

Unpredicated Particles

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21.1 Introduction

In their introduction to the volume *Grammatical Semantics*, Mohanan, Mohanan, and Wee lay out a research program of that name “which seeks to explore grammatically relevant aspects of meaning” (1999:1). This paper is intended to further this research program by addressing the analysis of the (b) examples in (1) and (2) and others like them:

- (1) a. He hosed the dirt off.
b. He hosed the window off.
- (2) a. He rinsed the dirt out.
b. He rinsed the cloth out.

Although the same particle appears in both members of each pair of examples, its relation to the object is different. In the (a) examples, intuitively the particle is predicated of the object, which refers to what we call the ‘material’ argument of the verb; thus, the (a) examples have resultative meanings, e.g., ‘the dirt is off’ and ‘the dirt is out’, with respect to some understood, but unexpressed location. In the (b) examples, where the object expresses the location (of the material), there is no such predication: the window is not off, nor is the cloth out. The acceptability of the (b) examples is yet more intriguing in the context of the existence of related examples as in (c) and (d):

- (1) c. He hosed the dirt off the window.
d. He hosed the window off (*the dirt/*of the dirt/*with the dirt).
- (2) c. He rinsed the dirt out of the cloth.
d. He rinsed the cloth out (*the dirt/*of the dirt/*with the dirt).

In the (c) examples, both material and location are expressed; the examples are related to the (a) examples, as they have the material as the object, with the location apparently being part of a PP headed by a preposition analogous to the particle in the (a) and (b) examples. We refer to these as 'full expression' examples. However, there are no examples which have the location as object (as in the (b) examples) which include the particle, and yet also express the material; none of the attempts to construct such examples as in the (d) sentences works. We refer to the particles in the (b) examples as 'unpredicated'.

Other verbs with the same behavior include *wipe*, *sweep*, *scrub* and *scrape*.

- (3) a. She wiped the crumbs off. (cf. The crumbs are off.)
 b. She wiped the table off. (cf. *The table is off.)
- (4) a. She scraped the paint off. (cf. The paint is off.)
 b. She scraped the windowsill off. (cf. *The windowsill is off.)

These are all removing type surface contact verbs—or *wipe* verbs—discussed in Levin and Rappaport Hovav (1991) and Rappaport Hovav and Levin (1998; hereafter RH&L98). They are surface contact verbs as they describe an action involving making contact with a surface in some manner; they are of the removing type as they describe actions usually performed to remove stuff from a surface or container.

In addition, there is an interesting restriction on the particles with unpredicated uses. The particles exemplified so far involve a notion of not being at a location, or movement away from a location: *off* and *out*. These particles have 'opposites', *on* or *in*, which are found with certain *spray/load* verbs—the surface contact verb subclass whose members describe actions intended to put stuff on a surface or in a container. However, these verb-particle combinations lack unpredicated uses.

- (5) a. He smeared the ointment on (his hands).
 b. *He smeared his hands on.
- (6) a. He stuffed the laundry in (the basket).
 b. *He stuffed the basket in.
- (7) a. He packed the clothes in (the suitcase).
 b. *He packed the suitcase in.

The relevant behavior is determined by the particle, not the verb, for the same verb can tolerate unpredicated uses of some particles, but not others, as the contrast between (8b) and (9b) shows:

- (8) a. She sprayed the paint on (the wall).
 b. *She sprayed the wall on.

- (9) a. She sprayed the dirt off (the wall).
 b. She sprayed the wall off.

Our analysis of when unpredicated particles are possible is based closely on observations on English resultative constructions with a subcategorized NP. Previous work has shown that a verb in a resultative construction has differential tolerance for which adjectives can head the result phrase: some adjectives are possible and some are not (*wipe the counter clean/*dirty*). Hay (1997) and Wechsler (2005) explicate the restriction in terms of the scale structure of the adjectives: only so-called 'maximal endpoint closed-scale' adjectives can give rise to a telic sentence, which the resultative construction requires. Our account of the particle constructions is that *wipe the table off* is analogous to *wipe the table clean*, while **wipe the table on* is analogous to **wipe the table dirty*.

The paper is organized as follows. In section 21.2, we present some basic facts about English unpredicated particle constructions. Section 21.3 briefly addresses previous literature on the topic. We present our analysis in section 21.4, relating the unpredicated particle construction to the resultative construction, and then focus on the precise aspectual properties of the relevant examples. We conclude with a brief summary and an overview of areas for future research.

21.2 Properties of the Unpredicated Particle Construction

The verbs appearing in the relevant constructions typically take just the location argument as object, as with *wipe* in the examples below (see RH&L98, Zeller 2001). The verbs can be augmented with one of the allowable particles (as in the (b) example), retaining the location as object; alternatively, the verbs can take the material as object and the location as a PP, as discussed above. They cannot, however, be found with the material alone, except in the presence of a particle.

- (10) a. *wipe* the mirror b. *wipe* the mirror off
 (11) a. **wipe* the fingerprints b. *wipe* the fingerprints off (the mirror)

In *wipe the mirror*, typically there is material (to be wiped off) implied; our world knowledge of mirrors is such that we assume that we wipe a mirror so that it can carry out its intended function better—in other words, by removing from it foreign substances that occlude or blur its surface. However, it is certainly possible to wipe a surface without anything being on it. Thus, the presence of some material on a surface is probably not part of the core meaning of *wipe* or comparable surface contact verbs (RH&L98). Similarly, consider *spray*, which also allows the unpredicated particle construction, though only with *off*. The verb itself just means putting liquid (drops)

into motion, and surely the default interpretation of *spray the wall* involves spraying something—the drops that are set in motion—onto the wall.

Both types of verb-particle construction (as in (3) or (4) above) have one overt internal argument and one unexpressed argument, but there is an asymmetry in the interpretation of the unexpressed argument. In those instances where the material is the direct object and the location is unexpressed, as in *wipe the fingerprints off*, the location must be understood as what Fillmore (1986) calls a definite null argument, better described as an unexpressed argument having a contextually determined interpretation (cf. Condoravdi and Gawron 1996, Lambrecht and Lemoine 2005).¹ Thus, (12a) is odd as the context does not allow a particular location to be inferred for the material, the fingerprints; in contrast, (12b), which includes enough context for the location to be inferred, is felicitous.

- (12) a. The maid said that whenever she goes in to clean a room,
#she has to wipe the fingerprints off.
b. If the maid sees that the mirror is dirty,
she has to wipe the fingerprints off (= 'off it').

Now in the unpredicated examples, the location is expressed and the material is unexpressed. Here the material is interpreted like an indefinite null argument in Fillmore's terms, comparable to the unexpressed object in *She just ate*. That is, some material is understood to be at the location, but the exact nature and quantity of the material can only be inferred using knowledge of what might be prototypically be found at such a location. These properties are illustrated in (13), where that material might be dust, fingerprints, toothpaste, water spots or anything else that might turn up on the surface of a mirror.

- (13) The maid said that whenever she goes in to clean a room,
she has to wipe the mirror off.

Importantly, the interpretation of the unexpressed material, unlike that of the unexpressed location, does not depend on context. Examples with unexpressed material are felicitous even in the absence of (adequate) context, unlike examples with unexpressed locations. The contrasting felicity of the sentences in (14) makes this point.

- (14) a. Before you drink, you need to wipe the glass off.

¹Condoravdi and Gawron's characterization of the interpretation as contextually dependent seems most accurate to us. Although it is true that unexpressed locations are often understood as definite, we suggest that this is a consequence of the more general oddness of non-quantized locations in such PPs (*#She wiped the fingerprints off glass; #She rinsed a spot out of silk*). Furthermore, the need to determine the unexpressed location from context strongly favors its being definite and, hence, referential, perhaps enhancing the bias against indefinite locations.

- b. #Before you drink, you need to wipe any/the fingerprints off.
(cf. Before you drink from a glass, you need to wipe any/the fingerprints off.)

The understood contextually determined location in *wipe the fingerprints off* is one manifestation of a more general phenomenon: even simple 'intransitive' expressions with particles such as *She ran off/out/in* show the same interpretive properties. With *run* and other motion verbs, the unexpressed location again receives a contextually determined interpretation. In the absence of a specific context, this location is determined deictically with motion verbs, being understood as the location of the speaker. As far as we can tell, all unexpressed locations—whether static locations, sources, goals, or paths—receive a contextually determined interpretation. Consider the examples in (15).

- (15) a. We squeezed the toothpaste out [].
b. We stuffed the feathers in [].
c. We pushed the needle through [].
d. We pushed the cart across [].
e. We crossed [] at the light.
f. All the employees left [] for home at 5pm today.
g. As soon as they open the office, the first customers telephone [].

We include the (e) and (f) examples here as their unexpressed path- and source-like arguments pattern in the same way as the others, although strictly speaking they would not be expressed syntactically as a complement of a particle or preposition in these examples; and we include the last example since the unexpressed argument is notionally a goal PP. We have no explanation for the observation that unexpressed locations receive a contextually determined interpretation, but the generality of the facts suggests that we should not seek an explanation for this interpretation as it is found in say (15b) just within that type of example; thus, we will set this question aside.

Finally, we mention the contribution of the particles *off* and *out* to the meaning of the construction. Each by its very nature defines a particular spatial relation between a Figure, the material, and a Ground, the location, borrowing the terms used by Talmy (1975).² In so doing, a particle imposes certain restrictions on possible materials and locations. Consider the differences in interpretation of the examples in (16).

- (16) a. wipe the suitcase
b. wipe the suitcase off
c. wipe the suitcase out

²Some particles have acquired additional non-spatial uses as with *up* and *on* in *cut the meat up* or *talk on*. We leave such uses aside.

The (a) sentence is vague as to what part and how much of the surface of the suitcase is being wiped; it could be some or all of it. The other two examples contrast with (a) in implying that some material is present at the location, presumably because the particle by its nature relates a Figure (the material) to a Ground (the location); furthermore, they describe a different kind of event: the removal of the material from the location, due to the 'removal' facet of meaning introduced by the particles. However, along with the difference in particle in the (b-c) examples, there is a difference in how the location is conceptualized: in the *off* example it is conceptualized as 2-dimensional, a surface, while in the *out* example it is conceptualized as 3-dimensional, a container. This conceptual difference plays out according to whether the wiping is understood as involving the exterior of the suitcase (the suitcase as a surface) or the interior of the suitcase (the suitcase as a container).

21.3 Previous Literature

The unpredicated uses of particles have not gone unnoticed in the literature. Svenonius (1996:31) presents the examples in (17), which are also considered in Zeller (2001), McIntyre (2003), and Svenonius (2003), among others.

- (17) a. The waiter wiped the dust off the table.
 b. The waiter wiped {off} the dust {off}.
 c. The waiter wiped {off} the table {off}.

The alternation is found to some degree in all Germanic languages, as extensively surveyed by Svenonius. In German, for instance, the verb *spülen* 'wash' in conjunction with the particle *ab* 'off' gives a familiar pattern (examples from Zeller (2001)):

- (18) a. Peter spülte den Teller.
 'Peter washed the plate.'
 b. Peter spülte den Teller ab.
 'Peter washed the plate off.'
- (19) a.*Peter spülte das Fett.
 'Peter washed the grease.'
 b. Peter spülte das Fett ab.
 'Peter washed the grease off.'

In Zeller's account, all the internal arguments in a verb-particle construction are licensed by the particle, and not by the verb (more specifically, not *only* by the verb).³ Zeller makes the important observation that in washing a plate, as in (18), the grease (theme) is what is removed; and that washing off the grease

³It seems to be a necessary but not sufficient condition on the unpredicated uses that the location be an argument of the verb itself; see our discussion of (48) below.

from a plate as in (19) implies that the plate (source) thereby becomes clean. He locates these properties in the semantics of the particle *ab*; *spülen* has a default argument structure of agent and source, and the theme is only linked through the particle. Once *ab* is added, either internal argument (source or theme) may be the object, giving the facts in (18)–(19) above.

Broadly speaking, German and English seem quite similar in the types and interpretations of unpredicated particle examples which intuitively alternate with predicated particle variants (as in (19)). For example, in terms of the interpretation of unexpressed arguments, the two languages are the same; an unexpressed location must be contextually determined, while an unexpressed material argument need not be and receives an unspecified interpretation (cf. 12 above):⁴

- (20) Jedes Mal wenn ich in die Küche gehe
 Each time when I in the kitchen go
 a. ??... muss ich das Fett ab-spülen.
 ... must I the grease off-wash
 b. ... muss ich die Teller ab-spülen.
 ... must I the plates off-wash

Using the notions of Figure and Ground, McIntyre (2007) also discusses our unpredicated examples under the notion of 'Ground promotion': "suppression of the Figure and promotion of the Ground to direct argument" (2007:353), presenting German examples such as those shown in (21):

- (21) a. Er hat den Tee (mit heißem Wasser) auf-gegossen.
 he has the tea (with hot water) on-poured
 b. Sie schmierte meinen Rücken (mit Sonnencreme) ein.
 she smeared my back (with sun-cream) in

The 'promotion' idea draws on the analysis of prepositions in Svenonius (1996, 2003), in which they are considered notionally transitive but syntactically decomposed into two parts, *p* licensing an 'external' argument, Figure, and *P* licensing an 'internal' argument, Ground. Svenonius' analysis of the alternation is that the canonical construction with a Figure object involves *p-P*, while the unpredicated variant only involves *P*. (22) illustrates with Dutch examples from Svenonius (2003); the promotion in the second case is evident from the syntactic derivation:

- (22) a. Ingrid smeert henna in haar haar.
 Figure Ground
 'Ingrid smears henna in her hair.'

⁴We are grateful to Magdalena Schwager for assistance with the German examples.

- b. Ingrid smeert [haar haar]_i in t_i.
 Ground
 'Ingrid smears up her hair.'

In (22a), the form *in* corresponds to *p-P*, licensing both arguments, the higher of which (Figure) is the verb's surface object. In (22b), only *P* is projected, giving an unaccusative-like structure. The object of *P* (Ground) moves to the verb's object position to be licensed on the surface (e.g., for case reasons).

Svenonius posits that German and Dutch have very flexible patterns of argument alternation, as suggested by the examples above and the derivation in (22b); he takes English to be somewhat restricted in comparison, essentially having only the *off/out* type of unpredicated example, derived in a different way from the general alternations found in German and Dutch. The existence of a real asymmetry between German and English, for example, might not seem surprising given that prepositions, particles, and (inseparable) verbal prefixes provide German with considerable potential resources for licensing argument alternations; we might indeed expect English to show fewer options. However, as McIntyre comments, the difference between German and English is only a tendency, and not a qualitative or parametric difference; examples as in (21) are not fully productive in German. McIntyre observes that "we should be mindful of two qualitative similarities between the languages: (i) the vast bulk of particle verbs disallow Ground promotion, and (ii) Ground promotion is not fully productive" (2007:355). To illustrate with one of his examples, Ground promotion in (23) is as bad in German as in English:

- (23) Ich habe {die Bettwäsche /*das Bett} ab-gerissen.
 I have {the bedsheets /*the bed} off-ripped

In summary, it seems likely that a full account of apparently unpredicated particle examples will involve careful consideration of specific types of verbs, with respect to the kind of action they denote. The semantic properties of the verbs will interact with the various argument-extension and argument-alternation resources in particular languages. We undertake such an enterprise in a limited way with respect to English in the analysis part of this paper. We take the previous literature to have shown that the unpredicated particle construction is a fact of all Germanic languages, only underscoring the importance of presenting an analysis of its core properties.

21.4 The Interpretation of Particle Constructions and Telicity

We now need to further elucidate why the unpredicated particle construction is possible with *off* and *out*, but not *on* and *in*. For example, there is a clear contrast in acceptability between (8b) and (9b), repeated in (24), yet there is no obvious, concomitant sense in which the semantics of *on* and *off* differ.

- (24) a. *She sprayed the wall on.
 b. She sprayed the wall off.

Hence, the next step is to identify the property that distinguishes complex events of removing described by *off/out* verb-particle examples from the complex events of putting described by *in/on* examples.

We first examine the aspectual properties of surface contact verbs outside the verb-particle construction. We then discuss the aspectual analysis of resultatives, as result phrases have the same roles as particles; they make it possible to telicize the event denoted by the verb and they provide additional licensing options for arguments. With this context, we return to the unpredicated particle examples and discuss their aspectual analysis. In turn, this provides the basis for our explanation of why certain particles are excluded from the unpredicated particle construction.

21.4.1 The basic (a)telicity of surface contact verbs

Surface contact verbs like *scrub*, *sweep* and *wipe* describe actions usually performed to remove stuff from a surface or container. They contrast with the putting type surface contact verbs, such as *dab*, *smear* and *stuff*, which describe actions usually performed to put stuff on a surface or in a container. (There are also a few surface contact verbs which describe actions that can be used for either putting or removing, such as *shovel* and *spray*.)

As discussed by Rappaport Hovav and Levin (2005), a hallmark of verbs such as *sweep* and *wipe* is that they allow either telic or atelic interpretations in their simple transitive uses with a definite location object. The atelic interpretation arises when the specific pattern of motion and contact characteristic of the verb is understood as repeated indefinitely over the surface (or container). The telic interpretation arises when the spatial extent of the surface is taken to bound the action, which still involves multiple instances of the characteristic pattern of motion and contact. In this instance, the event is over when the action has been carried out with respect to the entire surface. Specifically, on this interpretation the location serves as an incremental theme (Dowty 1991), with its spatial extent measuring out the event's progress.⁵

- (25) a. She wiped the counter for five minutes. (Atelic)
 b. She wiped the counter in 30 seconds flat. (Telic)

Surface contact verbs, which exemplify what might be called potential—or 'latent' (Tenny 1992:20)—incremental theme verbs, contrast with canonical

⁵In the absence of context, simple past examples such as *She wiped the counter* tend to receive a telic interpretation (and, in fact, some work does not even recognize the existence of an atelic interpretation; cf. Dowty's (1991:567) use of *mow the lawn* to illustrate the notion of incremental theme). Rappaport Hovav (2008) proposes that such telic interpretations are the result of conversational implicature, noting that pragmatic considerations govern their availability.

incremental theme verbs (e.g., *build*, *eat*, *translate*), which are necessarily telic when they take a definite object; their object is almost always understood as an incremental theme, with its spatial extent necessarily serving as a measure for the event.

21.4.2 Determining telicity in resultative examples

Telic predicates denote events with inherent terminal points. Most current approaches to telicity take such predicates to have a designated argument which plays a crucial role in determining whether this terminal point has been attained. Specifically, this argument has a property that in some sense 'measures out' the event, defining a homomorphism between a change in this property and the event's temporal progress (e.g., Beavers 2007, Borer 2005, Hay, Kennedy and Levin 1999, Krifka 1992, 1998, Ramchand 1997, Tenny 1992). Incremental themes are arguments that define the homomorphism via the spatial extent of their referent.

The homomorphism can also be defined in events of 'scalar' change: a change along a scale consisting of a set of degrees—points or intervals indicating measurement values—ordered on a particular dimension (e.g., cost, height, temperature; Kennedy (2001)). This dimension represents an attribute of an argument of the event, with the degrees indicating the possible values of this attribute. A scalar change involves a change in the value of the relevant attribute in a particular direction along the associated scale. The change along the scale also determines the time course of the event: there is a homomorphism between the scale of change and the event's temporal progress. Specifically, when the scale is bounded, it provides a natural bound for the event, and the event is telic.

Some verbs, such as *ascend* and *widen*, denote events of scalar change in that they lexically entail a scale. Other verbs, such as incremental theme verbs, do not lexicalize a scale of change (Rappaport Hovav 2008). Surface contact verbs also do not lexicalize a scale of change; however, in combination with a particle or a result phrase, they may form a complex event of removal or putting, and a scale of change is necessarily introduced via the particle, a PP or a result phrase. To show this, we start with resultative constructions based on surface contact verbs.

As Hay (1997) and Wechsler (2005) point out, an examination of naturally-occurring resultatives with subcategorized objects reveals that only so-called 'maximal endpoint closed-scale' gradable adjectives, such as *flat* or *clean*, can head the result phrase. 'Open-scale' gradable adjectives, such as *long* or *wide*, and 'minimal endpoint closed-scale' gradable adjectives such as *dirty* or *wet* cannot. That is, there are resultatives such as *hammer the metal flat* or *wipe the shelf clean*, but not **hammer the metal long* or **wipe the shelf wet*.

To understand what defines these three classes of gradable adjectives, it is

important to understand two properties: their associated scale and standard. An essential property of a gradable adjective is the existence of an associated attribute whose values can be ordered to form a scale. For example, *long* is associated with the attribute 'length', with the possible values of this attribute ranging from 0 to infinity (on some measurement system). Consequently, things possessing this attribute can be ordered, and thus compared, according to their lengths. When a gradable adjective is predicated of an object, as in *The new kitchen counter is long*, an implicit comparison is made between the length of the kitchen counter and a contextually determined 'standard' of length, with this particular counter exceeding this standard. Maximal endpoint closed-scale adjectives, as their name implies, are associated with a closed scale, a scale with a maximal value; this value is used as the default standard, so the adjective is only applicable when this value is reached. In contrast, the scale associated with 'open-scale' adjectives lacks a minimum or maximum value;⁶ these adjectives necessarily have a contextually determined standard. Minimal endpoint closed-scale adjectives such as *dirty* and *wet* also have a bounded scale, but it is bounded by a minimum value: that is, the relevant adjective can be applied as soon as an entity has the property to even a minimal degree. For instance, a towel is dirty as soon as there is a speck of dust on it or wet as soon as there is a drop of liquid on it. However, what makes these adjectives like open-scale adjectives is that when evaluating their applicability to an entity, the standard of dirtiness or wetness that is used is often contextually determined and assigned a value above the minimal degree, as Wechsler discusses.

Since maximal endpoint closed-scale adjectives are associated with a scale with a maximal value, this value can serve as a bound on the scalar change denoted by a resultative, thus making the event temporally bounded. In contrast, the scale associated with open-scale adjectives lacks a maximum value; such adjectives do not provide a natural bound on a scalar change, so there is no clear temporal bound for the event denoted by a resultative. The same applies to the minimal endpoint closed-scale adjectives: apparently, there is no clear natural bound for the scalar change.

The distribution of adjectives in resultatives, then, suggests that result phrases can serve to telicize events. However, this statement is not sufficiently nuanced, as sentences with appropriate result phrases are not always telic.

⁶Occasionally, an adjective whose associated scale is typically open may be associated with a closed scale when applied to a particular argument (Kennedy and McNally 2005:265ff.). It is interesting that the few examples cited of open-scale adjectives heading result phrases show exactly such shifts. Thus, Hay (1997:12) cites *her nails were clipped short*; due to the way nails grow, *short* here has a maximal endpoint (contrasting, for example, with *short* applied to dresses). Open-scale adjectives may also be found with pseudo-resultatives, as in *open one's mouth wide* (see Levinson 2006). Here we focus solely on the types of scales relevant to our concerns and ignore further subtypes that may be otherwise important, such as scales closed at one vs. both ends.

Again, we make this point with surface contact verbs, though it holds more generally. It is more accurate to say that examples such as *Sam wiped the table* or *Phil pounded the scrap metal*, which may receive either telic or atelic interpretations with a definite object (see section (21.4.3)), become necessarily telic with a result phrase, as shown in (26).

- (26) a. Sam wiped the table clean in one minute flat.
b. Phil pounded the scrap metal flat in an hour.

However, if the object of the resultative is not quantized, then the sentence is nevertheless atelic, as in these examples with mass noun objects:

- (27) a. Sam wiped furniture clean for an hour.
b. Phil pounded scrap metal flat for an afternoon.

These examples show that in resultatives maximal endpoint closed-scale adjectives define a scalar change that is necessarily bounded, and that change is predicated of some entity, which is an incremental theme in its own right by virtue of its spatial extent. In other words, for each part of this entity, the boundedness of the change of state denoted by the resultative is being assessed. The entire event is bounded only if the spatial extent of this entity is bounded: in resultatives the scale of change has no effect on telicity, for the only possible result phrases guarantee that the scale of change is bounded. Thus, resultative constructions are telic or atelic depending precisely on whether the object is quantized.

Thus, two interacting 'measures' must be recognized in resultatives, and as we show in sections 21.4.3 and 21.4.4, both figure in the interpretation of verb-particle examples. It is the nature of the scale of change, whose importance has not been fully appreciated in previous studies, which distinguishes the predicated and unpredicated particle examples. In this paper we describe these two measures informally, focussing on why both must be identified.⁷

21.4.3 Determining telicity when the material argument is expressed

Now we return to the constructions of interest. In the full expression and acceptable verb-particle examples, the PPs or particles do not telicize across the board, but only under precisely the same circumstances as result phrases: that is, they must provide a bound to the scale of change and the argument that changes, as an incremental theme, must have a bounded spatial extent. What differentiates these constructions from resultatives is that the scale of change involves a change in the material's location.

The telicity of the putting type surface contact verbs, often referred to as *spray/load* verbs, has received considerable discussion (Dowty 1991, Jack-

⁷Based mainly on other data, Beavers (2007) recognizes that the computation of telicity frequently involves these two types of measure and proposes a way to formalize these observations.

endoff 1996), and the analyses of these verbs can be extended to the full expression examples. In these examples, the material is expressed as the object and contributes to the delimitation of the event. Compare an example with a quantized material NP to one with a non-quantized material NP: only if this NP is quantized is the example telic; contrast (28) with (29).⁸

- (28) a. She swept dirt off the floor for/*in 2 minutes.
b. He wiped toothpaste out of the sink for/*in 5 minutes. (Atelic)
- (29) a. She swept the dirt off the floor *for/in 5 minutes.
b. He wiped the toothpaste out of the sink *for/in 5 minutes. (Telic)

Furthermore, the progressive entails the perfect with atelic predicates, but not with telic predicates (Dowty 1979, among others). Thus, the availability of perfect entailments only in (30b), where the material is non-quantized, also indicates that such sentences are atelic; in contrast, the examples in (31b), where the material is quantized, lack these entailments, consistent with telicity.

- (30) a. She is sweeping dirt off the floor.
⇒ She has swept dirt off the floor.
b. He is wiping toothpaste out of the sink.
⇒ He has wiped toothpaste out of the sink.
- (31) a. She is sweeping the dirt off the floor.
≠ She has swept the dirt off the floor.
b. He is wiping the toothpaste out of the sink.
≠ He has wiped the toothpaste out of the sink.

As previous work notes, what matters to the determination of telicity is that the object, i.e. the material, is an incremental theme. The spatial extent of the material provides a measure of the progress of the event. Only when the material is quantized is this measure bounded, and the event telic.

Such accounts focus on the spatial extent of the material, that is, a measure as incremental theme; however, there is more to the determination of the telicity of the event than this. As in resultatives, all parts of the material as a direct object are involved in an event of scalar change: from being located on some surface, or in some container, to no longer being located on or in it. This

⁸The location argument does not contribute to the basic telicity of full expression sentences where both material and location are expressed. When the location is a singular NP there is a strong preference that it be quantized; examples like *She wiped the spot off stainless steel* or *She rinsed the grease off velvet* are rather odd, but if acceptable are telic (due to the quantized material argument). Examples of this type improve in acceptability in habitual contexts: consider *When you rinse a spot off velvet, it leaves a stain*, which also receives a telic interpretation. If there is a plural location (e.g., *She wiped the jam off (the) counters*), then it is irrelevant to our concerns, as atelicity arises from iteratively carrying out the action with respect to the location.

change is characterizable by a two-point scale, necessarily bounded (on-off, in-out). Hence there is also bounded change, predicated of an argument and holding of that argument's spatial extent, just as with the resultatives. While the overall telicity of the sentence is determined by whether the spatial extent is bounded or not, the contribution of the boundedness of the scalar change to the overall telicity, though not usually commented on, cannot be ignored.

Predicated particle examples work just like the full expression examples, except that the location is not expressed, but contextually determined (see (15) above). The scale of change is once again from *on* to *off* (or from *in* to *out* of) the location, and thus necessarily bounded, so that the overall telicity is determined by whether the material is quantized or not. So, as we expect, the examples in the first pair below with non-quantized material NPs are atelic, while those in the second pair with quantized NPs are telic.

- (32) a. He rinsed dirt out for/*in 30 seconds.
 b. She wiped jam off for/*in just a minute.
- (33) a. He rinsed the dirt out in just 30 seconds.
 b. She wiped the jam off in one minute flat.

Specifically, in (33a), the dirt is understood to have been removed from its location to some acceptable degree, while in (33b) the jam is removed from its location to some acceptable degree (see note 9).

21.4.4 Determining telicity in unpredicated particle examples

The full expression and predicated particle examples can be thought of as describing removing events. Importantly, unpredicated particle examples are conceptually different, and are better characterized as involving clearing or emptying events brought about by the relevant form of surface contact, depending on whether the location is a surface or a container. As in non-particle examples like *I cleared the table* or *I emptied the tub*, what matters in the unpredicated examples is the state of the location: it starts off in a state of having material on or in it and ends up in a state of not having material on or in it. There is a scale between these two states, defined by the loss of material (see section (21.4.3)). The location argument has a spatial extent which also determines the progress of the event up to the change of state, and the particular particle gives more information about the nature of the surface or container.

As the examples below show, the unpredicated particle examples are telic, only when the location NP is quantized.

- (34) a. She wiped the counter off in/*?for 10 minutes.
 b. He rinsed the cloth out in/*?for 30 seconds.
- (35) a. She wiped glass off *in/for 2 hours.

- b. He rinsed rice out *in/for 10 minutes.

- (36) a. She was wiping the counter off. \nrightarrow She had wiped the counter off.
 b. He was rinsing the cloth out. \nrightarrow He had rinsed the cloth out.

In this respect they are like the predicated particle examples: it appears that the spatial extent of the object provides a measure whose boundedness determines the telicity of the example.

Yet how can examples such as (34) be telic given that their unexpressed material argument receives an unspecified interpretation? The availability of the telic interpretation makes sense in the context of our world knowledge. In the presence of the particles *off* or *out*, surface contact verbs are being used in the description of events of clearing or emptying, and such events are over when the surface is bare or the container empty to an acceptable degree.⁹

As the unpredicated particles examples have a location object, the amount of material is not and can not be a determining factor: 'is not', because it is unexpressed, by hypothesis, and 'can not' as we know that only properties of the direct object enter into the determination of telicity. Just as our intuitions tell us, the events in (36) are over when the counter is bare and the cloth has nothing unwanted in it; we have no interest in what was on the counter or in the cloth, or how much of it there was. This is due precisely to the fact that the particles define closed-scale changes in such clearing or emptying uses: the event simply involves a location changing from a state where it has stuff on or in it to one where it does not. Given the bounded nature of the change, the overall telicity of the sentence is then determined by the spatial extent of the location, which serves as an incremental theme, as shown above in (34)–(36).

21.4.5 The difference between *off/out* and *on/in*

The remaining issue is why *off* or *out*, but not *on* or *in*, have unpredicated uses:

- (37) a. We smeared (the) lotion on (the baby).
 b.*We smeared the baby on.
- (38) a. We sprayed (the) paint on (the wall).
 b.*We sprayed the wall on.

In events of clearing or emptying, if the location is spatially bounded, then it imposes a natural bound on the event: the event is over when everything is removed from it. That is, there is a salient point of transition to a result state

⁹By acceptable degree, we mean that if any material remains, the remaining amount is so little as not to count (cf. Lasnik (1999) on 'pragmatic halos' and Kennedy and McNally (2005) on imprecision in adjective uses). Due to this imprecision, speakers vary as to how acceptable they find examples like *He wiped the counter off (#but he left some crumbs)* or *He rinsed the cloth out (#but it still had some dye in it)*.

at the end of the process of clearing or emptying the location. In contrast, the unacceptable unpredicated particle examples involve *on* and *in* and describe filling or covering events, crucially, a different relation between the location and the event. It is true that as soon as even a little bit of material is placed on or in a location, the predicate *on* or *in* could be said to hold of that location; in this sense, these particles are just like the minimal endpoint closed-scale adjective *dirty*, which can be applied as soon as a minimal amount of dirt is on a surface. However, as Wechsler discusses, *dirty* is treated as a 'de facto' open-scale adjective, with a standard that is somewhere above the minimum (see section 21.4.2); we propose that the same holds of *on* and *in*. Therefore, an unpredicated particle construction with one of them will involve an open scale of change (applied over the spatial extent of the location, as an incremental theme), and, for this reason, the telicity of the whole construction cannot be guaranteed simply by the boundedness of the location argument; yet, the well-formedness of the construction rests on this guarantee.

The predicated particle constructions involving *in* and *on* are quite straightforward. The telicity of (38a), for example, is determined by the volume of paint, which serves as a measure of the event, and the overall interpretation is atelic or telic, according to whether the object is the mass *paint* or the count *the paint*, as only the latter has a quantized spatial extent.

21.4.6 Filling in: An apparent exception

Our discussion suggests that only *off* and *out* permit unpredicated particle uses, specifically in describing clearing or emptying events. Surprising, then, is an apparent exception to this generalization: *in* seems to have an unpredicated use with *fill*, as in (39b).

- (39) a. We filled the hole (with plaster).
b. We filled the hole in. (cf. *The hole is in.)

We attribute this use to *fill*'s being a change of state verb: for instance, it shows the causative alternation, the hallmark of such verbs: *We filled the tub/The tub filled*. We have already pointed to parallels between particles and result phrases, and we propose that the unpredicated particle in (39b) further specifies the result state lexicalized by *fill*, just as result phrases do with change of state verbs (e.g., *break the bag open*; RH&L98).

As a change of state verb, *fill* lexicalizes a scalar change: a positive change along a scale of fullness. This scale represents the occupied volume of a container—an entity with a 3-dimensional spatial extent—and it has a maximal endpoint, representing a state in which the container has no empty volume. In this respect, *fill* is different from the surface contact verbs found in the unpredicated *off* and *out* examples. As noted in section 21.4.2, surface contact verbs are not lexically associated with a scale of change, but such a scale

is contributed by the unpredicated particle. In isolation, surface contact verbs with a definite object may be interpreted as atelic, contrasting with the telic *fill the hole*. In contrast, an unpredicated particle with *fill* is not contributing telicity; rather, it simply further specifies the result state lexicalized by the verb.

Unlike simple uses of *fill*, the unpredicated particle uses are best with objects which denote holes or other 'negative' spaces. Such examples describe a decrease in the unoccupied volume defined by the negative space—a change which occurs as this space is filled. The contrasting interpretations of the pair in (40) reinforce this point.

- (40) a. We filled the glass (up). b. We filled the glass in.

While the (a) sentence just describes the action of gradually filling the space inside the glass, (b) is odd precisely because it forces the glass to be treated as a negative space. To the extent it is interpretable, it describes a process which leaves the glass in a state in which it lacks interior usable space, depriving it of its intended function. Underscoring this point, the unpredicated particle use in *We filled the form *(in)* is acceptable because, abstractly, the form is 'filled' when the necessary amount of information is entered onto it—once again, the maximal endpoint of a scale.

We argued in section 21.4.5 that *in* resists unpredicated uses as it can not introduce a bounded scale of change, yet such a scale is necessary to ensure that the telicity of a verb-particle construction could be determined by properties of its object. However, the verb-particle constructions discussed so far involved surface contact verbs, which do not lexicalize a scalar change, let alone a bounded change of state. In contrast, *fill* already lexicalizes such a change, which we assume is why it can combine with *in*, while maintaining the constraint that the telicity of the overall verb-particle construction depends on its object. Furthermore, since *in* describes a containment relation between a Figure and a Ground, it is compatible with the change *fill* lexicalizes, and it is apparently exploited in the description of a subclass of filling events. We leave open for now an explanation for precisely why this specialization in meaning occurs.

fill's 'antonym' *empty* also lexicalizes a scalar change involving a closed scale with a maximal endpoint that involves a change in the occupied volume of a container, but this time a negative change. Again, it allows unpredicated particle uses, as does the semantically similar verb *clear*.

- (41) We emptied the bucket (out).
(42) The waiter cleared the table off/away.
(43) The police cleared the room out.

The unpredicated particles in these examples include the familiar *out* and *off*, as well as *away*. All three represent spatial relations between a Figure and

Ground that are compatible with the removing nature of the events described by these verbs, again supporting the proposal that with change of state verbs unpredicated particles further specify the lexicalized change of state.

Given that filling is the opposite of emptying, the verb *cover*, roughly the opposite of a verb of clearing, might be expected to allow unpredicated particle uses with *on*—the opposite of *off*. However, *cover* allows such uses with *over* and *in*, but not *on*:¹⁰

- (44) a. He covered the table (*on).
 b. Crew members quickly covered in the hole, where the box had been
 ...
 c. I picked up the blanket and covered myself over with it.

As with *fill*, simple uses of *cover* as in *cover the table* are telic with a quantized object, indicating that the verb itself is associated with a maximal endpoint closed scale of change, a change that involves the gradual occlusion of a surface. The subtle differences in meaning in the unpredicated particle examples are, as we would expect, nuanced by the underlying spatial meanings of the particles. (44b) resembles the comparable *in* examples with *fill*: a negative space in a surface is being filled in as part of the covering process. In (44c), *over* is licensed due to the spatial dispersal facet of covering actions, which involves precisely the type of spatial configuration that can be described by this particle. Thus, the particle reinforces the verb's own meaning. Again, the particles do not introduce bounded scales of change, but refine the nature of the bounded scalar change lexicalized in *cover* itself.

We return now to *on*'s exclusion with *cover* and attribute it to the nature of the spatial relation it names. This relation has been characterized in naive physics terms as a relation of support (often against gravity). When a Figure and a Ground are in such a relation, the Ground does not impose any limitation on the spatial extent of the Figure; it contrasts with a Ground in the *in* or *over* relation, which can impose such a limitation on its Figure due to the nature of the containment and dispersal relations. For instance, in **cover the table on*, the fixed area of the table is irrelevant to *on*, which simply cares about the table as a support. Since the scale of change associated with *cover* involves occlusion of a surface, the spatial relation described by *on* is incompatible with it and can not combine with the verb to further specify it.

The previous sections showed that unpredicated particles are only possible if they can be associated with a scale of change with a maximal endpoint. The examples discussed in this section demonstrate that in the absence of such an endpoint, such particles are possible if they can combine with a predicate which lexicalizes a bounded scale of change, which is compatible with the

¹⁰The (b-c) examples were found via internet searches.

scale of change associated with the particle by virtue of the spatial relation it denotes. It is only in these two instances that the overall telicity of an event can depend on just the object.

21.5 Conclusion

Only some particles allow unpredicated uses with surface contact and change of state verbs. From our observations so far, these include *off*, *out*, *in* limited ways *away*, *over* and *in*, but not *on*. Although the canonical unpredicated particle examples involve removing events, the correct generalization is that such examples are acceptable only if their telicity can be determined solely from the properties of the expressed location object. We have shown that this requirement imposes a constraint on possible unpredicated particle examples: the event must be associated with a bounded scale of change. We have further suggested that this requirement holds more generally: it is manifested in predicated particle constructions, full expression constructions, and subcategorized NP resultative constructions. This observation might provide new insights into the nature of secondary predication in English.

More work is also needed in the domain of unpredicated particles. Even particles which allow unpredicated uses with surface contact verbs resist such uses with other verbs:

- (45) a. I broke the branch off (the tree).
 b.*I broke the tree off. (on the intended interpretation)
 (46) a. I cut the flower out (of the paper).
 b.*I cut the paper out.
 (47) a. I pushed the box off (the table).
 b.*I pushed the table off. (on the intended interpretation)

Rapaport Hovav and Levin (1998, 2005) and Rapaport Hovav (2008) have argued that change of state verbs like *break* lexically specify a scale of change, and that the argument that this scale is predicated of must be expressed; this might limit the argument realization options available to such verbs. Although *break the branch* and *break the branch off* have somewhat different interpretations, it is a property of the branch that determines telicity in both: the event is over when the branch is either broken or separated from the tree. It is possible that the unpredicated *break* example is out precisely because what is separated from the tree (i.e. the branch) is not 'in the picture': there is no sense in which the 'amount of branch' is inferable from the 'amount of tree'. We hypothesize that the *cut* example might have a comparable explanation. Here the particle construction has a creation sense, and the nature and extent of the created object (i.e. the flower) can not be inferred from the raw material (i.e. the paper). The key to the *push* example may be

that the location is not an underlying argument of the verb, as it is in the surface contact verb examples. In its simple use, *push* takes a theme, as in (48), in contrast to surface contact verbs, which take a location.

- (48) a. I pushed the cart (up the hill).
 b. *I pushed the hill.

These are just a few of the many examples we have encountered where two internal arguments of a verb are not equally possible in the NP position of the $V \wedge NP \wedge Prt$ construction.

We hope that this paper provides a basis for future studies into the distribution of unpredicated particles, and that these and related studies of argument realization and interpretation will further contribute to our understanding of the nature and breadth of Grammatical Semantics.

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We are very pleased to present this paper to Mohanan, addressing a puzzling phenomenon which became apparent to us while we were teaching a syntax class, and which neither one of us could solve in front of the other. We hope that it will be seen as a contribution to the 'Grammatical Semantics' program that Mohanan and his colleagues have laid out, and we invite Mohanan himself to solve the remaining problems.

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