A Preliminary Study on Semantic Patterns in Verb-Particle Combinations Appearing with Particles up, on and out in the English Language

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Preliminary Examination: Data Analysis

1 Introduction

An English verb particle construction (VPC) is composed of a head verb and an obligatory particle, specifically prepositions without a null-instantiated complement. Here are a few examples of VPCs that appear with the particle on and over:

(1) a. “He once took on the manager of his club and worked him over thoroughly with his fists.” (Brown)
   b. “Mrs. Coolidge decided to leave the radio on for them. (Brown)
   c. “The small car flew on relentlessly.” (Brown)

The label of VPC is specifically given to verb and particle pairs that combine in such a way that the original semantic properties of the verb (without the particle) are altered as exemplified in (1a). In this example, “take on” means to challenge or fight someone (specifically “the manager” in the sentence) and “work over” means to give someone a severe beating, while these meanings are absent in either the verbs or particles separately. Syntactically, VPCs can occur intransitively as in example (1a) or transitively as in (1c). Thus for a verb + particle pair to constitute a transitive VPC, the particle cannot act the head of a prepositional phrase, as is the case for the word on in the sentence “I'll sleep [on the floor]pp” where “on the floor is a prepositional phrase.

For transitive VPCs, a number of tests have been established to determine if given a string of verb (O'Dowd 1998), the NP appearing to the right of the particle is the object of the preposition (an evidence for non-VPC) or if it is, in fact, the object of the verb itself (an evidence for VPC), which I will touch on later in the paper.

(2) Passivization: VPC should passivize (“Turn off the light” → “The light was turned off” / “Turn off the road” → **“The road was turned off”), Verb-substitution: verb + particle combination should be replaceable by another non VPC verb (“The light was extinguished” for “The light was turned off”), NP-insertion: often, the object can either precede or follow the particle (“We turned [the light] off”/*“We turned [the road] off”), P-stress: the particle of a VPC should be able to receive prosodic stress (“The button was sewed ON” vs. “The button was SEWED on”), and V-nominalization: VPC should allow for nominalization (“His looking up of the information”/*“His looking into of the information”)
Unfortunately these diagnoses for identifying a VPC are not entirely foolproof. Although these tests do provide us with a general basis for recognizing a VPC from a non-VPC, not all of the VPCs pattern in the same way (O’Dowd 1998, Bolinger 1971). For instance, taking O’Dowd’s example, while the NP-insertion works to identify *sleep in* in “George Washington slept in this bed” as a non-VPC (i.e. **George Washington slept this bed in”), the passivization test fails: “This bed was slept in by George Washington” is acceptable.

Another factor that presents itself as a significant problem in VPC recognition is polysemy. While there are cases where a particle may interact with verb in a productive way manner, the pattern does not apply across all VPCs. For example, VPCs such as *tear up, cut up, split up,* and *eat up* seem to entail an aspect of completion (compared to their verb counterparts). However, the same pattern does not apply to *put up* (e.g. “The dealer put a painting up for auction.”), *show up* (e.g. “She showed up to the funeral”), and *make up* (e.g. “Tom and Jerry made up after a fight.”). Even VPCs composed of the same verb and particle show polysemy. Such is the case with *take on* as in the example (1a) and *take on* as in adopting a certain quality or characteristic as evidenced in sentences like “The party *took on* an air of elegance.” This lack of unifying features across all VPCs and their syntactic and semantic flexibility pose a challenge to clearly defining identifying the nature of these verb-particles pairs. This is an especially confounding challenge in natural language processing (NLP) that seeks to develop and establish automatic methods for not just identifying but also predicting linguistic phenomena such as VPCs in written text and speech.

2 Motivation and Research Questions

Given all these problems in pinning down the exact behavior displayed by VPCs, it still remains that for the most part human speakers are able to recognize, understand, and make use of these VPCs in everyday speech. Moreover, the comprehension and use of such VPCs would be more or less unconsciously and effortlessly achieved. And even in face of an novel or non-conventional VPC, a speaker will likely guess at a meaning. Take the following sentences as examples:

(3) “[I] woke up 45 minutes later with a bloody nose, **kleenexed it up**, fell back into a half dream state.” (Google Search)
(4) “They are smart enough to **aoe me out** of stealth.” (Google Search)
Let’s say a reader is asked to define the above two sentences. In sentence (3) the VPC they encounter is *kleenexed up*. Even if this verb+particle combination has never happened before, by means of understanding what Kleenex is and knowing that the writer had a bloody nose, the reader will have no trouble in interpreting its meaning. Understanding sentence (4) would be just as easy if the reader knew the meaning of the verb *aoe*\(^1\). Not knowing what the verb means, the reader is left to guessing it from the surrounding context. There can be several interpretations such this sentence including ones that do not treat the *aoe* out as a VPC (e.g. “They are smart enough to [aoe=avoid|capture] me out of [stealth=fear|want to avoid]”). However, one might also arrive at an interpretation where stealth is made analogous to lie or deception to mean accuse or uncover a stealthy lie; a close interpretation to its actual meaning.

What is interesting here is that even when presented with a seemingly nonsensical word, it is possible to arrive at the correct reading from the given context (and some measure of imagination). That such understanding is possible and that there is a knowledge to be gained even in novel cases seems to suggest that there is more to VPCs than just an idiosyncratic combining of words and that there must be a cue or a pattern on which an English speaker can base a guess on the meaning even when presented with a non-conventional VPC. If so, what are these patterns and do these patterns serve to describe the VPCs as a whole?

In this paper I will present a corpus-based investigation to ascertain the overarching patterns within the attested usages of three most frequently used VPCs in the English language. The goal of this study is to carry out a preliminary investigation on whether or not VPCs display patterns that allow that allow for classification into natural classes. For the purposes of this study, I will be limiting my data to cover only the transitive VPCs. Throughout this paper, I will treat VPC as a single unit. The question of where the meaning of VPC originates and determining the specific nature of how a particle contributes meaning to the verb in a VPC are certainly interesting topics. However, this effort is out of the scope of this paper.

In section 3 of this paper, I will describe the methodology used to collect the corpus data and detail the methods used to narrow down the sample size. Section 4 will describe the methods and challenges in categorizing the extracted VPCs. Then in section 5, I will summarize

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\(^1\) The word *aoe* is an acronym of “area of effect”. It is used in role-playing game domains to refer to a magical cast that causes damage to enemies within a certain radius of the caster (noun) or the act of casting of such spells (verb). The word is pronounced as an acronym ([ei oʊ i]). This sentence basically means that the speaker was in a stealth when the aoe caused him to be pulled out of stealth.
methodology used to determine overall behavioral patterns of VPC in the data. I then analyze the gathered and categorized data set to show that there are indeed a number of observable semantic patterns by which VPCs behave. However, I will also show that these patterns aren’t full encompassing of all observed VPCs and that there are areas in which these patterns overlap making their semantic classification difficult.

3 Data Extraction

Brown Corpus \(^2\) is a million word corpus of modern American English compiled from a variety of categories and genres of text printed in 1961. The fully Treebank-annotated version of Brown Corpus was used as the source for corpus data. VPCs were extracted from the Brown Corpus using the Treebank tags as described in the Treebank annotation guidelines (Bies et al. 1995).

The following observations have been used to extract the VPCs from the corpus:

- Verbs are labeled VBx*, where the x marks for tense, person, and number of the verb\(^3\)
- Particles are labeled with PRT
- Particle node is a sister of the verb and it follows the verb node. And conversely, verb node is a sister to the particle node and it precedes the particle node.

The retrieved data was counted for frequency and the top three particles of the highest frequency were selected for the study. Following is the frequency count result:

<table>
<thead>
<tr>
<th>All Particles</th>
<th>Frequency Count</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>up</td>
<td>1182</td>
<td>32.17%</td>
</tr>
<tr>
<td>out</td>
<td>962</td>
<td>26.18%</td>
</tr>
<tr>
<td>on</td>
<td>331</td>
<td>9.01%</td>
</tr>
<tr>
<td>off</td>
<td>314</td>
<td>8.55%</td>
</tr>
<tr>
<td>[remaining]</td>
<td>885</td>
<td>24.09%</td>
</tr>
<tr>
<td>TOTAL:</td>
<td>3674</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Table 1: There were a total of 3674 sentences with VPCs. Approximately 75% of the data was composed of up, out, on, and off.

In the retrieved data, 75% of the VPCs occurred with the particles up, out, on and off (Table 1). The remaining VPCs appeared with 28 distinct particles (25% of total data). Complete

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\(^2\) Brown Corpus Manual can be found at http://icame.uib.no/brown/bcm.html

\(^3\) The variations on the Treebank tags for verbs are as follows:

- VB - Verb, base form
- VBD - Verb, past tense
- VBG - Verb, gerund or present participle
- VBN - Verb, past participle
- VBP - Verb, non-3rd person singular present
- VBZ - Verb, 3rd person singular present
breakdown of particles is included in Table A of the Appendix. The top three particles of the highest frequency (i.e. *up*, *out*, and *on*) selected for the study accounted for approximately 2475 sentences, which made up 67% of all data (Table 2).

Each of the sentences with VPCs containing *up*, *out*, and *on* were hand analyzed to further select the transitive VPCs. During this process, the VPCs as labeled by TreeBank were tested using the O’Dowd’s diagnoses for VPC mentioned above (2). Instances failing the tests (e.g. “Johnny Leighton picked up some new numbers out in Texas which he’s *springing* [PRT-*on* the ringsiders]pp in the Rum House.” where *on* is the head of the prepositional phrase), adjectivals (e.g. “[…] a room with some of the instruments *lined up*.”), and duplicate sentences were removed4 from the dataset. The intransitive VPCs were found to make up approximately 40% and other extraneous instances (i.e. adjectivals, duplicates, and errors) made up about 8% of the data. The resulting data set included 1302 sentences with transitive VPCs, which was approximately 52% of the starting set.

Definitions for each of the VPCs in the resulting set of 1302 sentences were then looked up in the Cambridge Dictionaries Online (http://dictionary.cambridge.org/) and Encarta® World English Dictionary, North American Edition (http://encarta.msn.com/encnet/features/dictionary/dictionaryhome.aspx) for definitions. If any definitions were missing, they were augmented looking the VPC up in the WordNet (http://wordnet.princeton.edu/perl/webwn) and FrameNet (http://framenet.icsi.berkeley.edu/). In particular looked for a specific entry for the VPC in question or an entry for the verb without the particle that included an example of the VPC. Judgment as to the correct sense for the VPC was based on personal intuition. In a number of cases where the intuition failed and found no dictionary definition (e.g. baseball specific terminology: “Jim Gentile bounced a hard shot off Kunke’s glove and *beat it out* for a single […]”), I either consulted Google search for more data and context given the VPC, or solicited a general definition from a native speaker of English. If the VPC with its appropriate sense was not found in either or both of the dictionaries, the sentence was labeled as undefined. In addition, if VPCs were judged too ambiguous in the given context to place in one sense or another (e.g. “When yuh come back, I’ll *pull it out* agin till you’re both inside” where knowing

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4 The Brown Corpus contained a number of duplicate sentences with slightly different tree structures. Sentences weren’t considered duplicate if two or more distinct VPCs appeared in them. If a sentence was seen again with already annotated VPC or VPCs, it was considered duplicate and was removed.
what “it” is could have helped to distinguish exactly what pull out could mean), it was labeled as accordingly and placed aside.

Each VPC was then assigned with a sense number, an arbitrary designation beginning at 1. In order to work with a more manageable data set, the instances with VPCs of the same form and same sense were collapsed:

(5) “Remembering his own thirst Matsuo took out his water bottle.”
   (Cambridge: to remove something somewhere)
(6) “But before she left her room she dug into her big moiré bag took out the envelope holding her marriage contract and the wax seal had been broken.”
   (Cambridge: to remove something somewhere)
(7) “But Henry Ford […] in 1905 as a precautionary measure took out a license from the man who claimed to be its inventor.”
   (Encarta: to obtain something such as permit, mortgage, or insurance by applying for it)

For example, in the above case, out of the three sentences with the VPC take out, (5) and (6) carry the same sense. Thus (5) and (6) would be assigned as sense 1 and collapsed into one; and (7) would be assigned sense 2. Ambiguous and undefined sentences were neither removed nor collapsed into any one particular sense. And any other duplicates or non-VCPs I missed during the first pass were also removed. This process yielded a final list of sentences with 526 unique VPC tokens; this included a total of 254 distinct verbs paired up with any of the three particles: up, out and on.

4. Classification Methodology and Challenges

As a next step, each of the VPCs of the resulting set were then examined and clustered by their meanings. Since no two meanings are exactly alike for any given pair of VPCs, one method of classification can hardly be adequate for all attested VPCs. Instead of striving for a single decision tree that would allow categorization of majority of verbs, I chose to evaluate each of the VPCs individually using their dictionary definitions, role of the arguments of the VPC—the subject and object noun phrase of the VPC, and other rather general taxonomic classification. They include (but certainly are not limited to) VPCs of dressing, motion, creation, destruction, sports, and reporting. Also, the aspectual nature of the VPCs was considered: VPCs of continuation (most often found with the particle on as in “I drove the tractor on not looking down”) and state change (most often found with particles up and out). Metaphors and metaphorical extensions were also looked at during the process of classification. For example, Lakoff’s “Good is Up” orientational metaphor (Lakoff 1980) was used to classify sentences such
as “Your squad is good, one of the best, keep it up, keep up the good work”. Finally and just as importantly, the general context was taken into account including personal intuition of meaning and world knowledge of how a given VPC would be used in real world was also considered.

One of the biggest challenges in coming up with satisfactory categories for VPCs was deciding on how semantically specific a category should be made. That is, because no two VPCs are exactly alike in their meaning, there is always the (unhelpful) solution of having as many categories as there are VPCs. This was especially challenging in this investigation because meaning of each VPC was evaluated on an individual basis rather than through a single taxonomic classification tree. The trick was in maintaining a balance between the need for a category to faithfully reflect the semantic nature of its members and the need for it to be inclusive for more than one or two VPCs by reflecting the commonalities amongst the varying semantic behavior amongst its members.

Several factors played into the deciding whether or not two or more VPCs should be placed in a single category. Questions that were asked include: (1) are there any salient features amongst the VPCs that allow them to considered members of a same category? (2) How much information would be lost in grouping the two VPCs together; just how great is this loss? (3) Is there any specific advantages to be gained from placing the VPCs in the same category? Let me illustrate such decision with an example. Over 90 verbs occurring with the particles out and up were grouped into one large category of VPCs of completion (based on their aspectual behavior) even though the members did vary in meaning. They could have certainly been separated out into groups of finer meaning granularity, but in doing so it meant creating dozen new groups since the particles paired up with for the most part carry different meaning. The category included sentences like the following:

(8) “Urge them to **write out** their questions for the box.”
    (Encarta: to write out something in its complete form)

(9) “Thayer **folded it up** and offered a drink.”
    (Encarta: to fold something completely or become folded completely)

Both write out and fold up have been grouped in the same completion group, despite the fact that they convey two very distinct definitions. However, grouping these two into one had two advantages. The first advantage was that such grouping removes the necessity to create two separate categories for each of the VPCs. Secondly and perhaps more importantly, it removes the need to mark sentence (9) as an ambiguous sentence. Reading the sentence (9), it is hard
to tell what the object pronoun “it” really is. It could refer to a book that Thayer could be reading; a book which he had to fold up or close in order to offer his guest a drink. The pronoun it could possibly refer to a origami cup Thayer folded up in order to pour the drink, which then he offered to his guest. By making the aspectual completeness as the requirement for membership of a single category, the ambiguity is neutralized; as it is the case that whether in folding up a book or folding up a cup, Thayer is achieving the act of folding.

Another challenge in categorizing the VPCs came in for those verbs that were somewhat idiomatic in nature. Take the following sentences for example:

(10) “I shouldn’t like to have to write you up for insubordination as well as dereliction of duty.”  
(Encarta: to report somebody in writing for violating a law or rule)
(11) “District Attorney Mills hastily swore out a number of warrants against men who […]”  
(Encarta: to issue a warrant for arrest by making a charge or accusation under a formal oath)
(12) “Dean and myself will try to cut out horses to ride.”  
(Encarta: to separate an animal, especially a cow, from a herd)
(13) “It’s dryin’ myself out that does it”  
(Cambridge: Someone who dries out stops being dependent on alcohol)
(14) “He was to put out too because there was only one way of understanding what she’d done.”  
(Cambridge: to annoy or upset someone, often by what you do or say to them)

Each of the above VPCs are very specific in meaning and idiomatic in nature – the meaning cannot be fully gathered from the VPC or even the context. For such data, I made the decision of clustering them under a general category of idiosyncratic/idiomatic VPCs. Although the category itself does not discriminate the meaning of its members, each and every one of the members have clearly distinct meanings that cannot be placed in other categories. In addition to the idiomatic VPCs, VPCs that did not lend for categorization without creating its own category were also flagged as members of idiosyncratic/idiomatic VPCs. Although these VPCs are more conventional in meaning, they only appear once or twice in the entire Brown Corpus (the frequency is noted in brackets by the sentences):

(15) “Oh cut it out, Tom!” [2x]  
(Encarta: to stop doing something that is annoying to somebody)
(16) “Mr. Notte said that instead he will take up the matter with Atty. Gen. J. Joseph Nugent” [2x]  
(Cambridge: to discuss something or deal with something)
(17) “We were brought up that way” [2x]  
(Cambridge: care for a child until it is an adult, often giving it particular beliefs)
“Waddell had looked the man over, trying to size him up.” [1x]
(Encarta: to assess a person or situation and form a judgement)

Moreover, even though each of the VPCs used in the sentences (15)-(18) carry meanings that
can be guessed from context, they are not far from the idiomatic ones in that they either appear
within a specific argument structure (e.g. take up as in (16) appears as “Subj-NP take up Obj-
NP PP-with”) or appear to carry meaning outside what the context would provide (e.g. cut out
implies ending not just any activity but something that is annoying to someone). Overall, the
decision to group all these cases together was a result of need for a manageable number of
categories. Since a member of this category carries a specific meaning that is clearly distinct
from that of the other members, if there is a need later to separate out the VPCs, they could
easily be achieved.

The process of categorization, thus, resulted in the neighborhood of 55 categories, including a
bucket for idiosyncratic VPCs and a bucket for ambiguous VPCs. Following are some
exemplars of the resulting categories:

(19) VPCs of Activation: turn on, click on, switch on, leave on
(20) VPCs of Deactivation: shoot out, stub out, snuff out, black out, blow out, put out,
press out
(21) VPCs of Arrangement: lay out, set out, shake out, spread out, straighten out
(22) VPCs of Completion: wipe out, cancel out, knock out, mix up, bind up, fold up

For categories (8) and (9), the key classification consisted of object NP to be a source of light or
flame, or a certain appliance that require a power source, including cigarettes, candle, radio,
and television. Classification of category (10) required the VPC to carry a meaning of
arrangement of some item or placing of an item in some arrangement for a purpose. This
category included usages such as “It was laid out in 196 for chariot races and other public
games”, “Tables may be set up as in Table 1”, or “Then he spread out the last list on the
counter”. Unlike the categories (8)-(10), the members in the category (11) are bound together by
their aspectual nature rather than their specific meaning.

5 Analyses of Salient Behavioral Patterns in VPC

The data is simply too diverse and complex to reduce the observations into a single or
even a handful of systematic accounts that will describe all of the corpus data. The categories^5

^5 I have included the categories in the Appendix: Table B. For more information, please reference the CD
included with the paper.
we discussed in section 4 have been developed based on the sharing of a subset of largely
diverse semantic properties. In some sense, such categorization is an artificial imposition of
what we consciously perceive as related to how they really might be cognitively related. This is
not to say that the effort is, therefore, useless or unhelpful, but that this is one way to carve up
the world; and perhaps the task would be only partly done if we weren’t to step back from these
small categories to see if there’s a general pattern we can gain from a second look at the data.

As I have already alluded in section 4, these categories are not uniform in size, quality or
descriptive properties of its members. Some categories are narrow as to the piece of the world
the verb+particle combinations describe, like the VPCs of baseball, which includes give up –
allow an opposing player something while pitching and #beat out – get to a base safely. Some
categories include members semantically related in such a way that they could potentially be
interchangeably. Example of such category would be VPCs of spoil or damage, which includes
mess up, foul up, muck up, fuck up, and louse up – all meaning, more or less, “to damage,
harm, or upset someone or something, or to do something very badly” (Cambridge). Others are
much broader in meaning and are less semantically related such as the VPCs of completion as
we have seen in the section above.

So the question is there a good way to account for the semantic relatedness of such diverse
data? Recapping the purpose of this paper: are there any observable patterns in the corpus
data? One way to attempt at finding answers to this questions would be to evaluate the
existence of a larger trend on how the VPCs are used and how they are related to each other.

Despite the complexities of the VPCs found in the corpus, I believe there are patterns to be
observed. One way to find these patterns might be to take a step back to see if there are
broader generalizations we can gather from the data the data. If we were to picture individual
data points of VPC (by its sense) in some sort of a semantic plane, there might be areas with
higher VPC concentrations and other areas with lower concentrations. Then taking the areas of
higher density as the focal point to observe (1) any patterns or tendencies in these high density
area and (2) how these tendencies are reflected as we move out of the denser semantic areas,
perhaps we can begin to understand the properties that might govern the axes of the semantic
plane.
One the advantages of such sampling and modeling is that it allows us to look at general trends that might help explain the most salient of the data. On the flip side, the disadvantage of such a method is that because the areas of high density are given more weight, the areas of low density get less attention, and in some cases the in-between cases can be overlooked. However, in the abundance of over 500 data points with unique variations, the above method is the method I chose to take. And through this method I have observed 3 large trends that stem from the 3 larger categories: (1) property of spatial configuration, (2) property of spatial orientation, and (3) property of aspect.

Although the account or analysis of VPCs would not be complete without exploration of all three areas, I will limit the presentation to the first two that deal with spatial configuration. While I have spent much time with all three of the above properties, for the purposes of this paper I feel I must limit the presentation to a size I am able to manage. Also, given the spatial category and the aspect, I feel more equipped to do a better justice to the analysis of the former kind.

In the rest of this section I will describe with support from data the property of spatial configuration and the property of spatial orientation. I will also note their metaphorical uses as well as how these metaphorical extensions help relate the VPCs in a coherent manner.

A word on notation: I will be marking all VPCs that were not defined by the dictionaries with a #. For example: “Do you love to run up hem, #sew on buttons, make neat buttonholes?” Where sew on has not been defined by any of the dictionaries used.

5.1 A note on spatial properties
As I had noted in at the beginning of the paper, the intent of the study was not to examine and attribute the meaning of the resulting VPC as a function of either the particle or the verb. However, evidences in the data show that it might not be entirely possible to completely sever VPCs’ behavioral descriptions from the meaning and representation of their counterpart prepositions (or adverbs). Inevitably, the particles on, out, and up are related to the prepositions on, out, and up (which is sometimes seem to be perceived as the inherent meanings of the three lexical items). In case of the prepositions, specifically spatial prepositions such location and orientation, are known to describe scenes that are characterized by the relation between a trajector and a landmark (elements of a conceptual model by Langacker 1986). Preposition of location is, then, a snapshot of scene in which the trajector remains on a particular location in
relation to the landmark; and the prepositions of orientation describe the scene in which the trajector moves from one place to another in relation to the landmark (Tyler and Evans 2003).

In sections 5.2 and 5.3, I will be describing these two types of spatial properties seen in VPCs. I chose to use the trajector and landmark model to describe the VPCs. However, I would like to remind the reader that my intent was to classify and describe the VPCs as a unit, which certainly is a semantically more complex unit than that of the naked particle/preposition.

In the following two sections I will begin by giving the literal examples found in the corpus data. From there I will follow these examples of other data that they relate through the means of metaphor.

5.2 Property of spatial configuration

5.2.1 EVIDENCE Consider the following examples for VPCs appearing with the particle on:

(23) **VPCs of Location** (verb + on)
    a. “Do you love to run up hem, #sew on {buttons}$_{\text{Obj-NP}}$, make neat buttonholes?”
    b. “From this point I paint in as direct manner as possible by #flowing on {the washes}$_{\text{Obj-NP}}$ with pure color mixture as I can manage.”
    c. “But the farmers outsmarted Washington by shortening the distance between rows and #pouring on {the fertilizer}$_{\text{Obj-NP}}$.”

In (23a), someone is asked if they like to sew on buttons. The VPC sew on specifies the special configuration of the object NP, “buttons”, our trajector. Here, the trajector is situated on top of an unmentioned landmark, likely a clothing of some sort, by the means of sewing. The same is true for the (23b) and (23c). In (23b), washes that get situated on an unmentioned landmark by the means of flowing (causing paint to flow), as is the fertilizer, in (23c) that is placed on the landmark by pouring. In each of these cases, we can observe that the object NP is the trajector and that the VPC necessitates a landmark, which we can only gather from the context. Next are examples of VPCs that are subset to the ones in (23):

(24) **VPCs of Wearing** (verb + on)
    a. “Undismayed by contretemps, small band of faithful gathered at Lauchili’s home […] put on {their uniforms}, and headed for farm several miles away.”
    b. “Then he stood back to look at Mr. Jack who was pulling on {his pigskin gloves}.”
    c. “[…] Poet commented as he buckled on {his tank harness}.”
    d. “She jerked {the coat back} on.”
e. “There I got my [...] shoulder harness, slipped {my coat} on, and went back into the front room.”

Much like the examples in (23), these VPCs also specify the location of the trajector in relation to the landmark. Here, the trajector is a clothing item or a piece of gear and the unmentioned landmark is the agent or the doer of the wearing action. In this case, the trajector is not placed on top of the landmark, rather it is around and surrounds parts of the landmark – the human body.

Next are the VPCs that appear with the particles *up*.

(25) **VPCs of Location (verb + up)**
   a. “We could put up {cribs}_{Obj-NP} on the second floor sleeping porch [...]”
   b. “Perhaps he had better have someone help him put up {the pegboard}_{Obj-NP} and build the workbench.”
   c. “To his faint surprise Russ held up {his hand}_{Obj-NP}.”

As the VPCs with *on*, the VPCs with *up* also specify for spatial configuration of the object NP. For (25a) and (25b), the crib and the pegboard, respectively, is placed in a location presumably found some place spatially higher than where the subjects of the sentences is located. Unlike the VPCs with *on*, however, the *up* VPCs can specify landmark explicitly as is the case in (25a), where the PP “on the second floor sleeping porch” is the landmark where the trajector would be located. Although rest of the sentences do not show explicit landmarks as in (25a) and the reader must define it from the given context and his/her world knowledge, adding a PP to each of these sentences is not inconceivable (25b: “help him put up the pegboard *on the studio wall*”, 25c: “Russ held up his hand *in the air*, or 25d: “she lugged the clothes to hang them up *on the clothesline* while the sun [...]”). Such an addition, however, would be unusual for the VPCs with *on*: (23a) !“Do you love to [...] sew on buttons *on your shirt*”, (23b) !“I paint [...] by flowing on the washes *on the canvas*”, or (24d) !“She jerked on the coat *on herself*”. Such addition comes across redundant. If explicit specification of the landmark is needed, the reaction by a native speaker of English would be to drop the particle *on* of the VPC and keep the PP.

A similar behavior can be observed with VPCs appearing with *out*:

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6 It seems me that in this case ?“Do you love to sew on buttons *all over your shirt*” or ?“I paint by flowing on the washes *over the canvas*” might not be so odd. Probably this is because in this case, the PP doesn’t necessarily specify for the landmark of the VPC, rather it specifies a particular section or location within the location of the landmark.
(26) **VPCs of Location** (verb + *out*)

a. “The planet is very low in radiation form mineral deposits and the atmosphere seems to **shield out** {most of the solar output}**"**.

b. “He drew a long breath and opening the trunk and **hung out** {her clothes and spoilables}** upon the wagon ribs.**”

Here again, the object NP specifies the trajector of VPC. However, the configuration is slightly different to that of the VPCs of *on* and *up*: while the trajector remains the object of the VPC, the landmark is not a specific location relative to the position of the trajector. Rather landmark here is the location where the trajector is not on or in. In other words, the trajector sits outside the landmark. In the sentence (26a), then, the trajector is the “most of the solar output”, “atmosphere” constitutes a border between the landmark and the trajector, and the landmark, is then, everything on the other side of the “atmosphere”. In example (26b), the trajector again, is the object NP and the trunk, would then, constitute the landmark as it is that the clothing and spoilables have been placed outside the wagon/car trunk. The PP in (26b), would then be a specific location in which the trajector has been placed.

5.2.2 METAPHORICAL USES Data shows that the above VPCs of spatial location can be used metaphorical and that this metaphorical extension serves to link up some of the other categories of VPC to the VPC of location.

There are two particular observable metaphors found in the verb + *on* data that concern spatial configuration that I would like to take closer look at. These are the metaphorical use of VPCs of wearing (clothing items) to refer to acquiring a foreign quality, and the metaphorical use that links the locative *on* VPCs to the VPCs of addition and gain. Consider the following examples:

(27) **VPCs of Acquire** (take + *on*)

a. “As the world began to **take on** {the guise of an immense air raid or gas oven}, I believe his art became meaningless to him.”

b. “But now the dream was beginning to **take on** {overtones of a nightmare}”

c. “His face **took on** {a certain pallor}.”

I propose that the governing metaphor here is the concept of attribute expressed in terms of wearable items or, in Lakoff’s metaphor notation, **ATTRIBUTES ARE CLOTHING ITEMS**. We have already looked at the VPCs of wearing (24), where the wearer puts on a coat (24d), by situating it on herself. In a similar way, the foreign character or quality is placed over and around the trajector (or the subject of VPC). In (27a), the world “wears” a guise of certain attribute. In
(27a) and (27b), the dream and face begins to display the character of nightmare or pallor, respectively.

The second metaphor is the view that the concepts of add and gain can be expressed in terms of spatial configuration of VPCs of on.

(28) **VPCs of Add or Gain** (verb + on)
   a. “In all, the Senate signed check for $46.7 billion which not only included the extra 3.5 billion […] but **tacked on** {$754 million more than the President had asked for}.”
   b. “Now when Henri was 12 he […] weighed an astounding 72 pounds and his greatest desire was to **pack on** {some weight}.”
   c. “[…] you can **put** {some milage} on yourself and have solid alibi somewhere, while I take care of your seat cover, boy.”

The argument structure of the VPCs in these sentences is very much like the one displayed by sentences in (23). The trajector is the object NP of the VPC and the landmark is implied. The difference is that the VPC requires for the landmark to be of the same type as the trajector for it to add to something that is already there. In each of this case, by tacking/packing/putting on the trajector, the landmark is gaining more of the same (i.e. tack value on value, pack weight on weight, and tack miles on miles).

In addition to the metaphors that appear with VPCs of on, there are two other metaphors that are observable in VPCs with up and out. Let’s first look at the VPCs of up:

(29) **VPCs of State** (keep + up)
   a. “**Keep** {it} up, your squad is good, one of the best, **keep** {it} up, **keep up** {the good work}.”
   b. “[He] found it difficult to **keep up** {a conversation with his mother or father}, no matter the subject.”

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7 I realize that there can be two potential readings in this sentence. The first is reading the “yourself” as the object of the preposition on, which would make the on a head of PP and not the particle of the verb. The second reading and the interpretation I choose to take is that the reflexive “yourself” acts an intensifier of the subject “you”. This sentence looks like something out of a dialog. The full thing reads “Then after I’m back another fifty, so you can put some milage on yourself and have solid alibi somewhere while I take care of your seat cover, boy”. To me it looks as though this is a part of a larger dialogue. It’s hard to tell without more context what the speaker exactly meant by it, but it looks to me that he is encouraging the boy (he himself) to drive out to a certain place through which he can establish an alibi, while the speaker (as opposed to the boy, he himself) will help cover up whatever the boy has done.

8 where milage is milage on a vehicle. So in order to gain milage the boy will have to drive the vehicle.
These two sentences are slightly different in terms of their senses. The first one refers to maintaining the work at a place it is currently at. The meaning of the second sentence has to do with maintaining at a good place. Either way, we have two metaphors at play here: the metaphor of STATE IS LOCATION (Lakoff 1999), where states are expressed in terms of location, and GOOD IS UP (Lakoff 1980) where being configured at a high location is a good thing. In other words, being at a high location is being at a good state. This applies to both of the sentences. By keeping up the good work (29a), one is maintaining the high location or a good or acceptable state, and by keeping a conversation up, one is maintaining the conversation at a good state, which probably means fluent and ongoing.

Following are example sentences of VPCs of out:

(30) VPCs of Location (keep + out)

a. "But now we can keep {it} out no longer because we have come into a time when it invades our experience at every moment."

b. "Leave that fool {picture} out,‘ she added sharply."

c. "He rolled over and tried shut out {the noise}, now louder”

d. “By holding out {prospects for external capital assistance}, the United States can provide strong incentives to prepare for […] self-sustaining growth.”

These two uses of VPCs can be seen as metaphorical usages of verb+out in example (26). The trajector here sits outside the landmark. In all of the sentences above, the trajector is viewed as an undesired entity that is prevented from coming into the protected landmark. Thus, good is in and BAD IS OUTSIDE.

5.3 Property of spatial orientation
In the section above, we looked at cases where the trajector was caused to be stationary. In this section, I will describe data whose trajector moves in a direction along a path. VPCs of particles out and up had displayed this property of spatial orientation.

5.3.1 VERB+UP: EVIDENCE The property of the spatial orientation tie together several of the VPCs appearing with the particle up. Consider the following examples:

(31) Straighten/Upward/Toward (verb + up)

a. (Straighten) “A shot caught him and straightened {him} up in screaming pain.”

b. (Straighten) “he paused and turned up {the cuffs of his trousers}.”

c. (Upward) “fishermen took advantage of them to pull up {whoppers}.”

d. (Upward) “he hefted {his bulk} up”

e. (Upward) “She put a strong hand under the old man’s arm and lifted {him} up”
f. (Toward) “Julia felt at peace and drew {her legs} up and clasped her hands tightly around the bent knees”
g. (Toward) “He must have galloped his horse […] when he brought up {Ward’s guns} to save Newton’s crumbling line.”

The path by which the trajector moves may be different, but all of the VPCs in the sentences have to do with caused motion of the trajector, the object NP of the VPC. In (31a) and (31b), the trajector is caused to change from a bent position to an upright position. In example (31c), (31d) and (31e), the trajector is moved from a lower location to a higher location. The sentences in (31f) and (31g), the trajectory different from others: rather than moving upwards, the trajector is moved toward the landmark. In case of (31f), the landmark would be Julia’s body, and in (31g) it would be Newton’s crumbling line (or perhaps a battle site).

5.3.2 VERB+OUT: EVIDENCE The following sentences show VPCs with particle out that are characterized by an outward movement of the trajector.

(32) Cause to Move Outwards
a. “Beaming idiotically he pooched out {his lips} and attempted to kiss her.”
b. “She opened it an inch and poked out {the keys} for me to give you.”
c. “One fellow who had liver spots held out {his hands} to hold the great healer.”

Like the VPCs of location and spatial configuration, in the above sentences we see that the trajector is the object NP of the VPC. Although unspecified, the landmark here again is the area from which the trajector is cause to move from and outwards. For example, in (32a), the agent “he” moves his lips outwards, and in (32b), where woman opens, what is presumably a door, and causes the key to leave the landmark.

Relating to the outward movements are the VPCs of distribution and emission. Consider the following cases:

(33) Distribute
a. “U.S. Rubber Company of New York, passes out {a form itemizing the value of benefits}”
b. “This procedure is much more effective than giving out {a membership packet}”
c. “[You] describe {the punishment} they meted out in one analogous instance.”
d. “But instead of delivering the rations […] at intervals of perhaps two weeks or a month, the Belgians felt obliged to dole {it} out more often”
e. “… {vegetables and raw whole-wheat grains} are handed out with fresh fruit and whole-wheat cookies at snack time in the afternoons.”
(34) **Emit**
   a. “At this, the students let out {a yell} knowing full well the actual frontier was beyond the town of Kehl.”
   b. “She gave out {a series of cackly wails}, perhaps mourning her nest…”
   c. “The little boys shrilled out {a Yiddish translation or interpretation of the Five Books of Moses, which they had previously chanted in Hebrew}.”
   d. “But a glance at Songau and the other women confirmed {what} Brassnose had blurted out.”
   e. “Somehow managing to get out {a cool, poised ‘Won’t you hold on a second please’}, I covered up the mouthpiece.”
   f. “He could remember […] the thump of his father’s heart sending out {signals} – regular like radar.”

Both (33) and (34) are subsets of outward movement (32). The difference between (32) and the above two examples is the path in which the trajector moves. For (33), the trajector is also is caused to move outwards from a landmark, however instead of proceeding in a single line, it expands outwards from a single point to multiple points outside the landmark. For (34), the path my which the trajector moves is similar to that of (32). What makes this group special is that every trajector here is characterized by some communicative signal, setting the landmark as the source of the signal. The examples (34c) through (34d), could also be classified as VPCs of saying. Sentence (34f) is unique; while “send out” acts as emission of “signals” it takes on the character of distribution by the modifier it follows “regular like radar”.

Next are the VPCs that are characterized by the meaning of causing something or someone to be moved outside.

(35) **Cause to Come Outside**
   a. “I went back to the agency car and got out {an electric bug}”
   b. “He pulled open the top drawer and drew out {a tin type}”
   c. “They had fought from caves and the marines resorted to burning {them} out”
   d. “all you had to do was haul out {the broom} and sweep off your sidewalk”

VPCs in the above sentences describe the trajector’s movement from a landmark to a place outside the landmark. In addition to this, in each of the examples depict situations where the agent that causes the trajector to move, is located outside the landmark and is causing the trajector to be pulled out into the space where the agent is found.

Similar trajector movement is found in the example (36).

(36) **Remove**
   a. “He threw out {some of Hutchins’ more wildly experimental courses}”
   b. “He assumed he could blick {the splinter} out.”
c. “Have you audited your program recently to weed out {those phrases that draw least participation}?"

d. “Tell him to take out {all the liquor that he did not want}”

e. “I could scratch {her eyes} out’ Eileen cried and stamped her foot’

f. “[she] lifted her wet hair from her back and squeezed out {the water}”

g. “While there are still {many bugs} to be ironed out, the technique is fast developing”

Compared to the sentences in (35), the grouping of these VPCs were motivated their specific meaning of removing an unwanted something with the intent to discard. Thus, they can be considered a subset of the VPCs in (35). In addition, these VPCs also carry the idea of something being forced into coming or going outside. However, the movement of the trajector from a landmark to a place outside is still apparent in these VPCs.

The next example sentences are from VPCs of emptying:

(37) Empty
a. “Did it take a man of sixty-five longer to write a letter, shave, clean out {a barn}, read a newspaper than a man of thirty?"

b. “The last obstacle in Mrs. Geraghty’s {globe-girdling trip} was smoothed out when a representative of Syria called upon her”

In (37) the object NP of the VPC is no longer the trajector. Rather, it acts as the landmark from which the trajector is removed. Again, these examples also show the movement of the trajector from the specified landmark to a place outside the landmark.

Finally, here is the last set of VPCs with out that can be characterized through orientation of the trajector:

(38) Cause to Stand Out
a. “There was no time to pick out {a penny}; I got a coin between my thumb and forefinger, [...] and flipped my little missile.”

b. “In More’s Utopia, communism is not a means of separating out {a warrior elite} from lumpish mass.”

c. “Let’s try not to key {them} out at this stage of the game”

d. “The league workers search out {the prose and cons of the most complex issues} and make them available to the public”

Here, again, our trajector is the object noun of the VPC. These VPCs can also be considered a subset of (35) as they describe caused movement of a trajector out of the landmark to a place outside. Although each of the VPCs in these examples display this same tendency, they are slightly different in meaning from one another. For example, VPC in (38a) means select, VPCs
in (38b) and (38c) means to discriminate or label something in particular from a group of mixture, and VPC in (38d) means to search, find, and show something that might have not been noticeable before. Despite these differences, they are unified under this category in that the noun of the VPC is made to stand out, special, or visible by the means of selection, separation, or segregation. This theme we will see again in the following section on metaphorical uses.

5.3.3 METAPHORICAL USES There seems to be two observable metaphorical uses of the verb + up data that has to do with spatial orientation. The first of them has to do with the view that moving upwards is to have more of something. In other words, MORE IS UP (Lakoff 1980). The metaphor can be seen in (39).

(39) Cause to Increase
a. “The reason was to speed up {domestic production in USSR}, which Khrushchev promised upon grabbing power.”
b. “The higher price supports provided by the new legislation […] are pushing up {farm income}, making it possible for farmers to afford new machinery.”
c. “Greg slammed his throttle to the fire wall and #rammed up {the RPM}”
d. “It is interesting that, although the percentage of married students is not appreciably higher at Brooklyn than elsewhere […] the anxiety of the unmarried has puffed up {the estimate}.”
e. “Only a malevolent giant could have piled up {those crouching monsters of granite}”

In (39), the concept of increasing quantity has been expressed in terms of VPCs that mean upward movement exemplified in (31c)-(31e). That is, speeding up production, results in more of what is produced; pushing up the farm income, means more income; and ramming up the rpm increases the speed. (39e) is slightly different from the preceding sentences in that it extends further from the idea that increase means more (which, in turns, means upward movement) to the notion that by increasing we are accumulating more of the same kind. Thus in piling up those crouching monsters of granite, we accumulate more of the monsters.

The second metaphor displayed in the data is the metaphor of GOOD IS UP, which can be observed in (40). This metaphor describes increase in the “goodness” in terms of upward movement. By moving upward, a person or entity is caused to improves to become larger, stronger, better, and well-rounded.

(40) Cause to Improve
a. “Recent surveys have shown a desire on the part of consumers to step up {their buying plans for durable goods}.”
b. “Check thickness of clay and build up {thin areas} by moistening the surface with a little water and adding small pieces of clay.”

c. “We also do a number of things to build up {the prestige of engineer as a ‘professional’}”

d. “It is a desperate effort to prop up {a sagging candidate}”

e. “Mrs. Marr is the first contact a Skid Row figure talks to after he decides he wants to pick {himself} up.”

Another metaphor at play in the VPCs of spatial orientation is VISIBLE IS UP and OUT.

Consider the following sentences:

(41) Visible is UP
a. “Please don’t dig up {too tough a case} for me this close to election.”

b. “…hands often call up {ideas of crime and punishment}.”

c. “All of which brings up {another problem} in the use of psychoanalytic insight in a literary work”

d. “But I have been at some pains to review it as the drama of the common man, to point up {what happened to him under Eisenhower’s leadership}”

In all of the sentences above, the visibility is expressed in terms VPCs of upward movement. In this metaphorical use, the landmark acts as the visual field of the observer or the speaker. What lies under the visual field is hidden and what lies above it is accessible. In (41a) the speaker perhaps is a politician, who rather not deal with a difficult case too close to an election, probably one in which he’s running. Just as a person would not simply go out looking for an unpleasant thing buried under the earth (e.g. a dead body), the speaker is asking not to be given a tough case he would have to handle. The usage of (41b)-(41d) are similar in that by causing a problem or an idea that haven’t been yet thought of to be put up onto the visual field of the thinker or speaker. By doing so, they become perceptible and open for opinions, debates or thought.

The VISIBLE IS OUT for the VPCs appearing with the particle out are for the most part similar to the ones in (41). Here are the examples:

(42) Visible is OUT
a. “What we can attempt […] is to point out {the manner in which Christianity entered into particular aspects of the life of the nation}.”

b. “A visit to the site by a group of several person can usually bring out {new ideas} or …”

c. “The Junior Class brought out {the most competitive competition in the history of this Class}.”

d. “Visitors to the school ask what shampoo they use on the children’s hair to bring out {the sheen}.”
In this metaphor the viewer stands outside a closed room or box, whatever would prevent him from noticing what is inside. By bringing the item out of the room or the box, it is made visible and accessible. The landmark is then the closed container, and everything outside is in the viewer or speaker’s field of view. In (42a) and (42b), some issue or a new idea is caused to move from hiding (or non existence) into the outside world where the viewer sits. In (42c) and (42d), hereto unseen ability or quality is made public by bringing them outside, making them visible. And by making them visible, they are also made public or accessible by those who can see.

6 Evaluations and Conclusion
This study has truly been a preliminary investigation as it raises more questions than answers them. I believe that this study has shown me that there are patterns to be observed in how the VPCs behave semantically, but it has also shown me that the approach I took to answering my research questions need revising and refining.

In retrospect, my research questions were simply too broad. As I have explained in the introduction, my motivation behind this study was to understand if there were tendencies for VPCs to semantically pattern together into natural semantic classes. To achieve this it seemed like an appropriate approach to grab as much VPC data as possible. My reasoning? While analysis with smaller sampling would yield more specific answers to questions, it would not be conducive to ascertaining major trends and patterns in the larger data.

The result was that I could only achieve a small piece of what I had intended or hoped to do. The only way I could start to answer my research questions in a systematic way would require a knowledge of possible existing methods I could use -- as a first step, invest much more time in the investigation, and finally have a better way to keep track of all the data and observations. What it comes down to is that I believe I bit off much more than I could ever chew for a short prelim paper. If this realization is of any merit, this investigation has been more than successful.

That said, even if this were a larger scale project, my approach might still not the best one. The scope of this study is simply too wide. I now realize that even if I were to desire to see larger trends, going with a lot of data isn’t the answer. A better way, I believe is to start somewhere in a mid grain level and proceed up or down depending on where the data points at. Whether it is
limiting the data to, say, 2 particles or limiting my questions to something more specific (e.g. looking aspectual properties and argument structures of VPCs that appear with both “up” and “out”), would certainly a better starting point than what I did for this investigation.

There are several things I’m curious about and would require further analysis.

- I would like to further explore the aspectual properties of VPCs with up and out, which I haven’t been able to do fully in this study.
- I believe that some of the metaphors I described in this paper affects more than just VPCs of spatial properties. For example, VPCs such as “gather X up” can go potentially be classified as aspectual (i.e. accomplishment) or it could go with VPCs of MORE IS UP (i.e. “Gather the pebbles up and put them in the corner.”). I think there are a number of verbs that pair with particles that result in something that’s clearly fully aspectual (“write X out”), while there are others that are ambiguous like “gather X up” or “put your hand up”. It would be interesting to investigate if there’s anything observable in this.
- I think it would be also fun to look at the metaphor VISIBLE IS UP for up and out. My question would be when metaphors are parallel like in (41) and (42), how does a person know which one to use? The examples I gave make up just about most of the instances of this metaphor in Brown Corpus so there would need to be a need to look into other sources (such a Google).
- Study the VPCs classified as ambiguous to see what it is that make them ambiguous. This might give us a clue on what humans cue on in order to fully understand the VPCs.

7. References


