The Semantic Assymmetry of 'Argument Alternations' (and Why it Matters)

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1 The *Swarm-with*-Construction ("*Swarm*-Alternation")

The first half of this paper is concerned with sentence pairs like the following:

(1) Bees swarm in the garden   Music resounded in the hall
     The garden swarms with bees   The hall resounded with music

     Snails are crawling in the garden   Fireflies glowed in the field
     The garden is crawling with snails   The field glowed with fireflies

     Fish abound in the pond   Garlic reeked on his breath
     The pond abounds with fish   His breath reeked with garlic

Such sentences were first noted in Jespersen (1933), then were introduced in Generative Grammar by Fillmore (1968) and Anderson (1971). The most extensive treatment, from which some of the data below is taken, is Salkoff's (1983) "Bees are Swarming in the Garden", *Language* 59.2, 288-346; cf. also Boons & Leclere (1976) (for discussion of the closely-parallel French data), and see Levin (1993) for further references. For convenience in referring to the two kinds of sentences, I will adopt this terminology:

> AGENT-SUBJECT (A-Subject) FORM: "Bees are swarming in the garden"

> LOCATION-SUBJECT (L-Subject) FORM: "The garden is swarming with bees"

The *swarm*-alternation (in which only intransitive verbs are found) should be distinguished carefully from the *spray-load*-alternation (which allows only transitive verbs):

(2) Mary sprayed paint on the wall.   Mary loaded hay onto the truck.
     Mary sprayed the wall with paint.   Mary loaded the truck with hay.

The two alternations have very different properties, and the latter will not be examined here.

1.1 Semantic Properties of the Location-Subject Form: Some Observations

We will begin with five observations about the *swarm*-alternation; the first concerns the nature of the verbs occurring in it:

Observation 1 *Verbs appearing in the Locative-Subject Form are almost exclusively of five semantic classes of intransitive verbs that are all process ("activity") or stative in aktionsart.*

(3)	*Small local movements, typically occurring repetitively:*	crawl, drip, bubble, dance, dribble, erupt, flow, flutter, foam, froth, gush, heave, hop, jump, pulsate, quiver, ripple, roil, rumble, run, shake, shiver, swarm, sway, swim, throb, tremble, vibrate,
	Animal sounds and other simple sounds, often repetitive:	buzz, cackle, chatter, chirp, crackle, creak, echo, fizz, hiss, hum, jingle, murmur, rustle; resonate, resound, twitter, whistle; *(Salkoff's corpus has about 200.)*
	Kinds of light emission:	beam, blaze, brighten, flame, glow, flicker, flare up, flash, glimmer, glisten, glitter, light up, shimmer
	Smells and Tastes:	reek, smell, be fragrant, etc.; taste
	Verbs indicating degree of occupancy/ abundance:	abound, teem (?); be rich, rife, rampant (with)

For comparison, the verbs in (4) are intransitive, activity verbs but do not fit any of the five semantic classes:

(4) *The field grazed with cattle.
     *The floor squatted with boys.
     *The road marched with soldiers.
     *The whole library studied with busy students.
     *The gymnasium exercised with energetic athletes.

The verbs *echo* and *harmonize* form a minimal pair:

(5) a. The voices of the choristers echoed/resounded in the church.
         The church echoed/resounded with the voices of the choristers.

     b. The voices of the choristers harmonized (blended, solemnly intoned) in the church.
         *The church harmonized (blended, solemnly intoned) with the voices of the choristers.

That is, *resound* and *echo* occur in the in the L-subject form because even the simplest, most primitive noises can echo (as can speech or music too). whereas *harmonize*, etc. can only be predicated of more organized sounds (specifically, music), hence are not available in L-subject sentences,

    Also, the movement class verbs must be "manner of motion" verbs; verbs of pure translative movement are not acceptable in L-subject examples:

(6) *The sky flew with birds.
     *The forest ran with deer. *(but OK: The streets ran with blood.)*
     *The pond swam with fish.

    The earliest and perhaps the most familiar observation about L-subject sentences in the linguistic literature (Anderson 1971) is this one:

Observation 2 *The L-subject form seems to entail that the activity in question "fills" the entire Location to a greater extent than the A-subject form.*

Anderson cited these examples as illustration:

(7)   a. Bees are swarming in the garden, but most of the garden has no bees in it.

       b. # The garden is swarming with bees, but most of the the garden has no bees in it.

(8)   a. Ants are crawling on the table, but they're confined to this one corner of it.

       b. # The table is crawling with ants, but but they're confined this one corner of it.

The next two observations concern the *with*-phrase:

Observation 3 *Location-subject forms sound natural only when the* with-*phrase is an indefinite plural or mass term, but not a singular NP.*

(9)   a. The wall crawled with roaches.
          *The wall crawled with a roach. *(Salkoff (1983):292)*
          (cf.: A roach crawled on the wall.*)*

       b. The bottle buzzed with flies
          *The bottle buzzed with the big fly.

       c. The city square tinkled (resounded, etc.) with the sound of many bells (on the horses and carts).
          ?The square rang with the sound of a bell in the tower striking 1 A.M.

       d. The sky blazed with lights/stars/bonfires/flashbulbs
          *The sky flashed with a bright flashbulb/kieg light/bonfire.

A NP specifying measurement is acceptable only if interpretable as an estimate, (10a). But a measurement NP is anomalous if it is so specific as to suggest that a precise enumeration has been made, see (10b):

(10) a. The table crawled with a hundred cockroaches.

       b.?The table crawled with seventy-three cockroaches.

True quantificational NPs are never possible in the *with*-phrase:

(11) a. No cockroaches were crawling on the table.
         Each cockroach was crawling on the table.
         Most cockroaches were crawling on the table.

       b. *The table was crawling with no cockroaches.   *(Ewald Lang, p.c.)*
         (cf. The table wasn't crawling with cockroaches.)
         *The table was crawling with each cockroach.
         *The table was crawling with most cockroaches.

Exceptions to this rule can occur when repeated actions by the denoted entity are implicitly understood:

(12) a. The whole school buzzed with the rumor about the librarian dating the principal.

       b. The square rang throughout the night with the sound of a bell in the tower tolling for the lost seamen.

The "buzzing" in (12)a must allude to many re-tellings of the rumor by different individuals; it's clear that a single announcement of the rumor is not referred to, no matter how "buzz-like" otherwise. Thus the restriction on the NP object of *with* is really a semantic/pragmatic one of inferable reference to multiple events, not a requirement for syntactically overt definiteness. Therefore we need to revise Observation 3 slightly:

Observation 3 (revised) *L-Subject forms are acceptable only when the nature of verb and* with-*phrase permit the interpretation that an indefinite number of distinct events take place involving the* with-*phrase denotation.*

The next observation will be treated only briefly here:

Observation 4 *L-Subject sentences with sound verbs are often more natural if the* with-*NP denotes a sound itself than if it denotes the agents or instruments that produce these sounds (Salkoff 1983:307). Conversely, A-Subject sentences are robustly anomalous if the subject denotes a sound rather than its agent.*

For example, *The barnyard cackled with the calls of geese* is just as natural, if not more so, than *The barnyard cackled with geese.* But among the A-subject forms, the sentence *??The calls of geese cackled in the barnyard* is significantly ill-formed, while *Geese cackled in the barnyard* is perfectly fine. See Dowty () for discussion.

For the next observation, it is useful to distinguish between two degrees of metaphorical abstractness, *Hyperbolic* vs. *Metaphorical*, as in this contrast.

(13)   *Literal:*   a.   Graceful couples danced on the floor
                            *The floor danced with graceful couples

     Hyperbole: b.   Fireflies danced in the garden
                            The garden danced with fireflies

     Metaphor: e.   Visions of success danced in his head.
                            His head danced with visions of success

"Dancing" is what couples do, literally. Fireflies cannot dance, in the true sense, but they do make small hops when they fly that suggesting dancing. Ideas in the head cannot be seen to move at all, much less dance. Note that the L-subject form here is unacceptable in the literature sentence. On the other hand, only the metaphorical L-subject sentences is fully acceptable in the following case:

(14)   *Literal*:   a.   Water dripped from the roof
                            ?The roof dripped with water

     Hyperbole: b.   Sweat dripped from his face
                            His face dripped with sweat

     Metaphor: c.   *Sarcasm dripped from her voice
                            Her voice dripped with sarcasm

These two cases suggest suggest this:

Observation 5 *More abstract senses (hyperbolic or metaphorical) tend to be found more often in L-Subject form than A-Subject form, especially in literary writing in English, where the L-Subject form is highly productive. There are certain verbs (or V + N combinations) that are natural and even familiar as L-sentences which would be quite bizarre as A-subject sentences.*

New L-subject form seems to be most often innovated by writers striving for colorful descriptions:

(15)   The bridge was populous with merry-makers *Mark Twain, cited in Salkoff*

Examination of the 350 verbs in Salkoff (1983) suggests that the L-subject form is far more productive in metaphorical interpretations than in literal ones.

Observation 6 *Constructions Parallel to the English L-subject form are found in a number of Indo-European languages (but not all — cf. German) and at least some non-Indo-European languages:*

- Godjevac (1996) attests a parallel to the L-subject construction in French (cf. also Boons & Leclere (1976)), some other Romance languages, Dutch, Serbo-Croatian, Russian, some Bantu languages, Finnish, possibly Hungarian.

- In all these languages, an L-subject sentence is one in which (i) a NP denoting a location is the subject, (ii) the verb is from one of the same semantic fields described for English, (iii) the NP corresponding to the English *with*-NP is marked by instrumental case or by a preposition that includes instrument or means as one of its senses (e.g. French *de*).

- Examples from Dutch (due to J. Hoeksema); Dutch has two syntactic forms corresponding to the L-subject sentence:

  (16)   Insecten krioelen in de tuin
         "Insects are crawling in the garden"

  (17)   De tuin krioelt van de insecten
         "The garden is crawling with insects"

  (18)   Het krioelt van de insecten in de tuin
         literally, "It crawls with insects in the garden"

1.2   Toward an analysis of the L-subject form (the *swarm-with*-construction)

1.2.1   The texture metaphor

After I had presented a talk on this topic on an earlier occasion, Ray Jackendoff proposed to me that L-subject sentences "describe the texture of a surface"; thus *The garden swarms with bees* characterizes the garden's texture as bee swarming. When I first heard this suggestion, I thought it to be merely an interesting metaphor: a metaphor is not in itself a linguistic analysis, and I doubted that his proposal was relevant to the semantic analysis of the construction. Later, however, I reflected that a metaphor could be a clue to an analysis, if we carefully examine the deeper structural parallels between the metaphor and the linguistic phenomenon, then construct a formal analysis based on those parallels.

In order to ask "What is 'dynamic texture'?", we need to reflect on ordinary texture. Though the English word *texture* was at first limited to describing a property of textiles, in current (non-technical) usage one speaks of "the texture of snow", "the texture of plowed fields" and in more abstract senses, "texture" in a musical composition, "a poem's texture", "the texture of suburban life", etc. Thus we can distinguish two senses of (ordinary) texture:

CONCRETE TEXTURE: The texture of a surface is a pattern of deviations from planarity which is distributed over (relatively small) parts of the surface and which is perceivable by touch and/or vision (often both).

GENERALIZED TEXTURE: The texture of an entity is a pattern in or on it, of a nature/material determined by the kind of entity, which is distributed over all (relevant) small parts of it, is recognized by vision or other senses, and is interpreted as a property of the whole (surface) of the object (rather than a figure or object on the surface).

Contrast texture with *shape*, *size* and *profile*: these three are kinds of properties of an object as whole, but not properties exhibited in any proper subparts of the object. On the opposite extreme, *color* and *composition* are properties exhibited in every subpart of an object (or rather its surface), no matter how small. *Texture* is a property that falls in between: Texture is exhibited in relatively small areas, all over an object, but not in regions smaller than some minimal size.[1] The notion of texture we need here, however, still differs in being moving rather than static:

DYNAMIC TEXTURE is like generalized texture, but the impression of texture is due to movement (or else fluctuating emission of sound, light or smell), whereas ordinary texture is formed by static, unvarying patterns or color or roughness on the surface of some object.

1.2.2 The Dynamic Texture Hypothesis

We are now ready to describe L-subject sentences in terms of dynamic texture:

- HYPOTHESIS: L-subject sentences describe a situation where a kind of event is occurring simultaneously and repetitively throughout all parts of a place or space. (The events are DISTRIBUTED throughout all subregions (or surface, or space).)

- These subregions of activity are so small, numerous, and homogeneous that the dominant perception they create together is a "texture of movement" in the surface as a whole (DYNAMIC TEXTURE).

- That is, the small events and the small agents performing them may not be readily distinguishable as individuals. Rather the perception of a certain kind of movement-texture in the surface/space is MORE SALIENT than the perception of the individuals.

- Likewise, other kinds of L-subject sentences (*twinkle with starts, twitter with birds*) describe situations in which individual light sources or sound sources are less salient than the overall effect they produce throughout a region in other L-subject sentences.

1.2.3 Describing the *swarm-with* construction linguistically

The best systematic way to describe the SWARM-WITH-construction is via a lexical rule that takes an ordinary intransitive verb as input and alters both its syntactic valence and its meaning (but not its phonological shape). Verbs as found in A-subject sentences are the input to this rule, and the corresponding verbs as found in L-subject sentences are the output.

For purposes of this paper, the following informal statement of this lexical rule will suffice.[2]

- For any verb input α, the rule yields a new verb (or "new verbal construction") with the same phonological form as before, with new syntactic subcategorization "y α with x" (i.e. subject and *with*-phrase complement), and with a new meaning, which describes the

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[1]The student of aspect may reflect on the way in which *color* and *sound* correspond to stative properties, *texture* corresponds to processes, and *shape* or *profile* correspond to telic properties.

[2]This is a highly informal statement of the rule. See Dowty (1998) and Dowty () for more detailed formalizations.

property a location y has when the kind of activity denoted by the original α is being performed in most/all (very small) subparts of location y, by some instance of x in each case; that is, the original property α is distributed throughout all small regions of y.

1.3 Characteristics of L-subject sentences potentially explained by the dynamic texture hypothesis

We can now see how many of the observations about L-Subject sentences follow from this analysis:

- Why do L-subject sentences entail that all parts of the region have the activity going on in them?

  This follows directly from the 'distributivity' in the statement of the rule.

- Why are the only verbs found in the *swarm-with* construction those that refer to "small" movements, simple light emissions, simple sounds, or smells?

  Only such simple, small events can occur repeatedly throughout a surface so as to create a distinctive dynamic texture perception that is more salient than the agents individually or events individually. Cf. *The table crawled with ants* vs. **The field grazed with cattle*; *echo with voices* vs. **harmonize with voices*. The activity of cattle grazing produces no characteristic movement texture that is identifiable at a distance so great that the movement is more salient than the individual cows.

- Why must the *with*-NP must be semantically indefinite?

  This follows from the fact that an event occurs in every small subpart of the region, therefore each event has its own agent in that region. If the regions are so small as to create a texture-perception, then the minimal regions can't be clearly individuated or counted. There must be an agent in each of these regions, hence the total number of agents cannot be counted either.

  (Discussion of the remaining observations will be skipped here.)

2 Professor Abraham's question

After the presentation of an earlier version of this analysis, Werner Abraham posed the following question to me: "You have described many properties of the L-subject Form, but you have told us nothing about properties of the A-subject Form. Why?" Such a question had never occurred to me before, and I didn't give an adequate response at the time.

But after thinking about this question later, it occured to me that it actually touches on a fundamental issue in my analysis of so-called 'verb alternations', though one I had not yet addressed directly at that point, but to which we will now turn. Abraham was correct in noting that I had said little about the Agent-Subject sentences, but I argue now that this is entirely appropriate.

2.1 Structure and Assumptions of This Kind of Analysis

The assumptions and reasoning implicit in this analysis of the *swarm-with* Conststuction are the following; these are stated in a general form, so that they can be applied to other argument alternations (verb diatheses) as well as the *swarm*-alternation:

i. One of the two forms of the diathesis ('argument alternation'), let us call it X, is more basic and general that the other (call it Y), both syntactically and semantically; i.e. Y is the "marked" construction, X is unmarked. Many verbs occur in X that do not occur in Y, while there are few or no verbs that occur in Y that do not occur in X.

ii. The "alternation" is analyzed as the application of a lexical rule to a verb, changing the subcategorization it has in X to the new subcategorization it has in Y. Simultaneously, the rule makes a semantic change in the original meaning of the verb (as found in X) to get the new meaning the verb has in Y. (I will refer to this meaning change as a function, f, mapping verb meanings to new verb meanings). The semantic change can be subtle, yet consequential.

iii. When f is applied to meanings of some verbs that occur in X, it yields a meaningful and pragmatically sensible result, but when f is applied to other verbs occurring in X, the resulting meaning is anomalous or inappropriate in some way. f thus acts as a "semantic filter" that prevents the second kind of verb from appearing felicitously in Y. (f may also restrict the arguments of the verb in Y semantically.) However, the nature of f was motivated independently of the task of selecting the right verbs for Y.

iv. A consequence of this view is that there is nothing distinctive about the lexical semantics of an "alternating" verb in the X construction, nor anything distinctive about the compositional semantics or "argument structure" of the X construction itself. Rather, it is only in the Y construction that f interacts with verb meanings in an interesting way, limiting the verbs in Y to a subclass that is identifiable in semantic terms.

For example, sentence (19a) does have an L-subject counterpart, but this A-subject sentence itself has no unusual semantic or syntactic properties which differentiate it from (19b) or (19c) (which do not have L-subject counterparts).

(19) a. Ants are crawling on the table

b. Ants are dying on the table

c. Three ants are crawling on the table

I stress these properties of the analysis, because it differs from a second, popular view of the relation between syntax and semantics in these alternations. We next turn to that view.

3 A Better-Known View of the Relationship between 'Argument Alternation' and Verb Semantics: Levin (1993)

In her important and highly influential 1993 book *English Verb Classes and Alternations* (Levin 1993:4–11), Beth Levin drew attention to the correlation between semantic classes of verbs and the classes that do/don't participate in various 'argument alternations'. In the introductory chapter of that book, she explains her position on this relationship by presenting a set of four semantic classes of verbs and their differing interactions with three alternations:

Four semantic types of verbs (Levin):

(20) a. **Touch** Verbs: touch, pat, stroke, tickle, touch, ...

b. **Hit** Verbs: hit, bash, kick, pound, tap, whack,...

c. **Cut** Verbs: cut, hack, saw, scratch, slash, ...

d. **Break** Verbs: break, crack, rip, shatter, snap, ...

Here are the three verb alternations, as applied to all four classes; note that not all classes of verbs participate in each alternation: *The "Middle Alternation":*

(21)   a.   Terry touched the cat
           *Cats touch easily

       b.   Carla hit the door
           *Door frames hit easily

       c.   Someone cut the bread
           The bread cuts easily

       d.   Janet broke the vase
           Crystal vases break easily

   Body-Part Possessor Ascension:

(22)   a.   Terry touched Bill's shoulder
           Terry touched Bill on the shoulder

       b.   Carla hit Bill's back
           Carla hit Bill on the back

       c.   Margaret cut Bill's arm
           Margaret cut Bill on the arm

       d.   Janet broke Bill's finger
           *Janet broke Bill on the finger

   The Conative Alternation

(23)   a.   Terry touched the cat
           *Terry touched at the cat

       b.   Carla hit the door
           Carla hit at the door

       c.   Margaret cut the bread
           Margaret cut at the bread

       d.   Janet broke the vase
           *Janet broke at the vase

Levin summarizes the interaction of the verb classes and alternations with the following table:

	Touch-verbs	*Hit*-verbs	*Cut*-Verbs	*Break*-Verbs
Middle Alternation:	No	No	Yes	Yes
Body-Part Possessor Ascension:	Yes	Yes	Yes	No
Conative Alternation:	No	Yes	Yes	No

Levin's next step is identifying of relevant semantic components which are shared by all verbs in a class, for each of the four classes:

Touch-type verbs: involve CONTACT (but not motion) ("verbs of pure contact")

Hit-type verbs: involve both MOTION and CONTACT ("contact by motion")

Cut-Type verbs: involve CONTACT, MOTION, and CHANGE OF STATE (in Patient argument) ("causing a change of state by moving something into contact with the entity that changes state")

Break-type verbs: involve CHANGE-OF-STATE only ("pure change of state verbs"; "a notion of contact is not involved in their meaning")

Finally, Levin then associates a set of meaning components with each alternation:

Middle-Alternation: "found with verbs whose meaning involves a change of state (in the object)"

Body-Part Possessor Alternation: "sensitive to the notion of contact"

Conative Alternation: "sensitive to both contact and motion"

Levin's summary of the relation of verb meaning to diathesis is worth quoting:

> "Studies of diathesis alternations [including this example] show that verbs in English and other languages fall into classes on the basis of shared components of meaning. The class members have in common a range of properties, including the possible expression and interpretation of their arguments, as well as ... related forms. Furthermore the existence of regular relationship between verb meaning and verb behavior suggest that not all aspects of of a verb's behavior need to be listed in its lexical entry, ... The picture that emerges is that a verb's behavior arises from the interaction of its meaning and general principles of grammar. Thus the lexical knowledge of a speaker of a language must include knowledge of the meaning of individual verbs, the meaning components that determine the syntactic behavior of verbs, and the general principles that determine behavior from verb meaning."
> Levin (1993:11)

What I want to draw attention to is what is absent from Levin's theoretical view of the interaction between meaning and diathesis (as expressed in the 1993 discussion):

- There is no mention of any semantic effect involved in the alternation itself. (Perhaps the treatment of the manifestation of "argument alternation" is assumed to be entirely within the syntactic component, and thus do not involve changing meaning.) As far as this explanation goes, the semantics of corresponding pairs of sentences within each pattern could be exactly the same.

- The "analysis" of the phenomenon thus consists of a LISTING OF THE CORRELATIONS between features of verb meanings and participation in syntactic alternation patterns. There is no attempt to explain WHY each alternation pattern should be associated with its particular combination of semantic features of verb meaning, rather than with other features. In other words, Levin's analysis would have been as satisfactory if it had been the case that the *touch* and *hit* verbs that underwent the Middle Alternation while the *cut* and *break* verbs did not.

If the "semantic filtering" analysis of the *swarm-with* construction is correct, however, the next question to ask is whether the three argument alternations in Levin's example also involve a change in meaning in one of the alternates, and whether it is the meaning change in each case that determines which verbs undergo which alternation. Although I will not have as much space to devote to these as to the *swarm-with*-construction, I believe I can show that it does in these cases.

One caveat at this point: the method of description in (Levin 1993) is not really incompatible with the view of alternations presented, though it stops short of the final step of explanation that I am trying to take here. Also, Levin's views on alternations may have changed considerably since here 1993 book was written. I choose this book to cite for comparion simply because it has been widely read and is very influential.

4 Semantics in Levin's three alternations

4.1 Semantics of the English Middle Construction

The syntax of the English "Middle" Construction has been much discussed, its semantics less so. I propose that the follow is a correct characterization (albeit informal) of the construction's meaning:

- The Middle Verb Construction compares one object (implicitly) to other objects indirectly: via comparing the an ACTION performed on the first object, to the same action performed on the other objects; the actions are compared with respect fo ease, difficulty, time needed, etc. in performing them.

For example: *This car drives easily* compares this car with other cars (or "the average car") indirectly, by comparing the action of driving this car with the action of driving other other cars, with the conclusion that the first action requires less effort than the others. (The standard of comparison may be mentioned explicitly, too: *This car drives better than that car.*)

Greg Carlson has pointed out to me that sentence (24a) does not entail (24b),

(24) a. This car drives well.

     b. Someone drives this car well.

much less does it entail that everyone drives this car well. Rather, it in effect says that this car has certain features and properties that enable it to be driven well, under typical circumstances of driver, road, traffic, etc. Hence:

- The Middle verb construction compares actions GENERICALLY – it generalizing over possible agents, possible occasions, and circumstances.

- Because the comparison is between generic actions on specific objects, the only factors that determine whether a Middle Construction sentence is true are PROPERTIES INHERENT IN THE OBJECT ACTED ON.

Another way to see this property attested is to consider what kinds of explanations can and cannot be appropriately given for the truth of middle construction example:

(25) a. This car drives well ...

b. ...because the suspension is engineered well.

c. ??...because we're driving on smooth pavement.

(26) a. I sunburn easily ...

b. ...because I have pale skin and blue eyes.

c. ??...because I spend a lot of time outside in the sun.

The (c)-examples in each case refer to "accidental" properties of the situation, rather than essential (permanent) properties of the subject of the middle verb, and as such are not fully appropriate.

A nice comparison is provided by the *Tough*-construction; though similar to the middle construction in several ways, it differs in that it is not generic, while the Middle always is.

(27) a.*The ceiling in this room touches easily (because I have a tall ladder.)

b. The ceiling in this room is easy to touch (because I have a tall ladder.)

Most examples of Middle Construction sentences cited in the literature indlucd an adverb like *easily* or *well*, but these examples from van Oosten (1986) show that the adverb is not necessary, and that same notion of comparison-via-performed-action is involved:

(28) a. This tent puts up in about two minutes.   (only relevant factor is inherent properties of the tent)

b. (Instant cereal advertisement) [this cereal] prepares in your bowl instantly.   (relevant factor is properties of the cereal itself)

c. I think it's silver. It polishes like silver.   (properties of object being polished)

d. (This brand of dog kibble) cuts like meat, chews like meat.

- Rule deriving "Middle" Verbs from active transitive verbs (Informal sketch):

   The "Middle Construction" maps a transitive verb α (e.g. *drive*) into a (phonologically identical) intransitive middle verb α'.

   Meaning: an object x (e.g. 'this car') has the α' property just in case the generic action of performing α on x (driving this car) compares in the specified way ('easily') with the generic action of performing α on other objects of the same class ('driving other cars').

4.1.1 The semantics of the Middle Construction "filters" the verbs that can appear in it

- The meanings of the verbs of the *Break*-Class and the *Cut*-class all entail the causing of a physical change in all or part of the direct object referent (the Patient), cf. *break the vase, cut the bread*. Therefore, inherent physical properties of the the Patient can affect the ease/difficulty of bringing about this physical change in it. Thus, the Middle Construction is meaningful with these verbs, cf. *Crystal breaks easily, The bread cuts easily*.

- The meanings of the verbs of the *Touch*-Class and *Hit*-Class do not entail that any physical change must be produced in the Patient argument (as Levin noted), Therefore, inherent physical properties of the Patient argument should not affect the ease/difficulty of performing this kind of action on the Patient. And thus, the Middle Construction should be semantically anomalous with these verbs, cf. **The wall touches easily, *The wall hits easily*.

4.2 Part-to-Whole Spread and English Possessor-Ascension

Before discussing the possessor-ascension construction itself, we need to look at a semantic property of the verbs the undergoing it.

4.2.1 Part-to-Whole Spread in verb meanings

When certain verbally-denoted relations involving contact hold between an Agent an a Patient, the relation is often generalized to hold between the Agent and an object of which the Patient is a physical proper sub-part I will call this phenomenon PART-TO-WHOLE SPREAD. The effect can be seen in a characteristic pattern of entailment:

(29) a. Mary touched the toenail on John's big toe.

   b. (therefore) Mary touched John's big toe.

   c. (therefore) Mary touched John's foot.

   d. (therefore) Mary touched John's body.

   e. (therefore) Mary touched John.

(30) a. The pebble hit your front door knob.

   b. (and since the knob is part of the front door) The pebble hit your front door.

   c. (and since the door is part of the front of your house) The pebble hit the front of your house.

   d. (and since the front of your house is part of your house) The pebble hit your house.

(31) a. John scratched the front fender of your car.

   b. (and therefore) John scratched your car.

Exactly which verbs allow part-to-whole spread in which sentences is somewhat vague and complicated: if John has touched Mary and Mary is a part of the U.S. Senate, we do not say that John has touched the U.S. Senate. But if John has contacted Mary and she is a member of the Senate, it can sometimes be said that John has contacted the U.S. Senate. However, this vagueness does not affect the point being made here.

- The verbs of the *Break*-Class do not permit part-to-whole spread in the Patient argument:

(32) a. Mary broke John's arm   *does not entail:*

   b. Mary broke John;

Note that up to this point we have not mentioned the Body-Part Possessor Ascension construction, only semantic properties of verbs by themselves

4.3 Semantics of the Body-Part Possessor Ascension Construction:

The hypothesis we propose at this point is that the (Body-Part) Possessor Ascension Construction allows the Patient of the original verb to be identified via two separate arguments of the derived verb: (i) the physically-contacted "core" subpart and (ii) the whole object (or person) to which the verb can be generalized by part-to-whole spread.

Here then is the semantic rule for the Possessor Ascension Construction (informal sketch):

The meaning of 'x α' y on z' is:

i. $x \ \alpha \ z$ is true and x is in physical contact with z,

ii. z is a physical proper subpart of y,

iii. $x \ \alpha \ y$ is true also (because of part-to-whole spread of the α-relation),

iv. the meaning of α involves motion from x to z.

(Clause (iv) is included because some stative verbs, like *see*, do allow part-to-whole generalization but do not seem to appear in English possessor-ascension sentences; the requirement of motion rules out these statives.)

Thus the predictions about verbs and Possessor-Ascension are as follows:

- Verbs whose meaning allows part-to-whole generalization (namely the *Touch*-Class and *Hit*-Class) should be semantically appropriate in the Possessor-Ascension construction, since the core-contact region and generalized contact region can be distinct.

- Verbs that do not allow part-to-whole generalization (namely, *break* and some other *Break*-Class verbs) cannot be used in the possessor-ascension construction. (This is of course the restriction we have already observed from examples.)

Why should *Break*-Verbs not permit part-to-whole generalization as the other verbs do? (Note that this question does not need to be answered in order to defend my main hypothesis (above), which only predicts a match in verbs between part-whole entailments and possessor constructions whatever match that may be. But it is nonetheless an interesting question, to which I propose the following tentative solution:

- Hypothesis: predicates of the *break*-class entail not only a permanent change in part of all of the Patient argument (as do the *Cut*-class verbs), but also entail that the function which the object normally serves can no longer be fulfilled, as a consequence of this change. (cf. *a broken TV set, a shattered glass, a ripped shirt*). On the other hand, with verbs of the *Cut*-class the effect of the change may not prevent the object from serving such a function (*cf. a cake that has been cut, a table that has been scratched*). Since the function served by the part may differ from the function served by the whole, "Part-Whole Spreading" could incorrectly suggest that the function of the whole object has been disabled: cf. *John's arm is broken* vs. *John is broken.* And thus the possessor-ascension construction is inappropriate too. (Caveat: not all the verbs in Levin's *Break*-Class behave exactly alike in this respect!)

4.4 The Conative Construction

For the conative construction (*cut the salami* vs. *cut at the salami, swat the fly* vs. *swat at the fly*), the following short description must suffice.

The meaning of the construction entails that the action is incomplete in one of two ways:

- With verbs that entail physical change in the Patient, the derived construction means that some but not all of the Patient is affected, and is consistent with the possibility that very little is affected, cf. *eat at the cake*).

- The remaining verbs in this construction entail motion and contact but not necessarily any physical change in the Patient at all, but they do involve a distinguishable manner or shape of movement by the agent even if contact fails to be achieved (*hit, swat, slap at the fly*, etc.). With these verbs, the action is understood not to involve contact but only to involve this characteristic movement (cf. *He swatted at the fly but missed, She slapped at the mosquito repeatedly, He stabbed at the attacker with the dagger*).

As Levin pointed out, the *touch* verbs do not entail any particular kind of movement toward the object, only contact; hence there is no specific movement left to be entailed (as above) and the *touch* verbs are anomalous with this class. On the other hand, the telic verbs like *break* may already involve a strong enough entailment of completion of action that **break at the lamp* produces a conflict between the incompleted entailment of *at* and the completed entailment of *break*.[3]

5   Some Important Questions Raised:

I have now argued that with four different alternation constructions, a subtle semantic shift that arises through an argument alternation is responsible for "filtering" certain kinds of verbs out of participation in the alternation. The tantalizing questions that now remains are:

- Do ALL argument alternations (in English) that admit some semantic classes of verbs but reject others do so because the "derived" construction in the alternation has some such semantically filtering effect?

- If so, then all semantically-restricted argument alternations must consist in (i) one syntactic pattern that is semantically basic (or "purely compositional", or "semantically unmarked") and (ii) a syntactic alternate that is semantically potent (adds to or changes the meaning of the verb). That is, all alternations are asymmetric. Is this true?

- Do the semantic effects produced by the semantically potent constructions fall into natural semantic classes?

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[3]It may be noted that there is nothing anomalous about the progressive with such verbs, e.g. *He is breaking the lamp*, but this difference may be due to the fact that the English progressive remains open to the possibility that the action will be completed after all, whereas the conative *at* strictly entails lack of completion.

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