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John S. Lumsden

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## THE LOAD ALTERNATION: SEMANTIC SHIFTS AND IMPLICIT ARGUMENTS

John S. Lumsden  
Université du Québec à Montréal

### 1. Introduction

**V**ERBS like *to load*, e.g. *to pack*, *to stock*, *to pile*, *to heap*, *to stack*, etc., can be realized in two different argument structures, cf. Fillmore (1968), Anderson 1971, Rappaport & Levin 1985; 1986, Pinker 1989, and many others.<sup>1</sup> The two realizations of *to load* are illustrated below. Following Rappaport and Levin, these will be called the Locatum and the Location alternates (indicating the role of the direct object in the two realizations of these verbs).

- (1) a. George loaded the hay (on the wagon) (Locatum)  
b. George loaded the wagon (with the hay) (Location)

In the Locatum alternate (the example in (1a)), the locatum argument, i.e., 'the hay', is the direct object of the verb while the location argument is an optional preposition phrase. In the Location alternate (the example in (1b)), the location argument, i.e., 'the wagon', is the direct object and the locatum argument is an optional preposition phrase. Moreover, these alternate syntactic realizations do not have the same interpretation. In (1a), for example, George did something to the hay, but in (1b), he did something to the wagon. In (1b), the wagon is understood to be fully loaded, but this is not the case for (1a).

Since verbs with similar semantics have similar alternate realizations in many other natural languages, the alternation cannot be explained in terms of two distinct lexical items that, by coincidence, each have the same phonological form. Somehow a single lexical item can be realized in distinct syntactic structures with different meanings (although these meanings are closely related). The problem is compounded because for most, if not all of this class, the same phonological form can also be realized as a noun, i.e. a third syntactic

realization, also with a related meaning, e.g. *to load/a load to pile/a pile, to heap/a heap, etc.*

A descriptively adequate theory must be able to represent the idiosyncratic semantic properties of these lexical items (the information which distinguishes between the individual members of the general class) and at the same time, it must be able to express empirical generalizations in the representation of those semantic properties which are common to the whole class (the information which varies in the meaning of a given lexical item when it is realized as a noun or as either one of the two alternate verb realizations). Furthermore, the theory must account for the correspondance between these semantic contrasts and the different syntactic structures that they appear in.

Following Jackendoff (1972; 1983; 1990) and others, it is assumed here that linguistic representations include an autonomous level of semantic representation; namely, Lexical Conceptual Structure (LCS). The conceptual categories of LCS make reference to mental representations of the world that are generated by non-linguistic cognitive faculties, e.g. the faculties of vision, touch, etc. Some of these concepts are predicate functions which define relations between a number of argument positions, positions that must be filled by other conceptual categories. Others are substantive concepts which name things or even complex situations. Substantive concepts are complete expressions in themselves, although nothing prevents the optional elaboration of their internal structure in the linguistic representation.<sup>2</sup> It is also assumed here that the argument positions in the syntactic and the semantic representations are systematically linked, so that the hierarchy of a verb's arguments in the syntactic structure is parallel to the hierarchy of arguments in the verbal LCS.

It is argued below that the idiosyncratic semantic information of these lexical items is always encoded in a substantive concept. The semantic information which is common to the whole class is encoded in predicate concepts. The account requires that the idiosyncratic substantive concept and the phonological form of each item is encoded in one lexical entry, while the predicate concepts that are common to the whole class and the syntactic features that define a verb or a noun are stored in different lexical entries. Therefore, every expression that involves these items must be derived by combining two or more lexical entries.

For example, if the lexical entry containing the substantive concept [LOAD] and the phonological form /lod/ combines with the lexical entry containing the features of a noun, i.e. [+N, -V], the noun *load* is derived. In a verbal derivation, the substantive concept appears in the verbal LCS as the

implicit argument of some predicate concept. The lexical items of the 'load' class allow a semantic/syntactic alternation as verbs because the pertinent substantive concepts can be combined with the pertinent predicate concepts in more than one way, as implicit locatum arguments or as implicit location arguments. A straightforward algorithm of correspondance derives the syntactic alternation from this semantic alternation.

The next section discusses the nature of semantic representations in the lexicon and, in particular, the relation between nominal and verbal meanings. The third section provides an account of the data of the 'load' class, and the fourth section contrasts the semantics of the 'load' class verbs with similar verbs that do not allow the alternation.

## 2. Nominal and Verbal Semantics

The verbs of the Locatum/Location alternation can usually be paired with a cognate noun, e.g. *to load/a load*, *to pile/a pile*, *to stock/a stock*, *to heap/a heap*, etc. The meanings of these nouns seem to be closely related to the meanings of the verbs. For example, the subtle meaning distinction between *to heap* and *to pile* seems to be quite parallel to the meaning distinction between *a heap* and *a pile*, etc. That is, the verb *to heap* is to the verb *to pile* as the noun *a heap* is to the noun *a pile* and similarly, the noun *a load* is to *a stock* as the verb *to load* is to *to stock*, etc. These detailed parallels suggest that the semantic representations of the verbs and the related nouns must have some element in common.

Of course, there is a well established format in generative linguistics for the representation of substantive concepts in verbal semantics. Argument positions in a verbal LCS representation may be filled with substantive concepts which are not projected as phrases in the syntactic representation, cf. Jackendoff (1990), and the references therein. Verbal and nominal meanings are therefore related because the nominal meaning appears as an implicit argument in the verbal LCS.

On the other hand, as Jackendoff notes, the meaning of some verbs is not identical to the meaning of the nouns that have the same phonetic shape as the verb (although they are clearly related). Thus one may 'butter the bread' with any substance which has the general physical properties of butter, e.g. margarine, peanut butter, jam, etc.; the meaning of the verb does not have precisely the same reference as the related noun. Similarly, one may 'pocket the change' literally by putting it in one's pocket, but the verb can also mean that someone

took possession of the change (but not necessarily by physically putting it in his pocket). Again, the meaning of the verbal expression is related to that of the cognate noun, but it is not identical to it. Therefore, the meaning of the substantive concept when it is implicit in a verbal expression may be slightly different than the meaning of the same substantive concept when it is realized explicitly in a noun phrase.

One mental process that allows the ambiguous interpretation of certain concepts was originally described in Gestalt Theory, a psychological theory that has been useful in various accounts of natural language semantics.<sup>3</sup> Let us suppose that a substantive concept is simply a long term memory of the usage of a phonological form, i.e. the form is the address of the lexical entry where this memory is stored. That is, every time, a particular phonological form is used, the language learner remembers his/her perception of the speech situation, using this lexical entry. The resulting memory must be a vague mix of relevant and irrelevant information, with the participants that are constant (and therefore relevant) in every situation where the form is used gradually becoming more prominent as successive usage reinforces them in memory. Since we are not so vague when we use a substantive concept in speech, however, there must be a particular process which allows this complex mixture of information to be made precise.

The pertinent process is 'centring', described by Wertheimer (1938). Wertheimer was interested in the way that human cognitive processes function in developing new insights about our knowledge of the world. According to Wertheimer: «Until recently such accomplishments were thought of as essentially the results of 'imagination', or 'chance', or 'the intuition of genius'. But it is not these alone. *Formal* determinations, expressible in definite laws, are also involved. ...the essential process may be one of *centring*, where the important point is: *from the point of view of which part shall the remaining parts be seen?*», cf. p. 281, Wertheimer's emphasis.

This process of centring applies to the interpretation of substantive concepts in LCS representations in the following way. As described above, substantive concepts may name vague and complex situations that involve more than one participant. Nonetheless, a substantive concept in an argument position, i.e. an explicit or an implicit argument, must be understood as a single, whole entity: the vague mixture of memories that make up the concept must be understood as a 'gestalt'. The 'gestalt' interpretation of an argument is accomplished by focussing on one of the prominent participants in the situation, who thus becomes the central figure of the interpretation. The other infor-

mation in the situation named by this concept becomes more peripheral and it is perceived through its relation to the central figure in the gestalt.

Crucially, the interpretation of certain substantive concepts may undergo a gestalt shift, depending on which one of the participants in the situation is seen as the center of the gestalt. Since it changes the interpretation of the implicit argument, a gestalt shift may provide that this unit of meaning appear in a different argument position in the verbal LCS. Given that the hierarchy of arguments in the syntactic representation is linked to the hierarchy of arguments in the LCS, this alternation in the LCS representation requires that the explicit arguments of the verb are realized differently in the syntax. That is, different syntactic realizations of what seem to be similar argument structures can be derived from the fact that an implicit argument may have different interpretations and thus different positions in the LCS representation of the verb.

Moreover, the fact that the interpretation of an implicit argument in a verbal expression differs slightly from the interpretation of the cognate noun can be derived in the same way. When the substantive concept is realized as a noun it has a specific center and when it is realized as an implicit argument in a verbal expression, it has a different center. For example, when it is realized as a noun, the substantive concept [BUTTER] is centered on the definition of the material itself. When it is realized as an implicit argument in a verbal expression, however, the same substantive concept is centered on the action that is typically made with such a material. Similarly, when used as a noun, [POCKET] centers on the literal location, but used in a verbal expression, it centers on the typical use that is made of such locations.

This approach will be presented in some detail in the account of the English lexical items of the 'load' class in the following section.

### 3. The LOAD Alternation

Following many others, cf. Rappaport & Levin (1985), Pinker (1989), etc., let us assume that the verbs of the 'load' class involve predicate concepts that describe a change of state or location; namely, "x CAUSE y COME TO BE AT z". The precise description of this predicate expression is not crucial here, although the relative hierarchy of the argument positions that are defined is significant ( $x > y > z$ ).<sup>4</sup> Since all the verbs of this and many other classes have these predicate concepts in common, the predicates must be derived from their own independent lexical entries. A large generalization will not be expressed if these predicates must be repeated in every individual lexical entry. The

idiosyncratic semantic information of each verb is stored as a substantive concept in a specific lexical entry, together with the idiosyncratic phonological form, e.g., [LOAD] and /lod/, respectively. The semantic information which is common to the whole class of verbs is stored in predicate concepts elsewhere.

The derivation of the Location alternate of the verb requires that the substantive concept [LOAD] should be combined with the predicate expression of the verbal LCS as an implicit argument.

(2) George loaded the wagon.

[x CAUSE [LOAD] COME TO BE AT z]

In short, the substantive concept 'LOAD' is the implicit locatum in the Location alternate of *to load*.

To make the account as explicit as possible, we must ask how the implicit argument of *to load* should be interpreted. As noted above, the Location alternate has a 'wholistic' interpretation — the wagon is understood to be completely filled with a load. Here, [LOAD] must mean something like "the maximum quantity of material that is normally manipulated". Thus, "George loaded the wagon." means "George CAUSE [the maximum quantity of material that is normally manipulated] COME TO BE AT the wagon".

On the other hand, the Locatum alternate normally does not have such a 'wholistic' interpretation. But, the Locatum alternate "George loaded the hay." does not mean simply that "George put the hay somewhere." A fair paraphrase of the Locatum alternation "George loaded the hay." using the noun *a load* might be as follows: "George caused the hay to come to be (part of) a load." Following the structure of this paraphrase, the LCS of the Locatum alternate should be as follows.

(3) George loaded the hay.

[x CAUSE [y COME TO BE AT [LOAD]]]

The predicates of the LCS have not changed, but the substantive concept now appears as an implicit argument in a different LCS position, i.e. the location. In other words, the Locatum/Location alternation derives from the alternating position of the implicit argument in the verbal LCS (in the Location alternate, the implicit argument is the locatum, but in the Locatum alternate, it is the location). It is notable that the possibility of such alternations is inherent in the fundamental structure of the account. Since every derivation requires that two or more lexical entries must be combined, it is not surprising that some may be combined in more than one way.

But what is the interpretation of the substantive concept implicit argument in the location position? Since the Locatum alternate does not have a wholistic interpretation, the substantive concept [LOAD] cannot mean “the maximum quantity of material normally manipulated”. Intuitively, it seems to mean something like “a state of preparedness for manipulation in some manipulator”. Thus, “George loaded the hay.” means something like “[George CAUSE the hay COME TO BE AT [a state of preparedness for manipulation in some manipulator]]”. In short, if this is the correct representation of the LCSs of the Locatum/Location verbs, then the pertinent substantive concepts are ambiguous. When in locatum position, they have one interpretation; but when it is in the location position, they mean something slightly different.

This is the ambiguity at the heart of the Locatum/Location alternation. Several studies have already observed that semantic alternations in natural language resemble ‘gestalt shifts’ in that the perception of the speaker/listener can focus on one aspect or another of what is essentially a single representation, cf. Talmy (1978) ‘Figure and Ground’, Guerssel (1986), ‘Intrinsic and Extrinsic change’; Schwartz-Norman (1976) ‘Container and Contents’; Pinker (1989), for several alternations, including the alternation of *to load*; etc. The present observation is quite similar to these, but it is different in that in this account, the gestalt shift of the Locatum/Location alternation (and perhaps other alternations) is localized in the verbal substantive concept and this substantive concept is incorporated as an implicit argument in the locatum or the location position in the verbal LCS, depending on its interpretation.

The substantive concept [LOAD], for example, includes two participants: some material to be manipulated and some manipulator which will carry the material. The use of this substantive concept as an implicit argument requires that one of these two participants become more prominent in the interpretation than the other. If the substantive concept appears in the locatum position of the LCS, it must be interpreted as a ‘Quantity’. In this case, the material is the most prominent aspect of the gestalt and the substantive concept speaks of “the maximum quantity of material normally manipulated”. If the substantive concept appears in the location position of the LCS, it must be interpreted as a ‘State’. In this case, the manipulator is the most prominent aspect of the gestalt and the substantive concept speaks of “a state of preparedness for manipulation in some manipulator”.

If the semantic shift of the Locatum/Location alternation is in fact localized in the interpretation of the substantive concept, then it should be possible wherever that substantive concept appears. It was argued above that the semantic



representations of the cognate nouns which are related to the Locatum/Location verbs have the same substantive concepts as the verbs. Therefore, this account of the Locatum/Location alternation predicts that the same ambiguity should be present in the related nouns. It turns out that there is some evidence to support this view. Since the meaning to [LOAD] involves a 'Quantity' versus a 'State', the noun *a load* provides a clear illustration of the parallel (other examples will be discussed below).<sup>5</sup>

- (4) a. Ed has to buy forty loads of hay in order to feed his cattle through the winter.  
 b. This load of hay is smaller than the last load.

In the first example, the noun *load* must be taken to mean a fixed amount, i.e. 'the maximum quantity of material normally manipulated'. Only this meaning can explain the calculation of quantity that is clearly evident in the example. On the other hand, the second example expressly denies that the noun *load* means a fixed amount — one load is smaller than the other. Here the noun *load* means "an (indefinite) amount of material in a state of preparedness for manipulation in some manipulator". These facts show that the noun *load* and the verb *to load* are both liable to the same semantic shift.

The derivation of the optional preposition phrases that may appear in construction with these verbs must follow from this basic account of the alternation. Only the Location examples have an implicit argument [LOAD] which has an interpretation which is compatible with the interpretation of the 'with' adjunct. Only the Locatum examples have an implicit argument [LOAD] which can be modified with a location adjunct. Using the informal definitions for the implicit argument discussed above, the alternates are to be interpreted as follows.

- (5) a. George CAUSE the hay COME TO BE AT [a state of preparedness for manipulation in some manipulator]  
 b. George CAUSE [the maximum quantity of material normally manipulated] COME TO BE AT the wagon

The interpretation of the preposition phrases depends on their incorporation in the interpretation of the implicit argument, as illustrated below.

- (6) a. George loaded the hay on the wagon.  
 George CAUSE the hay COME TO BE AT [a state of preparedness for manipulation *on the wagon*]

- b. George loaded the wagon with hay.  
 George CAUSE [the maximum quantity of *hay* normally manipulated]  
 COME TO BE AT the wagon

The preposition phrases actually name the participant which is the center of the gestalt interpretation of the substantive concept in that specific realization.

Given these interpretations, the formal LCS representation of the sentences with the preposition phrases will be as follows.

- (7) a. George loaded the hay on the wagon.  
 [x CAUSE [y COME TO BE AT [LOAD (z)]]]
- b. George loaded the wagon with hay.  
 [x CAUSE [[LOAD (y)] COME TO BE AT z]]

Notice that these representations permit an interesting generalization: non-implicit arguments of LCS predicates are obligatory in the syntax, but the arguments of implicit arguments are optional. Of course, the arguments of explicit arguments, i.e. arguments in noun phrases, are also optional. In short, the arguments of substantive concepts are optional (as per definition). Thus the present analysis provides a simple and direct account of this aspect of the syntactic behavior of the *Locatum/Location* verbs.

The algorithm which maps from LCS representations to syntactic projections must include something like the following.

- (8) *Linking Algorithm*<sup>6</sup>
- i) The least-embedded LCS argument is the subject.  
 (i.e., the NP with nominative Case)
  - ii) The next least-embedded argument is the direct object.  
 (i.e., the NP with accusative Case)
  - iii) The next least-embedded argument is an indirect object.  
 (i.e., the NP with an inherent Case)

As the reader may easily see, this algorithm correctly predicts that the adjuncts embedded within the implicit arguments in the representations above will be assigned an inherent Case. Following Chomsky (1986), suppose that structural Cases are assigned at S-structure according to syntactic structure, while inherent Cases are assigned at D-structure according to semantic relations. More specifically, the pertinent semantic relations of the adjuncts are those which are defined by the interpretation of the implicit argument. Essentially, the adjunct

is an argument of the implicit argument and only indirectly is it an argument of the verbal LCS.<sup>7</sup>

This account extends easily to those Locatum/Location verbs that have an implicit argument which has a negative interpretation. The verb *to clear* is such a verb. Following the format of *to load*, the basic alternates of *to clear* have the following LCS representations.

- (9) a. Susan cleared the dishes.  
 [Susan CAUSE [the dishes COME TO BE AT [CLEAR]]]  
 b. Susan cleared the table.  
 [Susan CAUSE [[CLEAR] COME TO BE AT the table]]

The Locatum example means something like “the dishes COME TO BE AT [a state of being absent from an area]”, while the Location example means something like “[a complete absence of material] COME TO BE AT the table”. Thus, the account of the basic alternation of *to clear* is quite parallel to the account of *to load*.

The two verbs are different in that *to clear* requires different adjunct phrases.

- (10) a. Susan cleared the dishes from the table.  
 [Susan CAUSE[the dishes COME TO BE AT [CLEAR from the table]]]  
 b. Susan cleared the table of dishes.  
 [Susan CAUSE[[CLEAR of dishes] COME TO BE AT the table]]

Presumably, this difference derives from the difference between the interpretation of the implicit argument [LOAD] and that of the implicit argument [CLEAR]: [CLEAR] speaks of the absence of material, while [LOAD] speaks of the presence of material. As is well known, in many languages an argument in the scope of a negative operator is realized with Genitive Case, cf. Neidle (1988) on Russian, Jackendoff (1990) on English. Thus, the negative sense of the substantive concepts of verbs like *to clear* is the source of the Genitive realization of the argument.

In this account, the choice of *with* or *of* or a locative preposition is directly determined by inherent Case assignment. It is the particular interpretation of the implicit argument of the verb which determines the semantic relation of the adjunct preposition phrase and so determines the appropriate inherent Case for that adjunct. Given the linking conventions proposed above, it follows that if the LCS implicit argument of the verb is generated with an explicit position for an adjunct, that adjunct will be realized with the appropriate inherent Case (for

English, this means in the appropriate preposition phrase). If no such adjunct position is generated, then no adjunct will appear.

The next section will compare the Locatum/Location verbs with verbs which seem very similar in their interpretation but which do not participate in the alternation.

#### 4. Alternating versus Non-alternating Verbs

Since the Locatum/Location alternation derives from the different positions of a substantive concept in the verbal LCS, it should follow that the verbs which are similar to the Locatum/Location verbs but which do not alternate have substantive concepts which can occupy only one position in the verbal LCS. As Pinker (1989) observes, the verbs which do allow the alternation have more semantic constraints on their arguments than do similar verbs which do not alternate. It would seem that in order to be the focus of the gestalt interpretation of the substantive concept, a participant must be specifically defined in the meaning of the substantive concept. Participants which are not thus defined cannot be the focus of the gestalt. Several examples will be discussed to illustrate this point.

##### 4.1 [LOAD] versus 'FILL'

The verb *to fill* allows the Location alternate, but does not allow the Locatum alternate.

- (11) a. \*Michael filled the water in the bucket.  
 b. Michael filled the bucket with water.

What is the difference between *to load* and *to fill*?

Following the format of *to load*, the LCS representations of these examples would be as follows.

- (12) a. \*[Michael CAUSE [the water COME TO BE AT [FILL in the bucket]]]  
 b. [Michael CAUSE [[FILL with water] COME TO BE AT the bucket]]

The meaning of 'FILL' in the Location alternate seems to be very close to the meaning of [LOAD] in the Location alternate, but there is still a significant difference. Where [LOAD] means "the maximum quantity of material normally

manipulated”, ‘FILL’ seems to mean simply ‘the maximum quantity of material’. That is; if a wagon is loaded, it is not only replete (the material which fills the wagon has an additional status in that it is meant for manipulation). In contrast, if a wagon is filled, it is replete, but there is no additional status for the material in question. In other words, the language makes a distinction between “some material” and “some material which is ready for manipulation”; but it makes no distinction between “some material” and “some material which is ready for containment”.

Thus we can explain the impossibility of the Locatum alternate for *to fill* in contrast with *to load*. Both verbs have a substantive concept which involves two participants, i.e., container and content, cf. Schwartz-Norman (1976). Both substantive concepts can be interpreted as a Quantity of material, but only the substantive concept of *to load*, i.e., [LOAD], can be understood as a location because only this substantive concept names a particular status for the material which is located in the container. The material in a manipulator may be considered to be a load (if it is appropriately placed, etc.), but the material in a randomly chosen container has no special status because of its location.

This account of the interpretation of *to fill* is supported by the fact that in certain special contexts, the verb *does* allow a Locatum alternate. Rappaport and Levin (1985) point out the following example, taken from a cookbook.<sup>8</sup>

(13) Take a little of the mixture at a time and *fill it into the zuchinni*.

This is the use of *to fill* in the Locatum alternate — a use which is not normally allowed. What is different about the cookbook use of *to fill*?

In contrast with the standard usage of the verb, there is a derived nominal for the cookbook use of *to fill*, namely *filling* (as in “Jello makes a lousy pie-filling.”). The meaning of this nominal is related to the kind of container which is pertinent to the context. Something which is a *filling* is found in an *edible* container and something which is placed in an edible container is (at least, in cooking circles) something which is itself edible. Thus, the container in the cookbook use of *to fill* gives a particular status to the material which it contains. The interpretation of the substantive concept ‘FILL’ in the cookbook Locatum alternate is something like the following.

(14) He filled the mixture into the zuchinni.

[he CAUSE [the mixture COME TO BE AT [a state of preparedness for eating in the zuchinni]]]

The substantive concept of the cookbook use of *to fill* does assign a particular status to the material which is found in the container and so, in this context the Locatum alternate is possible.

Another context where this use of *to fill* is possible is the garbage disposal industry or the construction industry, where holes in the ground are filled with (*land*)*fill*. In such contexts, sentences like the following seem to me to be quite acceptable.

- (15) a. The city workers have been filling garbage into the landfill site for three years.
- b. The contractor told me not to fill topsoil around the foundations.

Since the context again provides for a particular status for the material in the container, the substantive concept 'FILL' can be interpreted as the 'State' of something in this location and so the verb can appear in the Locatum alternate.

Similarly, there are contexts where the verb *to load* cannot be used in the Locatum alternate.

- (16) a. Gertrude loaded her bookshelves with knick-knacks from Africa.
- b. Al loaded the crack in the wall with the new brand of plaster.

Here the substantive concept [LOAD] means something like "a large amount". In these contexts, there is no concept of 'manipulation' in the substantive concept, so the presence of the material in the location does not impart a particular status to the material. As expected, the Locatum alternate in such contexts is less acceptable.

- (17) a. ??Gertrude loaded the knick-knacks from Africa on her bookshelves.
- b. ??Al loaded the new brand of plaster in the crack in the wall.

The judgements of the use of these verbs in particular contexts seem to vary considerably from speaker to speaker. It is my impression that speakers who are quite familiar with the contexts in question are more certain of the judgements as given above. This is reassuring. Since the alternation depends on general information which is derived from non-linguistic cognitive faculties, i.e., substantive concepts, it is natural that people who have lived in contexts where the pertinent verbs have specialized uses will have somewhat different notions about what this general information is. In a theory where the Locatum/Location alternation depends on different LCS predicates, the cookbook use of *to fill* and the standard use of *to fill* must be understood as two different verbs belonging to distinct verb classes. In the present analysis of the alternation,

there is a single verb. The substantive concept may take on more detail in certain contexts and in certain idiolects, but it is still the same substantive concept.

#### 4.2 'PILE' versus 'COVER'

If the substantive concept [LOAD] speaks of a Quantity or a State, the substantive concept of the verb *to pile*, i.e., [PILE], speaks of a Configuration or a State. Like *to load*, *to pile* permits the Locatum/Location alternation.

- (18) a. Alice piled the carrots on her plate.  
 b. Alice piled her plate with the carrots.

Following the format of *to load*, these examples have the following LCS representations.

- (19) a. [Alice CAUSE [the carrots COME TO BE AT [PILE on her plate]]]  
 b. [Alice CAUSE [[PILE with the carrots] COME TO BE AT her plate]]

The substantive concept [PILE] in the Locatum example speaks of the State of some material. The carrots have come to be in a State [PILE] defined by their physical relation to each other (more or less, one on top of the other on the plate, etc.). In the Location example, however, the same substantive concept speaks of a Configuration on a foundation. This shape (more or less, a pyramid composed of carrots) has come to be at the plate. The substantive concept allows two perspectives and one or the other of these perspectives becomes the center in the interpretation and this centring determines the position of the substantive concept in the verbal LCS, and this position, in turn, determines the syntactic realization of the verb's arguments.

It is worth noting that the noun *a pile* also has two interpretations, even though the distinction between Configuration and State is not so prominent as the distinction between Quantity and State which is found in *a load*.

- (20) a. Alice threw the books in a pile. (=state)  
 b. Alice made a pile of the books. (=configuration)

In the (20a) example, the books are in a state [PILE]. In the (20b) example, the books have a configuration which constitutes a [PILE]. The alternate interpretations of the substantive concept are parallel in the noun and the verb.

Consider now another verb which (like *to fill*) does not permit the Locatum alternate, namely *to cover*.

- (21) a. \*Alison covered the handkerchief on her face.  
 b. Alison covered her face with the handkerchief.

The substantive concept [COVER] in the Location alternate speaks of a Configuration on a foundation (more or less, a shape which extends over the surface of something). But the concept [COVER] gives no special status to the material that makes up this configuration (serving as a cover does not require that a material is in a specific State). Since the substantive concept defines no State, it cannot appear in the Locatum alternate.

#### 4.3 'WIND' versus 'COIL'

The verb *to wind* allows both alternates of the Locatum/Location alternation. The substantive concept [WIND] describes both a particular State of some material and a specific Configuration on a foundation.

- (22) a. Jennifer wound the rope around the fencepost.  
 b. Jennifer wound the fencepost with the rope.

Presumably, these examples have the following LCS representations.

- (23) a. [Jennifer CAUSE [the rope COME TO BE AT [WIND around the fencepost]]]  
 b. [Jennifer CAUSE [[WIND with the rope] COME TO BE AT the fencepost]]

In the Locatum alternate, [WIND] is seen as the State of an object that has a specific shape (more or less, a kind of spiral). In the Location alternate, the same substantive concept is seen as a Configuration on a foundation (more or less, a spiral which extends around the circumference of something). In the example above, this configuration, composed of the rope, has come to be at the fencepost.

In contrast, the verb *to coil* allows only the Locatum variant.

- (24) a. Ed coiled the rope on the fencepost.  
 b. \*Ed coiled the fencepost with a rope.

The interpretation of the substantive concept [COIL] in the Locatum alternate seems very close indeed to the interpretation of [WIND] in the Locatum alternate. On the other hand, the substantive concept [COIL] does not speak of a Configuration on a foundation. Since [COIL] does not have this second perspective, i.e., since it does not speak of any foundation, it cannot appear in the Location alternate.



The comparison of three pairs of verbs (*to load* with *to fill* and *to pile* with *to cover* and *to wind* with *to coil*) confirms that verbs which do undergo the alternation have more constrained substantive concepts than verbs which do not. The location participant in the substantive concept [LOAD] gives a particular status to the material found in such a location, but this is not true for the location participant of the substantive concept 'FILL'. The substantive concept [PILE] defines a State and Configuration on a foundation. The substantive concept [COVER] defines a Configuration on a foundation, but says nothing about the State of the material which makes up such a Configuration. The substantive concept [WIND] has two participants, a material in a specific State and a specific Configuration on a foundation. The substantive concept [COIL] speaks of a material in a specific State, but makes no mention of a Configuration on a foundation.

#### 4.4 *The Anomaly of to put*

Since this analysis of the Locatum/Location verbs argues that they are verbs of 'change of state/location', it is inevitable that the discussion should turn to the properties of the prototypical verb of change of location, namely *to put*. This verb does not allow the Location alternate. Moreover, in the Locatum pattern, both the locatum *and the location* are unequivocally obligatory. Finally, it is notable that there are few verbs, if any, which share these particular properties of *to put*.

- (25) a. Maud put the book on the table  
 b. \*Maud put the table with the book.  
 c. \*Maud put the book.

In the present analysis, there is a direct and natural account for this verb. I suggest that *to put* is the change of location verb *which has no substantive concept* and thus has no implicit argument.

(26) *to put* = [x CAUSE [y COME TO BE AT z]]

Since there is no implicit argument, all three LCS arguments must be realised in the syntax. Since there is no implicit argument, there is no possibility of an alternation in the realization of the LCS. Since there can only be one meaning for a 'change of location' LCS without any implicit argument, *to put* is unique; a verb with similar properties would mean exactly what *to put* means.

This analysis of *to put* has support in the observation that *to put* serves as a light verb for the class of 'change of location' verbs. Thus, the following

sentences are nearly synonymous (modulo the precisions of category and the presence of the prepositions).

(27) a. George loaded the wagon with hay.

[George CAUSE [[LOAD with hay] COME TO BE AT the wagon]]

b. George put a load of hay on the wagon.

[George CAUSE [a load of hay COME TO BE AT on the wagon]]

The nominal phrase *a load of hay* as the locatum of *to put* nearly reproduces in the syntax what is lexically specified in the Location alternate of *to load*, i.e., 'load of hay' ↔ [LOAD with hay].

The existence of a verb like *to put* is a natural consequence of the assumptions of the present account of the Locatum/Location alternation. Moreover, this account of *to put* permits a natural account of its properties as a light verb (and for the properties of light verbs in general).

## 5. Conclusion

The meanings of verbs which belong to the same general class are differentiated by the content of the substantive concept that appears as an implicit argument in their semantic representation. Verbs that undergo an alternation have substantive concepts which are ambiguous in that their gestalt interpretation can be centered on different participants in different realizations. This ambiguity permits the substantive concept to appear as an implicit locatum or as an implicit location in the verbal LCS.

This account provides a limit in principle to the number of such alternations to be expected in the verbs of natural languages, i.e., the number of LCS argument positions which might be realized by an implicit argument. The analysis offers a direct explanation of the fact that the nouns which are cognates of the verbs of the Locatum/Location alternation also have an ambiguous interpretation. It accounts naturally for the particular properties of the optional preposition phrases which appear in these constructions. The basic mechanism of the alternation provides a direct account of the differences between those verbs which allow the alternations and seemingly similar verbs which do not, including the very particular properties of *to put*.

Finally, the analysis proposed here allows the expression of a broad generalization concerning lexical representations; the predicates which are common to whole classes of verbs need only appear once in the lexicon. The specific information of a given verb, the substantive concept and the phonological representation, is derived from an independent lexical entry and

it is combined with the general information (the LCS predicates) in the derivation. Similarly, the analysis permits a direct account of the relation between the verb and the cognate noun. That is, the substantive concept and the associated phonological information are stored in the lexicon independently of both LCS and category specifications. Thus, the idiosyncratic substantive concept and the idiosyncratic phonological form of the verb *to load* and those of the noun *a load* are derived from the same lexical entry.

## Notes

1. A different verb class (the class which includes verbs like *to spray*) permits an alternation which at first glance seems to be parallel to the alternation of verbs like *to load*.

- (i) a. Isabel sprayed the paint on the wall.
- b. Isabel sprayed the wall with paint.

Although they have often been treated as a uniform class, cf. Rappaport & Levin (1985, 1986), Jackendoff (1990), verbs like *to load*, *to pack*, *to stock*, *to pile*, *to heap*, *to stack*, etc. are in many ways different from verbs like *to spray*, *to splatter*, *to sprinkle*, *to smear*, *to daub*, *to butter*, *to rub*, *to stuff*, *to crowd*, *to jam*, etc. Lumsden (1992) points out these differences. For convenience, I label the alternation of *to spray* the “Manner/Location” alternation. Only Manner/Location verbs allow the use of the preposition *towards*. The Locatum/Location verbs do not permit such a construction. Only Manner/Location verbs allow an independent negation of the manner of the action expressed by the verb. Such constructions are at best marginal with Locatum/Location verbs. Similarly, only the Manner/Location verbs allow a paraphrase of the manner of the action as ‘by verb-ing’. Again, this reading is difficult with Locatum/Location verbs. Finally, most of the Manner verbs have an obligatory Locative PP. The corresponding PP for the Locatum verbs, however, is always optional. These facts show that the syntactic/semantic patterns of the Manner/Location verbs like *to spray* are quite different than those of the Locatum/Location verbs like *to load*.

2. Although substantive concepts are complete expressions, so that in principle, their internal structure has no inherent need to be expressed overtly, this does not prevent independent processes, e.g. Case Theory or pragmatic effects, from making the expression of some part of this internal structure obligatory in the representation.

3. Talmy (1978), for example, argues for the pertinence of the gestalt notions ‘Figure and Ground’ and Pinker (1989) describes a gestalt shift in load/spray verbs and in Dative shift verbs and other verb alternations.

4. This standardized predicate formalism is adopted here for convenience. Although something like these predicates is necessary to the analysis, the particular predicates that are used in the text are not argued to be (nor believed to be) the best account of predicate concepts for natural language semantics, cf. Lumsden, in preparation, for a different account involving Action Tier and Thematic Tier predicate expressions.

5. Some verbs, e.g. *to clear*, have no simple noun parallel. Others, e.g. *to stack*, have a parallel cognate noun, but it is not easy to find a context where the two interpretations of the verbal ELE

can be distinguished for the noun. This difficulty may be due to the delicacy of the nuance involved or it may be that the nominal and verbal ELEs have drifted apart, so that they no longer mean the same thing. If the latter is true, then such nouns should not give a feeling of redundancy when they appear as with-theme adjuncts with the related verb.

6. The point here is that the analysis permits a straightforward algorithm of semantic/syntactic correspondance. Revising the predicate expression, e.g. using two tiers, etc., will require a revision of the algorithm but the result should still be straightforward. See Lumsden (in preparation) for an explicit account of semantic/syntactic correspondance for various verb classes, including ergative verbs.

7. This result is interesting in that, in the syntax, arguments of arguments, i.e., the complements of nouns, are generally realized with an inherent Case, e.g. genitive, and are generally optional. The proposed analysis thus makes a very broad generalization.

8. From R. Hograrian (1980) *The Armenian Cookbook*, Athenaeum, N.Y.

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