State Change and Location Change:
A Study of the Locative Alternation and Related Phenomena
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1. Introduction

This paper is concerned with three types of pair of sentences which appear to be paraphrases. A first one is two alternative realizations of arguments of a verb relating to covering or putting. Verbs such as spray and load (the spray/load verbs) appear in the syntactic frames "NP V NP1 with NP2," and "NP V NP2 on/onto/into NP1," as shown in (1)-(2).

(1) a. Jack sprayed the wall with paint.
    b. Jack sprayed paint on the wall.
(2) a. Bill loaded the truck with cartons.
    b. Bill loaded cartons onto the truck.

The pairs of sentences in (1) and (2) describe putting substances on surfaces or in containers. The (a) sentences express arguments which denote surfaces or containers as the direct object and arguments which denote substances as the object of the preposition with. The (b) sentences express arguments which denote substances as the direct object and arguments which denote surfaces or containers as the object of prepositions such as on, onto, and into. We will refer to the constructions exemplified in the (a) and (b) sentences in (1)-(2) as the with form and the onto form respectively.

A second type is two alternative realizations of arguments of a verb relating to removal. Verbs such as clear and empty (the clear verbs) appear in the syntactic frames "NP V NP1 of NP2," and "NP V NP2 from NP1," as shown in (3)-(4).

(3) a. Doug cleared the table of dishes.
    b. Doug cleared dishes from the table.
(4) a. We emptied the tank of water.
    b. We emptied water from the tank.

The pairs of sentences in (3) and (4) describe removing substances from surfaces or containers. The (a) sentences express arguments which denote surfaces or containers as the direct object and arguments which denote substances as the
object of the preposition of. The (b) sentences express arguments which denote substances as the direct object and arguments which denote surfaces or containers as the object of a preposition like from. We will refer to the constructions exemplified in the (a) and (b) sentences in (3)-(4) as the of form and the from form respectively. These two types illustrate the so-called locative alternation.

A third one is a pair of sentences with two roughly synonymous verbs: rob and steal. The verb rob appears in the syntactic frame "NP rob NP, of NP,"; the verb steal appears in the frame "NP steal NP, from NP," as shown in (5).

(5) a. She robbed him of his watch.
    b. She stole his watch from him.

The pair of sentences in (5) describe removing possessions from a possessor. Sentence (5a) expresses an argument which denotes a possessor as the direct object and an argument which denotes possessions as the object of the preposition of. Sentence (5b) expresses an arguments which denotes possessions as the direct object and an argument which denotes a possessor as the object of the preposition from.

Since the pairs of sentences in (1)-(5) differ in grammatical structure, meaning differences between them are to be expected. A large number of studies have been made on semantic differences between the with form and the onto form, especially the difference in implication between them: The with form implies that surfaces or containers are completely covered or filled, whereas the onto form need not imply this. For example, sentence (2a) implies that the truck is completely filled with cartons, but sentence (2b) does not necessarily imply this.

Gropen et al. (1991) discuss the idea that an argument which denotes an affected entity is expressed as the direct object and demonstrate that it plays an important role in explaining the semantic difference between the of form and the onto form.1

The purpose of this paper is to show that the analysis of Gropen et al. helps explain the distributional difference between the near-paraphrases illustrated in (1)-(5). We first overview the analysis of Gropen et al. in section 2. Then in section 3, we demonstrate that some additional examples are explained in the same way. Section 4 argues that the analysis of Gropen et al. helps account for the distributional difference between the of form and the from
form. Section 5 argues that their analysis can also explain the difference between the near-paraphrases with rob and steal. In section 6, we make concluding remarks.

2. Overview of Gropen et al. (1991)

It is widely accepted that we can view an event from different perspectives. For example, an event of loading a wagon by putting papers in it can be construed either as causing a wagon to become full of papers or as causing papers to go into a wagon. In the former construal, the change of fullness of the wagon is highlighted; in the latter construal, the motion of the papers is highlighted.

Gropen et al. claim that this difference in construal accompanies the alternation illustrated with the verb load in (6).

(6) a. They loaded the wagon with the papers.
   b. They loaded the papers onto the wagon.

They argue that these sentences emphasize different facets of the conceived situation: Sentence (6a) emphasizes the change of fullness of the wagon, whereas sentence (6b) accords greater prominence to the motion of the papers. In their analysis, a change of fullness and a motion are subsumed under the notion of change: A change of fullness involves an entity which undergoes a state change and a motion involves an entity which undergoes a location change. Thus the wagon in (6a) and the papers in (6b) are claimed to be affected, whether the affectedness involves a state change or a location change.

Attaching great importance to the position of an argument, Gropen et al. claim that the argument which denotes an affected entity is realized as the direct object. For example, in (6a), the argument the wagon denotes an entity which changes its state and therefore it is expressed as the direct object; in (6a), the argument the papers denotes entities which undergo a location change and therefore it is expressed as the direct object. Since the with form expresses an argument which denotes surfaces or containers as the direct object, the form is claimed to highlight a state change of surfaces or containers. By contrast, since the onto form expresses an argument which denotes substances as the direct object, the form is claimed to put emphasis on a location change of substances.
With this basic idea, Gropen et al. account for the fact that some verbs relating to putting and covering do not allow both alternative realizations of their arguments, as shown in (7)-(8).

(7) a. Mary filled the glass with water.
   b. *Mary filled water into the glass.
(8) a. *Mary poured the glass with water.
   b. Mary poured water into the glass.

They argue that verbs which specify a resultant state appear in the with form and verbs which specify a type of motion appear in the onto form. For example, the meaning of the verb fill involves a resultant state: A container changes from not full to full in an event of filling. Hence fill is compatible with the with form, as in (7a), which highlights a state change. Though fill is choosy about how something changes its state, it is not choosy about the manner of motion. Hence, as in (7b), it does not appear in the onto form, which emphasizes a location change.

By contrast, the verb pour specifies how something moves. In other words, pour describes a particular manner in which a substance changes its location. Hence the verb is compatible with the onto form, as in (8b), which emphasizes a location change. Though pour makes explicit how something moves, it does not make explicit how something changes its state. Hence, as in (8a), it is incompatible with the with form, which accords greater prominence to a state change.

Gropen et al. further argue that verbs which specify either a type of motion or a resultant state, but not both, allow only one realization of their arguments, as illustrated in (7) and (8), whereas verbs which specify both a type of motion and a resultant state allow the two realizations of their arguments, as illustrated with verbs like spray and load. For example, since the verb load specifies both a type of motion and a resultant state, we can construe loading either as moving a substance to a container or as changing the state of a container from being not full to being full by means of moving entities into it. Hence load is compatible with both the onto form, which highlights a location change of a substance, and the with form, which puts emphasis on a state change of a container.

This is one of the main points Gropen et al. discuss to prove the superiority of their analysis. In section 3, we deal with the distributional
difference between the with form and the onto form. We demonstrate that some additional data are also explained in their analysis.

3. The Spray/Load Verbs

This section discusses three cases in which an event is not described by both forms. Let us first consider the following contrast, cited from Anderson (1971: 389).

(9) a. *John smeared the wall with paint, but most of the wall didn't get any paint on it.
    b. John smeared paint on the wall, but most of the wall didn't get any paint on it.

The oddity of the whole sentence in (9a) is not attributable to the acceptability of the two clauses. On the one hand, the second clause of (9a) is well-formed by itself, since the same clause is found in an acceptable sentence like (9b). On the other hand, the first clause of (9a) is acceptable by itself, as in (10a).

(10) a. John smeared the wall with paint.
    b. John smeared paint on the wall.

Like the verb load, the verb smear specifies both a type of motion and a resultant state; therefore it allows two alternative expressions of its arguments. It then follows that the oddity of sentence (9a) is attributable to the discrepancy between the meaning of the first clause and the meaning of the second clause.

Given the analysis of Gropen et al., the contrast in (9) can be explained in terms of the difference in construal. The first clause of (9a) accords greater prominence to a state change by virtue of its grammatical form. This construal is incompatible with the meaning of the second clause, which denies the implication of a state change of the wall. Hence the whole sentence in (9a) is contradictory. By contrast, the argument denoting paint is expressed as the direct object in the first clause of (9b); therefore the clause is claimed to highlight a location change of paint. Since the clause does not highlight a state change of the wall, it is not incompatible with the second clause, in which the state change of the wall is denied.
Second, let us consider the following examples, cited from Jackendoff (1990: 172-173).

(11) a. Felix loaded the truck with the books.
   b. Felix loaded the books onto the truck.
(12) a. *Felix loaded the truck with some books.
   b. Felix loaded some books onto the truck.

These examples indicate that some events of loading are described by either the *with* form or the *from* form, but others are compatible with only one of them. The point is that an event of loading in which some books move cannot be encoded by a *with* form.

The fact can also be naturally explained, given the analysis of Gropen et al. Loading some books does not entail a state change of a truck. In this case, the truck is not understood as an affected entity; therefore the argument which refers to the truck in such a situation is not expressed as the direct object. Hence the *with* form in (12a) is unacceptable.

This explanation assumes that a container cannot be interpreted to undergo a state change unless the relevant internal space in the container is completely occupied by something. This assumption is proved to be valid by one of three experiments in Gropen et al. They demonstrate that objects which are completely covered or filled are more likely to be construed as affected, than those that are only partly covered or filled.

So far we have seen that the distributional difference between the two alternative expressions are explained in the analysis of Gropen et al. Instead of adopting this approach, one might argue that some constraints suffice for its explanation. One might propose, for example, a constraint to the effect that an entity expressed as the direct object must be holistically affected to explain the contrast in (9). However, as Gropen et al. (1991: 162) actually note, this proposal is untenable. They present sentence (13) to illustrate this point.

(13) A vandal sprayed the sculpture with paint.

As noted in Gropen et al. this sentence can encode a situation in which only a splotch of paint is sprayed. Though we expect that the sentence violates a constraint which says that the whole of something must be affected by the action denoted by the sentence, it is acceptable. The fact is not captured by proposing such a constraint. Gropen et al. explain that an interpretation which
says that the whole of something is affected is just a consequence of the most natural construal of a state change. Therefore, it predicts a situation in which putting substance on one part of an object is construed as changing its state. In (13), since spraying a splotch is construed as ruining the statue, the event is compatible with the meaning of the with form.

Another constraint one might propose is that the determiner some cannot be used to modify an NP in a with-phrase. Though this constraint appears to explain the different acceptability of (a) and (b) in (12), it is proved untenable by the following fact.5

(14) Harry loaded the truck with some really heavy books.

Sentence (14) is problematic for those who propose a constraint on the use of the determiner some. Unlike sentence (12a), sentence (14), which involves some in the with-phrase, is acceptable. This indicates that the fact cannot be explained by proposing such a constraint.

Again, the fact can also be naturally explained given the analysis of Gropen et al. Remember that an event which is construed as changing a state of an entity is described by a with form. Since loading some really heavy books, rather than some ordinary books, is construed as affecting a state of the truck, the event is encoded by a with form.

Third, let us consider the following contrast, cited from Fraser (1971: 607).

(15) a. *The boy loaded the wagon with boards one by one.

b. The boy loaded the boards one by one onto the wagon.

The adverbial phrase one by one appears in the onto form, as in (15b), but not in the with form, as in (15a). If we take into consideration the fact that the phrase one by one describes a type of motion, we can explain why the phrase is compatible with the onto form, but not with the with form in terms of the difference in construal. Since one by one specifies how something moves, it is compatible with an expression which puts emphasis on a motion of substance, but it is not compatible with an expression which accords greater prominence to a state change of a container.

All these things make it clear that the analysis of Gropen et al. naturally explains distributional differences between the with form and the onto form. In the following sections, we see if we can gain similar advantages by applying the
analysis of Gropen et al. to the other types of roughly synonymous sentences.

4. The *Clear Verbs*

This section deals with the alternation found with verbs of removal such as *clear* and *empty*. We show that the notions of state change and location change also play an important role in explaining the distributional difference between the *of* form and the *from* form, examining both physical and abstract removal.⁸

First, we discuss a case in which physical removal is involved. Like an event of loading, an event of emptying a tub by removing water from it can be construed in two different ways. One can construe the event either as causing a tub to become empty, highlighting a state change of the tub, or as causing water to go from the tub, putting emphasis on a motion of water. Since the verb *empty* specifies both a type of motion and a resultant state, it allows two alternative realizations of its arguments, as in (16).

(16) a. Mary emptied the tub of water.
    b. Mary emptied water from the tub.

If we apply the analysis of Gropen et al. to the two alternative expressions, the *of* form, which expresses a container argument as the direct object, is claimed to emphasize a state change; the *from* form, which expresses a substance argument as the direct object, is claimed to highlight a location change.

As in the case of the alternation found with the verb *load*, a semantic difference between the two alternative realizations is expected.

(17) a. Doug cleared the table of dishes.
    b. Doug cleared dishes from the table.

For example, sentence (17a) implies that all the dishes are removed from the table; sentence (17b) need not imply this. Thus in (17b), but not in (17a), some dishes may still be left on the table. Again the meaning difference manifests itself clearly in the following examples, cited from Jackendoff (1990: 174).

(18) a. *Bill cleared the table of some dishes.
    b. Bill cleared some dishes from the table.

The different acceptability of (a) and (b) in (18) shows that an event of removing some dishes from the table cannot be encoded by an *of* form.
This fact can also be explained given the analysis of Gropen et al. Like loading some books, clearing some dishes per se does not entail a state change of a surface from which they are removed under normal circumstances. Hence the event is incompatible with the of form, which puts emphasis on a state change.

Next, let us consider the difference between physical and abstract removal. The sentences in (16) and (17) describe events which involve physical removal. In (16), water is actually removed from the tub and in (17), physical motion of dishes is involved. Such events can be construed either as a state change or as a location change. Now consider the following examples.

(19) a. We tried to clear the mine of the fumes.
    b. We tried to clear the fumes from the mine.

The point is that the removal of fumes can be encoded by a from form, as in (19b), just as the removal of water can be encoded by a from form. Since we can perceive fumes, we can also perceive the motion of fumes. Then we can highlight a location change of fumes; therefore the construal is compatible with the from form.

By contrast, as observed in Levin and Rappaport (1991) and Levin (1993), verbs which appear in both the of form and the from form do not allow the from form, when a substance argument refers to an abstract entity. The pair of sentences in (20) is cited from Levin and Rappaport (p. 143).

(20) a. The judge cleared the accused of guilt.
    b. *The judge cleared guilt from the accused.

(21) a. The doctrine emptied their lives of meaning.
    b. *The doctrine emptied meaning from their lives.

We cannot perceive abstract entities such as guilt and meaning. Therefore we cannot perceive a motion of such entities. The unacceptability of the (b) sentences in (20) and (21) shows that abstract removal is more likely to be construed as a state change. These facts can also be captured in terms of the difference in construal. The removal of a person's abstract property is easily construed as causing a person to undergo a change but it is difficult to construe the event as causing an abstract property to undergo a change. In other words, when a means of achieving a state change is not perceivable, it cannot be highlighted. Hence the removal of a person's abstract property is encoded by an of form, which puts emphasis on a state change, rather than a
location change.

In this section, we have demonstrated that the distributional difference between the of form and the from form is motivated by the difference in construal: The of form highlights a state change, whereas the from form puts emphasis on a location change. The following section argues that the same explanation holds for the difference between two roughly synonymous sentences with rob and steal.

5. Rob and Steal

The verbs rob and steal can be used to describe roughly the same event. As we have mentioned in section 1, the verb rob appears in the of form; the verb steal appears in the from form. This section explains why some events are not compatible with both forms.

Since a pair of sentences with the verbs rob and steal are only near-paraphrases, some events can be described either by an of form or by a from form, as illustrated in (5), but others are compatible with only one of them, as illustrated in (22), cited from Goldberg (1995: 46).

(22) a. *I robbed him of a penny.
    b. I stole a penny from him.

The different acceptability of (a) and (b) in (22) shows that while the removal of a penny can be encoded by a from form, which emphasizes a location change of possessions, it cannot be encoded by an of form, which puts emphasis on a state change of a possessor.

The contrast can also be explained along the lines discussed so far. Removing a penny from a person does not entail a state change of the person under normal circumstances. Since the person is not understood to be affected, the person is not denoted by an argument which stands in the grammatical relation of direct object.

However, as observed in Goldberg (1995: 46), when removing a penny from a person is construed as changing his state, the oddity disappears. Sentence (24) is cited from Goldberg.

(23) I robbed him of a penny which was worth a thousand dollars.
(24) I robbed him of his last penny.

The situation described in sentence (23) involves the removal of fairly valuable
possessions; therefore the possessor is understood to be seriously affected." In the situation described in sentence (24), a penny amounts to all his property; therefore the removal of a penny seriously affects him. Since these situations involve a person who undergoes a state change, they are compatible with the of form.

Next, let us consider the following examples, cited from Williams (1974: 47).

(25) a. They robbed me of my wallet.
   b. They stole my wallet from me.

(26) a. *They robbed me of your wallet.
   b. They stole your wallet from me.

These examples show that the removal of someone's own property can be described either by an of form or by a from form, whereas the removal of someone else's property can be described only by a from form. Again, the facts can be captured in the analysis of Groepen et al. Removing someone's own property from him can be construed in two different ways: The event is construed either as causing someone to be affected or as causing his property to go from the possessor. Hence the event is compatible with both forms, as shown in (25). By contrast, removing someone else's property from a person does not entail a state change of the person under normal circumstances. Hence the event is incompatible with an expression which accords greater prominence to a state change, as shown in (26a). However, according to one of my informant, when a person has had to carry someone else's wallet for him, sentence (26a) becomes more acceptable. In this situation, someone else's wallet is construed as his possessions, because he is responsible for the wallet. Since he fails to maintain the wallet in expected condition, a person is understood to undergo a state change; therefore it is compatible with an of form. It follows from these considerations that the difference in construal underlies the difference in acceptability of the two synonymous sentences.

6. Conclusion

This paper has demonstrated some advantages of the analysis of Groepen et al. This paper has claimed, applying this analysis in the alternation found with verbs of removal, that the of form highlights a state change of containers
or surfaces; the from form puts emphasis on a location change of a substance. It has been shown that such a difference in construal motivates some interesting facts about the near-paraphrases.

We have also argued that the same explanation holds for roughly synonymous sentences which describe possessional removal. Viewed in this light, rob and steal can be regarded as examples of the of form and the from form respectively. We hold that the relation of rob and steal should be treated in the same way as the relation of fill and pour, as suggested in Gropen et al. In both cases English provides two different verbs for two different perspectives.

Notes

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1 This kind of idea is found in Rappaport and Levin (1988) and Pinker (1989), among others.

2 See Pinker (1989) and Levin (1993), for further discussion.

3 Anderson uses a different notation to show the oddity of sentence (9a).

4 The same point is discussed in Pinker (1989: 78).

5 I am grateful to Robyne Tiedeman for providing sentence (14) to me.

6 The parallelism between the alternation illustrated with the verb load and the one found with the verb clear is suggested in Hook (1983); Foley and Van Valin (1984); Rappaport and Levin (1988); Pinker (1989); Levin and Rappaport (1991), among others.

7 I am grateful to Robyne Tiedeman for providing sentence (23) to me.

References


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