

The Structure of Lexical Meaning: Why Semantics Really Matters*

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Abstract

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1. INTRODUCTION. In this paper I explore the interface between syntax and lexical semantics, and in particular how lexical meaning is structured and what this may (or may not) tell us about syntax. I primarily focus on the semantic underpinnings of argument realization, i.e. how participants in an event are encoded morphosyntactically in a clause describing that event. I take as my starting point the Universal Alignment Hypothesis (UAH) of Perlmutter and Postal (1984):

- (1) **Universal Alignment Hypothesis:** There exist principles of [Universal Grammar] which predict the initial [grammatical] relation borne by each nominal in a given clause from the meaning of the clause. (Perlmutter and Postal 1984:97)

In other words, the UAH posits a principled interface between semantics and syntax. This is a relatively uncontroversial position, and the question is simply what independently-defined morphosyntactic are semantic primitives are relevant and how are they lined up in a way that predicts the relevant patterns. Starting with the morphosyntax, one universal of argument realization is that co-arguments in a clause are distinguishable by distinct coding properties such as grammatical function, case, and position. For example, in (2) the agent has the grammatical function of subject, is in the nominative case, and occupies a certain syntactic position (e.g. [Spec,TP]), while the patient is the object, is accusative, and occupies a distinct position (e.g. [Comp,V] or [Spec,vP]).

- (2) Kim broke the vase. (*Kim*=SU, Nom, [Spec,vP]; *the vase*=DO, Acc, [Comp,V])

Crucially, the properties that distinguish co-arguments in a clause also form independently defined **morphosyntactic prominence hierarchies**. For example, cases are rankable in terms of morphological markedness, so that nominative is unmarked relative to accusative, etc. (Croft 2003). Grammatical functions are perhaps rankable in terms of their relative accessibility to syntactic operations such as relativization, so that subjects are most likely across languages to be relativizable, direct objects next most likely, etc. (Keenan and Comrie 1977). Furthermore, syntactic positions are assumed to fall into asymmetric c-command relationships, so that subjects in [Spec,TP] c-command objects in [Comp,V], etc. (Chomsky 1981). These hierarchies are summarized in (3).

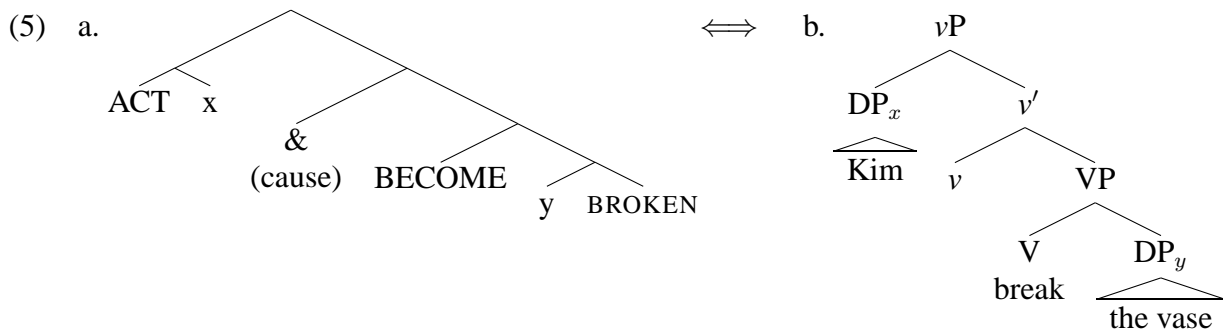
- | | | | |
|-----|------------------------|-----------------------------|----------------------------------|
| (3) | Case Markedness | NP-Accessibility | Configuration (C-command) |
| | Nom > Acc > Dat > Obl | SU > DO > IO > OBL | SU > IO > DO > OBL |
| | (cf. Croft 2003:142ff) | (Keenan and Comrie 1977:66) | (Chomsky 1981) |

These hierarchies in turn determine the relative prominence of the co-arguments in the clause. In (2) *Kim* is more prominent than *the vase* because it has a less marked case, a more accessible grammatical function, and a higher position. Which coding properties are relevant for a particular language, or a particular phenomenon in a particular language, is language-dependent, but co-arguments can usually be distinguished in this way. Since the early days of thematic roles (Fillmore 1968, Jackendoff 1972:*inter alia*), it has been assumed that morphosyntactic prominence derives from some more basic notion of **lexical semantic prominence** that follows from the meaning of the clause/head verb. For example, Fillmore observed that agents have priority to subject position over instruments, which have priority over patients. Subsequent work (e.g. Jackendoff 1972) codified these preferences as thematic role hierarchies such as (4a), yielding the subject selection rule in (4b) (see Dik 1978, 1980, Givón 1984, Bresnan and Kanerva 1989, Baker 1997).

- (4) a. Agent < Instrument < Patient/Theme
 b. The argument with the highest thematic role is the subject.

Thematic role hierarchies can be thought of as a defining a type of semantic prominence, wherein certain thematic roles are more prominent than others, making certain arguments more

semantically prominent than others. Thematic roles have since come under attack for various reasons (see Dowty 1989, Wechsler 1995, Levin and Rappaport Hovav 2005, *inter alia*) and have largely been abandoned. Nowadays it is generally assumed that verb meaning is best represented in terms structured event representations, often referred to as a predicate decomposition (Jackendoff 1976, 1983, 1990b, Dowty 1979, Levin and Rappaport (Hovav) 1988, 1995, 1998, 2005, Pinker 1989, Gropen et al. 1991, Wunderlich 1997, Van Valin and LaPolla 1997, Van Valin 2002, Davis 1996, Davis and Koenig 2000, Davis 2001, Wunderlich and Lakämper 2001, Koenig and Davis 2006, *inter alia*). Theories differ as to the details, but the idea is that verb meaning is structured in such a way as to reflect the basic subevental structure of the event, thereby creating hierarchically arranged underlying meaning representations. For example, following the style of representation in Wunderlich (1997), we can decompose (2) as in (5a), where a larger cause event breaks down into an acting event and a change-of-state event. Such representations also rank co-arguments relative to one another (in terms of depth of embeddedness), so that the actor is more prominent than the patient. This in turn maps (almost isomorphically) into syntactic structure, where the agent c-commands the patient (and has a more accessible grammatical function, etc.), as shown in (5b).



In fact, so nearly isomorphic are standard decompositions to syntactic structures that much recent work assumes that the decomposition *is* the syntax, i.e. the functional head v in (5b) represents cause, and *break* is grafted onto a change-of-state functional head (Hale and Keyser 1993, 1997, 1998, 2002, Pesetsky 1995, Baker 1997, Travis 2000, Folli and Ramchand 2002, Ramchand 2002, Harley 2003, *inter alia*). Regardless, as long as decompositions such as (5a) are independently motivated by something other than the argument realization facts they are meant to explain, argument realization reduces to a simple **prominence preservation** principle (Levin and Rappaport Hovav 2005:140-145): relative semantic prominence determines relative morphosyntactic prominence.

Prominence preservation also plays a crucial role in how argument alternations, in which one or more arguments of a verb has multiple encoding options, are analyzed. In this paper I look in particular at cases of **argument/oblique alternations**, in which one or more arguments in a clause alternate between direct argument (subject, direct object, and indirect object) and oblique realization.¹ Consider the dative alternation in (6), where the recipient *Mary* may be realized as either an indirect object or in a goal PP. Following Gropen et al. (1989), Pinker (1989), Harley (2003) and Rappaport Hovav and Levin (2008) this can be analyzed in terms of distinct but related decompositions: (6a) represents caused motion via a primitive GO TO predicate that ranks the

¹For purposes of this study I consider an argument to be any participant necessarily entailed to be part of the event by the verb. A direct argument is one that has the subject, direct object, or indirect object grammatical function (as much as grammatical functions can be determined in a language) and/or structural case such as nominative, accusative, or structural dative. I consider an argument oblique if it has an oblique grammatical function and/or is marked by a non-structural case/adposition (including semantic dative) or both. I ignore direct argument to direct argument alternations such as causative/inchoative alternations or ergative/absolutive alternations in split intransitive languages.

theme higher/earlier than the location, and (6b) represents caused possession, which ranks the possessor (qua location) higher/earlier than the theme.

- (6) a. John sent/mailed/throw *a book to Mary*. caused motion, [x CAUSE [y GO TO z]]
 b. John sent/mailed/throw **Mary** *a book*. caused possession, [x CAUSE [z HAVE y]]

This approach makes two crucial predictions. First, the contrast between HAVE and GO TO captures an important semantic fact that the indirect object must be a potential possessor, while the PP need only indicate a location (cf. *John sent a book to London* is fine but #*John sent London a book* is only felicitous on a reading that *London* is an agency such as Scotland Yard; Green 1974:103-104). Second, the semantic reranking of the two co-arguments plus the prominence preservation principle predicts that there should be syntactic reranking, which indeed there is. This is demonstrated by the well-known fact that the more prominent argument always asymmetrically c-commands the less prominent argument (see Barss and Lasnik 1986, Larson 1988, Pesetsky 1995, Harley 2003). For example, in (7) a quantifier in the first argument licenses a bound variable in the second argument but not conversely, regardless of which variant is used.

- (7) a. I denied [each worker]_i [his_i paycheck].
 b.??I denied [its_i owner] [each paycheck]_i.
 c. I denied [each paycheck]_i to [its_i owner].
 d.??I denied [his_i paycheck] to [each worker]_i.

In more syntactic analyses (Harley 2003), HAVE and GO TO are instantiated by grammatical formatives (P_{HAVE} and P_{LOC} for Harley) with differing Spec/Comp structure, where the syntactic and semantic reranking are literally the same operation. Regardless, as long as different decompositions are independently motivated, argument realization follows for free from prominence preservation.

However, despite the elegance of decompositions, a question not often asked is whether there really *is* independent motivation for distinct decompositions in argument/oblique alternations. To put it another way, what do HAVE and GO TO mean such that we expect them to alternate, and given that they take the “same” two arguments, why would each of them rank a different argument more prominently? In this paper I argue that when we start to ask this question we quickly find that the standard motivations for decompositions begin to break down. Other than getting the linking facts right, nothing about the semantics embodied in the decompositions in (6) predicts the alternation. On the basis of a careful re-examination of the truth conditional differences found in argument/oblique alternations (such as the possessor/goal contrast in (6)), I show that there is a notion of semantic prominence in these alternations, but not one that is reducible to subevent structure or any other type of semantics normally associated with decompositions. Adopting a lexical entailment-based approach to meaning (Ladusaw and Dowty 1988, Dowty 1989, 1991, Primus 1999, Ackerman and Moore 2001, Beavers 2006a), I instead make the following three claims:

- #1 Morphosyntactic prominence in argument/oblique alternations is computed in terms of the relative prominence of different realization options of the same argument *across clauses* (not co-arguments within a clause).
- #2 Among the realization options available for a given argument, the argument is realized more prominently if it has a stronger set of truth conditions associated with it.
- #3 Semantic prominence is defined at least partly as relative strength of truth conditions.

In this way I argue that there is more to the grammatically relevant components of lexical semantics than subevent structure. Rather, very fine-grained distinctions in the truth conditions associated with particular arguments also figure into facts about argument realization. In §2 I begin by examining two case studies in object/oblique alternations (the locative and conative alternations) and show that the various motivations for decompositional approaches to argument realization (subevent structure, aspect, types of subevents) fail to make the relevant predictions in a non-ad hoc way. In §3 I propose instead that strength of truth conditions is relevant for predicting argument realization facts, and provided a detailed semantic analysis of object/oblique alternations in terms of an implicational hierarchy of degrees of affectedness. In §4 I analyze the morphosyntax of these alternations in terms of a MORPHOSYNTACTIC ALIGNMENT PRINCIPLE which makes crucial reference to the strength of truth conditions in a way that applies broadly across a range of alternations. In §5 I show that other argument/oblique alternations also show constraints on strength of truth conditions, and show how the analysis I propose can be extended to them as well. I conclude in §6 by showing that despite claim #1, we can still encompass a notion of relative co-argument asymmetry once we allow that strength of truth conditions interacts with levels of pure syntax to rank argument in a clause regardless of their semantic relationships. I also argue that my proposal is not incompatible with decompositions, and that on one view may actually augment them. Indeed, some degree of decompositional structure may also augment the approach I outline here in a way of increasing the explanatory power of both.

2. DECOMPOSITIONS - MOTIVATIONS AND LIMITATIONS. I begin by looking more closely at the standard motivations for event decompositions that have been proposed over the years, and show that despite the obvious value such representations have for explaining facts about the mapping of lexical meaning to grammar, they fall short when it comes to argument/oblique alternations. In general, decompositions capture the following properties:

- **Subevent structure** - Events can be broken down into subevents of certain types (Jackendoff 1976, Dowty 1979, Rappaport Hovav and Levin 1998)
- **Grammatically relevant vs. irrelevant meaning (templates vs. lexical roots)** - Only certain semantic information in the decomposition is relevant for the grammar (Pesetsky 1995, Rappaport Hovav and Levin 1998, Grimshaw 2005).
- **Correlations between participants** - *N*-ary primitive predicates determine necessary semantic correlations between co-arguments as well as their relative ranking in the clause (Rappaport Hovav and Levin 1998)
- **Lexical aspect** - Certain decompositions correspond to certain aspectual classes (e.g. accomplishment vs. activities; Dowty 1979) and the structure of the decomposition plays a role in how aspectual meanings are built up (aspectual composition; Ramchand 2002)

Consider the decomposition in (8) (from Rappaport Hovav and Levin 1998:119, (32)).

(8) Phil swept the floor clean.

[[*x* ACT_{<sweep>} *y*] CAUSE [BECOME *y* < CLEAN >]]

This decomposition encodes the fact that there is a causing event in which an acting event precedes a becoming event, i.e. it makes claims about subevent structure. It also indicates that the event is an

accomplishment (a standard interpretation of CAUSE/BECOME structures; Dowty 1979). It furthermore captures the fact that the predicate is transitive, since there is both a causer and a patient, which follows from the acidity of ACT and BECOME. Furthermore, the only information relevant for the syntax are the ACT, CAUSE, and BECOME predicates that form the larger template. The lexical roots *sweep* and *clean* fill in certain open positions in the decomposition indicating the real world action and result, but this information is usually irrelevant for the syntax.

As mentioned in §1, argument/oblique alternations are analyzed in terms of distinct but related decompositions. But which decompositions, and why? I look in detail at two case studies in object/oblique alternations, starting with the well-known *spray/load* locative alternation (Hall (Partee) 1965, Fillmore 1968, 1977, Anderson 1971, 1977, Schwartz-Norman 1976, Givón 1984, Jeffries and Willis 1984, Rappaport and Levin 1988, Pinker 1989, Jackendoff 1990b, 1996, Dowty 1991, Gropen et al. 1991, Levin 1993, Goldberg 1995, Croft 1998, Baker 1997, Davis and Koenig 2000, Davis 2001, Koenig and Davis 2006, Beavers 2005, 2006b, among numerous others). I begin with this alternation not only because it has an interesting set of syntactic and semantic properties, but also because it is cross-linguistically attested (on Hungarian see de Groot 1998, Villó 1980, Ackerman 1992, de Groot 1998; Italian, Farrell 1994; Spanish, Mateu 2000; French, Tremblay 1991; German, Brinkmann 1997; Dutch, de Groot 1998; Danish, Herslund 1995; Japanese, Kageyama 1980; ChiBemba, Givón 1969; Sesotho, Machobane 1996). There is something very universal across languages that gives rise to this alternation.

Verbs that undergo this alternation include *load*, *spray*, *spatter*, *splash*, *smear*, *drizzle*, and *shower* (see Levin 1993:49-55, 111-132), i.e. a subset of verbs with the core semantics in (9).

- (9) **Core Semantics of Locative Verbs:** Some CAUSER acts upon some THEME and moves that THEME into some mutual configuration with some static LOCATION.

For such verbs it is typically the case that either the theme or the location can be realized as the direct object; the remaining argument must be realized as an oblique, as shown in (10) and (11).

- (10) a. John loaded **the hay** *onto the wagon*.
 b. John loaded *the wagon* **with the hay**. (Locative)
- (11) a. John sprayed/smear/splattered/caked **the mud** *on(to) the wall*.
 b. John sprayed/smear/splattered/caked *the wall* **with the mud**.

However, there is also a semantic contrast: whichever argument is the object receives an interpretation of completeness, the well-known “holistic effect” of Anderson (1971, 1977). For example, as shown in (12a) for *load*, when the theme is the object there is an expectation that all of it is moved (it is incompatible with a context in which this does not obtain). When the theme is an oblique, it is compatible with contexts in which completeness may or may not have occurred, as shown in (12b,c). However, even as an oblique the theme must be at least partly moved, as shown in (12d), a point I return to in detail below.

- (12) a. #Kim loaded *the hay* onto the wagon, but still needed a truck for the rest.
 b. Kim loaded the wagon *with the hay*, but still needed a truck for the rest.
 c. Kim loaded the wagon *with the hay*, leaving none behind.
 d. #Kim loaded the wagon *with the hay*, but none of the hay moved.

Similar facts hold for the location, shown in (13) for *load*, where the relevant notion of completeness is becoming completely full, something that must obtain when the location is the object but left unspecified when it is an oblique, although at least some filling must have occurred.

- (13) a. #Kim loaded *the wagon* with the hay, and still had extra room for the grain.
 b. Kim loaded the hay *onto the wagon*, and still had extra room for the grain.
 c. Kim loaded the hay *onto the wagon*, filling it up completely.
 d. #Kim loaded the hay *onto the wagon*, but none of the wagon had hay on it.

Before proceeding, I offer three quick caveats about this data (following similar cautionary notes in Jeffries and Willis 1984, Dowty 1991, Herslund 1995, Laffut 1998, Beavers 2006a, Beavers and Francez in press). First, bare plural and mass noun objects generate atelicity of the predicate. When this happens it mitigates the holistic effect:

- (14) a. John loaded hay onto the wagon, but had some hay left over. (bare mass)
 b. John loaded wagons with the hay, but couldn't fill all of the wagons. (bare plural)

However, the effects of bare plural and mass nouns are independent of the locative alternation, since *any* English predicate (and in most other languages) will be atelic with a bare plural/mass object (Garey 1957, Verkuyl 1972, 1993, Dowty 1991). I thus set this aside as an orthogonal factor and control for it using only definite, specific DPs. Second, as Jeffries and Willis (1984) in particular point out, some nouns (such as liquid nouns; Levin 1993:118-119) tend to resist holistic interpretations (cf. *?John sprayed the paint on the wall, but had some left over*) unless explicitly quantified (cf. *John sprayed the gallon of paint on the wall, #but had some left over*). Furthermore, some nouns generate atelicity regardless of whether they are bare plural or mass nouns. These include nouns such as *fire* that are inherently viewed of as undifferentiable and generally lack canonical quantities (cf. *#a gallon of fire; John sprayed the fire with water, but could only reach part of it*). However, this is a fact about specific nouns, not events, and thus I avoid such nouns in my examples. In other words, I am only interested in holistic readings that follow at least partly from the verb involved. Crucially, there are verbs, such as perception and activity verbs, which never give rise to holistic readings even with an overtly quantized, definite, specific object:

- (15) a. John saw/felt the gallon of paint, but since it was mostly hidden behind the cabinet he only saw/felt the top of it. (Perception)
 b. John touched/tapped/swiped/rubbed the gallon of paint, but could only reach the top of it. (Activities)

In neither case must the entire object be acted upon, as the context indicates. Thus while definite, specific nouns of the appropriate type are necessary to get the holistic readings in (12) and (13), they are not sufficient, and we must also use appropriate verbs. It is the effect of the verb I am interested in here. Third and finally, the relevant notion of completeness is often contextually determined. Full for a wagon is different than full for a car (e.g. one would never load hay into the driver's seat of a car). However, there is always a relevant final state that constitutes "complete" in this context, and it is the existence of this reading I am interested in here regardless of how the details vary from context to context. With these factors controlled for, the question is how decompositions explain this alternation. There are several possibilities, which I go through in turn.

Subevent Structure: It could be that the relative prominence of each argument in each clause reflects a difference in subevent structure. Consider the classic decompositional analysis of Rapaport and Levin (1988) (see also Pinker 1989, Gropen et al. 1991), who analyze locative alternations as a contrast between caused change-of-location vs. caused change-of-state that results from a caused change-of-location (similar to the dative alternation in §1).

- (16) a. John loaded the hay onto the wagon. (change-of-location, cf. *put*)
 [[*x* cause [*y* to come to be at *z*]/LOAD]]
 b. John loaded the wagon with the hay. (change-of-state, cf. *fill*)
 [[*x* cause [*z* to come to be in STATE]]
 BY MEANS OF [*x* cause [*y* to come to be at *z*]/LOAD]]

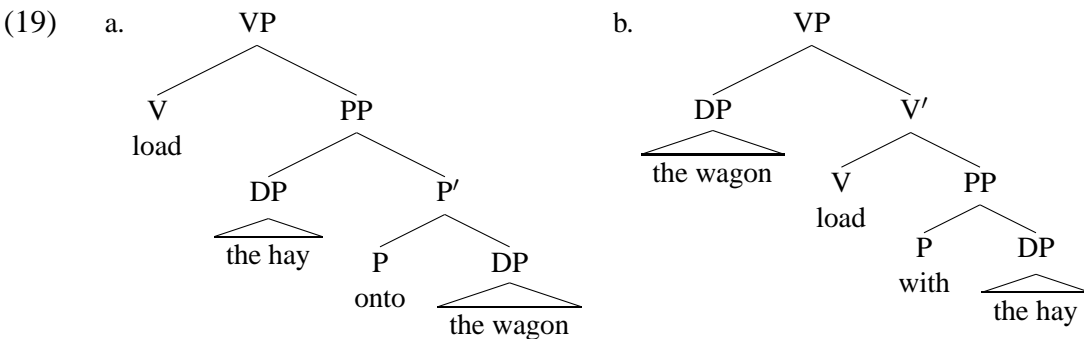
The rule linking the appropriate participant to object position is roughly the following:

- (17) When the [predicate decomposition] of a verb includes one of the substructures in [(18)], link the variable represented by *x* in either substructure to the [direct object position].

- (18) a. ...[*x* come to be at LOCATION]...
 b. ...[*x* come to be in STATE]... (cf. Levin and Rappaport 1988:25-26, (21)-(22), (24))

In other words, themes and patients have equal claim to objecthood, and whichever one a particular use of *load* selects for is the object. However, there is a crucial implicit assumption here. In (16b) both *y* and *z* satisfy (17). Why is the patient the object? This is due to the BY MEANS OF relation, which makes the patient more prominent, giving it the edge for objecthood. Thus the contrast also depends on a *structural* property of the representation: relative embeddedness.

This can also be seen in more recent syntactified accounts. For example, Hale and Keyser (2002:241-242, (45), (44)) give the analysis in (19) for the locative alternation. On this analysis the alternation reflects a semantic contrast between two dyadic prepositions *with* and *onto* which denote the closely related semantic notions of “central coincidence” and “co-location” respectively. The latter takes the theme as specifier and the location as complement, while the former takes the theme as complement and the location as specifier (which is satisfied through a process of delayed gratification by the verb *load*; we can ignore this detail here).



Since these *with* and *onto* are actual syntactic formatives, the syntactic reranking of the arguments follows without a separate linking rule. But in both theories the same question arises: what determines the decompositional structure of the event representation?

Regardless of the type of representation, the most obvious answer is subevent structure. [*x* CAUSE [*y* BECOME ϕ]] represents a causing event with an embedded becoming event. But is (16b) or (19b) the appropriate decomposition? It is not. Following the flow of causation and/or temporality, the change-of-location should precede the change-of-state since the change-of-location causes the change-of-state. In other words, the decomposition for (16b) *should* be:

- (20) [[*x* cause [*y* to come to be at *z*]/LOAD]] CAUSE [*x* cause [*z* to come to be in STATE]]

However, this would get the argument realization wrong. It appears that relative embeddedness here is motivated by the syntactic facts it was meant to explain, rather than independent semantics

1996, Broccias 2003, Beavers 2006a, 2007b; on Walpiri, Laughren 1988; German, Frense and Bennett 1996; Danish, Durst-Andersen and Herslund 1996; Galician, Rosales Sequeiros 2005). In each case we have an argument undergoing an object/oblique alternation, but the contrast differs from verb class to verb class. With cutting verbs the object is affected in some way but not the corresponding oblique (similar to *cut* in the locative alternation). For consumption verbs it is whether the whole argument was eaten vs. perhaps just part of it (i.e. a holistic effect). For hitting verbs no effect is entailed at all. Instead the object is impacted but the oblique is not necessarily impacted.

- (22) a. Marie cut/sliced/scratched/slashed *the rope*. (The rope is cut)
 b. Marie cut/sliced/scratched/slashed *at the rope*. (Rope may or may not be cut)
- (23) a. Marie ate *her cake*/drank *her wine*. (All of cake/wine eaten)
 b. Marie ate *at her cake*/drank *at her wine*. (At least some, maybe all)
- (24) a. Marie hit/slapped/smacked/whacked *Defarge*. (Defarge hit, not necessarily affected)
 b. Marie hit/slapped/smacked/whacked *at Defarge*. (Defarge not necessarily hit)

Thus object alternations are not in general about BECOME. With no apparent semantic unity. We might wonder if alternations are about something non-semantic, e.g. alternations exist to make one argument more prominent in the clause for information structural purposes.

Pragmatics: Decompositions are not commonly thought of as being based on pragmatic factors, but recently Rappaport Hovav and Levin (2008) have suggested that some alternations (such as some variants of the dative alternation) are motivated primarily by information structure: the alternation makes the more topical argument come earlier in the clause. We might wonder if all alternations have this underpinning. While this is certainly a relevant factor for the *choice* of a variant in context, it does not seem obvious that this is what fundamentally underlies alternations. First, given the truth-conditional contrasts we see in alternations, making one argument more topical requires saying something different about it truth conditionally, a property not found in information structural operations such as passivization or various types of A'-movement. Second, as shown with the conative alternation, sometimes alternations affect just one argument and involve no reranking. There is no relevant prominence shift between co-arguments that could correspond to relative topicality. Thus alternations in general do not seem to be governed by pragmatics, just as they are not fundamentally governed by subevent structure, aspect, or subevent type. So what *does* underlie all of these alternations? In the next section I argue that there is one thing that unifies all of these alternations, but it is not something that has to do with decompositional semantics.

3. STRENGTH OF TRUTH CONDITIONS. All else being equal, in each of the above alternations the object realization of any argument always has strictly stronger truth conditions associated with it than the corresponding oblique realization. I codify this in the informal principle given in (25).³

- (25) MORPHOSYNTACTIC ALIGNMENT PRINCIPLE (MAP) (INFORMAL): In object/oblique alternations the direct object realization of an alternating participant has stronger truth conditions associated with it than its corresponding oblique realization.

Regardless of the specific truth conditions, this is the one factor that governs all of these alternations. For the conative this is very clear: in each of (22)-(24) the object variant entails the oblique

³There is one class of counter-examples to this claim, namely alternations that do not show a truth conditional contrast at all. I set these aside for now and return to them in §4.

variant, but not conversely. Some unique property holds of the object for a given verb class (holistic effect, effect, impact) that is absent for the corresponding oblique. For the locative alternation this is harder to see. With *spray/load* verbs whatever is object has an entailment of holistic affectedness (all moved or filled) absent when it is an oblique, and for *cut/slice* verbs whatever is object has an entailment of affectedness it does not have when it is an oblique. However, we do not get a strict entailment relation between the variants, since for each argument that loses some property in its oblique realization the other argument has gained a property in becoming an object.

For the *spray/load* alternation at least we can mitigate this effect by looking at bare plural and mass objects. Recall that bare mass/plural noun objects always determine atelicity and thus compromise the holistic effect. If we make one argument of a *spray/load* verb a bare plural or mass noun, and let the other be a definite, specific DP, only the latter shows a holistic effect, and an entailment relation obtains between the two variants. This is shown in (27) and (26) where in each case the (a) variant entails the (b) variant but not conversely, just as in the conative.⁴

- (26) a. John loaded the wagon with hay.
 b. John loaded hay onto the wagon.
- (27) a. John loaded the hay onto (several) wagons.
 b. John loaded (several) wagons with the hay.

For *cut/slice* locative alternation we cannot pull the same trick, since the relevant property is undergoing any effect at all, which bare plural/mass nouns do not mitigate. However it should be obvious that the same idea holds, since the object realization of any argument has an entailment left unspecified for the corresponding oblique. Thus object/oblique alternations are about relative strength of readings *relative to the alternating argument*, something orthogonal to decompositions.

In the remainder of this section I explore more deeply exactly what the relevant truth conditions are for object/oblique alternations, setting the stage for a syntactic analysis in the next section. I propose to link all of the alternations in §2 together under a single grammatical construct I refer to as the **Affectedness Hierarchy**, an implicational hierarchy of increasingly more specific degrees of affectedness. I model affectedness here following the scalar semantics of Beavers (2006a, 2007a, 2008b, to appear), which implements the scalar approach to change-of-state in Hay et al. (1999) and Kennedy and Levin (2001) in terms of the mereological event semantic framework of Krifka (1998).⁵ On this approach a dynamic predicate ϕ is a relation between at least three arguments: a theme x that undergoes a change, an event e in which the change occurs, and some predicate-supplied scale argument s_ϕ that defines the particular change undergone by x . For example, we

⁴One motivation Rappaport and Levin (1988) give for the decompositions in (16) is what they refer to as the “near-paraphrase relation” wherein they claim that the change-of-state version of the locative alternation always entails the change-of-location version. Crucially, they *only* look at cases where the theme argument is a mass noun or bare plural, just negating the holistic effect for that argument, giving the appearance of the near-paraphrase relation. Interestingly, in his discussion of locative verbs in Hungarian, Villó (1980) assumes completeness is necessary only for the *theme* direct object variant rather than the location direct object variant, since “whenever a single point of a body is moved, the whole body necessarily starts to move. Therefore ... the feature ‘totally affected’ is granted by the feature ‘physically touch’.” (Villó 1980:56). This is exactly the *opposite* conclusion to that reached by Levin and Rappaport. However, Villó bases his conclusion on the example *Követ dob az ablakba* ‘stone+acc throws the window+in’ ‘He throws a stone at the window’ (Villó 1980:55, (113a)), which involves a singular count noun whose referent must indeed be totally moved if any part of it is moved since it is indivisible. This is a striking example of how the choice of direct object expression can influence one’s analysis.

⁵I adopt this framework since it provides a convenient language for stating the necessary entailment relations, as well as tying them into other properties of different degrees of affectedness. Nothing crucial hinges on this analysis.

can define motion as a transition along a physical path scale as in (28a) and change-of-state as a transition along an abstract property scale as in (28b) (following Tenny 1987, 1992, 1994, Krifka 1998). Likewise we can define creation/consumption events as transitions along abstract scales of existence as in (28c) (following Hay et al. 1999).

- (28) a. John walked to the coffeeshop. (scale/path s_ϕ of John's *position*)
 $\exists e[\text{walk}'(\mathbf{j}, \mathbf{s}_p, e) \wedge \text{result}(\mathbf{j}, \mathbf{s}_p, \text{coffeeshop}, e)]$
- b. John wiped the table clean (scale s_c of *cleanliness* of the table)
 $\exists e[\text{wipe}'(\mathbf{j}, \mathbf{t}, \mathbf{s}_c, e) \wedge \text{result}(\mathbf{t}, \mathbf{s}_b, \text{clean}, e)]$
- c. John ate the apple. (scale s_v of *volume/existence* of the apple)
 $\exists e[\text{eat}'(\mathbf{j}, \mathbf{a}, \mathbf{s}_v, e) \wedge \text{result}(\mathbf{a}, \mathbf{s}_v, \text{gone}, e)]$

The predicate *result* is intended here as a simplification of the analysis of motion and abstract change in Krifka (1998) and Beavers (2006a, 2007c) in terms of a transition between SOURCE and GOAL states defined in terms of a generalized movement relation holding between e and s . In other words, ϕ describes a relation of x “moving” adjacently along s_ϕ (from one state/place to the “next” state/place) while e precedes temporally, until x reaches its final result state on s_ϕ . To put this in terms of the formalization of Krifka and Beavers, the following substitution holds:

$$(29) \quad \forall x, s, e, g[\text{result}(x, s, g, e) \leftrightarrow \exists!b[\text{SOURCE}(s, x, b, e) \wedge \text{GOAL}(s, x, g, e)]]$$

As demonstrated by Krifka and Beavers, the homomorphic relation between e and s_ϕ results in certain transfer of mereological reference properties between them that ensures a correlation between changes and aspect. For example, boundary points on s_ϕ are preserved in e in a way that ensures telicity for ϕ when the goal is specific, while internal mereological complexity of s_ϕ is preserved in e in a way that predicts durativity for changes along complex scales. However, I use the simpler representation in (28) here since (a) I focus only on GOAL states and set SOURCE states aside and (b) the aspectual details are largely irrelevant, save that telicity is guaranteed if the goal state is specific (see Krifka 1998 for a proof under an appropriate definition of telicity).

On the basis of this, we can define at least four degrees of affectedness for theme arguments, stated in terms of how specific a predicate is about the result state. I define first a **quantized change**, wherein the theme undergoes a definite, specific change named by the predicate (following Hay et al. 1999 almost to the letter). For example in (30) the jeans are lengthened by exactly five inches. We can encode this as a predicate-supplied result state \mathbf{g}_ϕ entailed to hold of x in e by ϕ along the scale s_ϕ (in this case being five inches longer on a scale of length).

$$(30) \quad \textbf{Quantized:} \text{ The tailor lengthened the jeans 5ins.} \quad [\text{result}(x, \mathbf{s}_\phi, \mathbf{g}_\phi, e)]$$

A **non-quantized change** as in (31) is a non-specific change, where the jeans have become longer by some unspecified amount, i.e. implied to exist but not further specified by the predicate.

$$(31) \quad \textbf{Non-quantized:} \text{ The tailor lengthened the jeans.} \quad \exists g[\text{result}(x, \mathbf{s}_\phi, g, e)]$$

So far we have essentially followed Hay et al.'s analysis of these two types of changes. The definitions predict that both types of changes entail an actual change-of-state:

- (32) a. The tailor lengthened the jeans 5ins, #but nothing changed about the jeans.
b. The tailor lengthened the jeans, #but nothing changed about the jeans.

Likewise, both pass the *What happened to X is Y* test of Cruse (1973) (see also Jackendoff 1990b), which supposedly picks out affected arguments (I offer an analysis of this below):

- (33) a. What happened to the jeans is the tailor lengthened them 5ins.
 b. What happened to the jeans is the tailor lengthened them.

The primary difference between quantized and non-quantized change is that only the former is necessarily telic. This is shown in (34), and follows from the definition of *result* in (29) plus the specific/non-specific result state contrast.

- (34) a. The tailor lengthened the jeans 5in. in/?for an hour.
 b. The tailor lengthened the jeans for/# an hour.

In other words, predicates that entail quantized changes are accomplishments (e.g. *load, move, devour, destroy, build*) and achievements (e.g. *break, shatter, crack, prick*), and those that entail non-quantized changes are degree achievements (e.g. *cool, widen, lengthen, ascend, descend*). Thus there is independent evidence that quantized and non-quantized changes (a) represent two types of changes but (b) differ in specificity about the end state.

However, more to the point, note a crucial property of the quantized/non-quantized contrast: non-quantized change is defined in terms of an existential generalization over quantized change, i.e. all quantized changes entail a non-quantized change since a definite change implies that some change has occurred. Thus the truth conditions for a quantized change are strictly stronger than those for a non-quantized change. This is an important property I exploit for analyzing alternations.

We can further expand this analysis by looking at impact verbs such as *hit, slap, punch, wipe* and *kick* which entail physical contact but not a result state (cf. *John hit/slapped the car, but nothing changed about the car*). Nonetheless, they pattern with quantized and non-quantized change predicates in passing the *What happened to X is Y* test (Rappaport Hovav and Levin 2001):

- (35) a. John hit/slapped/touched/wiped the car. (No effect)
 b. What happened to the car was John hit/slapped/wiped it. (Passes test)

Rappaport Hovav and Levin suggest that what unifies the objects of (30), (31), and (35) is that they are all “force recipients”. They receive the brunt of an action and may or may not change, i.e. they have potential for change. How to define potential is not an easy question, and I certainly do not propose a definitive answer, but we could naïvely define it as possible change, i.e. something has potential for change in an event if there is some possible world at which change occurs:

- (36) **Potential:** John kicked/slapped/hit/wiped the wall. $\diamond \exists g[result(x, s, g, e)]$

Crucially, on this definition a potential change is just an existential generalization over a non-quantized change, i.e. what (36) encodes is that there exists a world at which some change occurred, a weakening of (31) where the world in question is the real world. Therefore the truth conditions for a non-quantized change are strictly stronger than for a potential change.⁶ Finally, we may also say that a participant can be involved in an event but no change is expected. This is an argument that is not specified for any of the above thematic properties, but still has a thematic role:

- (37) **Unspecified (for):** John touched/grazed/saw the wall. $\exists \theta[\theta(x, e)]$

⁶This existential generalization hinges on defining a potential change as one involving a change in a possible world. If one assumes potential is about the real world, the relevant truth conditions resolves to a probability less than 1 but greater than 0 for a change. If this is the case, the implicational relationship between non-quantized and potential change would still hold, since a change actually occurring has a probability of 1, which implies that there is a probability of change greater than 0, but not conversely.

Such arguments are distinguished in not passing the *What happened to X is Y* test:

(38) ??What happened to the wall is that John touched/grazed/saw it.

Of course (37) is an existential generalization over (36) (θ could be $\lambda x \lambda e \diamond \exists g[result(x, s_\phi, g, e)]$). Since each degree of affectedness is a weakening of the previous one through existential generalization, we derive the implicational hierarchy in (39) that I refer to as the **Affectedness Hierarchy**, with the distinguishing tests in (40) (which themselves clearly indicate the weakening nature of the relevant truth conditions).

(39) For all x, e, s, ϕ , *quantized* \rightarrow *non-quantized* \rightarrow *potential* \rightarrow *unspecified*

(40)

Tests	Degrees of Affectedness			
	Quantized	Non-quantized	Potential	Unspecified
Predicate is telic	✓	×	×	×
Change is entailed	✓	✓	×	×
Passes <i>What happened to X is Y</i>	✓	✓	✓	×

Telicity and result entailments follow from the definition of *result*. The *What happened to X is Y* test has not been defined, but can be defined quite simply as a property of potential changes:

(41) *What happened to x is ϕ* is true iff x undergoes a potential change in ϕ .

Since on the Affectedness Hierarchy all quantized and non-quantized changes entail the potential for a change then by (41) *What happened to X is Y* should pick out exactly quantized, non-quantized, and potential changes and not anything else. Thus the hierarchy provides a clean way of explaining what links these three notions together. (For more on this notion of affectedness and other phenomena it may tie into, see Beavers 2007a,b, Gaylord 2007).

Finally, object/oblique alternations, when lined up in the right way, represent different ways of shifting down the hierarchy in terms of **minimal implicational contrasts** (i.e. one step down the hierarchy in terms of one degree of existential generalization). I show this here for the conative alternation with eating, cutting/slicing, and impact verbs, with appropriate tests to distinguish the types of affectedness (I give tests here for *eat*, *cut* and *hit*):

(42) Consumption verbs (the scale is a scale of volume/existence of theme):

- a. John ate *the pizza* (in/?for an hour), #but left it untouched. **(quantized)**
- b. John ate *at the pizza* (for/#in an hour), #but left it untouched. **(non-quantized)**

(43) Cutting/slicing verbs (the scale is a scale of material integrity of theme):

- a. John cut *the rope* (for/#in an hour), #but left it unscathed. **(non-quantized)**
- b. What happened to the rope is that John cut *at it*, but left it unscathed. **(potential)**

(44) Impact verbs (the scale is unspecified, covering anything that could result from impact):

- a. What happened to the rope is that John hit *it*, but left it unscathed. **(potential)**
- b. ??What happened to the rope is that John hit *at it*. **(unspecified)**

We can summarize these contrasts as follows:

(45)

Contrast	:	<i>quantized</i>	\rightarrow	<i>non-quantized</i>	\rightarrow	<i>potential</i>	\rightarrow	<i>unspecified</i>
<i>Eat</i> conative	:	DO	\Leftrightarrow	OBL				
<i>Cut</i> conative	:			DO	\Leftrightarrow	OBL		
<i>Hit</i> conative	:					DO	\Leftrightarrow	OBL

The locative alternation is similar. For *spray/load* verbs the contrast is quantized vs. non-quantized change, where the relevant test is (a) both variants entail a change but (b) differ in telicity. However, telicity tests are hard to apply since we have two arguments alternating. But if we nullify the holistic effect by using a bare plural or mass noun, we see exactly the right effects. For example, using a bare plural/mass theme gives (46), while using a bare plural/mass location gives (47).

- (46) Definite location (scale is scale of filling):
- a. John loaded the wagon with hay (in/?for an hour), #but it remained empty. **(quantized)**
 - b. John loaded hay onto the wagon (for/*in an hour), #but it remained empty. **(non-quantized)**
- (47) Definite theme (scale is path to goal):
- a. John loaded the hay onto wagons (in/?for an hour), #but none of it moved. **(quantized)**
 - b. John loaded wagons with the hay (for/*in an hour), #but none of it moved. **(non-quantized)**

For the *cut/slice* locative alternations, the contrast is a non-quantized/potential one, demonstrable by the fact that *cut/slice* are in general atelic (one can cut or slice something and then carry on cutting or slicing it, much like a degree achievement such as *cool*; Dowty 1979, Hay et al. 1999), but both arguments pass the *What happened to X is Y test* (at least to my ears).

- (48) Affectedness of instrument (scale is scale of material integrity):
- a. John cut/sliced the diamond on the window (for/*in an hour), #but the diamond remained unchanged. **(non-quantized)**
 - b. John cut/sliced the window with the diamond (for/*in an hour), but the diamond remained unchanged.
 - c. ?What happened to the diamond is John cut/sliced the window with it. **(potential)**
- (49) Affectedness of patient/goal (scale is scale of material integrity):
- a. John cut/sliced the window with the diamond (for/*in an hour), #but the window remained unchanged. **(non-quantized)**
 - b. John cut/sliced the diamond on the window (for/*in an hour), but the window remained unchanged.
 - c. ?What happened to the window is John cut/sliced the diamond on it. **(potential)**

This gives us the general picture of the locative alternation as follows:

(50)	Contrast	:	<i>quantized</i>	→	<i>non-quantized</i>	→	<i>potential</i>	→	<i>unspecified</i>
	<i>Load</i> location	:	DO	↔	OBL				
	<i>Cut</i> location	:			DO	↔	OBL		
	<i>Load</i> theme	:	DO	↔	OBL				
	<i>Cut</i> theme	:			DO	↔	OBL		

The absence of potential/unspecified locative alternations may have to do with the fact that the core semantics of locative verbs involves at least some motion of the theme, meaning there is always potential change. Although they differ, both the locative and conative are amenable to an analysis in terms of the same semantic primitive, degree of affectedness. In the next section I sketch an analysis for these alternations, making crucial use of the weakening truth conditions.

4. ANALYZING OBJECT/OBLIQUE ALTERNATIONS. The relevant principles are trivial to state in a lexical entailment-based theory, in which a verb's meaning consists of a largely unstructured set of properties that the verb entails to hold of its arguments (Ladusaw and Dowty 1988, Dowty 1989, 1991, Primus 1999, Ackerman and Moore 2001, Beavers 2005, 2006a). I start by considering Dowty's (1991:576, (31)) ARGUMENT SELECTION PRINCIPLE, given here in (51), for subject and object selection based on two particular prototypes defined for typical agents and patients:⁷

- (51) ARGUMENT SELECTION PRINCIPLE (ASP): In predicates with a grammatical subject and object, the argument for which the predicate entails the greatest number of Proto-Agent properties will be lexicalized as the subject of the predicate; the argument having the greatest number of Proto-Patient entailments will be lexicalized as the direct object.

This principle is not an online linking principle (at least as Dowty intended it), but rather is a guide to lexicalization. In other words, it makes predictions about *possible and impossible transitive verbs*. The exact nature of the proto-agent and proto-patient properties are largely irrelevant. As long as one can identify the appropriate properties one can predict for any transitive verb which argument is the subject and which is the object. However, for the sake of completeness, I give Dowty's proto-agent and proto-patient roles in (52) and (53) respectively.

- (52) Dowty's proto-agent (Dowty 1991:572, (27)):
- i. *volitional involvement in the event or state*
 - ii. *sentience (and/or perception)*
 - iii. *causing an event or change of state in another participant*
 - iv. *movement (relative to the position of another participant)*
 - v. *exists independently of the event named by the verb*
- (53) Dowty's proto-patient (Dowty 1991:572, (28)):
- i. *undergoes change of state*
 - ii. *incremental theme*
 - iii. *causally affected by another participant*
 - iv. *stationary (relative to movement of another participant)*
 - v. *does not exist independently of the event, or not at all*

A canonical agent is one that is volitional, sentient, causes an event, has independent motion properties, and independent existence, while a canonical patient undergoes a change, is the incremental theme (measures out the temporal progress of the event à la Tenny 1987, 1992, 1994), is causally affected, is stationary relative to other participants, and does not necessarily exist independent of the event. Unlike decompositional approaches to argument realization, there is no inherent ranking of the arguments. There are just two proto-types, and a comparison of relative proto-typicality via counting lexical entailments that figures into subject and object selection.

⁷The term "lexical entailment" here deserves some discussion. Lexical entailments are not entailments in the traditional sense (as a relationship between a set of antecedent sentences and a consequent sentence in some language). Rather they are properties that the verb implies to be true of its arguments (e.g. through material implication). Crucially, they are assigned in the lexicon and figure into lexical operations on the verb such as argument realization. This means that by the time a verb enters the syntax any semantic operations that cancel or change the lexical entailments (such as negation, modal operators, quantification, etc.) do not have an effect on argument realization since this is pre-determined. Thus in *John ate the sandwich* the lexical entailments *eat* associates with its arguments determine which is subject and object. In *John did not eat the sandwich*, technically no properties need hold of either argument, but the argument realization facts are fixed prior to negation. For this reason I control for any factors that obscure the relevant lexical entailments by avoiding negation, modality, and quantification unless relevant to a particular problem.

Left as it is, this theory roughly captures the facts of the locative alternation, as discussed extensively by Dowty (1991:587-596). This follows from Dowty's COROLLARY 2 to the ASP:⁸

- (54) COROLLARY 2: With a three-place predicate, the nonsubject argument having the greater number of entailed Proto-Patient properties will be lexicalized as the direct object and the nonsubject argument having fewer entailed Proto-Patient properties will be lexicalized as an oblique or prepositional object (and if two nonsubject arguments have approximately equal numbers of entailed P-Patient [sic] properties, either or both may be lexicalized as direct object). (Dowty 1991:576, (33))

In general this predicts that any left over arguments get oblique realization. Both variants of the locative alternation fall under the parenthetical in (54). In *load the hay onto the wagon vs. load the wagon with the hay* both *the hay* and *the wagon* have roughly the same proto-patient lexical entailments: undergoing a change, being causally affected, and being relatively stationary. If we assume that the incremental theme lexical entailment can "float" to one participant or the other, it tips the balance towards object realization for that participant. Likewise, in *cut the window with the diamond vs. cut the diamond on the window* the two non-subjects share the proto-patient lexical entailments of being causally affected and being relatively stationary. The tipping point comes in which participant is assigned the lexical entailment of undergoing a change.

The crucial shape of the MAP is already in place: the alternations rest on assigning an extra lexical entailment (strengthening the truth conditions) to give one participant the edge for objecthood. However, as stated the ASP and COROLLARY 2 are relatively narrow in their scope, and leave many questions still open (see in particular Davis 2001 for discussion). In particular, this theory makes no predictions about the following factors:

- *What happens with two-argument intransitive verbs (cf. the oblique variant of the conative)?*
Dowty's proposal only applies to verbs with a subject and an object.
- *How do oblique arguments work (are there restrictions on their lexical entailments)?*
Dowty's proposal predicts that a non-subject, non-object of a transitive verb will have less proto-agent and proto-patient lexical entailments than its co-arguments, but is there anything more unified about what types of arguments are oblique, and why?
- *What possible roles are there (any combination of lexical entailments or just some)?*
Dowty gives 10 total lexical entailments for a possible 1024 combinations. But does anything rule out certain combinations of lexical entailments?

The first question is an obvious lacuna in the predictions, but is not difficult to overcome with a sufficiently modified ASP. The second and third questions, however, are fundamentally tied to one another, and undermine to some degree Dowty's proposals about the locative alternation. For example, Dowty's analysis does not satisfactorily answer the question of why we see exactly the truth conditional contrasts we do see. For example, why is the relevant "floating" lexical entailment in the *spray/load* alternation the incremental theme lexical entailment? It could just as easily have been any of the other four proto-patient lexical entailments. For example, there could be a verb *shload* where in *I shload the hay onto the wagon vs. I shload the wagon with the hay* the hay is

⁸This is not in fact technically a corollary, since it relies on a notion of oblique realization not encoded in the ASP. Rather it is perhaps best viewed as a separate principle dealing with three-place transitive predicates, whereas the ASP deals with two-place transitive predicates.

an incremental theme in both cases but lacks the lexical entailment of independent existence in the oblique variant. But as far as I am aware, in any object/oblique alternation where the direct object is an incremental theme, this is the lexical entailment that is dropped in the oblique variant.

Furthermore, the strictly monotonic nature of the strength of lexical entailments is not directly captured. Nothing rules out the possibility that the oblique argument *gains* lexical entailments, such as proto-agent lexical entailments. Nor does this approach say how many lexical entailments may be “floated”. For example, we find no alternations where an object is both affected and an incremental theme but the corresponding oblique lacks both of these lexical entailments. Clearly what is needed are additional constraints that rule out certain types of alternations.

As far as I am aware, the only major attempt to address these problems within lexical entailment-based approaches is Ackerman and Moore (2001). Building directly on Dowty’s proto-agent and proto-patient roles (although augmenting the latter with an extra lexical entailment irrelevant here), they propose a PARADIGMATIC ARGUMENT SELECTION PRINCIPLE (*ibid.*:169, (2)) that places constraints on what oblique arguments may look like in alternation with direct arguments:

(55) PARADIGMATIC ARGUMENT SELECTION PRINCIPLE (PASP):

Let $P(\dots, arg_i, \dots)$ and $P'(\dots, arg'_i, \dots)$ be related predicates, where arg_i and arg'_i are corresponding arguments. If arg_i and arg'_i exhibit different grammatical encodings and arg_i is more prototypical with respect to a particular proto-role than arg'_i , then arg_i ’s encoding will be less oblique than arg'_i ’s encoding.

Thus for Ackerman and Moore every alternation reflects a paradigmatic relationship between two verb forms with different thematic role and argument structure assignment. One form takes argument i as a direct argument, the second as an oblique, and the former assigns a “more prototypical” role to i than the latter. There is a crucial property of this proposal that I adopt directly into my own analysis: unlike the ASP, which is a principle on possible and impossible verbs, the PASP makes predictions about *the space of polysemy for different uses of the same verb*.⁹ Ackerman and Moore motivate this on the basis of partitive vs. accusative/genitive case alternation in Finnish and Estonian (Kiparsky 1998, 2001b,a) and nominative/dative subject alternations (Moore and Perlmutter 2000). Their specific analysis of Finnish and Estonian is irrelevant here, and I defer discussion of subjects until §5. The larger issue is that the PASP, while addressing the issue of what to do with oblique arguments in general, nonetheless suffers from the same problem as Dowty’s: nothing in their approach indicates (a) which proto-role lexical entailments will vary for a given alternation and (b) whether or not the less prototypical role contains any non-proto-role lexical entailments not assigned to the more prototypical role.

For example, on Ackerman and Moore’s (2001:34-46) counting algorithm, each proto-agent lexical entailment contributes some positive integer n towards the prototypicality of the participant, while each proto-patient lexical entailment contributes a negative integer $-n$, where the sum of these numbers is the participant’s THEMATIC LOADING. Something is more proto-agentive if it has a higher thematic loading and it is more proto-patientive if it has a lower thematic loading. But this means that by the PASP something could become less prototypical relative to the proto-patient

⁹One may ask why alternations should be viewed as polysemy rather than as derivation. Since Fillmore (1968) it has often been assumed that various alternations can be derived through derivational processes, either lexical or syntactic derivation. However, several factors have led many researchers in argument realization to abandon derivations. First, the semantic contrasts found in alternations are difficult to capture derivationally, especially if alternations are reduced to types of A-movement. Second, the idiosyncrasy in which verbs of a given verb class do and do not alternate makes derivational rules difficult to state, since they often have to be keyed to the exact lexical entries they apply to, effectively reducing to lexicalization. Thus polysemy is a standard way of capturing alternations, and I assume this here as well.

role simply by *gaining* a number of proto-agent entailments and not losing any proto-patient lexical entailments. As far as I am aware this never happens in object/oblique alternations, i.e. there is no conative where the oblique has all the same entailments as the corresponding object but also has several proto-agent properties. These are options that must also be ruled out.¹⁰

Building on Ackerman and Moore’s insights regarding polysemy and argument/oblique principles, some simple modifications to Dowty’s original proposal plus a redefinition of proto-patient give us the crucial constraints we need. We can address the issue of non-transitive verbs by restating the ASP as in (56) to make object encoding conditional on transitivity.

- (56) ARGUMENT SELECTION PRINCIPLE (REVISION 1): In predicates with a grammatical subject, the argument for which the predicate entails the greatest number of Proto-Agent properties will be lexicalized as the subject of the predicate; *if the predicate licenses a grammatical object*, the argument having the greatest number of Proto-Patient lexical entailments will be lexicalized as the direct object.

We can also add a separate principle of oblique realization to cover what happens when an argument is not a direct argument:

- (57) OBLIQUE SELECTION PRINCIPLE (OSP): An argument not realized as a direct argument can be realized as an oblique (marked by a compatible oblique marker).

For anything not realized as a direct argument, the OSP is a default lexicalization rule that allows that argument to be realized as an oblique, provided it is marked by an appropriate oblique marker (locative markers for locations, etc.). This effectively replicates Dowty’s COROLLARY 2. (It also opens the possibility that some arguments may *not* be realizable if no compatible oblique marker exists in the language. I set aside this possibility here, though see Beavers (2008).)

We can capture object/oblique alternations by capitalizing on the possibility that the lexical entailments that constitute the proto-patient role are not independent of one another as they are for Dowty or Ackerman and Moore. Rather, they are related to one another implicationally in a way that restrict their co-occurrence. For purposes of this sketch, I reject all of Dowty’s and Ackerman and Moore’s proposed proto-patient lexical entailments, and posit only the three in (58).

- (58) i. undergoes a *quantized* change
 ii. undergoes a *non-quantized* change
 iii. has *potential* for a change

However, these properties stand in implicational relationships to one another. This has the effect of restricting the space of logically possible combinations of properties (i.e. thematic roles) in a way that determines the subset hierarchy in (59). (For the sake of convenience I name each set by the name of its strongest lexical entailment, set in small caps.)

- (59) **Name:** QUANTIZED NON-QUANTIZED POTENTIAL UNSPECIFIED
Role: $\left\{ \begin{array}{l} \textit{quantized} \\ \textit{non-quantized} \\ \textit{potential} \end{array} \right\} \supset \left\{ \begin{array}{l} \textit{non-quantized} \\ \textit{potential} \end{array} \right\} \supset \{ \textit{potential} \} \supset \{ \}$

¹⁰Ackerman and Moore do give a few cases of subject/oblique alternations that they argue involve added lexical entailments, though I defer discussion to §5. Note that in differential object marking languages objects are marked for having normally agentive properties such as being human (Aissen 2003). Typically these properties are not thematic role properties (they do not relate the argument back to the event) so I set them aside for now.

The subset hierarchy in (59) is just a recasting of the Affectedness Hierarchy from lexical entailments into sets of lexical entailments, which is what the ASP is stated in terms of. What is important is that *only* these four roles are semantically contentful. The remaining four possible roles are all semantically vacuous since they are reducible to the possible roles above:

- (60) a. $\left\{ \begin{array}{l} \text{quantized} \\ \text{potential} \end{array} \right\}$ b. $\left\{ \begin{array}{l} \text{quantized} \\ \text{non-quantized} \end{array} \right\}$ c. $\{ \text{non-quantized} \}$ d. $\{ \text{quantized} \}$

In each case the role is ruled out because some lexical entailment not in the role is entailed by one that is. For example, since (60a) has the quantized change lexical entailment, it necessarily entails non-quantized change, so that this combination of lexical entailments is truth conditionally equivalent to the QUANTIZED role. The rest of the roles suffer from similar problems. Thus the implicational relationships between lexical entailments restricts the space of possible roles to just those in (59). To capture the alternation facts we simply need a principle that governs what happens when a particular argument of a verb can be realized either as a direct argument or as an oblique à la Ackerman and Moore’s PASP. This is restatement of the MAP in (62), which I reformulate in terms of minimal contrasts defined in (61) along a hierarchy such as the the Affectedness Hierarchy:

- (61) **Minimal Contrasts (version 1):** Q is minimally weaker than R ($Q \subset_M R$) on a hierarchy of possible roles iff $Q \subset R$ and there is no role P on the hierarchy such that $Q \subset P \subset R$.
- (62) **MORPHOSYNTACTIC ALIGNMENT PRINCIPLE (MAP) (FORMAL, VERSION 1):** When participant x may be realized as either a direct object or oblique complement of verb V , it bears role R as a direct object and role $Q \subset_M R$ as an oblique.

The MAP does not refer to particular thematic roles, only only the object/oblique contrast and some hierarchy of possible roles. Following the PASP of Ackerman and Moore (2001) the MAP is a constraint on possible polysemy: it predicts what possible argument structures a verb can have among the ones left open by the ASP. For example, we could assume there are two uses the verb *load* and two uses for *cut*, each with a different predicate argument structure (PAS):¹¹

- (63) Argument structures for *load/spray/cut/slice*:
- a. PAS < Subject Object Oblique_{with} >
- b. PAS < Subject Object Oblique_{on(to)/in(to)} >

The argument with the most proto-agent entailments is always the subject by the ASP. Of the two remaining arguments one is the object by the ASP and the other the oblique by the OSP in one variant and vice versa in the other. The MAP determines that the two possible argument structures in (63) can *only* have certain interpretations, relative to whatever thematic roles are appropriate for the particular verb class (QUANTIZED for *spray/load*, NON-QUANTIZED for *cut/slice*).

- (64) Realization options for *load/spray*:
- | | | | | | | |
|----|---------------|---|-------------|-----------|----------------------------------|---|
| a. | PAS | < | Subject | Object | Oblique _{with} | > |
| | Thematic Role | | PROTO-AGENT | QUANTIZED | NON-QUANTIZED | |
| b. | PAS | < | Subject | Object | Oblique _{on(to)/in(to)} | > |
| | Thematic Role | | PROTO-AGENT | QUANTIZED | NON-QUANTIZED | |

¹¹I stipulate the exact oblique markers (in this case the prepositions *with* vs. *into/onto*). Following the OSP the relevant oblique marker is constrained to be one that is semantically compatible, which in this case would mean causal intermediacy or location. Thus we may not need to stipulate this, though for expository purposes I do.

Realization options for *cut/slice*:

a.	PAS	<	Subject	Object	Oblique _{with}	>
	Thematic Role		PROTO-AGENT	NON-QUANTIZED	POTENTIAL	
b.	PAS	<	Subject	Object	Oblique _{on(to)/in(to)}	>
	Thematic Role		PROTO-AGENT	NON-QUANTIZED	POTENTIAL	

Similar analyses can be given for the conative. The MAP predicts that we should have no reversal of this pattern, i.e. there should be no polysemous verb where the alternating participant has *more* lexical entailments as an oblique than the corresponding object realization, and as far as I am aware this is indeed the case. Of course, nothing here predicts *which* verbs will lexicalize such polysemy. As noted in fn. 9 this is part and parcel of non-derivational analyses, since it is often unpredictable which verbs will show an alternation among a given verb class (though some subregularities do exist). What this analysis predicts is simply what polysemy will look like when it is lexicalized, crucially ruling out the unattested cases allowed by Dowty's and Ackerman and Moore's analyses by capitalizing on an a priori hierarchy of weakening truth conditions among lexical entailments, with minimal stipulations in the form-to-meaning mapping principle.

However, as alluded to in fn. 3, the MAP also makes a prediction that all alternations *must* show a contrast. However, some alternations do not, including some variants of the conative alternation:

(65) Act of consumption verbs (in the conative):

- a. Sandy gnawed/chewed her steak.
- b. Sandy gnawed/chewed at/on her steak.

(66) Verbs of removal (in the locative):

- a. John cleared the table of the dishes.
- b. John cleared the dishes off the table.

(67) *Blame* alternations:

- a. Kim blamed Sandy for her problems.
- b. Kim blamed her problems on Sandy.

To my ears, the two variants of each of these alternations are truth conditionally equivalent, though they certainly have different discourse uses. Thus we need to modify the MAP slightly to allow the possibility that a contrast may not ensue, primarily by changing \subset_M to \subseteq_M :

(68) **Minimal Contrasts (Final):** Q is minimally weaker than or equal to R ($Q \subseteq_M R$) on a hierarchy of possible roles iff $Q \subseteq R$ and there is no role P on the hierarchy such that $Q \subset P \subset R$.

(69) MORPHOSYNTACTIC ALIGNMENT PRINCIPLE (MAP) (FORMAL, VERSION 2): When participant x may be realized as either a direct or oblique argument of verb V , it bears role R in both variants or R as a direct argument and role $Q \subseteq_M R$ as an oblique.

This predicts that some alternations may show a contrast of weakening truth conditions, while others may not show a contrast at all. Again, since alternations reflect lexicalization (i.e. polysemy) we cannot *necessarily* predict what sort of contrast one will find with a particular verb (though presumably some subregularities may be found). But we can predict what contrast will exist if it is lexicalized, again an advantage of this approach. I turn in the next section to additional data which suggest that the MAP has applicability beyonds objects and beyond affectedness.

5. BEYOND OBJECT/OBLIQUE ALTERNATIONS. In this section I consider data on alternations other than object/oblique alternations and semantic domains other than affectedness, and demonstrate that the MAP can be generalized to govern all argument/oblique alternations. This discussion is tentative, since for reasons of space I cannot provide analyses of all of these alternations, but they provide further support for the MAP and the role of strength of truth conditions.

Before turning to other grammatical functions, I note a different type of object/oblique alternations that shows an holistic effect, namely traversal object alternations (Martin 1975; on English see Levin 1993, Wheeler 1996; Japanese, Kuno 1973). This is illustrated in (70).

- (70) a. I climbed the stairs. (All traversed)
 b. I climbed up the stairs. (\leq traversed)

Here the object variant has a reading in which all of the stairs were traversed, but the oblique variant allows some but not necessarily all of the stairs to be traversed, i.e. (70a) entails (70b). But the stairs are not affected in any sense, as shown by the failure of the *What happened to X is Y* test:

- (71) ??What happened to the stairs is John climbed them.

This suggests that we need a new proto-role lexical entailment of “total traversal”, where its presence/absence is governed by the MAP. However, introducing such a lexical entailment doubles the number of possible thematic roles as follows:

$$(72) \begin{array}{ccccccc} \left\{ \begin{array}{l} \textit{quantized} \\ \textit{non-quantized} \\ \textit{potential} \\ \textit{totally traversed} \end{array} \right\} & \supset & \left\{ \begin{array}{l} \textit{non-quantized} \\ \textit{potential} \\ \textit{totally traversed} \end{array} \right\} & \supset & \left\{ \begin{array}{l} \textit{potential} \\ \textit{totally traversed} \end{array} \right\} & \supset & \{ \textit{totally traversed} \} \\ \cup & & \cup & & \cup & & \cup \\ \left\{ \begin{array}{l} \textit{quantized} \\ \textit{non-quantized} \\ \textit{potential} \end{array} \right\} & \supset & \left\{ \begin{array}{l} \textit{non-quantized} \\ \textit{potential} \end{array} \right\} & \supset & \{ \textit{potential} \} & \supset & \{ \} \end{array}$$

While this is still compatible with the MAP, it predicts more types of alternations that we see, e.g. it also predicts alternations where affected paths either (a) become less affected in the oblique or (b) become less traversed in the oblique.

However, there is reason to think that “mixed” thematic roles, such as affected paths, are simply never assigned. Paths always co-occur with themes (since a theme is not a theme without a path to traverse and vice versa), and as shown in (71), it is the theme rather than the path that is affected:

- (73) What happened to the ball is it rolled down the hill.

Thus being a path and being affected are mutually exclusive: being affected means traversing some path, and being a path means being traversed. This results in a disjunctive notion of a proto-patient (patients and traversal objects), yielding only the following five possible roles:

$$(74) \begin{array}{ccccccc} & & & & & & \{ \textit{totally traversed} \} \\ & & & & & & \cup \\ \left\{ \begin{array}{l} \textit{quantized} \\ \textit{non-quantized} \\ \textit{potential} \end{array} \right\} & \supset & \left\{ \begin{array}{l} \textit{non-quantized} \\ \textit{potential} \end{array} \right\} & \supset & \{ \textit{potential} \} & \supset & \{ \} \end{array}$$

This is not unexpected on a proto-role approach, since no lexical entailment is necessary or sufficient for objecthood.

Turning away from objects, as noted in §1 the dative alternation involves a contrast between being a potential possessor vs. a goal, giving rise to the “Scotland Yard” reading.

- (75) a. Kim mailed/tossed *Mary/#London* a ball. (Only possessor “Scotland Yard” reading)
 b. Kim mailed/tossed a ball *to Mary/London*. (Goal or possessor reading)

Crucially, a possessor is an “affected” goal, i.e. a goal that also involves coming into possession (following Jackendoff 1990b). Thus we find an asymmetric entailment relation between the variants: (75a) entails (75b) but not conversely. Assuming a hierarchy of possible recipient/goal roles, we can generalize the MAP slightly to allow not just object/oblique alternations but direct/oblique complement alternations as well, covering both direct and indirect objects:¹²

- (76) MORPHOSYNTACTIC ALIGNMENT PRINCIPLE (MAP) (FORMAL, VERSION 3): When participant *x* may be realized as either a direct or oblique *complement* of verb *V*, it bears role *R* as a direct complement and role $Q \subseteq_M R$ as an oblique.

Subject/oblique alternations are harder to find (probably due to the fact that languages prefer unmarked DP subjects). However, there are some cases. First, there are reciprocal alternations with symmetric dynamic predicates (see Dowty 1991:583; see also Quang Phuc Dong 1970):

- (77) a. The truck and the car collided. (Truck and car in motion)
 b. The truck collided with the car. (Car not necessarily in motion)

When both participants are realized, conjoined, in subject position, it must be the case that both are in motion. When *the car*, however, is realized as an oblique marked by *with* it need not be in motion. This is demonstrated in the following:

- (78) a. The truck collided with the car, which was parked on the side of the road.
 b. The truck collided with the car, which was rolling down the hill.
 c. #The truck and the car collided while the car was standing still.

In (78a,b) the sentence is compatible with interpretations in which the car was or was not moving, but in (78c) the sentence is not compatible with contexts in which the car was not in motion. Thus (77a) entails (77b) but not conversely, supporting the MAP for the subject/oblique contrast.

Second, causees (demoted subjects) in derived causatives also sometimes show case alternations, frequently with a concomitant semantic contrast having to do with degree of manipulation by the causer (on Chicheŵa see Alsina 1992; French, Authier and Reed 1991; Hungarian, Hetzron 1976; Japanese, Shibatani 1973; Spanish, Beavers 2006a). For example, in French *faire* causatives of transitive verbs the causee is usually a dative DP or a dative clitic as in (79a,b). However, in some dialects of French causatives of transitives permit the causee to be realized as an accusative clitic as in (79c), with a corresponding change in meaning (Hyman and Zimmer 1976). As Baillard (1982) and Authier and Reed (1991) note, while the accusative clitic indicates forcible causation,

¹²Here is another difference between Ackerman and Moore’s approach and mine. The PASP makes crucial reference to proto-role lexical entailments. In general, a proto-role based analysis of subject/object selection (and thereby of subject/object vs. oblique contrasts) is warranted by the fact that neither of these two grammatical functions has any necessary or sufficient conditions associated with them (e.g. see Levin 1999 for an extensive list of the approximately 40 different roles a direct object in English can have). However, there is no evidence for a corresponding “proto-recipient” role for indirect objects of ditransitive verbs, since (as discussed in §1) there is a categorical constraint that any argument bearing this grammatical function have some type of possessor semantics associated with it (or perhaps more generally the subject of some kind of HAVE predicate as in Green 1974, encompassing both possession and benefactive/malefactive semantics). The MAP as currently stated makes no reference to proto-roles, but only to strength of truth conditions, which is orthogonal to proto-roles, thus making it preferable.

the dative clitic actually indicates an underspecification of the coerciveness of causation (for instance either forcible causation or something more permissive or subtly manipulative).¹³

- (79) a. *J'ai fait manger des épinards à Maurice.*
 I made eat spinach DAT Maurice
 'I made Maurice eat spinach.'
- b. *Je lui ai fait manger des épinards.*
 I him-DAT made eat spinach
 'I made/let him eat spinach.' (Coercive or non-coercive)
- c. *Je l' ai fait manger des épinards.*
 I him-ACC made eat spinach
 'I made him eat spinach.' (Coercive; French; Authier and Reed 1991:(1))

Thus the accusative version of (79c) entails the dative version in (79b) (i.e. it is compatible with a stricter set of contexts). This follows McCawley (1976), who argues that making someone do something entails having them do it and that non-coercive causatives such as *have* causatives in English can occur in coercive contexts:

- (80) The bandit took the passengers' money and then had them lie face down on the floor while his partner tied them up. (McCawley 1976:fn.2)

There is an alternative view on causees, proposed by Ackerman and Moore (1999, 2001). They argue that while there is underspecification of coercion in the oblique variant (which they label a type of affectedness), they also argue that the oblique is additionally specified for an agent property such as volitionality, something left unspecified (or perhaps contradicted outright) in the direct argument variants. They make this argument primarily on the basis of the Spanish data in (81). This data shows that while the predicate *hacer probarlo* 'make taste it' is compatible with both dative and accusative causee clitics, the dative clitic is apparently incompatible with a reading in which the causation was forced, while the accusative clitic is incompatible with a reading in which it was not forced, attributable to the assignment or negation of volitionality respectively. If this analysis holds, it suggests that the MAP may not be extended to causee alternations, which predicts weakening of truth conditions, not negation of truth conditions.¹⁴

- (81) a. *La/??le hice probarlo a la fuerza.*
 her.ACC/her.DAT made.1SG try/taste.INF-3SG by force
 'I made her try/taste it by force.'
- b. *Le/??la hice probarlo diciéndole que era riquísimo.*
 her.DAT/her.ACC made.1SG try/taste.INF-3SG telling-3SG.DAT that was.IMPF
 delicious.
 'I had her try/taste it by telling her it was delicious.'
 (Spanish; Ackerman and Moore 1999:23, (28), citing Strozer 1976:6.90)

¹³While I have found several French speakers who have confirmed the judgments in (79b), I have yet to find one who speaks a dialect in which (79c) is grammatical.

¹⁴Not all dialects of Spanish allow an accusative clitic with a causativized transitive verb. It is not clear what the judgments for speakers of these dialects would be regarding coercion, though presumably, as in many other languages, the dative realization would allow both readings.

However, while it may *typically* be the case that direct argument causees are used for non-volitional contexts and oblique causees are used in volitional contexts, this is not a requirement. In fact, in the same sort of coercive context as McCawley’s example in (80), *hacer probarlo* with a dative clitic is acceptable to my informants:¹⁵

- (82) *Los bandidos violentos le hicieron probar su propia sangre*
 The bandits violent 3SG.DAT made.3PL try/taste.INF 3SG.POSS own blood
 (*a la fuerza*).
 (by force)

‘The violent bandits had her taste her own blood by force.’

This suggests that it is not necessarily the case that there is a lexical entailment of *volitionality* present with the dative absent with the accusative. In as much as the judgments in (81) are correct, the reading in (81a) perhaps arises because the accusative version is inherently non-volitional (being forced causation) and thus the dative is the only way to realize a volitional causee, giving rise to an implicature but crucially not an entailment of volitionality.

A third type of subject/oblique alternations are nominative/dative alternations such as those found in Slavic and Indo-Aryan languages (Moore and Perlmutter 2000). In such alternations the contrast has to do roughly with volitionality. Nominative realizations indicate volitional causers, whereas datives (though frequently used to indicate non-volitionality) are generally unspecified for volitionality. This is shown in the following example from Marathi (Ashwini Deo, p.c.), where (83a) indicates working to understand a poem, and (83b) is unspecified between volitional or accidental readings. The fact that both are compatible with volitional readings is shown by their acceptability with a volitional modifier meaning *with much effort*.

- (83) a. *mi (khup kashta gheun) kavita samajlo*
 I.NOM.MSG much effort taking poem-NOM.FSG understand-PERF.MSG
 ‘I understood the poem (with much effort).’ (volitional)
- b. *malā (khup kashta gheun) kavita samajli*
 I.DAT much effort taking poem-NOM.FSG understand-PERF.FSG
 ‘I came to understood the poem (with much effort).’ (volitional or non-volitional)

Again, there is an entailment relation: deliberately causing something to happen entails something just happening, so that (83a) entails (83b) but not conversely. This suggests that in general nominative/dative contrasts are about the non-specification of volitionality. However, (Ackerman and Moore 2001:152, (16)) give the following Polish example, where a nominative subject is compatible with volitional modifiers, but when the subject is made dative (and the verb is marked with a reflexive morpheme), it is no longer compatible with such modifiers:

- (84) a. *Janek czytał tę książkę dobrowolnie/celowo/chętnie.*
 John-NOM read-MASC the book voluntarily/on purpose/willingly
 ‘John read the book voluntarily/on purpose/willingly.’
- b. **Janekowi czytało się tę książkę dobrowolnie/celowo/chętnie.*
 John-NOM read-NEUT RFLX the book voluntarily/on purpose/willingly

¹⁵In addition, none of the native speakers I have consulted about (81a) agree with these judgments, and instead find *le dice probarlo* acceptable in coerced contexts (such as the one in (82)).

This suggests that datives in Polish are specified for non-volitionality, not a contrast predicted by the MAP. However, the degree to which (84b) is excluded may be in its direct contrast with (84a), where Gricean maxims would dictate using the stronger (and less marked) form if that is the intended reading, though I have not been able to test this claim as yet.¹⁶ Thus while more work is needed on both causee and nominative/dative subject alternations, the preceding data is suggestive of the MAP applying to subjects as well, so that we can generalize it from being about direct/oblique complements to all direct/oblique contrasts:

- (85) MORPHOSYNTACTIC ALIGNMENT PRINCIPLE (MAP) (FORMAL, FINAL): When participant x may be realized as either a direct or oblique *argument* of verb V , it bears role R as a direct argument and role $Q \subseteq_M R$ as an oblique.

This is of course not to say that the variants in any alternation are interchangeable when the relevant lexical entailments doesn't matter. For example, although oblique variants are acceptable in contexts where the stronger truth conditions hold, Gricean maxims would typically dictate using the strongest variant of an alternation when possible, so that in actual discourse the two variants of any alternation would have quite different uses and perhaps different implications. The point is simply that all else being equal the weaker variants are compatible with all the same contexts as the stronger variants, plus more, something that goes beyond just object/oblique alternations.

6. CONCLUSION - PROMINENCE PRESERVATION AND CO-ARGUMENTS REVISITED. In this section I take stock of the proposal here. The contrasts found in argument/oblique alternations are not motivated by subevent structure, aspectual composition, types of subevents, or pragmatics. Rather, the relevant contrast has to do with strength of the truth conditions associated with direct argument variants over corresponding oblique variants. But how principled is this? By rejecting decompositions in our analysis we have dispensed with prominence preservation. While nothing compels us to maintain a notion of prominence preservation, the degree to which a principle of that generality holds in the mapping from lexical semantics to syntax we can feel confident that the specific generalizations are not ad hoc. I argue here that we can indeed maintain prominence preservation on my approach, and furthermore I suggest that my approach is compatible with a certain degree of decompositional semantics in a way that fills gaps left by both approaches.

First and foremost, the MAP itself is a prominence preservation principle, albeit one that has two features that make it distinct from the prominence preservation associated with decompositions. First, recall the morphosyntactic prominence hierarchies in (3), repeated here:

- | | | | |
|------|------------------------|-----------------------------|----------------------------------|
| (86) | Case Markedness | NP-Accessibility | Configuration (C-command) |
| | Nom > Acc > Dat > Obl | SU > DO > IO > OBL | SU > IO > DO > OBL |
| | (cf. Croft 2003:142ff) | (Keenan and Comrie 1977:66) | (Chomsky 1981) |

While in decompositions relative prominence along these hierarchies is computed between co-arguments within a clause, on my approach it is computed between different realizations of the *same argument across clauses*. For example, in the dative alternation the comparison vis à vis the MAP is not between the theme and the recipient in each variant, but rather between different realizations of the recipient across variants, regardless of how the theme is realized. Thus we can view

¹⁶Furthermore, in their analysis of Polish and Marathi (but not Hindi), Ackerman and Moore (2006:Ch. 6) also attribute an additional proto-patient lexical entailment of causally affected (Dowty 1991:572, (28)) for the oblique not present for the direct argument, contra the MAP. However, in no case do they provide a linguistic argument for such a lexical entailment and I see no particular reason to assume one.

morphosyntactic prominence shifts via the MAP not as rerankings of co-arguments but simply as a choice about how prominent to make a particular argument in the clause relative only to other possible ways of realizing that same argument. (I return to the issue of co-arguments below.)

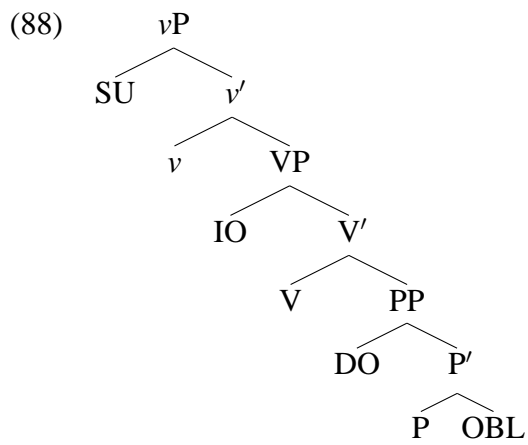
Second, and more importantly, the notion of semantic prominence encoded in the MAP is one of strength of truth conditions. An argument is more semantically prominent if it has a stronger set of truth conditions associated with it. Unlike decompositional semantics, this has nothing to do with the structure of how these truth conditions are represented. It has to do with their actual meanings, thus explaining why we see certain alternations and not others. For example, we find dative alternations because possession (HAVE) is just a more specific version of change-of-location (GO TO), something not predicted on decompositional approaches. Furthermore, strength of truth conditions follows from the inherent entailment relations between variants. In other words, a hierarchy like the Affectedness Hierarchy is *independently defined*, following from the a priori meanings of the variants in the alternation, not from how these meanings are represented structurally.

Thus the MAP *is* a prominence preservation principle, defined in terms of a notion of semantic prominence and a way of computing morphosyntactic prominence that are distinct from those in decompositions, but no less predictable.

(87)		Semantic prominence	Morphosyntactic prominence
	Decompositions	Place in decomposition	Prominence over co-arguments
	MAP	Strength of truth conditions	Prominence over alternative realizations

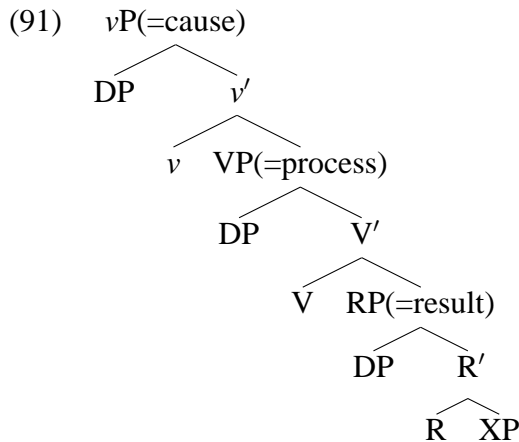
But without comparing co-arguments, how do we capture the co-argument rerankings that occur in some argument/oblique alternations such as the dative and locative alternations? Can we have syntactic reranking without semantic reranking? I believe that we can, and sketch an outline here.

Suppose that the prominence hierarchies in (86) exist *independent* of lexical semantics as ways of telling arguments apart (Aissen 2003). For example, focusing on c-command relations, suppose there is a basic clause structure such as the one in (88) that determines four primary grammatical functions that stand in asymmetric c-command relationships. This is exactly the proposal encapsulated in work on high/low applicative (Pylkkänen 2000), where argument positions reflect underlying applicative heads at different heights in syntactic structure. In fact, the structure in (88) is effectively the one proposed by Miyagawa and Tsujioka (2004) for Japanese ditransitives.



Given an independently defined notion of c-command relationships, it is obvious that co-argument prominence shifts can arise *even though* argument/alternations only affect one argument semantically. This is because alternations between certain positions in (88) can change c-command relations with non-alternating arguments.

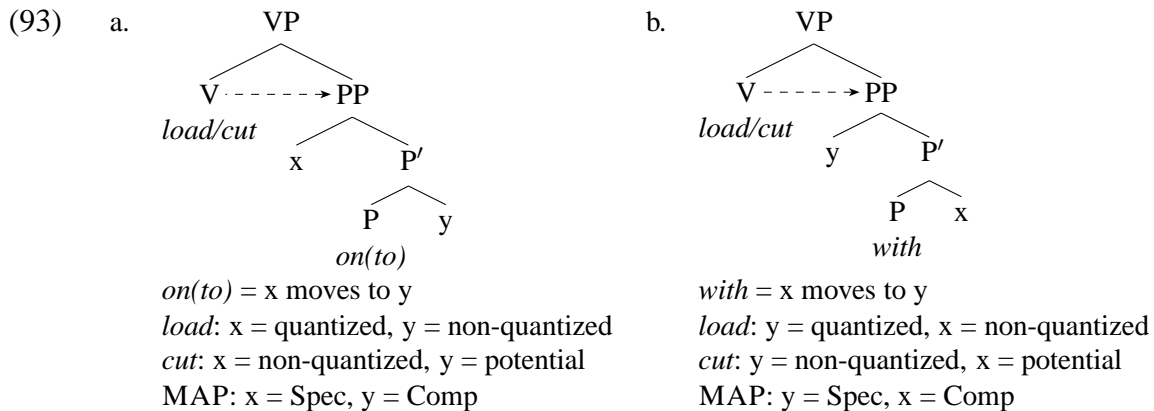
Indeed, the data discussed in this paper has focused on what happens below CAUSE, i.e. in decompositional terms object/oblique and dative alternations are about the internal structure of ψ , while subject/oblique alternations are about the internal structure of ϕ . On these grounds we might try to reintroduce at least causal structure into syntactic structure, for example to motivate (88) in terms of the flow of causation as in (91), following Ramchand (2002) (see also Croft 1990, 1991, 1998).



So the question is simply whether lexical entailment-based and decompositional views of argument realization are compatible. I suggest that they are, wherein we can assume that the gross breakdown of a clause may follow roughly causal lines, while the MAP and strength of lexical entailments helps explain what happens in the subevents that form the causal relationship. In particular, although I have presented the MAP as a constraint on possible lexemes, we could alternatively view it as a constraint on possible inventories of primitive decompositional predicates:

- (92) MORPHOSYNTACTIC ALIGNMENT PRINCIPLE (FOR DECOMPOSITIONS): For roughly synonymous predicates P_1 and P_2 which assign an argument x roles Φ_{P_1} and Φ_{P_2} respectively, if $\Phi_{P_2} \subseteq_M \Phi_{P_1}$ then x is the specifier of P_1 and complement of P_2 .

This predicts that any two inherently synonymous primitive predicates have argument structures that do not violate the MAP. For example, Hale and Keyser's (2002) *with* and *on(to)* are suppletive pair that encode co-location but differ in argument structure (one's Comp is the other's Spec and vice versa). When combined with particular verbs the verb overlays on top of this how much effect (if any) there is (Gawron 1986, Wechsler 1995, Beavers 2006a, 2008), corresponding to the MAP:



Thus P determines the basic spatial relation, V overlays specific thematic role information, and the MAP determines the rest of the contrast (note that this does require at least a partly lexicalist

ϕ] event structure. Conversely, causal decomposition fills a gap in the model presented here: it makes predictions about causer/non-causer (i.e. subject/non-subject) asymmetries that seem fairly consistent across languages. The upshot of both approaches is summarized as follows:

(97)	Semantics	Morphosyntax
Decompositions	Gross causal structure	Subject/non-subject asymmetries
MAP	Fine-grained lexical entailments	Argument/oblique shifts

In this way it is possible to overlay the two types, filling in gaps in the application of the other. But crucial in this is that the lexical semantics of a verb must consist at least partly in a network of lexical entailments of varying degrees of specificity. These lexical entailments stand in implicational relationships to one another such as the Affectedness Hierarchy, and these implicational relationships form a type of semantic structure that can do some of the same work as decompositional structure in defining a notion of semantic prominence, but does so in a way that follows from the meaning of the the clauses rather than how those meanings are structured. Thus semantic prominence is more than embeddedness in event structure. It also includes strength of truth conditions, capturing broad generalizations about argument alternations that are difficult to capture otherwise.

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