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Tuning in to the verb-particle construction in English

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The present work investigates English verb particle combinations (e.g., *put on*) and argues that item-specific and general information are needed and should be related within a default inheritance hierarchy. When verb particle combinations appear within verb phrases, a tripartite phrasal syntax is defended, whether or not the V and P are adjacent (e.g., *She put on the wrong shoes; she put the wrong shoes on*). The < V NP P > order is motivated as the default word order by explicitly relating a verb-particle construction to the caused-motion construction (e.g., *she put the shoes on her feet*). Well-known and independently needed processing considerations related to complement length, information status, and semantics motivate system-wide generalizations that can serve to override the default word order. Lexical verb-particle combinations (e.g., *a pickup truck*; *a showdown)* and an idiomatic case, V-*off* are also briefly discussed as providing further evidence for the need for both item-specific and more general constructions.

1. Introduction

The present paper focuses on American English's verb-particle construction in the service of making several larger points. Because the semantics involved is frequently not strictly compositional, hundreds of individual verb-particle combinations must be represented. At the same time, generalizations about the pattern's form and function are naturally captured via a default inheritance network that not only relates individual verb-particle combinations to a general construction, but also explicitly relates the general verb-particle construction to the caused-motion construction.

The English verb-particle construction involves a verb and preposition (aka "particle") that combine to form a single semantic predication. Instances of the construction have often been labeled *phrasal verbs* due to the fact that they display some properties that are typical of words and other properties that are typical of phrases. A small subset of the hundreds of conventional examples that exist is provided in Table 1:

fix up	cast off	fake out
give up	throw up	pig out
break off	look up	turn out
heat up	figure out	look out
cool down	call up	rub off
chew out	eke out	go out
fall down	cough up	take off
run away	turn off	turn up
throw out	give in	bring up
make out	heat up	clean up
grow out	rise up	empty out
sit down	send off	tune out
chew out	polish up	single out

put down	turn down	double up
tune in	pick off	use up
pick up	throw away	dry out

Table 1: Examples of English verb-particle combinations

The present account of the English verb-particle construction aims to make the following points:

- Hundreds of familiar verb-particle combinations are represented in a "construct-i-con" which is an expanded version of the familiar lexicon that includes fully specified or partially abstract words, idioms, and more abstract phrasal patterns (cf. also Jackendoff 2002); entries are related to a general verb-particle construction via a default inheritance network.
- A general verb-particle construction has the underspecified phrasal form [V {P, (NP)}]$_{VP}$, and constituent order is determined by:
    a.) a separate verb phrase construction that combines with the verb-particle construction (and other argument structure constructions).
    b.) an inheritance relationship between the verb-particle construction and the caused-motion construction.
- Individual verb-particle combinations unify with the general phrasal construction *and* general word-formation constructions.

2. Item-specific knowledge

Memory is cheap. Even a cursory review of work in psychology reveals that humans have a vast ability to represent information. One phenomenon that demonstrates this in a striking way comes from the domain of vision in the form of negative priming. In one paradigm, participants decide whether two novel shapes match each other. A third novel shape, in a distinct color, is superimposed on one of the two novel shapes to be compared, such that in order to perform the comparison, the third novel shape must essentially be ignored. It has been demonstrated that when the ignored shape subsequently is used as a target shape later on in the experiment, response times are slower, indicating that there is some implicit memory of the shape and that the shape had been ignored previously. This slowdown in response has been found even after 200 intervening trials, and even at delays of up to a month (DeSchepper and Treisman 1996). The fact that participants demonstrate evidence of retention of the novel shapes, even though the shapes simply had to be suppressed in an earlier trial, is impressive evidence of our remarkable incidental memory.

Within the field of language, there is also ample evidence of item-specific memory. Tens of thousands of words, idioms and compositional "prefabs" are learned (Dabrowska 2004; Jackendoff 2002a; Pawley and Syder 1983; Sinclair 1990; Wray 2002). There is ample evidence from research in language acquisition that children are aware of which patterns they have witnessed previously (e.g., Akhtar and Tomasello 1997; Baker 1979; Bannard and Mathews 2008; Bates and MacWhinney 1982; Bowerman 1982; Braine 1976; Lieven et al. 1997; Tomasello 2003; Wonnacott, Newport and Tanenhaus 2008; Wonnacott 2011). The same is true of adult language processing. In fact, we know not only which verbs we've witnessed in which constructions, for example, but also the relative frequencies of those constructions for a given verb (Baayen et al. 1997;

Bod 1998; Booij 2002; Bybee 2000; Ellis 2002; Gahl and Garnsey 2004; Garnsey et al. 1997; Losiewicz 1992; MacDonald, Pearlmutter and Seidenberg 1993; Trueswell et al. 1993). Thus there is ample psycholinguistic evidence that patterns are stored if they are not fully predictable or if they are sufficiently frequent (cf. also Bybee 1985; 2006; 2010; Losiewicz 1992; Pierrehumbert 2000). Recent work in our lab has demonstrated that recall and recognition memory for verbatim language is well above chance, even when no warning of a memory test is given, and even at delays of up to a week (Gurevich, Johnson, and Goldberg 2010).

Taken together, these observations support the idea that it is quite *possible* for many or even all regularly occurring verb-particle combinations to be represented in the mental lexicon. In the following section, we make the case that it is necessary to store hundreds of individual verb-particle combinations because of their not-strictly compositional meanings.

2.1 Non-compositionality entails that combinations must be stored

The need to retain specific information about hundreds of verb-particle combinations follows from the fact that their meanings are not strictly predictable (cf. also Jackendoff 2002b: 73). That is, while it is clear that the meanings of verb-particle combinations are rarely entirely arbitrary, neither are they entirely predictable from either the meaning of the verb or the meaning of the particle. For example, while *take it off* can mean to disrobe, *take it on* does not mean the opposite (cf. *to put it on*). The intransitive, *take up with someone* means roughly to begin to date, while the transitive counterpart, *take something up with someone* means roughly to initiate a confrontation. *To take something over* means roughly to bring, while *to take someone down* means to conquer, and *to take someone out* can imply either a date or a murder. Similarly while one can *look someone up* or *look someone up and down* (meaning two quite different things), it is not conventional English to *look someone down*. While *off* in (1a & b) are possibly related, the interpretation of (1c) and (1d) are quite different, beyond what is contributed by the individual words involved:

1.a. take a shirt off ≈
b. pull a shirt off ≠
c. drop a shirt off ≠
d. pull a robbery off

The fact that neither the verb nor the particle retain their typical meanings within the compound in these cases argues against treating the P as a regular complement of the main verb (although see Svenonius this volume), because the idiomatic meaning would need to be stipulated both for the verb and for the particle even though those idiomatic meanings only occur when the two are used together. Unless we want to posit a special sense of each verb that may only occur with a particular particle *and* a special sense of each particle that may only occur with a particular verb, we need to attach meanings directly to the V-P combinations.

Moreover, unlike familiar cases of complementation, the P involved in V-P combinations must be a specific *word* as represented in (2a):

2. a. *take* (agent, theme, *off*)

Uncontroversial cases of complements are selected via semantic role and/or grammatical category:

3a. *Give* (agent, theme, recipient) -- (NP, NP, NP)
b. *Put* (agent, theme, location) -- (NP, NP, PP)

Finally, unlike other complements of verbs, with few exceptions, the particle cannot be generally appear as an answer fragment (4a), nor can it be displaced in long-distance dependency constructions (4b) the way clear complements can.

4a. What/where/how did she clean the room? *Up.
b. *Off she broke the twig.

Exceptions include *Off she went* (Müller, personal communication), *Away he ran*; also the inverted, *Down came the rain.* In these cases, the verb is an intransitive verb of motion and the particle has a compositional, locative interpretation. Thus there are several ways in which the particle differs from clear verbal complements: the meaning of the verb and the particle depend on each other, a particular particle and not a general category of particles is required for each verb sense, and the particle is not, in the general case, allowed to appear outside of the verb phrase.

At the same time that the meanings are not predictable from either the P or the V in isolation, neither are the meanings of verb-particle combinations unrelated to the meanings of the V and P in other contexts (e.g., Blom 2005; Thim 2012; Tyler & Evans 2001). For example, consider *fix up*. *Up* serves to mark telicity or the satisfactory finishing of an event in many V-P combinations, as it does in *fix up*: cf. also *clean up; pick up; sweep up, chew up* (see Cappelle 2005). In addition, both the simple verb, *fix*, and the verb-particle *fix up* can mean "prepare" or "repair" (5a,b; 6a,b). Therefore these senses of *fix up* are naturally viewed as compositional. At the same time, *fix up* can alternatively mean "match-make" (7b) which is not a possible meaning for *fix* in isolation (7a). The # is used to indicate semantic or pragmatic infelicity. Here and below, examples within quotes are from the 450 million word Contemporary Corpus of American English (Davies 2008):

5a. She fixed a sandwich for herself. ("prepare")
b. She fixed a sandwich up for herself.

6a. Buy and fix this old house. ("repair")
b. "Buy and fix up this old house"

7a. # a friend of hers tried to fix her with one of her exes. (intended, "match-make")
b. "a friend of hers tried to fix her up with one of her exes."

Any account that aimed to avoid listing particular combinations would run roughshod over the meanings of the combinations: i.e., it would not be possible to account for their non-compositional meanings is offered (see also Goldberg 2006:205-212; Masini 2005; Samvelian & Faghiri 2013 for discussion). It is evident, once one takes a careful look at existing verb-particle combinations, that a good deal of item-specific information is required.

Finally, there is psycholinguistic evidence in support of the idea that item-specific information is retained. In an ERP study, Cappelle, Shtyrov, & Pulvermüller (2010) found that familiar verb-particle combinations, whether compositional and locative (*rise up; fall down*) or not (*heat up*) showed an enhanced "mismatch negativity" (MMN) response which is viewed as a hallmark of lexically stored roots (Pulvermüller, et al. 2001). Novel verb-particle combinations (e.g., *fall up*) did not elicit the enhanced MMN effect. The effect is naturally interpreted as resulting from the fact that familiar verb-particle combinations are mentally represented, just as word roots are.

2.2 Items and generalizations

USAGE-BASED approaches to grammar propose that generalizations exist alongside item-specific knowledge (Barlow and Kemmer 2000; Bybee 1995; Goldberg 1999; Langacker 1988; Tomasello 2003). The relationship between items and generalizations is captured by a default inheritance network, which ensures that all non-conflicting information is shared between mother and daughter nodes. Conflicting (exceptional) information in the daughter node overrides the inheritance. Broad generalizations exist in the highest levels of the inheritance hierarchy; partial generalizations are captured by lower level representations, and idiomatic cases are specified with their own peculiar properties below one or more of the generalizations (e.g., Boas & Sag 2012; Chaves 2013; Flickinger, Pollard, & Wasow 1985; Goldberg 1995; Goldberg & van der Auwera 2012; Gonzálvez-García 2009; Hudson 2006; Kim & Davies, to appear; Lakoff 1987; Sag 2010; Trousdale 2013).

It is quite clear that default inheritance is independently needed for our knowledge of the world at large (pace, e.g., Folli et al. 2005). To take simple real-world examples, most fruit tastes sweet, and if we are told to open our mouths to receive a piece of "fruit," we would naturally expect something sweet. And yet of course lemons are fruit but are not sweet. Our specific knowledge of lemons overrides our more general knowledge about fruit. Another example is that if we are asked to apply for a faculty position, we would normally expect to be interviewed. But it turns out that jobs in the philosophy department at Princeton do not interview candidates.[1]

It is unremarkable in the domain of morphology that more specific knowledge preempts general knowledge, as long as either would satisfy the functional demands of the context equally well (cf. Kiparsky 1968; Panini, see Deo 2007); this is exactly how we understand the way irregular word forms are learned (Anderson 1982). Once we recognize that an expanded version of the lexicon—a construct-i-con—is needed, it becomes clear that the same type of generalizations, subregularities, and idiomatic cases are needed for all sorts of constructions.

[1] A philosopher colleague cheerfully explained that this is because if they had been interviewed, half of the department would not have been hired.

A partial network relating *fix up*'s three senses to each other, to the simple verb *fix,* and to the particle *up* is provided in Figure 1. Arrows indicate default inheritance: information is shared between mother and daughter node unless the daughter node specifically overrides the information. Links are intended to capture *motivation* among constructions; i.e., a construction CxA inherits from another construction CxB, if and only if CxA is more natural and more likely to exist given the existence of CxB. Bidirectional arrows indicate that neither form is necessarily more basic, but instead the two forms mutually motivate each other. In Figure 1, for example, the three senses of *fix up* mutually motivate each other, while only the two senses that are related to senses of the simple verb *fix* inherit from *fix*.

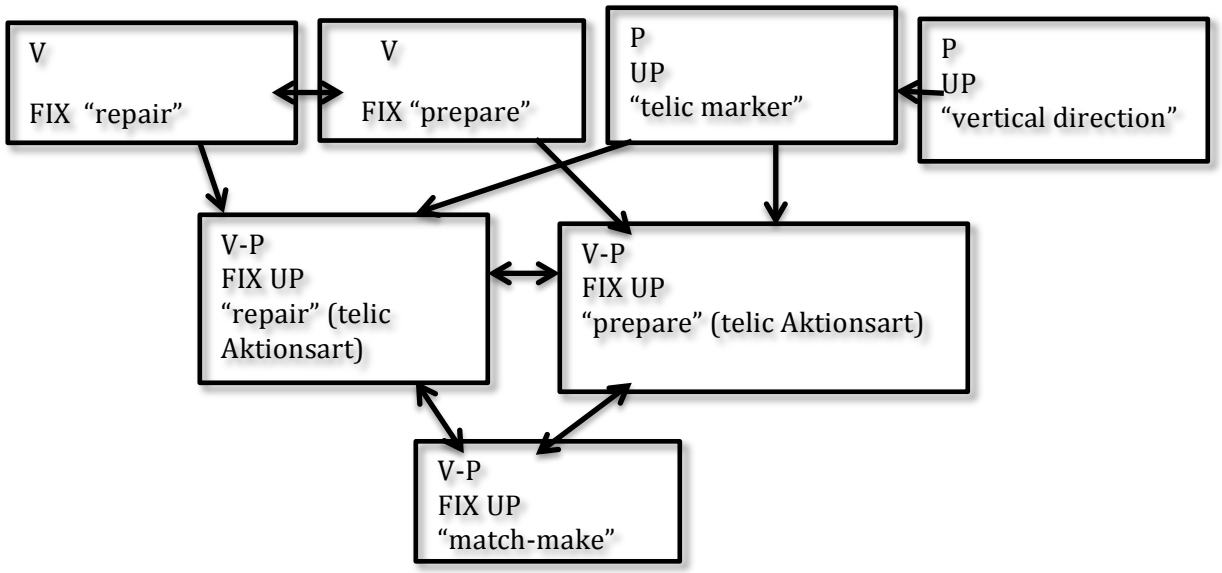

Figure 1. The inheritance hierarchy relating the various senses of *fix up* to the senses of the simple roots, *fix* and *up*.

The verb-particle combinations in Figure 1 are intentionally unspecified beyond their status as combinations of verbs and particles. In the following section, we investigate their syntactic properties and the more full inheritance hierarchy related to the general verb-particle construction.

3. The phrasal verb-particle construction

The issue of whether the verb and particle combine to form a word or phrase has long bedeviled researchers. As discussed in more detail below, several theorists have argued that verb-particle combinations are phrasal when the V and P are separated by an NP (8a), while they are compound words when the V and P are adjacent (8b):

8a. She picked the paper up.
b. She picked up the paper.

The distinction between words and multi-word units is less important in constructionist approaches than it is in mainstream generative syntactic approaches, since both words and multi-word patterns are the same basic type of unit: pairings of form and function. Either can be lexically filled (e.g., *dog* and *going great guns*), partially lexically filled (e.g., *re-verb* and *The Xer, the Yer*) or completely abstract (e.g., the noun construction; the double-object construction). Word and phrasal constructions are combined to form actual expressions as long as there are no conflicts among their various constraints.

At the same time, words are not the same as phrases: the distinguishing criterion suggested in section 3.3 is that words cannot be interrupted by phrases. We first clarify that certain other criteria that have been used to distinguish words and phrases are unreliable. Then it is argued that when used as a verbal complex predicate, the verb-

particle combination is phrasal, regardless of whether the P is adjacent to the V or not. That is *pick up* is a multi-word construction (a phrase) in both (8a) and (8b). At the same time, verb particle combinations can often combine with word level constructions; in this case, the verb-particle combination can be expressed as a word (e.g., as in *a pickup truck*; see section 5).

3.1 Unreliable criteria

Compositionality

Although it is often assumed that phrases are always compositional and words never are, neither assumption is valid. Many phrasal idioms are noncompositional (cf. *jump off the page, let the dust settle, gather steam, get a handle on, pass the buck, <one's> ass is grass*). At the same time, many words are straightforwardly compositional as when they involve productive morphology (e.g., *anti-poodle*; *transcultural*).

Some verb-particle combinations, particularly those with directional interpretations are fully compositional (e.g., *look up* (at the sky); *look down* (at the ground)). Typically, the same verb-particle combinations have non-compositional interpretations as well (e.g., *look up* (a number); *look down* (on someone)). There is no reason to assume that whether or not a verb-particle combination is compositional should determine whether it is treated as a word or phrase. Instead, we recognize that both words and phrases can be stored or created on the fly (cf. also Blom 2005; Culicover & Jackendoff 2005; DiScullio & Williams 1987; Goldberg 1995; Jackendoff 2002a; Müller 2002b).

The position of inflectional morphology

Inflectional morphology can separate V and P as in (7), and this might be viewed as *prima facie* evidence that the V and P must be phrasal,[2] since it is often assumed that inflectional morphology cannot appear inside derivational morphology due to a "level ordering" constraint (Kiparsky 1968).

9. She *pick<u>ed</u> up* the paper.

For example, regular plurals, which are inflectional, do not commonly occur within compounds, which are derivational:

10a. ??rat<u>s</u> eater
b. rat eater<u>s</u>

Irregular plurals, on the other hand, which do not involve inflectional morphology but are instead independent roots, have been claimed to be fully acceptable within compounds (e.g., Pinker 1994):

11. mice eater

[2] For example, this faulty assumption is made in Goldberg (2003) in an analysis of Persian complex predicates.

If the level ordering hypothesis held up to scrutiny, it would imply that verb-particle combinations must be phrases even when V and P are adjacent, since inflectional morphology intervenes between V and P. However, it is well-known that there are various types of exceptions to the level ordering assumption (e.g., Booij 1993; Ackerman & Malouf 2003). For example, certain regular plurals are fully acceptable inside compounds (e.g., Kiparsky 1982; Sneed 2002):

12. baker<u>s</u> union (more than 2000 tokens of $N_{regular\text{-}pl}$ *union* in COCA)
13. admission<u>s</u> office (more than 300 tokens of $N_{regular\text{-}pl}$ *office* in COCA)
14. park<u>s</u> and recreation department (more than 900 tokens of $N_{regular\text{-}pl}$ *department* in COCA)

Moreover, irregular plurals inside compounds (e.g., *mice eater*) are typically dispreferred relative to singulars (*mouse eater*), indicating that plurals inside compounds are disfavored in part due to their semantics (e.g., Haskell et al. 2003).

Particularly relevant for verb-particle combinations is the fact that level ordering constraint is counter-exemplified by left-headed compounds, in which regular plural marking must occur on the head and therefore in the middle of the compound:

15a. passer<u>s</u> by
b. ??passer by<u>s</u>

16a. brother<u>s</u>-in-law
b. ?brother-in-law<u>s</u>

If verb-particle adjacent combinations are to be considered compounds, they would be left-headed compounds, since the verb is the head. Therefore it is expected that verbal morphology should affix to the verb as it does, intervening between the verb and particle. If verb-particle adjacent combinations are considered phrasal, the verbal morphology would also naturally attach to the verb. Therefore, the placement of inflectional morphology does not adjudicate between the compound and phrasal treatment of verb-particle combinations.

3.2 Is existing evidence from psycholinguistics relevant?

Konopka & Bock (2009) found that (quasi-) compositional verb-particles primed more idiomatic verb-particles that had the same word order. For example *take off a sweatshirt* primed *pull off a robbery*, while *take a sweatshirt off* primed *pull a robbery off*. While the authors argued that this indicates that even idiomatic verb-particles are phrases, another interpretation is simply that one construction can prime another of the same type; this interpretation does not require that the constructions involved are *necessarily* phrases.

The Cappelle, Shtyrov, Pulvermüller (2010) result mentioned above showed that familiar verb-particle combinations elicit an enhanced mismatch negativity (MMN) response, a response that is a hallmark of words (Pulvermüller et al. 2001). While this could be viewed as evidence that familiar verb-particle combinations *are* words (see discussion in Cappelle et al. 2010), an equally compelling explanation is that the enhanced MMN effect is due to the fact that familiar verb-particle combinations are

mentally represented, in a construct-i-con. Future work is needed to determine which interpretation is correct, for example, by testing phrasal idioms, which must be represented (since they are not strictly compositional) and yet which are not words.

3.3 Phrases, but not words, are separable by other phrases

In what follows, we take one test as criterial: phrases, but not words, are separable by other phrases. This test is stated in terms of separability by *phrases* to allow for inflectional morphology as noted above, or by infixes (*fan-fucking-tastic*). What we don't find are words that contain full phrases: *X YP Z, where [X + Z] is a word. Note that the criterion is only stated in one direction, allowing for the existence of inseparable phrasal idioms and unseparated verb-particle combinations. The use of a single criterion sidesteps the fact that distinct definitional criteria typically do not align in all cases (Croft & Cresswell 1991; Ackerman, Stump, and Webelhuth 2011; cf. also Walková 2013 for discussion specifically about issues related to tests for verb-particle combinations). The separation criterion requires that at least verb-particle combinations expressed with the order < V NP P > must be phrasal. After discussing and ultimately rejecting the possibility that the < V P NP > order involves by a compound verb, we argue that when expressed as part of a verb phrase, the verb-particle combinations are always phrasal, even when V and P are adjacent.

3.4. Generate a compound verb and a verb phrase?

The idea of generating each verbal verb-particle combination both as compound verb and as elements within a verb phrase has had widespread appeal (e.g., Baltin 1989; Cappelle 2006; Larson 1988; Farrell 2005; Müller 2002a; Williams 1997; Toivonen 2002; Zeller 2002). Researchers have suggested a compound option (i.e., $[V\ P]_{V0}$) and a verb phrase option, the latter involving either involving a small clause (e.g., Dikken 1995; Williams 1997) or a flat structure (e.g., Farrell 2005):

17a. $[V\ P]_{V0}$ and $[V\ [NP\ P]]_{VP}$ (e.g., den Dikken 1995; Williams 1997)
b. $[V\ P]_{V0}$ and $[V\ NP\ P]_{VP}$ (e.g., Farrell 2005)

The compound analysis is meant to capture instances in which the V and P are adjacent, and the phrasal analysis is intended to capture instances in which the V and P are separated. In favor of the compound analysis when the verb and particle are adjacent, is the fact that adverbs only seem to be allowed when the particle is separated from the verb (Emonds 1969; Fraser 1976; Farrell 2005; Jackendoff 2002b; Ramchand & Svenonius 2002):

18a. She turned the dimmer switches completely off.
b. ?? She turned completely off the dimmer switches.

19a. I'll fix your closet right up.
b. ??I'll fix right up your closet.

This pattern of judgments is predicted by the compound analysis, since adverb phrases would not be expected to intervene in the middle of a compound word.

Nonetheless, there exists evidence weighing against the compound analysis. First, if verb-particle combinations could be generated as compounds, then the compounds, as verbs, should themselves be available to occur in productive syntactic verb-particle constructions. That is, the [verb-particle]v0 analysis predicts that two particles should be allowed to co-occur non-adjacently. And yet, this is not possible, even when the intended meaning would be sensible, as is clear from the following examples (cf. also Stiebels & Wunderlich, 1994; Neeleman, 1994; Müller, 2002a):

20. a. *She threw up the night away.
  b. (cf. She vomited the night away)

21a. *He pigged out the night away.
b. (cf. He ate the night away.)

22a. *She yabbered away her head off.
b. (cf. She yabbered her head off).

Secondly, each of the not-strictly predictable meanings (and there are many, as already discussed) would need to be generated both by a word level [verb-particle]v0 compound and by a phrasal level $[V\ NP\ P]_{VP}$ form. Given our vast storage capacity, this may not be implausible on the basis of its redundancy alone, but it would require an explanation of how it is that the compound and phrasal forms should have, with rare exception, *identical* meanings (cf. also Cappelle 2006).[3]

Revisiting the initial evidence in favor of compound status, notice that adverbs can occasionally be found intervening between V and P as in (23):

23. I understand that you want to disable the fan control on the motherboard or be able to turn completely off the processor fan spin.
https://communities.intel.com/thread/28683

This type of example is admittedly very rare, yet that fact arguably follows independently, as discussed in the following section. Thus a compound analysis of even contiguous

[3] A third argument apparently in favor of phrasal status is the fact that if V-P combinations were compound verbs, one might expect them to allow unstressed personal pronouns to follow them, since uncontroversial compound verbs do (a-b). And yet V-P combinations do not (c):

a. "then deep-fat fry it"	Uncontroversial compound
b. "Ray upended it"	Uncontroversial compound
c. ??She picked-up it.	(0 hits in COCA) V-P

However, as discussed in section 3.2, there is an independent reason for the lack of < V P *unstressed pronoun*> order.

verbal verb-particle combinations is not well-supported (cf. also Blom 2002; Jackendoff 2002b).

Turning our attention to the phrasal analyses, the existence of (unergative) intransitive verb-particle argues against a small clause [V [NP P]] account (Williams 1997; den Dikken 1995), since there is no unaccusative NP with which the P could form a small clause.

24. She put up with the class.
25. She looked up to him.

Moreover many particles do not serve to semantically modify the NP argument. For example, *She cleaned the room up*, does not imply that the room is up (cf. also Jackendoff 2002b: 90; Walkova 2013; pace Ramchand & Svenonius 2002). This leads us to the solution adopted in the rest of the paper.

4. Solution: [V {P, NP}]$_{VP}$

The solution proposed here is a general, abstract phrasal verb phrase *construction*, with its word order underspecified, as indicated by the curly brackets in (26).

26.

TRANSITIVE ENGLISH V-P CONSTRUCTION
Form: [V {P, NP}] $_{VP}$
Function: predication; V-P (NP)

Constructions are defined as pairings of form and function that are learned and represented within a network of linguistic knowledge. Productive lexical and phrasal patterns, semi-productive lexical or phrasal patterns, fixed idioms and morphemes are all constructions. We will call the network of linguistic knowledge the construct-i-con (Goldberg 1995). It is an expanded, structured lexicon that includes the full network of learned pairings of form and function at varying levels of complexity and abstraction (Croft 2002; Fillmore, Kay, & O'Connor 1988; Goldberg 1995; Goldberg 1992, 1995; Lakoff 1987, Michaelis and Lambrecht 1996; Langacker 1987, 1991; Pullum & Zwicky 1991; Pollard & Sag 1987; cf. also, DiSciullo and Williams 1996; Culicover 1999; Jackendoff 1996; 2002a; Williams 1994).[4]

Like the present account, Gries (2003) argues for a constructional account of verb-particle combinations, although he posits two distinct constructions ("construction1" and "construction2" to account for the two word order possibilities instead of underspecifying the word order as is done here); similarly, Cappelle (2006) argues for distinct

[4] It should be noted that in order to allow for long-distance dependencies (e.g., wh-questions, non-subject relative clauses, topicalization, clefts, etc.), a non-canonical-VP construction will also be needed. In this case, a complement normally within the VP is realized outside of the VP. The bookkeeping devices needed for this are beyond the scope of the present article, but see Ginsberg & Sag (2000), Van Trijp (2014).

allostructions to account for the different word orders, although in agreement with the present account, he additionally relates the two word order patterns via an underspecified more abstract construction. The flat tripartide structure is also argued for by Jackendoff (2002b) and Culicover & Jackendoff (2005), although they do not address the factors determining which word order option is chosen. See also Blom 2002 and Booij 2005 for constructionist approaches that treat verb particles as words.

The present account goes beyond these previous accounts in arguing for an inheritance relationship between the verb-particular construction and the CAUSED-MOTION CONSTRUCTION (Goldberg 1995). We will see that this inheritance relationship will allow us to predict several aspects of the verb-particle construction. For example, the word order of actual expressions is determined by a) an independently motivated verb phrase construction that captures general ordering tendencies within the verb phrase (cf. also Gries 1999; 2003; Lohse, Hawkins and Wasow 2006) *and* b) the inheritance relationship between the verb-particle construction and the caused-motion construction. Before focusing on the inheritance relationship, we first turn our attention to the independently needed VP construction.

4.1. An independently needed VERB PHRASE (VP) construction

A generalization that shorter, non-focused constituents tend to occur before longer, focused constituents is well-known to hold across various constructions, and therefore should be captured by a very general, abstract construction (Bolinger 1971; Quirk et al. 1972; Lohse Hawkins & Wasow 2004; Wasow 2002; Hawkins 1994; 2004; Gries 2003; Van Dongen 1919). A second system-wide iconic generalization is that more closely related semantic elements tend to be represented closer together in the linear string. This generalization holds both at the level of morphology (Bybee 1985; 1985), and at the level of syntax (Behaghel 1932; Givón 1991; Webelhuth & Ackerman 1998). These factors and others have been unified within various processing accounts (Lohse, Hawkins, & Wasow 2004; Gries 2003). Yet, because processing motivations can be conventionalized in different ways in different languages (Yamashita & Chang 2001), a construction is required. That is, the facts are not fully predictable *directly* from processing considerations, which are presumably shared across speakers of all languages.

The system-wide generalizations taken in isolation account for a large degree of variability in the ordering of the object noun phrase and the particle. For example, the likelihood of < V P NP > order increases with the length of the NP (Gries 2003; Lohse, Hawkins, & Wasow 2004: 243). Also, as Fraser (1976) had already pointed out, verb-particle combinations with particularly idiomatic meanings are more likely to occur with the particle adjacent to the verb. For example, the <V NP P > order is clearly dispreferred relative to the < V P NP > order in the case of *eke out* (idiomatic), but this is not nearly as clear in the case of *throw out* (quasi-compositional):

27 a. "Jemma could barely eke out two ounces a session"
b. ??Jemma could barely eke two ounces a session out.

28 a." …assuming the Supreme Court doesn't throw out the entire thing"
b. …assuming the Supreme Court doesn't throw the entire thing out.

At the same time, the system-wide VP generalization fails to account for the full range of data. In particular, without the recognition of any additional factor, the general verb phrase construction predicts that if the NP is even just one word longer than an unfocused P, the < V P NP > order should always be preferred. And yet attested examples of the opposite ordering are common, as illustrated in 29-31 (cf. also 28b):

29. "Once I'd accomplished that, I'd clean the place up."
30. "Schumer didn't want to turn the spigot off"
31. "the wrestler will tune the doctor out"

In addition, the system-wide generalizations predict that if the NP and the P are unfocused and equally short, either order should be possible. And yet there is a clear preference for the < V NP P > order in this case:

32a. She gave it up.
b. ??She gave up it.

In fact, there are 793 tokens of *give it up* in the COCA corpus, but not a single example of *give up it* (Davies 2008).

This suggests that there is a countervailing principle to the system-wide generalizations embodied in the general verb phrase construction. What is required is a recognition that the verb-particle construction inherits from the caused-motion construction via a default inheritance hierarchy.

4.2. The verb-particle construction inherits from the caused-motion construction

In this section, we will defend the idea that the transitive verb-particle construction is related to the English caused-motion construction, a construction that involves a direct object and a prepositional phrase that designates a path or location. The caused-motion construction is illustrated in examples (33a-d), and represented schematically in (34) (Goldberg 1995)[5]:

33. a. She put the book on the table
b. She threw the book on the table.
c. She loaded hay onto the truck.
d. She sneezed the foam off the cappuccino.

34.

CAUSED-MOTION CONSTRUCTION			
Form:	V	{NP,	PP}
Function:	cause-move	(causee,	path)

[5] Grammatical categories (e.g., NP) are used here instead of grammatical relations (e.g., OBJ) simply to be consistent with the majority of work on the verb-particle pattern.

Positing an inheritance relationship between the caused-motion and verb-particle constructions captures the fact that it is not accidental that all particles have a locative sense (in addition to other senses), and in fact the vast majority of particles are prepositions (Emonds 1976; Jackendoff 1973, Zwicky 1985).[6] Possible exceptions, namely *away, ahead, back*, and *forward,* are arguably simply intransitive prepositions (Huddleston & Pullum 2002; but cf. Capelle 2004) . Notice these cases, like prototypical prepositions such as *on* or *in,* semantically relate an entity to a spatial location or direction in their literal uses. In fact, many verbs that lexically select for a location or path complement allow various particles including not only *in* or *on*, but also *away, ahead, back,* or *forward*, as well as full PPs. This is illustrated in 35-38:

35. Put the jacket on/away/back.
    Put on/away/back the jacket.
    (Put the jacket on him).

36. Take the garbage in/away/back.
    Take in/away/back the garbage.
    (Take the garbage out of the house.)

37. Get the bag in/away/back.
    Get in/away/back the bag.
    (Get the bag out of the car.)

38. Move the big can in/ahead/forward.
    Move in/ahead/forward the big can.
    (Move the big can to the left.)

The inheritance relationship also explains why so many of the most frequently occurring verb-particle combinations convey caused-motion (in addition to other, extended, non-compositional, non-motion senses). The inheritance relationship is also motivated diachronically, since the first verb particles were restricted to spatial meanings (Cappelle 2014; Gries 2003; Thim 2012).

The default order of the *caused motion* construction is unremarkable as it is directly motivated by the general verb phrase order. That is, the verb-particle construction inherits the analogous default order (<V NP P>) because of its systematic relationship to the caused-motion construction. While the < V NP P > order is also treated as a default order by Hawkins (1994), the inheritance hierarchy provides an explanation rather than a stipulation.

[6] Diessel and Tomasello (2005) find that children tend to use the < V NP P > order more commonly in their earliest utterances, which would make sense if this order is the default order. Ramchand and Svenonious (2002:389) likewise note an "obvious parallelism" between particles and prepositional phrases. On the other hand, Chomsky (1957) and Den Dikken (1995) treat the < V P NP > order as basic.

When the NP is an unstressed pronoun, there is no reason to override the default < V NP P > order; thus the fact that the opposite order is unacceptable is predicted (recall??*She gave up it*). In addition, the fact that, as we have already seen, modified particles strongly prefer the order: < V NP [adverb P] > (recall examples 18-19) also follows from the fact that modified Ps are longer and are typically focused; therefore, again, the default order is not overridden; if the NP is *particularly* long, the <V [adverb P] NP > order is improved, as expected (cf. 23).

Thus by relating the verb-particle construction to the caused-motion construction within a default inheritance hierarchy, several features follow without further stipulation including: the default constituent order, the striking similarity between particles and prepositions in terms of both meaning and form, and the frequent (although by no means absolute) caused-motion interpretation of verb-particle combinations.

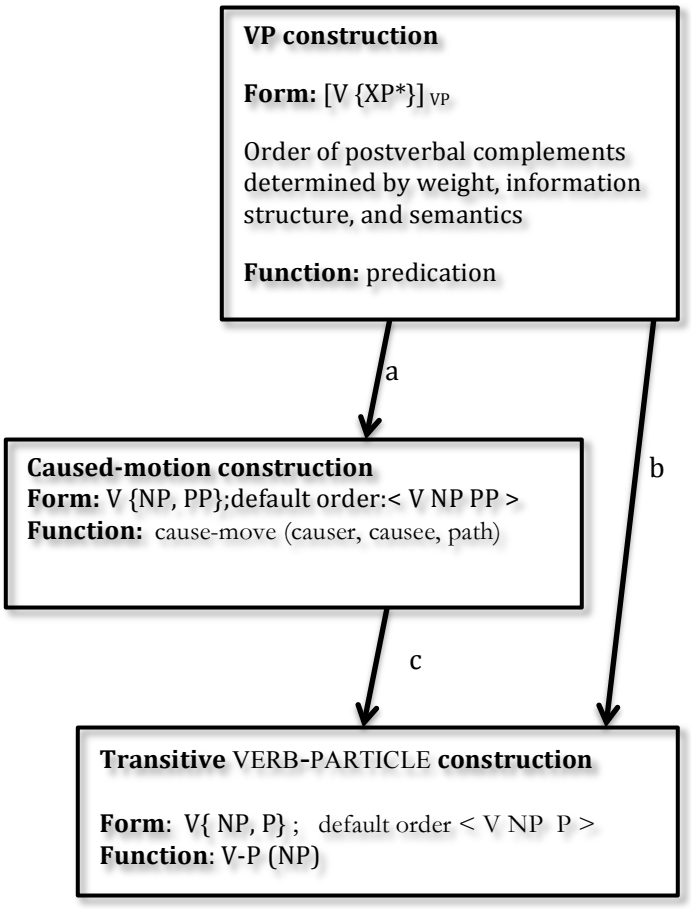

Figure 2: The transitive verb-particle construction and its relation to the caused-motion and general verb phrase constructions.

Figure 2 captures the three constructions so far discussed: the general VP construction, the caused-motion construction and the transitive verb-particle construction. The general VP construction at the top of the figure captures the language-wide constraint that complements that are shorter and designate discourse-given information tend to occur before longer complements expressing information that is new to the discourse (e.g., Wasow 2002). That generalization is inherited by the caused-motion construction (link a), by the verb-particle construction (link b), and by other constructions (e.g., the ditransitive construction, not shown). The < V NP PP> constituent order for the caused-motion construction is vastly more common than the reverse order because path PPs are typically longer and more in focus than the NP theme argument; in fact, the alternative < V PP NP> "heavy NP" shift order accounts for only roughly 7% of the data in the Brown corpus (Wasow 2002:91), and even less in COCA for certain verbs (Goldberg 2011; section 8.1). Thus the <V NP PP> order can be considered the default order for the caused-motion construction.

The verb-particle construction inherits the analogous < V NP P > constituent order from the caused-motion construction. And yet, because the NP complement is *usually* longer and more in focus than the P argument, and because the V and P quite often form a tight, non-compositional semantic bond, the general VP construction simultaneously motivates the alternate <V P NP> order. Thus the defaults associated with

the caused-motion and verb-particle constructions differ in strength, evidence that probabilities need to be associated with particular constraints (see also Bresnan et al. 2007).[7]

It should be noted that what has been represented in the figures thus far constitutes an abstract idealization. In fact, each general construction is a category formed from generalizing over a range of exemplars that that share parallel form and a family of related meanings. The intended inheritance relationship between the verb-particle construction and the caused-motion construction is as follows: verb-particle combinations with locative meanings inherit the locative meaning from the caused-motion construction. Many other verb-particle combinations inherit, in turn, from locative verb-particles, since their meanings are metaphorical extensions of the locative meanings. These non-locative verb-particle combinations, then, only inherit indirectly from the caused-motion construction. In the following sections, instances are related to general constructions more explicitly.

5. Word formation

The transitive verb-particle construction does not account for the fact that many verb-particle combinations can be used as simple nouns (or adjectives). Oftentimes, the meaning of the verb-particle nominalization is directly analogous to its meaning in verbal form. For these cases, a single verb-particle combination can be represented with links to both nominalization and phrasal verb-particle constructions.[8] This is the case with *slow down* in Figure 3, since *a slowdown* is straightforwardly related to the verbal, *to slow down*. On the other hand, some nominalizations need to be represented distinctly from a related verbal form, because their meanings are *not* strictly predictable from either their component parts, nor from the corresponding verbal verb-particle combinations. For example, if one is subjected to *a sitdown*, one is reprimanded or scolded in some way; clearly this does not simply follow from the fact that one has sat down.[9] This distinct but

[7] Note that link (b) may appear to be redundant given the existence of links (a) and (c). But default inheritance is not necessarily transitive. While the system-wide generalization about ordering motivates the ordering of the caused-motion construction's complements, it is the statistically predominant order of the caused-motion construction that is inherited by the verb-particle construction (to yield < V NP P> as the default order). And yet the system-wide VP generalization independently motivates the alternative < V P NP > order directly.

[8] An anonymous reviewer points out that Müller (2006) is critical of using inheritance for derivational morphology, but the critique rests on the assumption that one adopts complete inheritance instead of the default inheritance used here. It also seems to assume a feature-based semantics, which is in some ways problematic (Fillmore 1975).

[9] Tom Wasow supplied a headline, "A Sit-Down With Santa. The Yuletide Is Gayer Because Of This Royal Oak Resident " in which *sit-down* is used compositionally, indicating that nominalizations are somewhat productive. The noncompositional meanings nonetheless need to be listed.

related meaning is captured in Figure 3 by positing two entries of *sitdown* that are related to one another. Likewise, *a sendoff* implies a grand gesture related to an important departure of a person, while one can simply send a letter off (not shown) without any fanfare. While the verbal *turn-off* is at least two ways ambiguous, since one can either turn off lights or turn off a person (sexually), the nominalized *a turnoff* is only related to the latter interpretation (not shown).

Other nominalizations have no verbal counterpart. For example we know what a *showdown* is, but it doesn't make sense to *??show someone down.* So *show down* in Figure 3 is only linked to the nominalization construction. Conversely, *eke out* does not occur as a nominalization. This is represented by a link only to the phrasal verb-particle construction.

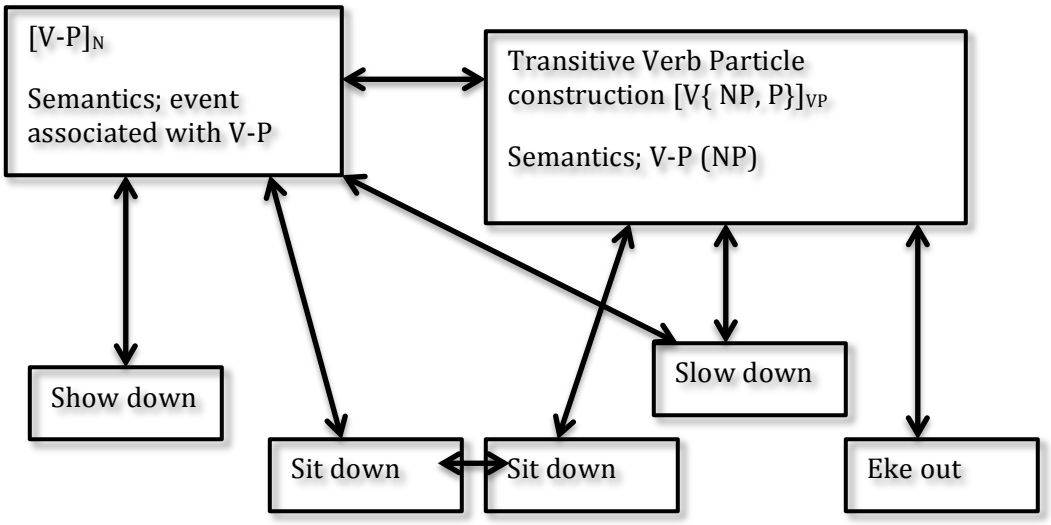

Figure 3: Particular verb-particle combinations linked to a bare nominalization construction (*show-down*) or the transitive verb-particle construction (*eke out*) or both: with predictable meaning differences (*slow down*) or distinct meanings (*sit down*).[10]

These cases again illustrate the need for a great deal of item-specific information. In addition to broad generalizations, individual items and clusters of items often have their own distributional quirks. All of the relevant information is accounted for in a quite natural way via an inheritance hierarchy.

6. Verb-particle idioms as intermediate level constructions

[10] As noted above, bidirectional arrows are used between items and the corresponding generalization in order to capture the idea is that the generalization wouldn't exist without the items, and at the same time the items are motivated by the generalization (Goldberg 1995). This might sound circular, but it isn't. The "word superiority effect" is useful as an analogy. A letter (e.g., T) is activated faster when it is in a word "SPLAT" than when it is not " ##T##". While one has to recognize letters in order to recognize a word, knowing the word *also* helps one recognize the letters. In fact, the apparent paradox has been solved in a connectionist model that included essentially two-way arrows, i.e., both bottom-up (letter to word) and top-down (word to letter) activation (McClelland & Rumelhart 1981).

Bidirectional arrows are also used when the relationship between two items is not obviously asymmetric; i.e., there is no clear reason to assume that either item is more basic. Since full specification is used here (Flickinger et al. 1985), the two-way inheritance does not create any computational issues.

Jackendoff (2002b:68) likewise recognizes "a large variety of constructions with different argument structures and semantic structures, all of which share the well-known syntax of verb + particle. Some combinations of verb+ particle are productive, some are semiproductive, and some are purely idiosyncratic; the patterns interweave in complex fashion" (cf. also Blom 2005). He details many subcases of verb-particle combinations that have their own particular semantic and syntactic properties. For example, he observes that a number of particles express aspectual properties of the event. When *away* is used this way, the verb-particle combination can only be intransitive:

2.a. Bill slept waltzed/drank/talked/read/sneezed away. (Jackendoff 2002b: 21a)
b. *Dave drank scotch/danced waltzes/read newspapers away. (Jackendoff 2002b: 22)

Jackendoff details several such "constructional idioms" that allow a range of verbs, including new denominal verbs. For example, he analyses an adjectival construction involving the particle *out* which is used to indicate that someone is worn out from too much V-ing/too much N" (Jackendoff 2002: 85; Hugou 2009):

3. a. He was netflixed out. (Jackendoff 2002b: 85)
b. She was all studied out.
c. She was all partied out.
d. You must be verb-particle'ed out by now, dear reader.

Another case, yet to be described as far as I know, has compositional instances as well as non-compositional instances, and involves the particle *off*. When used with verbs such as *wipe*, *wash, scrub* it is compositionally understood to imply that something was removed as in the following examples:

4. "he washed off the sand."
5. "I've scrubbed off the dirt"
6. "I … wiped off the blood and mucus"
7. "he picked himself off the ground, brushed off the dirt"

One typically removes unwanted things, and if one is told to wipe off a smile, the speaker indicates that the smile is inappropriate in the given context. The meaning can also apply metaphorically to verbs that do not normally convey removal; in this case, the examples nonetheless imply the dismissal of an undesirable idea, group, or situation as in the following examples:

8. "Hall shrugged off the criticism"
9. "The pirates had laughed off the threat,"
10. "Jamison … blew off the press."
11. "He shook off the thought."
12. "I had brushed off the suggestion of a guidebook."
13. "you just put off the decision"
14. "Dale waved off the question."

This intermediate level construction can be captured by positing a construction with two related senses within the default inheritance link: one sense is literal and compositional (e.g., 41-44) and this sense has given rise to a metaphorical extension (e.g., 45-51).

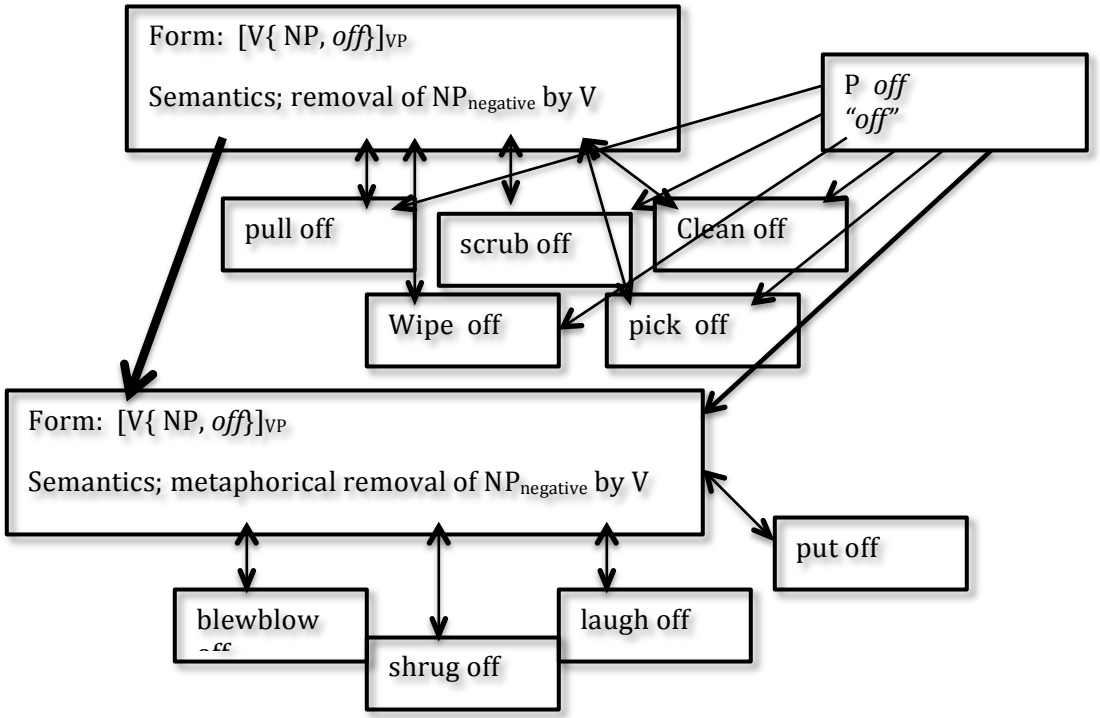

Figure 4: The V{NP, *off*} family of constructions. Inheritance relationships between items and generalization are shown. The boldfaced arrow indicates a metaphorical extension.

6.1 A word about the non-autonomy of syntax

Jackendoff takes the proliferation of verb-particle combinations as evidence of an autonomous syntactic template with no associated function (pg. 77ff). "This constitutes the classic sort of evidence for the autonomy of syntax: English assigns particular syntactic positions and syntactic properties to particles, no matter how their presence is licensed" (Jackendoff 2002b: 88).

It is true that the various functions of the verb-particle construction cover a broad range of meanings. And yet this is perhaps a pyrrhic victory for the claim of autonomous syntax insofar as every node in the inheritance hierarchy specifies a particular function as well as a form. In fact if we fail to appreciate the formal and semantic inheritance relationship with the caused-motion construction, the form itself, in terms of its default constituent order, can only be stipulated.[11]

[11] Moreover, while the range of interpretations each particle has is admittedly quite broad, it is far from random (cf. Brugman 1981 for discussion of *over*; Lindner 1983 for discussion of *up* and *out*; also Morgan 1997 for *out*; also Moehring (2013) for German *auf*).

7. Conclusion

The present analysis has made several observations. We need to recognize that hundreds of familiar verb-particle combinations are represented in a "construct-i-con," related to one another via a default inheritance network (cf. also Blom 2005; Jackendoff 2002b). A general verb-particle construction is needed, with constituent order underspecified: in simple active form, it has the form $[V \{P, NP\}]_{VP}$ (cf. also Cappelle 2006). A separate verb phrase construction that combines with the verb-particle construction and other verb phrase level constructions specifies order constraints on the basis of length, focus, and semantic cohesion (cf. Gries 2003; Hawkins 1994; Wasow 2002).

An explanation of the fact that < V NP P > is the default constituent order follows from the claim that the verb-particle construction inherits from the caused-motion construction. The fact that particles are a subset of prepositions, and the fact that verb-particle combinations often convey caused-motion also follow from the relationship between the verb-particle construction and the caused-motion construction.

Finally, we saw that verb-particle combinations can combine with the general phrasal construction and general word-formation constructions, with idiosyncrasies possible in both cases. That is, the present proposal supports the recognition of items *and* generalizations both in the case of the phrasal verb-particle construction, and also in the case of related word-level constructions. We need to tune in to specifics and generalizations in order to crack open the puzzles of language.

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References

Ackerman, F., & Malouf, R. (2006). Patterns of relatedness in complex morphological systems and why they matter. University of California, San Diego. 1–23.

Ackerman,F., G.T. Stump & G.Webelhuth. 2011. Lexicalism, Periphrasis and Implicative Morphology. In *Non-Transformational Syntax: Formal and Explicit Models of Grammar* ed. R. Borsley & K. Börjars, 325-358. Oxford: Wiley Blackwell.

Akhtar, N. & Tomasello, M. (1997). Young children's productivity with word order and verb morphology. *Developmental Psychology* 33, 952-65.

Anderson, S. R. (1982). Where's morphology?. *Linguistic inquiry*, *13*(4), 571-612.

Baayen, Harald, Cristina Burani, and Robert Schreuder. "Effects of semantic markedness in the processing of regular nominal singulars and plurals in Italian." *Yearbook of morphology 1996*. Springer Netherlands, 1997. 13-33.

Baker, C. L. (1979). Syntactic theory and the projection problem. *Linguistic Inquiry* 10, 533-81.

Baker, M. (1985). The mirror principle and morphosyntactic explanation. *Linguistic inquiry*, *16*(3), 373-415.

Baltin, Mark R. 1989 Heads and Projections. In: Mark Baltin and Anthony Kroch (eds), *Alternative conceptions of phrase structure.* The University of Chicago Press, Chicago, 1-16.

Bannard, C., & Matthews, D. (2008). Stored Word Sequences in Language Learning: The Effect of Familiarity on Children's Repetition of Four-Word Combinations. *Psychological Science*, *19*, 241–248.

Barlow, M., & Kemmer, S. (2000). *Usage Based Models of Grammar*. Stanford: CSLI Publications.

Bates, E., & MacWhinney, B. (1982). Functionalist Approaches to Grammar. In E. Wanner & L. R. Gleitman (Eds.), *Language Acquisition: The State of the Art* (pp. 175–218). New York: Cambridge University Press.

Behaghel, O. (1932). Deutsche Syntax, Vol. 4. *Heidelberg: Winter*.

Boas, H. C., & Sag, I. A. (2012). *Sign-based construction grammar*. CSLI Publications.

Bod, R. (1998). *Beyond grammar: an experience-based theory of language*. Stanford: Center for the Study of Language and Information.

Bolinger, Dwight. 1971. *The phrasal verb in English*. Cambridge, Mass; Harvard University Press.

Blom, Corrien. 2005. *Complex predicates in Dutch. synchrony and diachrony.* (LOT Dissertation Series 111). Utrecht University. http://www.lotpublications.nl/publish/issues/BlomC/.

Booij, Geert E. 2002. Separable complex verbs in Dutch: A case of periphrastic word formation. In Nicole Dehé, Ray S. Jackendoff, Andrew McIntyre & Silke Urban (eds.), *Verb-particle explorations* (Interface Explorations 1), 21–41. Berlin/ New York, NY: Mouton de Gruyter.

Booij, Geert E. (1993). Against split morphology. *Yearbook of morphology*, *1993*, 27-49.

Booij, Geert E. *The morphology of Dutch*. Oxford University Press, 2002.

Bowerman, M. (1982). 11. Reorganizational processes in lexical and syntactic development. *Language acquisition: The state of the art*, 319.

Braine, M. D. S. (1976). Children's first word combinations. *Monographs of the Society for Research in Child Development* 41, 1-104.

Bresnan, J., Cueni, A., Nikitina, T., & Baayen, R. H. (2007). Predicting the dative alternation. *Cognitive foundations of interpretation*, 69-94.

Brugman, Claudia Marlea. *The story of over: Polysemy, semantics, and the structure of the lexicon*. New York: Garland, 1988.

Bybee, Joan. (1985). *Morphology: A Study of the Relation between Meaning and Form*: John Benjamins Publishing Company.

Bybee, Joan. (1995). Regular morphology and the lexicon. *Language and cognitive processes*, *10*(5), 425-455.

Bybee, Joan. (2000). "The phonology of the lexicon: Evidence from lexical diffusion." *Usage-based models of language*: 65-85.

Bybee, Joan. (2006). From usage to grammar: the mind's response to repetition. *Language, 82*(4), 711-733.

Bybee, Joan. 2010. *Language, usage and cognition*. Vol. 98. Cambridge: Cambridge University Press, 2010.

Cappelle, Bert. (2004) "The particularity of particles, or why they are not just 'intransitive prepositions'." *Belgian journal of Linguistics* 18.1: 29-57.

Cappelle, Bert. 2005. Particle patterns in English: A comprehensive Coverage. Unpublished PhD thesis. K.U.Leuven.

Cappelle, Bert. (2006). Particle placement and the case for " allostructions " allostructions ". *Constructions online*, *SV1-7*, 1–28.
Cappelle, Bert. (2014). Review of Stefan Thim's (2012). Phrasal Verbs: The English Verb-Particle Construction and its History. *English Language and Linguistics*.
Cappelle, Bert., Shtyrov, Y., & Pulvermüller, F. (2010, December). Heating up or cooling up the brain? MEG evidence that phrasal verbs are lexical units. *Brain and language*.
Chaves, R. P. (2013). *Linearization-based word-part ellipsis* (Vol. 31, pp. 261–307). doi:10.1007/sl0988-008-9040-3
Chomsky, Noam (1957). *Syntactic Structures*. The Hague: Mouton.
Copestake, A. (2013). Can distributional approached improve on gold old-fashioned lexical semantics. In *IWCS Workshop Towards a Formal Distributional Semantics*.
Croft, William. *Typology and universals*. Cambridge University Press, 2002.
Croft, William, and M. Jo Cresswell. "Syntactic categories and grammatical relations: The cognitive organization of information." *Chicago and London* (1991).
Culicover, Peter W. 1999. Syntactic Nuts: Hard Cases, Syntactic Theory and Language Acquisition reviewed by John R Taylor. Cognitive Linguistics 10.251-61.
Culicover, P. W., & Jackendoff, R. (2005). *Simpler Syntax*. Oxford: Oxford University Press.
Dabrowska, E. (2004). *Language, Mind and Brain*. Georgetown: Georgetown University Press.
Davies, Mark. (2008)."The corpus of contemporary American English: 425 million words, 1990-present."
Deo, Ashwini. 2007. Derivational morphology in inheritance-based lexica: Insights from Panini. Lingua 117.175-201.
Diessel, H., & Tomasello, M. (2005). Particle placement in early child language: A multifactorial analysis. *Linguistics and Linguistic Theory*, *1*(1).
Di Sciullo, A. M., & Williams, E. (1987). *On the definition of word* (Vol. 14). Cambridge: MIT press.
Den Dikken, M. (1995). *Particles: On the syntax of verb-particle, triadic, and causative constructions*. Oxford University Press.
DeSchepper, B., & Treisman, A. (1996). Visual memory for novel shapes: implicit coding without attention. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *22*(1), 27.
Ellis, N. C. (2002). Frequency Effects in language processing: a review with implications for theories of implicit and explicit. *Studies in Second Language Acquisition, 24*(2), 143-188.
Emonds, Joseph E. "A structure-preserving constraint on NP movement transformations." *Chicago Linguistic Society*. Vol. 5. 1969.
Emonds, Joseph E. *A transformational approach to English syntax: Root, structure-preserving, and local transformations*. New York: Academic Press, 1976.
Farrell, Patrick. 2005. "English verb-preposition constructions: Constituency and order." *Language*: 96-137.
Fillmore, Charles J., Paul Kay, and Mary Catherine O'Connor. "Regularity and idiomaticity in grammatical constructions: The case of let alone." *Language* (1988): 501-538.

Fillmore, Charles J. 1975. Against Checklist Theories of Meaning. Berkeley Linguistics Society 1.
Flickinger, D., Pollard, C., & Wasow, T. (1985). Structure-sharing in lexical representation. In *Proceedings of the 23rd annual meeting on Association for Computational Linguistics* (pp. 262-267). Association for Computational Linguistics.
Folli, R., Harley, H., & Karimi, S. (2005). Determinants of event type in Persian complex predicates. *Lingua*, *115*(10), 1365–1401. doi:10.1016/j.lingua.2004.06.002
Fraser, Bruce. *The verb-particle combination in English*. New York: Academic Press, 1976.
Gahl, Susanne, and Susan M. Garnsey. "Knowledge of grammar, knowledge of usage: Syntactic probabilities affect pronunciation variation." *Language* (2004): 748-775.
Garnsey, S. M., Pearlmutter, N. J., Myers, E., & Lotocky, M. A. (1997). The contributions of verb bias and plausibility to the comprehension of temporarily ambiguous sentences. *Journal of Memory and Language*, *37*(1), 58-93.
Givón, T. (1991). Isomorphism in the Grammatical Code: Cognitive and Biological Considerations. *Studies in Language*, *1*(15), 85–114.
Ginzburg, Jonathan, and Ivan Sag. "Interrogative investigations." *CSLI: Stanford* (2000).
Goldberg, Adele E. (1995). *Constructions: A construction grammar approach to argument structure*. University of Chicago Press.
Goldberg, A. E. (1999). The emergence of the semantics of argument structure constructions. *The emergence of language*, 197-212.
Goldberg, Adele E. (2003). Words by Default: Inheritance and the Persian Complex Predicate Construction. In E. Francis & L. Michaelis (Eds.), Mismatch: Form-Function Incongruity and the Architecture of Grammar (pp. 84–112 ST – Words by Default: Inheritance and the). Stanford: CSLI Publications.
Goldberg, Adele E. (2011). Corpus evidence of the viability of statistical preemption. *Cognitive Linguistics*, *22*(1), 131-153.
Goldberg, Adele E., & van der Auwera, J. (2012). This is to count as a construction1. *Folia Linguistica*, *46*(1), 109-132.
Gonzálvez-García, F. (2009). The family of object-related depictives in English and Spanish: towards a usage-based constructionist analysis. *Language Sciences*, *31*(5), 663–723.
Greenbaum, S., Leech, G. N., & Svartvik, J. (1972). A grammar of contemporary English.
Gries, S. T. (1999). Particle movement: A cognitive and functional approach. *Cognitive Linguistics*, *10*(2), 105–145. doi:10.1515/cogl.1999.005
Gries, S. T. 2003. Gries, Stefan Th. *Multifactorial analysis in corpus linguistics: a study of Particle Placement*. London & New York: Continuum Press, pp. 240.
Gurevich, O., Johnson, M. A., & Goldberg, A. E. (2010). Incidental verbatim memory for language. *Language and Cognition*, *2*(1), 45-78.
Haskell, Todd, MacDonald, M. and Seidenberg, M. 2003. Language learning and innateness: Some implications of compounds research. Cognitive Psychology, 47.119-63.
Hawkins, John A. *A performance theory of order and constituency*. Vol. 73. Cambridge University Press, 1994.
Hawkins, John A. (2004). *Efficiency and complexity in grammars*. Oxford: Oxford University Press.
Hudson, Richard. (2006). Word Grammar and Construction Grammar.

Huddleston, Rodney, and Geoffrey K. Pullum. (2002). *The Cambridge Grammar of the English Language.* Cambridge: Cambridge University Press.
Hugou, Vincent. 2009. Productivité et émergence du sens. L'exemple de la construction (all) X-ed out dans un corpus de blogs et de forums de discussion. Thèses en préparation à Paris 3, dans le cadre de École doctorale Études anglophones, germanophones, et européennes (Paris) 13-11-2009.
Jackendoff, Ray. (1973). The base rules for prepositional phrases. *A festschrift for Morris Halle*, 345-356.
Jackendoff, Ray. 1996. "The proper treatment of measuring out, telicity, and perhaps even quantification in English." *Natural Language & Linguistic Theory* 14.2: 305-354.
Jackendoff, Ray. 2002a. Foundations of Language. Oxford: Oxford University Press.
Jackendoff, Ray. 2002b. English particle constructions, the lexicon, and the autonomy of syntax. In Nicole Dehé, Ray Jackendoff, Andrew McIntyre, and Silke Urban (Eds): *Verb-Particle Explorations, Interface Explorations.* Berlin, New York: Mouton de Gruyter. 67-94.
Kim, J., & Davies, M. (n.d.). The "causative V-ing" construction in English: A usage-based approach, (1).
Kiparsky, P. (1968). Tense and mood in Indo-European syntax. *Foundations of language*, *4*(1), 30-57.
Kiparsky, Paul. 1982. From cyclic phonology to lexical phonology. The Structure of Phonological Representations, ed. by H. van der Hulst and N. Smith, 131 - 75. Dordrecht: Foris.
Konopka, A. E., & Bock, K. (2009). Lexical or syntactic control of sentence formulation? Structural generalizations from idiom production. *Cognitive Psychology*, 68–101.
Lakoff, George. 1987. Women, Fire and Dangerous Things. University of Chicago Press.
Langacker, Ronald W. *Foundations of Cognitive Grammar: theoretical prerequisites. Volume 1*. Vol. 1. Stanford university press, 1987.
Langacker, Ronald W. Vol. 2. Stanford university press, 1991.
Langacker, R. W. (1988). A usage-based model. In B. Rudzka-Ostyn (Ed.), *Topics in cognitive linguistics*. Philadelphia: John Benjamins.
Larson, Richard 1988 Light Predicate Raising. *MIT Cognitive Science Center Working Papers.* MIT, Cambridge.
Lieven, E. V. M., Pine, J. M. & Baldwin, G. (1997). Lexically-based learning and early grammatical development. Journal of Child Language 24, 187-219.
Lindner, S. J. (1983). *A lexico-semantic analysis of English verb particle constructions*. Indiana University Linguistic Club.
Lohse, B., Hawkins, J. A., & Wasow, T. (2004). Domain minimization in English verb-particle constructions.. *Language*, *238*(1), 238–261.
Losiewicz, B. L. (1992). *The effect of frequency on linguistic morphology* (Doctoral dissertation, University of Texas at Austin).
MacDonald, M. C., Pearlmutter, N. J., & Seidenberg, M. S. (1994). The lexical nature of syntactic ambiguity resolution. *Psychological review*, *101*(4), 676.
Moehring, Anja. (2013)."Argument marking with prepositions in German: a constructional approach to'auf('on')."

Masini, Francesca. (2005) "Multi-word expressions between syntax and the lexicon: the case of Italian verb-particle constructions." *SKY Journal of Linguistics* 18.2005: 145-173.

McClelland, J. L., & Rumelhart, D. E. (1981). An interactive activation model of context effects in letter perception: I. An account of basic findings. *Psychological review*, *88*(5), 375

Michaelis, L. A., & Lambrecht, K. (1996). Toward a construction-based theory of language function: The case of nominal extraposition. *Language*, 215-247.

Morgan, P. S. (1997). Figuring out figure out. Metaphor and the semantics of the English verb-particle construction. *Cognitive Linguistics (includes Cognitive Linguistic Bibliography)*, *8*(4), 327-358.

Müller, Stefan. 2002a. *Complex predicates: Verbal complexes, resultative constructions, and particle verbs in German* (Studies in Constraint-Based Lexicalism 13). Stanford, CA: CSLI Publications.

Müller, Stefan. 2002b. Syntax or morphology: German particle verbs revisited. In Nicole Dehé, Ray Jackendoff, Andrew McIntyre & Silke Urban (eds.), *Verb particle explorations* (Interface Explorations 1), Mouton de Gruyter.

Müller, Stefan. 2006a. Phrasal or lexical constructions? *Language* 82(4). 850–883.

Pawley, A., & Snyder, F. H. (1983). Two puzzles for linguistic theory. In J. Richards & R. Smith (Eds.), *Language and Communication*. New York: Longmans.

Pierrehumbert, J. (2000). What people know about sounds of language. *Studies in the linguistic sciences*, *29*(2), 111-120.

Pinker, Steven. "The Language Instinct. New York: William Morrow and Company." (1994).

Pollard, C., & Sag, I. A. (1987). Information-based syntax and semantics, Volume 1: Fundamentals.

Pullum, Geoffrey K., and Arnold M. Zwicky. 1991. "A misconceived approach to morphology." *Proceedings of the West Coast Conference on Formal Linguistics*. Vol. 10.

Pulvermüller, F., Kujala, T., Shtyrov, Y., Simola, J., Tiitinen, H., Alku, P., et al. (2001). Memory traces for words as revealed by the mismatch negativity. Neuroimage, 14(3), 607–616.

Ramchand, G., & Svenonius, P. (2002). The Lexical Syntax and Lexical Semantics of the Verb-Particle Construction, 387–400.

Sag, I. A. (2010). Sign-Based Construction Grammar. In H. Boas & I. A. Sag (Eds.), *Sign Based Construction Grammar*. CSLI Publications.

Samvelian, P. & Faghiri, P. (2013). Re-thinking Compositionality in Persian Complex Predicates ∗, *252*().

Sinclair, J. (1990). *No Corpus Concordance Collocation*. Oxford: Oxford University.

Sneed, E. (2002). The acceptability of regular plurals in compounds. *Chicago Linguistic Society 38*, 617–632.

Stiebels, Barbara & Dieter Wunderlich. 1994. Morphology feeds syntax: the case of particle verbs. *Linguistics* 32(6). 913–968.

Toivonen, Ida. "Swedish particles and syntactic projection." *Dehé et al.(eds.)* (2002): 191-209.

Tomasello, M. (2003). *Constructing a language: A Usage-Based Theory of Language Acquisition*. Boston: Harvard University Press.
Trueswell, J. C., Tanenhaus, M. K., & Kello, C. (1993). Verb-specific constraints in sentence processing: separating effects of lexical preference from garden-paths. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *19*(3), 528.
Trousdale, G. (2013). On multiple source constructions in language change. *Studies in Language*, *24*, 491–514.
Tyler, A. and Evans, V. (2001) Reconsidering prepositional polysemy networks: The case of over. *Language*. 77:4. 2001 (pp.724-765).
Van Dongen, W. A. (1919). He put on his hat and He put his hat on. *Neophilologus*, *4*(1), 322-353.
Van Trijp, RLong-distance dependencies without filler–gaps: a cognitive-functional alternative in Fluid Construction Grammar. *Language and Cognition*, 1–29.
Walkova, M. (2013). *The aspectual function of particles in phrasal verbs*. University of Groningen.
Wasow, Thomas. 2002. *Postverbal behavior*. Stanford: CSLI.
Webelhuth, G., & Ackerman, F. (1998). *A Theory of Predicates*. Stanford, CA: CSLI Publications. Distributed by Cambridge University Press.
Williams, Edwin. 1997… In Sells, Peter, ed. *Complex Predicates*. CSLI Publications, 1997.
Williams, Edwin. (1994). Remarks on Lexical Knowledge. Lingua. 92.7-34.
Wonnacott, Elizabeth, Elissa L. Newport, and Michael K. Tanenhaus. "Acquiring and processing verb argument structure: Distributional learning in a miniature language." *Cognitive psychology* 56.3 (2008): 165-209.
Wonnacott, Elizabeth. "Balancing generalization and lexical conservatism: An artificial language study with child learners." *Journal of Memory and Language* 65.1 (2011): 1-14.
Wray, Alison. (2002). The Transition to Language. New York: Oxford University Press.
Yamashita, H., & Chang, F. (2001). "Long before short" preference in the production of a head-final language. *Cognition*, *81*(2), B45-B55.
Zeller, Jochen. "Particle verbs are heads and phrases." *Verb Particle Explorations* 1 (2002): 233.
Zwicky, Arnold M. "Clitics and particles." *Language* (1985): 283-305.

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