-raising alternant in most denominal *un*-prefixed verbs.

This kind of analysis can in principle apply to other members of the instrument noun that can be combined with *un*-. A rough classification according to the meanings listed in section 4 is given in (41),

²⁷ See Clark and Clark (1979) for detailed discussions on denominal verbs.

although each involves more or less some idiosyncratic peculiarities in syntactic realization.

- (41) a. binding: *unchain, unleash, untape; unshackle, unfetter; unpin, unglue, unnailed, unpeg, unscrew*, etc.
 b. closing: *unbolt/unbar/unlatch* (the gate); *unbutton/unzip/unsnap* (clothes); *unbuckle, unclamp, unclasp, unhinge*, etc.
 c. wrapping or dressing: *unveil, undrape, unrobe, unmask, unmuffle, unbonnet, unshroud*, etc.²⁸
 d. packing: *unblock, unclog, unplug*, etc.
 e. weaving: none

Note that there is no example for the weaving type. It is because we cannot move the very form itself to somewhere, nor remove it from somewhere.²⁹

²⁸ It has often been argued that denominal *un-*prefixed verbs like *unmask* are considered examples of a privative verb, i.e. taking mask(s) from. According to our analysis, however, it can be claimed that they also fall into the category of reversatives. The verb *unmask* does not only mean 'take off a mask,' but definitely conveys the sense of 'disclosing the figure'. This sense derives from the fact that the denominal verb *mask* means 'conceal the face,' not just 'putting on a mask'. Recall that this go-out-of-sight process is also characteristic of RT verbs.

²⁹ Although the whole discussion being developed here is limited to the case of *un-*prefixation, it is necessary to point out the similarities and differences between *un-* and other related prefixes, such as *de-* and *dis-*.

The implication of RT states cannot be discerned in the use of the prefix *de-*. The word *debutton*, for example, would be used to describe a situation where one removes buttons from, say, a shirt rather than opens it. However, if *unbutton* is used at all, it necessarily implies 'opening the shirt.' Thus, the result portion is crucial in characterizing the *un-*prefixation in contrast to *de-*. Similar observations are found in Clark and Clark (1979: 779) and also endorsed in Horn (1988: 222).

The distinction between *un-* and *dis-* is not so clear. Both seem to implicate 'come to be out of an RT state'. Although I have little idea of this contrast, there seem to be some discernible differences. First, *dis-* appears to be more result-oriented than *un-*. The *dis-*prefixed verb, it seems to me, is more often than not used as a passive form. Second, in some cases, the prefix *dis-* tends to mean separation of two things, while *un-* describes an internal disintegration. This may give an explanation to the slight difference shown below.

- (i) a. Her hair was tangled.
 b. Her hair was entangled (with the ivy).
 (ii) a. Her hair was untangled.
 b. Her hair was disentangled (from the ivy).

The intuition of native speakers is that in (ib) some expression of the material to which her hair is bound is implicit, while no such thing is usually felt in (ia), though *with itself*, if anything, might be implicit. The same intuition is preserved in (ii),

6.2. Nouns of location

There is another case of *un-* combining with nouns such as *uncage*, *unpen*, *unkennel*, *unhorse*, and *unearth*. In these cases, the base nouns can better be referred to as *nouns of location*. Consider the following pair:

- (42) a. They caged the dog (in the small enclosure).
 b. They uncaged the dog (from the small enclosure).

It is worth pointing out that the class of this type has some bearing on the wrapping verb. The conceptual structure for (42a) could be roughly represented as (43), where the optional PP has been fused with the conceptual structure corresponding to the nominal, i.e. [CAGE].

- (43) (i) [INCH [BE_{Ident} ([DOG], [IN ([RT-state])])]]
 (ii) [INCH [BE ([DOG], [IN ([CAGE SMALL ENCLOSURE])])]]]

This structure is equivalent to the one posited for (26c).

It should be noticed, moreover, that even in these cases, there must be some implication related to the meanings classified in section 4. The verb *uncage*, for example, conveys not only 'taking out of a cage,' but also 'setting free'. We usually cannot *uncage the dead dog*, though we can *take the dead dog out of a cage*.

6.3. Nouns of State Specification

There is still a limited group of denominal *un-*prefixed verbs in which it is difficult to classify the base nouns either as instrumental or as locational. They do not refer to any object or location, but a cognitively salient state or configuration of things, such as *cross* and *knot*. So we call them *nouns of state specification*. As a denominal verb, the noun of this group is usually available to signify a process

though the meaning is altered by prefixation. An anonymous reviewer has drawn my attention to this contrast.

Horn (1988: 225) observes that no new denominal *un-*verbs are appearing, and many of the older forms, i.e. *un-* verbs, have either given ground to their *de-/dis-* rivals, as in *unsex/desex*, or dropped out completely, as in *unking* or *uncurtain*. According to our present analysis, there is a good reason that *unsex* has been supplanted by *desex*. That is because it would be hard to see an RT state in the case of *unsex*. We can predict, in this light, that the form *unmask* will not be replaced with *demask*. Forms like *unsex*, which are not discussed in this paper, are probably thought of as relics of the time when the prefix *un-* enjoyed much more productivity.

creating a state or configuration lexically implied by the base noun. When combined with *un-*, it means “destroy the configuration”. What is more important, this class seems to fill the gap found in (41e).³⁰

This section has so far presented a sketchy idea of the relationship between nouns and verbs with respect to *un-*prefixation. Before closing this section, it is necessary to say something about the question posed at the outset. The reason we do not have *unpencil* and *ungun* is clear. These nouns are not associated with those actions that express the meanings available for *un-*prefixation. In the case of *unwall*, however, the situation is a bit different. The word *wall* can be used to convey the sense of blocking, or specifically a sense of entrapment. This suggests that the word *unwall* could be an accidental gap in present-day English. Actually it is registered in OED. So I think the existence of *unwall* has something to do with the necessity of lexicalization.³¹ That is, it is because we do not need to articulate an action which must be distinctively expressed by the word *unwall* that we do not have *unwall* in present-day English.

7. Concluding remarks

We have so far discussed and illustrated the status of the verb-forming prefix *un-* and its effect on the base verb within the framework of Conceptual Semantics. We have seen that the verbs which are compatible with *un-* can be identified with the so-called RT verbs and, furthermore, have shown that the effect of *un-*prefixation can be stated as a rule called the *Un-* Rule, which specifies the alternation process on the conceptual structure of the base verb.

Investigation of various RT verbs has revealed the nature of RT states. We have also seen that the *Un-* Rule is only applicable to the obligatory arguments and that it operates differently in semantic fields.

³⁰ If we are on the right track, it does not make sense to differentiate between nouns of state specification and verbs of change of state at least at the conceptual level. Verbs like *fold* and *roll*, for example, are actually used as general nouns to signify the state entailed by the denoted action. See Hoffman (1991), in which it is suggested that verbs like *cut* can be analyzed as adjectives on a lexical semantic level. See Hale and Keyser (1993) on the theoretical framework.

³¹ Each lexical item has its own value when it is registered in the mental lexicon. An action cannot be registered unless some special meaning is assigned to an action. See Kageyama (1988) on the related discussion on “naming” in general.

The limited scope of application could be considered a reflection of the fact that the prefix *un-* does not have an influence beyond the node immediately dominating a lexical head. This is a reasonable consequence, considering that the prefix attaches to nothing other than a verbal stem.

The work developed here also has some implication for the relationship between verbs and nouns within the context of *un-*prefixation. As we have seen, we do not have to draw a line between the categories of nouns and verbs in the conceptual component (at least with respect to *un-*prefixation). This consequence is also preferable, since we do not have to bring the categorical distinction in syntactic structure directly into the realm of conceptual structure.

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360 Asaji Oyabe-shi
 Toyama 932-01
 e-mail:JCA01670@niftyserve.or.jp