P-conflation in the English spray/load alternation

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1. Introduction

The following pairs of sentences exemplify the spray/load alternation in English (see Beavers 2017, Rappaport and Levin 1988, a.m.o).

(1) a. John sprayed paint onto the wall. (theme-object)
   b. John sprayed the wall with paint. (goal-object)

(2) a. John loaded hay into the truck.
   b. John loaded the truck with hay.

The alternation is characterized by two things: (1) a switch in the order of the post-verbal arguments, and (2) a corresponding change in the preposition used to introduce the non-post-verb argument (e.g., a locative preposition or with). I will refer to the structure where the theme argument occurs after the verb as the theme-object structure, and the structure where the goal occurs after the verb as the goal-object structure.

Previous analyses of the spray/load alternation have identified many interesting properties of the alternation that need explanation. These include a holistic effect (whichever argument occurs immediately following the verb is interpreted as holistically affected (Beavers 2017, Brinkmann 1995, Rappaport and Levin 1988, Tenny 1992, 1994, Wunderlich 1997)), the productivity of the alternation (Gropen 1989, Gropen et al. 1991a,b, Pinker 1989), its linking properties (Damonte 2005, D’Elia 2016, Dowty 1991, Larson 1990, Rappaport and Levin 1988), and the relationship between each structure (in all of the previously cited work to some extent).

This paper contributes to the structural analysis of the spray/load alternation by identifying the crucial importance of some previously noted but little explored syntactic differences between the theme-object and goal-object structures. Theme-object structures show more flexibility than goal-object structures; they can form the basis for unaccusative uses and object nominalizations of spray/load verbs, while goal-object structures cannot. This
syntactic difference immediately rules out analyses where the theme- and goal-object structures are entirely syntactically parallel (e.g., Goldberg 1995, Mateu 2000, 2017, Rappaport and Levin 1988). We are then left with a question regarding the source of these syntactic differences. I argue that the differences are best explained by assuming that the goal-object structure involves the conflation of a null preposition with the verb (cf. Brinkmann 1995, Damonte 2005, Wunderlich 1997), since this relates the syntactic limitations of the goal-object structure to limitations on prepositional objects. A question that I do not address here is the status of the PP in each structure; I focus only on the status of the object.

2. Syntactic differences between theme- and goal-object structures

2.1 Unaccusatives

Our first piece of evidence comes from unaccusative uses of spray/load verbs. Many (though not all) spray/load verbs can occur in unaccusative contexts. For those that can, only themes and never goals can become subjects of unaccusative uses (D’Elia 2016, Levin 1993). In contrast, both theme and goals can become subjects of passives.

(3) a. Paint sprayed onto the wall. (unaccusative theme-subject)
b. *The wall sprayed with paint. (unaccusative goal-subject)
c. Paint was sprayed onto the wall. (passive theme-subject)
d. The wall was sprayed with paint. (passive goal-subject)

(4) a. Icing drizzled onto the cake.
b. *The cake drizzled with icing.
c. Icing was drizzled onto the cake.
d. The cake was drizzled with icing.

Other spray/load verbs which show the same pattern are the following. A question mark before a verb indicates that a theme-subject unaccusative use is somewhat marginal; judgments of the verb in other structures remain clear.


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1 For me, this has a marginal use as a swarm-verb (Dowty 2001, Hoeksema 2009) in this sentence, under which reading it is grammatical (cf. The garden swarmed with bees). However, it is important to note that in this reading, the subject is interpreted as a location, and not a goal. That is, the sentence describes a cake with icing on it, but not a scenario where the cake comes to have icing on it. This distinction is, I believe, important, as it may relate to why location-subject sentences like those with swarm-type verbs are possible.

2 The list of verbs here is a subset of those provided in Levin (1993); the judgments summarized are mine.
(6) a. The audience crowded into the room.
b. *The room crowded with the audience.

(7) a. The sheets draped onto the bed.
b. *The bed draped with the sheets.

(8) a. Leaves piled onto the ground.
b. *The ground piled with leaves.

(9) a. Water pumped into the sink.
b. *The sink pumped with water.

(10) a. Seeds scattered into the field.
b. *The field scattered with seeds.

(11) a. Dust settled on the counter.
b. *The counter settled with dust.

(12) a. Ash sprinkled onto the ground.
b. *The ground sprinkled with ash.

There are also a number of spray/load verbs that do not allow unaccusative uses.

(13) cultivate, dab, daub, heap, inject, mound, pack, plant, plaster, rub, seed, sew, smudge, sow, stack, stock, strew, string, swab, vest

I have found no spray/load verbs that allow unaccusative goal-object uses. There come to mind a couple of apparent exceptions, shown in (14–15), but these do not constitute true exceptions to the generalization about spray/load verbs, as I will explain.

(14) Swarm-type verbs:
    a. Bees swarmed in the garden.
    b. The garden swarmed with bees.

(15) Fill-type verbs:
    a. Water filled *(into) the room.
    b. The room filled with water.

Regarding swarm-type verbs, what distinguishes the grammatical (14b) from ungrammatical goal-subject unaccusatives with spray/load verbs is semantically clear: in The garden swarmed with bees, the subject is interpreted not as a goal, but as a location. The sentence does not describe the garden coming to have bees in it, but instead that the bees are in the garden swarming. Though I do provide a syntactic analysis of swarm-type verbs here,
this distinction seems crucial, and allows us to maintain the generalization regarding the impossibility of goal subjects with spray/load verbs.

Fill-type verbs pose a more difficult problem. However, at least in English, what defines these verbs is precisely the fact that they do not freely participate in the spray/load alternation.

(16) a. John filled the tub with water.
    b. *John filled water into the tub.

Thus, even if we admit that these cases may allow true goal subjects, there is still generalization we can make about spray/load verbs, since these are not spray/load verbs. In addition, while there are many fill-type verbs (Levin 1993), I have only identified 4–6 that allow goal subjects: clog, fill, flood, ?interlace, ?interleave, and stop up. Furthermore, even these exceptions are entirely regular with regards to their nominalizations (to be discussed later), as their object nominalizations can only refer to their themes and never their goals.

2.2 Nominalizations

The second syntactic difference between theme- and goal-object uses of spray/load verbs has to do with their entity-denoting nominalizations. Such nominalizations of spray/load verbs can only refer to their themes and never their goals (Fraser 1971).

(17) a. the spray (= the paint/≠ the wall)
b. the load (= the books/≠ the truck)
c. the drizzle (= the icing/≠ the cake)
d. the squirt/spritz (= the water/≠ the petunias)
e. the crowd (= the people/≠ the room)
f. the dab/daub/smear/smudge/swab (= the paint/≠ the canvas)
g. the dusting (= the powdered sugar/≠ the cake)
h. the drape (= of the sheets/≠ of the bed)
i. the heap/mound/pile/stack (= the stones/≠ the sidewalk)
j. the spatter (= the blood/≠ the wall)
k. the stuffing (= the feathers/≠ the pillow)

There may be one possible exception, which is the entity nominal of the verb pack. I have no explanation for why pack can apparently refer to the goal of a packing eventuality, and leave it as a possible true exception.

A few spray/load verbs do not allow entity nominalizations: cram, cultivate, jam, pump, settle, sew, strew, and string. The rest do (see Levin 1993 for a list), and they show an identical pattern to the one in (17).
3. **Analysis: P-conflation**

I propose that the syntactic contrasts between theme- and goal-objects of *spray/load* verbs conform to independent generalizations if we assume that the goal-object structure involves the conflation of a null preposition with the verb. This proposal is sketched in (18).

\[(18)\]

\[a.\] \[
\begin{array}{c}
VP \\
V \\
v \\
\sqrt{\text{spray}} \\
\end{array}
\]

\[\begin{array}{c}
\text{DP} \\
\text{paint} \\
\end{array}\]

\[b.\] \[
\begin{array}{c}
VP \\
V \\
v \\
\sqrt{\text{spray}} \\
\end{array}
\]

\[\begin{array}{c}
\text{DP} \\
\text{P}_{\text{LOC}} \\
\text{the wall} \\
\end{array}\]

The theme-object structure in (18a) will be later modified slightly. For now, let us focus on the goal-object structure, and on the independent generalizations that lend it support.

### 3.1 P-stranding in A-movement

The first generalization supporting the P-conflation analysis of the goal-object structure has to do with differences in the possibility of P-stranding under different subtypes of A-movement. In passives, A-movement can strand a preposition, while in unaccusatives, it cannot (Keyser and Roeper 1984). This is shown in (19).

\[(19)\]

\[a.\] I broke the car. \hspace{1cm} (active)
\[b.\] The car was broken. \hspace{1cm} (passive)
\[c.\] The car broke. \hspace{1cm} (unaccusative)
\[d.\] I broke into the car. \hspace{1cm} (P-object)
\[e.\] The car was broken into. \hspace{1cm} (pseudo-passive)
\[f.\] *The car broke into. \hspace{1cm} (pseudo-unaccusative)

(19) establishes that a particular root, \(\sqrt{\text{break}}\), can occur with active, passive, and unaccusative uses (19a–c), as a kind of baseline. This same root can occur with a prepositional object (19d). However, while the prepositional object use of this root can occur in a pseudo-
passive (19e), it cannot occur in a would-be pseudo-unaccusative (19f). The same contrast extends to other cases, showing that it is not an idiosyncratic property of √/break that is responsible.

(20) a. John moved the platform.
    b. The platform was moved.
    c. The platform moved.
    d. John moved into the house.
    e. The house was moved into.
    f. *The house moved into.

(21) a. Sue blew the whistle at five.
    b. The whistle was blown at five.
    c. The whistle blew at five.
    d. Sue blew onto the hot soup.
    e. The hot soup was blown onto.
    f. *The soup blew onto.

(22) a. Sam turned the wheel.
    b. The wheel was turned.
    c. The wheel turned.
    d. Sam turned onto the driveway.
    e. ?The driveway was turned onto.

(23) a. Pat hung the picture on the wall.
    b. The picture was hung on the wall.
    c. The picture hung on the wall.
    d. Pat hung onto the trapeze.
    e. ?The trapeze was hung onto.
    f. *The trapeze hung onto.

It is tempting to say that the prepositional object uses of the verbs in (19–23) involve different roots from their transitive counterparts. If this were the case, we could explain the ungrammaticality of the pseudo-unaccusatives by saying that these distinct roots happen to disallow unaccusative uses, just like other unrelated verbs like destroy, eat, etc. However, three of the previous examples make this difficult to claim. In particular, break, blow, and hang all have irregular past tense and participle forms that are shared between their transitive and P-object uses. In at least some frameworks, shared irregular morphology of this sort is characteristic of identical roots (e.g., Borer [2013]). To take this approach, we would have to claim that the identical irregular morphology is due purely to happenstance in all three cases—making this approach far more tenuous than it may first appear.

In contrast, the null preposition analysis of goal-object spray/load verbs would identify the pattern in (19–23) with the impossibility of goal-subject unaccusative uses of spray/load
verbs. However, it is worth noting that there is still the question of why the P-stranding is possible under passive A-movement but not unaccusative A-movement. The empirical clarity of this pattern makes it a clear starting point for further investigation.

3.2 Entity nominalizations

Now, I turn to the other second generalization supporting the P-conflation analysis of goal-object uses of spray/load verbs, which has to do with entity nominalizations. As we saw in (17), entity nominalizations of spray/load verbs may refer to their theme arguments, but never their goal arguments. Under the P-conflation analysis, this falls in line with a general pattern regarding the possible referents of entity nominalizations of verbs. When such nominalizations are derived by productive affixes, they cannot refer to prepositional objects. Typically, such nominalizations can refer to eventualities, reified eventualities, or internal arguments.

(24) a. the sleep (= event/≠ the bed)
   b. the break (= event/= reified event/= the shelf)
   c. the invite (= reified event)
   d. the change (= event)
   e. the construction (= event/= internal argument/≠ the job site)

The nominalizing suffixes -al, -(a)tion, -ment, -ing, and -∅ show the same pattern (cf. Myers 1984, Pesetsky 1995).

However, some nominalizing affixes clearly allow more readings, including ones where the resulting nouns refer to objects of prepositions.

(25) a. door opener (agent/instrument)
    b. broiler (agent/instrument/internal argument (e.g., a kind of chicken))

(26) a. diner (agent/location)
    b. thinker (agent/object of about)

(27) a. residence (location)
    b. confidant (one confided in)

3 This term comes to me by way of Kyle Johnson (p.c.). The idea is that a reified eventuality is what an eventuality would be if it were an entity. To take an example from ((i)), the invite as an entity nominalization of invite receives a reified eventuality reading. It is not necessarily the eventuality itself (it may refer to a letter, for instance), but nor is it the theme/patient of the invitation (that would be the one(s) invited). The distinction between eventualities and reified eventualities is subtle, and ultimately not of crucial importance in the analysis presented in this paper.

4 In reference to, e.g., The vase broke on the shelf.
However, such uses do not seem to be fully productive. For instance, *dine* and *eat* have very similar meanings referring to the consumption of food. But while *diner* refers to a location where one can get food, *eater* cannot.

These exceptions make the argument from nominalizations a bit less clear than the argument from unaccusatives. Nominalizations are rather more complex and leaky than one might hope. But there are nevertheless some patterns: nominalizations like those in (17) are derived by zero-affixation or -ing, and as we have seen these affixes do not refer to prepositional objects (cf. Myers 1984, Pesetsky 1995). In addition, although there are exceptions to the generalization with particular affixes, there is still a clear general trend, where nominalizations referring to prepositional objects are less common than nominalizations referring to direct arguments. Under the P-conflation analysis, *spray/load* nominalizations fall in line with this general pattern.

To account for this pattern, I propose a small amendment to the theme-object structure presented in (18a). Rather than assuming that theme arguments come from the semantics of the root, I propose that they are introduced by a functional head that combines with the verb (cf. Smith and Yu 2021). This will allow theme- and goal-object uses of *spray/load* verbs to have the same underlying semantics, with the difference in their behavior coming from the syntactic and semantic properties of *theme* and *P LOC*.

\[
\begin{align*}
[VP] &= \lambda x. \lambda e. \text{spray}(e) \land \text{theme}(e, x) \\
[\text{theme}] &= \lambda P(\langle s, t \rangle). \lambda x. \lambda e. P(e) \land \text{theme}(e, x) \\
\text{P} &\land \sqrt{\text{spray}}
\end{align*}
\]

Under this approach, the zero-nominalizer would have the following semantics.

\[
[\boxempty_{\text{NMLZ}}] = \lambda P(e, x). \lambda x. \exists e[P(e, x)]
\]

It is worth noting that nothing semantically rules out entity nominalizations of goal-object verbs with this semantics; these would have to be ruled out by the syntax in whatever way they are ruled out in the cases in (24).

4. Conclusion

This paper has shown that theme- and goal-objects of *spray/load* verbs differ syntactically. This makes analyses of the *spray/load* alternation where these different arguments have the same syntactic status empirically untenable. I argued that P-conflation could reduce these asymmetries to independent patterns and provide a way of thinking about the syntax of the alternation (see Brinkmann 1995, Damonte 2005, and Wunderlich 1997 for proposals that
arrive at similar conclusions for different reasons). Of course, there are also more questions about the syntax of the spray/load alternation—with perhaps the most pressing being how the PPs I’ve ignored here (e.g., onto the wall, with the paint) could fit into the P-conflation analysis.

Furthermore, although the similarities between the behavior of prepositional objects and goal-objects of spray/load verbs identified here support treating them as syntactically similar, we are left with questions about the behavior of prepositional objects more generally. For instance, consider the sharp difference between the acceptability of P-stranding under passive and unaccusative A-movement. Passives and unaccusatives are typically considered to be rather similar, with the difference relating to the presence or absence of v/Voice. But it is not immediately obvious how the availability of P-stranding could be related to presence of v/Voice, and the ungrammaticality of it to its absence. In addition, the messy nature of nominalizations makes it unclear how to properly account for the general lack of P-object nominalizations, while allowing the few cases that do exist. It is my hope that highlighting these puzzles and their potential importance to the proper syntactic analysis of phenomena that may initially appear unrelated (like the spray/load alternation) will prove the first steps toward an explanation.

References


